Grasses of Mali

Kamal M. Ibrahim,
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ABSTRACT

Ibrahim, Kamal M., Shruti Dube, Paul M. Peterson, and Hasnaa A. Hosni. Grasses of Mali. *Smithsonian Contributions to Botany*, Number 108, x + 146 pages, 208 figures, 2018. — A vegetative key, descriptions, and illustrations for the identification of 199 native and naturalized grasses that occur in Mali are presented. In addition, we provide a modern classification, glossary of terms, and indexes to scientific and common names. The key is based on vegetative characters to allow identification of specimens that do not have flowering structures (inflorescences and spikelets). Two new combinations are made, *Urochloa orthostachys* and *Urochloa stigmatisata*, and we lectotypify *Panicum orthostachys*.

Cover images, from left to right: *Phragmites karka* inflorescence (Figure 149C); *Sorghastrum stipoides* inflorescence (Figure 170C); *Cenchrus biflorus* spikelet (Figure 41C); *Triphogonella minima* habit (Figure 192A); *Oxytenanthera abyssinica* ligule, sheath apex, and leaf blade (Figure 137B); *Loudetiopsis kerstingii* inflorescence (Figure 127C); *Ctenium villosum* inflorescence (Figure 59C).
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INTRODUCTION

Three hundred years before the Christian era, Theophrastus, a Greek scholar, recognized the grass family. The first scientific subdivision of the family was made by Brown (1814), who recognized two different spikelet types between the Panicoideae and Pooidae (Festucoideae) subfamilies. Bentham (1881) recognized 13 tribes in two major subfamilies. This classification using two subfamilies was adopted by most agrostologists for almost 150 years until more modern syntheses. With the infusion of molecular data, the present concept and classification of the grasses is changing at a rapid rate. We follow the grass classification presented in Soreng et al. (2017a, 2017b) and Peterson et al. (2017), which consists of ±11,506 species in 768 genera found in 12 subfamilies, 52 tribes, and 94 subtribes. We provide a synopsis of the classification for all grass genera that occur in Mali.

The most accurate way to identify grasses is to use floral characteristics. However, it is often necessary to identify grasses without having mature plants or only portions of those plants without complete spikelets. Under such conditions conventional botanical manuals offer little assistance. Moreover, identification using floral characteristics requires special training in grass taxonomy that is not available to most agronomists, technical field staff, and/or interested amateurs. Vegetative characters can be used for plant identification until a flowering specimen is obtained for positive verification. Vegetative structures of the grasses are easily visible and do not require any tool except a pocket hand lens (10−14×). Some vegetative characters are not particularly constant, so it is important to use characters that are less mutable and subject to environmental influences.

A common name often can help collectors and field officers tentatively identify a grass, particularly when local people have used a common name to describe a grass. Any given species may have one or more common names. Two or more grass species may have the same common name, and some species have no common name. Extensive local names are reported in Poilecot (1995, 1999) in several languages used in western Africa.

This publication presents a key, available Mali and English common names, descriptions, illustrations, and a glossary for the identification of 199 native and naturalized grasses that occur in Mali. Indexes to the common and scientific names are also included. This list of species is primarily based on the Kew list of the grasses of Mali, which has been updated. We have consulted many taxonomic treatments during the preparation of this work; most notable are Bogdan (1977), Clayton (1970a, 1970b), Clayton and Renvoize (1982), Clayton et al. (1974, 2006), Cope (1999, 2005), Freckman and Le-long (2003), Hatch (2003), Hilu (2003), Hitchcock (1951), Ibrahim and Kabuye (1988),
The descriptions of each species are presented in alphabetical order. We use the accepted species names in the *Catalogue of New World Grasses* (Soreng et al., 2017a) and consulted Quattrocchi (2006) and the U.S. Department of Agriculture–Natural Resources Conservation Service PLANTS Database to prepare the list of common names. We follow a worldwide generic classification based principally on molecular DNA sequence studies (Soreng et al., 2017b). Vegetative characteristics are used to construct the key for identification. Diagrammatic illustrations are used to emphasize the structural characteristics.

**Morphological Characters**

The common grass habit for most species is an upright, cylindrical, rarely compressed culm (stem) anchored in the soil by adventitious roots (Figure 1). The culm consists of nodes and

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**FIGURE 1.** General morphology. A. Culm. B. Rhizome and stolon. C. Sheath, ligule, and blade.
internodes with leaves distichously arising from the nodes. The inflorescence usually comprises numerous spikelets that are composed of one or more florets that contain the flower parts (pistil and stamens). The general morphology of a grass is shown in detail in Figures 1–8.

**Roots.** The luxuriant fibrous root system anchors the growing grass plant and comprises adventitious roots originating from the lower culm nodes (Figure 2). In some grasses additional prop roots emerge from the lower culm nodes just above ground level. Most grasses with geniculate culms root at the lower nodes.

**Rhizomes.** A rhizome is a more or less horizontal underground stem whose leaves are reduced to scales. Eventually it emerges above the ground surface to form a new flowering shoot or culm.

**Stolons.** A stolon is a trailing or reclining, aboveground stem that produces roots and flowering shoots from its nodes.

**Culms.** The grass stem is known as a culm (Figure 1) and consists of a series of internodes and nodes. The internodes at the base of a culm are very short, whereas in the upper portion of a culm they extend to a considerable length. Internodes are

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usually hollow but sometimes are solid, as in *Saccharum*, or filled with white pith, as in *Sorghum*. The plant height varies considerably based on the stage of growth, environmental conditions, and the species genetic makeup. Culms are mostly glabrous, particularly the sections enveloped by the leaf sheaths. Nodes vary, and in some species they are hairy, whereas in others they are glabrous.

Branching is from the buds situated below the leaf sheath at the nodes. Branching usually occurs at basal nodes only, or from basal, middle, and upper nodes. If the shoot initial remains within the sheath that envelopes the node, the branching is intravaginal. If the shoot initial grows laterally in a manner that ruptures the enveloping sheath, the branching habit is extravaginal. Branches from the base of the plant are known as tillers.

**Leaves.** A grass leaf is divided into the following parts: the leaf sheath (at the base) and the blade, also known as the lamina.

**Sheaths.** The leaf sheath originates at a node and protects the growing zone of the internode and structurally strengthens the culm. Sheaths are usually open and sometimes split with overlapping margins, or sheaths are closed with margins fused for all or part of their length. The sheath may be compressed or round, or occasionally keeled at the midrib. In some species, sheaths are longer than the blades, and in a few species they are longer than the adjacent internodes. Usually sheaths are of a paler shade of green than the blades and often are tinged with pink or purple at the base. They also are tinted with darker color near the blades. The tints are not consistent enough to be of much value in identification. Presence or absence of hairs on the sheath margins, surface, and the junction with the blade is an important characteristic for use in the identification (Figure 3).

**Auricles.** An auricle is an appendage that projects from each side of the collar that marks the division between the sheath and blade. Auricles may be horizontally clawed, rudimentary, or fully or slightly rounded. Most species do not possess auricles (Figure 3).
LIGULES. A ligule is a tissue clasping the stem or bud shoots inside the leaf at the junction of the blade and sheath on the adaxial (adjacent) surface. Ligules are usually present, and they may be simply a fringe of hairs, membranous or hyaline, ciliolate or ciliate membrane, or absent. The length of ligules may vary within a species (Figure 4). The shape and margin are usually quite constant, and they provide reliable distinguishing characteristics for identification.

COLLARS. The collar is found at the junction between the blade and the sheath (Figure 3). It may be vertically broad or narrow, continuous, or divided by a midrib. If the collar extends diagonally it is referred to as oblique. Collars are usually smooth but may be hairy over the whole surface or only on the inner and lowermost portion of the margin. Collars are usually green or yellowish-green and may be tinged with yellow or red.

BLADES. The blade or lamina is the upper portion of the leaf above the collar, ligule, and auricle. There is considerable variation in the length and the width of the blades and the ratio between these two characteristics is useful for identification (Figures 5, 6). Blades are usually linear to lanceolate, but in some species blades are filiform or ovate. There is a great deal of variation among species in the shape of the blade apex and base and hairiness of the upper and lower surfaces and margins. Blade venation is usually parallel, although sometimes there

FIGURE 4. Ligule types, shapes, and margins.
are evident cross veins. Frequently, there are considerable differences between blades from the upper and lower parts of the same plant and between blades taken from different plants of the same species.

**Reproductive Structures.** The spikelet is the characteristic floral structure in grasses. In most of the grass species, the inflorescence comprises numerous spikelets that are aligned in different sequences. In this study, the different types of inflorescences, spikelet shapes, and awn types are included. In the vegetative key no reference is made to the detailed spikelet parts.

**Inflorescences.** Different inflorescence types are distinguished by the presence or absence of pedicels and the branching of the main axis. Aside from the basic forms of a spike, raceme, and panicle, there are many subtypes (Figures 7, 8).

**Spikes.** In a spike, the spikelets are attached directly (sessile) to the unbranched main axis without pedicels. Most members of the tribe Triticeae have this type of inflorescence.

**Racemes.** A raceme is an unbranched inflorescence with each spikelet borne on a single pedicel directly on the axis. This type of inflorescence is rare in the grasses, but there are many species in which more than one raceme is found in the inflorescence; this arrangement is then technically referred to as a panicle.

**Panicles.** An inflorescence in which the main axis has several lateral, whorled, or individual indeterminate branches, each branch terminating in a pedicellate spikelet. A true panicle does not have any leaf sheaths within the inflorescence. A rame is a compound inflorescence in the tribe Andropogoneae consisting
of one to many units (branches) of one sessile and one or two pedicellate spikelets. This arrangement is typical of the Andropogoneae, and in many of the older published floras was referred to as “racemes.”

**Vegetation**

The five major vegetation zones in Mali are depicted on a vegetation map (Figure 9). The desert zone in northern Mali has very little vegetation because it lies in the Sahara Desert, which has scant rainfall. Grasses dominate the semidesert, steppe, and brush-grass savannah zones, especially *Cenchrus biflorus*. A global land cover map of Mali indicates 29,737 ha of open to sparse grassland and shrubland, 749 ha of woodland or deciduous forest, 23,508 ha of agriculture, 70,631 ha of bare soil, and only 66 ha of wetlands (Mayaux et al., 2004).

**Identification**

**Descriptions.** The grass descriptions were recorded from plant specimens at the United States National Herbarium (US), Department of Botany, National Museum of Natural History, Smithsonian Institution; the Cairo University Herbarium (CAI); and a few specimens on loan from Royal Botanical Gardens, Kew (K), United Kingdom. Information from these specimens was verified with the descriptions of species reported in the references. Each description includes the complete scientific name (with authorities and place of publication) and
common name(s), if known. Introduced species are marked with an asterisk (*), and native species are unmarked.

**Illustrations.** Plant illustrations used in this study were drawn from herbarium plant specimens and verified against illustrations appearing in several references. Several illustrations were redrawn from Ibrahim and Kabuye (1988) after observing Bogdan’s plant collection at the National Agriculture Research Station (NARS), Kitale, Kenya, in 1985.

Because this publication deals only with grasses, it is necessary to differentiate between true grasses and other grasslike species, which can be confused in natural conditions. True grasses belong to the grass family *Poaceae* and not the sedge family (*Cyperaceae*) or the rush family (*Juncaceae*). Their leaves are two-ranked and arise at solid conspicuous nodes along hollow stems (culms), which are circular in cross section. A leaf comprises a blade and a sheath surrounding the culm and open down the side in most cases to the base. Commonly, the top of the sheath has a membranous projection (ligule) pressed against the culm. Sometimes the ligule is represented by a fringe of hairs or a shallow rim. In other cases, it is absent. In contrast to grasses, the majority of sedges have solid stems that are mostly triangular in cross section. The base of the leaf usually forms a closed sheath.

![Inflorescence types](image-url)
around the stem, and there is no ligule. However, sometimes there is a projection at the top of the sheath, opposite the leaf blade, instead of between the blade and the culm as with grass species. Rushes have solid stems and are usually round in cross section, and the nodes are indistinct. The leaves of rushes are usually three-ranked and usually not stiff, ligules are absent or weakly developed, and auricles are absent.

**Keys.** Because we are dealing with 199 grasses in Mali, the keys have been constructed to make use of easily visible characteristics. The only additional aids necessary are a short metric scale graduated in millimeters and a hand lens with a magnification of 10–14x. The identification key is composed of two parts: a key to major groups and then keys to each group. Although many readers are familiar with the use of a dichotomous key, a note on how to use one seems appropriate here. The key contains a series of two contrasting statements. Start with the beginning of the key and read both groups of characteristics in couplet 1. Then decide which group fits the specimen best and note the number following the group. Proceed to the couplet with that number and repeat the process. Read each half of every couplet carefully before deciding which description best fits the specimen. Following this pattern, you will arrive at the stop in the key.

**FIGURE 8.** Inflorescence and spikelet characteristics: a. spikelet; b. lemma; c. upper glume; d. lower glume; e. pedicel; f. palea; g. anther; h. stigma; i. filament; j. ovary; k. lodicule; l. grain; m. rachilla; n. awn; o. raceme; p. peduncle; q. spatheole; r. spathe; s. single straight awn; t. single geniculated awn; u. twisted divided awn.
where a species name appears at the end of a half couplet. Turn to the text for a description and illustration of the species, which are arranged alphabetically. In using the key you may need to refer to the glossary, which immediately follows the descriptions.

**Synopsis**

The following list is a synopsis of the classification of the genera into subfamily, tribe, and subtribe for the grasses of Mali.

Subfamily Aristidoideae
- Tribe Aristideae: *Aristida, Stipagrostis*

Subfamily Arundinoideae
- Tribe Molinieae
  - Subtribe Crinipinae: *Elytrophorus*
  - Subtribe Molininae: *Phragmites*

Subfamily Bambusoideae
- Tribe Bambuseae
  - Subtribe Bambusinae: *Bambusa, Oxytenanthera*

Subfamily Chloridoideae
- Tribe Cynodontae
  - Subtribe Cteniinae: *Ctenium*
  - Subtribe Dactylocteniinae: *Acrachne, Dactyloctenium*
  - Subtribe Eleusininae: *Chloris, Chrysochloa, Coelachyrum, Cynodon, Dinebra, Eleusine, Micrachne, Microchloa, Schoenefeldia, Staffochloa, Tetrapogon*
  - Subtribe Hubbardochloinae: *Leptothrium*
  - Subtribe Tripogoninae: *Oropetium, Tripogonella*
  - Subtribe Traginae: *Tragus*

Subfamily Eragrostideae
- Tribe Eragrostideae
  - Subtribe Cotteinae: *Enneapogon*
  - Subtribe Eragrostidinae: *Eragrostis*

Tribe Zoysieae
- Subtribe Cobineae: *Acroceras, Alloteropsis, Echinochloa, Opismenus*
- Subtribe Cenchrinae: *Cenchrus, Setaria*
- Subtribe Eriochloineae: *Eriochloa, Tricholaena, Urochloa*
- Subtribe Panicineae: *Panicum*

Subfamily Panicoideae
- Tribe Arundinelleae: *Arundinella*
- Tribe Paniceae: *Sacciolepis, Trichanthesium*
- Tribe Andropogoneae: *Chrysopogon, Sehima*
- Subtribe Anthephorinae: *Anthephora, Digitaria*
- Subtribe Boivellinae: *Anadelphia, Andropogon, Cymbopogon, Dichanthium, Diectomis, Dieteropogon, Elymandra, Hyparrhenia, Hyperthelia, Parahyparrhenia, Schizachyrium, Themeda*
- Subtribe Arthraxoninae: *Arthraxon*
- Subtribe Cocineae: *Cox*
- Subtribe Ischaeminae: *Ischaemum*
- Subtribe Rottboellinae: *Hackelochloa, Hemarthria, Lasurus, Rottboellia*
- Subtribe Saccharinae: *Eclastia, Imperata, Sorghastrum, Sorghum*
- Subtribe Tripsacinae: *Elionurus, Rhytachne, Urelytrum, Vossia, Zia*

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Vegetative Key to the Grasses of Mali

1a. Culms bamboo, woody or reedlike .......................................................... Group 1
1b. Culms not bamboo, woody or reedlike ............................................................ 2
2a. Plants mat forming ............................................................................. Group 2
2b. Plants not mat forming ........................................................................ 3
3a. Auricles present ........................................................................ Group 3
3b. Auricles not present ........................................................................... 4
4a. Stolons present ........................................................................... Group 4
4b. Stolons absent ............................................................................... 5
5a. Leaf blade margins cartilaginous ............................................................. Group 5
5b. Leaf blade margins not cartilaginous ........................................................ 6
6a. Leaf blade bases cordate or amplexicaul ................................................... Group 6
6b. Leaf blade bases not cordate or amplexicaul ................................................ 7
7a. Leaf blade apices abruptly acute ............................................................ Group 7
7b. Leaf blade apices not abruptly acute ........................................................... 8
8a. Leaf blade apices obtuse .................................................................... Group 8
8b. Leaf blade apices not obtuse ................................................................. 9
9a. Leaf blade bases narrower than sheath apex ................................................ 10
9b. Leaf blade bases not narrower than sheath apex ........................................... 10
10a. Culms wiry ............................................................................ Group 10
10b. Culms not wiry ........................................................................... 11
11a. Rhizomes present ........................................................................ Group 11
11b. Rhizomes absent .......................................................................... 12
12a. Culm nodes hairy ...................................................................... Group 12
12b. Culm nodes not hairy ................................................................... 13
13a. Culm lower nodes rooting ................................................................. Group 13
13b. Culm lower nodes not rooting .............................................................. 14
14a. Oral hair ciliate ........................................................................ Group 14
14b. Oral hair not ciliate ....................................................................... 15
15a. Leaf blade apices attenuate or filiform ................................................... Group 15
15b. Leaf blade apices not attenuate or filiform ............................................... 16
16a. Leaf blade midrib conspicuous .............................................................. Group 16
16b. Leaf blade midrib not conspicuous ........................................................ 17
17a. Ligules a fringe of hairs ................................................................ Group 17
17b. Ligules not a fringe of hairs ................................................................. 18
18a. Ligules eciliate membrane ................................................................ Group 18
18b. Ligules ciliate membrane ................................................................... 19
GROUP 1. CULMS BAMBOO, WOODY OR REEDLIKE

1a. Bamboo ................................................................. 2
1b. Not bamboo .......................................................... 3
2a. Auricles present ................................................... (30) Bambusa vulgaris
2b. Auricles absent ..................................................... (28) Oxytenanthera abyssinica
3a. Culms reedlike ...................................................... 4
3b. Culms woody not reedlike ....................................... 7
4a. Ligules ciliate membrane ........................................ 5
4b. Ligules not ciliate membrane ................................... 6
5a. Ligules eciliate membrane ....................................... (51) Cymbopogon caesius
5b. Ligules a fringe of hairs ......................................... 6
6a. Rhizomes present .................................................. (77) Echinochloa pyramidalis
6b. Rhizomes absent ................................................... (115) Loudetia phragmitoides
7a. Lower nodes rooting .............................................. 8
7b. Lower nodes not rooting ......................................... 8
8a. Leaf blades coriaceous, stiff, apex pungent ............... (136) Panicum turgidum
8b. Leaf blades soft, apex not pungent ........................... (25) Aristida sieberiana

GROUP 2. MAT FORMING

1a. Leaf blades lanceolate/ovate ................................... (27) Arthronax lancifolius
1b. Leaf blades linear .................................................. 2
2a. Leaf blades convolute, apex pungent ....................... (170) Sporobolus spicatus
2b. Leaf blades conduplicate or flat surface, apex not pungent ........................................... 3
3a. Culms spongy ....................................................... (198) Vossia cuspidata
3b. Culms not spongy .................................................. 4
4a. Ligules a fringe of hairs .......................................... (157) Setaria geminata
4b. Ligules not a fringe of hairs .................................... 5
5a. Ligules eciliate or ciliolate membranes .................... 6
5b. Ligules not ciliate or ciliolate membranes ................. 7
6a. Rhizomes present .................................................. (53) Cynodon dactylon
6b. Rhizomes absent ................................................... (54) Dactyloctenium aegyptium
7a. Culms lower nodes rooting .................................... (139) Paspalum scrobiculatum
7b. Culms lower nodes not rooting ............................... 8
8a. Ligules apices acute, leaf blades flat linear .............. (69) Digitaria longiflora
8b. Ligules apices erose, leaf blades involute ................. (122) Oropetium aristatum

GROUP 3. AURICLE PRESENT

1a. Leaf blade bases with false petiole ......................... (126) Oryza longistaminata
1b. Leaf blade bases without false petiole ..................... 2
2a. Culms lower nodes rooting .................................... 3
2b. Culms lower nodes not rooting .............................. 4
3a. Culms spongy ....................................................... (124) Oryza barthii
3b. Culms not spongy .................................................. (125) Oryza brachyantha
4a. Ligules acute or acuminate ................................... (127) Oryza sativa
4b. Ligules not acute or acuminate ............................. 5
5a. Leaf blades chartaceous, plicated ......................... (185) Triticum aestivum
5b. Leaf blades not chartaceous, plicated ..................... 6
6a. Rhizomes present, short ....................................... (105) Hyparrhenia cyanescens
6b. Rhizomes absent .................................................. 7
7a. Oral hairs ciliate ................................................... (7) Andropogon canaliculatus
7b. Oral hairs lacking ................................................. 8
8a. Auricles continuous with ligules ............................ (138) Parahypharrhenia annua
8b. Auricles not continuous with ligules .................................................. 9
9a. Leaf blade bases tapering toward midrib .................................................. (8) Andropogon chevalieri
9b. Leaf blade bases not tapering toward midrib ........................................... 10
10a. Leaf blade margins glabrous ............................................................... (108) Hyperthelia dissoluta
10b. Leaf blade margins scabrous ............................................................... 11
11a. Ligules erose, leaf blade apices filiform ................................................... (13) Andropogon pseudapricus
11b. Ligules lacerate, leaf blade apices acute ................................................ (12) Andropogon perforigulatus

GROUP 4. STOLONS PRESENT
1a. Rhizomes present, elongated ............................................................... (134) Panicum repens
1b. Rhizomes absent ................................................................................. 2
2a. Leaf blade surfaces and margins hairy ................................................. (191) Urocloa mutica
2b. Leaf blade surfaces and margins not hairy ........................................... 3
3a. Culms prostrate .................................................................................. (104) Hemarthria altissima
3b. Culms not prostrate ............................................................................. 4
4a. Ligules eciliate membranes ................................................................ 5
4b. Ligules not eciliate membranes ............................................................. 6
5a. Ligules lacerate .................................................................................... (55) Dichanthium annulatum
5b. Ligules acute ....................................................................................... (70) Digitaria nuda
6a. Ligules ciliate membranes .................................................................. 7
6b. Ligules a fringe of hairs ................................................................. (39) Chloris gayana
7a. Leaf blade apices attenuate ................................................................. (43) Chrysochloa hindsii
7b. Leaf blade apices obtuse .................................................................... 8
8a. Culms lower nodes rooting ................................................................. (194) Urocloa stigmatisata
8b. Culms lower nodes not rooting ............................................................. 9
9a. Leaf blades spreading, convolute ......................................................... (173) Stipagrostis acutiflora
9b. Leaf blades ascending, conduplicate .................................................. (166) Sporobolus ioclados

GROUP 5. LEAF BLADE MARGIN CARTILAGINOUS
1a. Culms prostrate .................................................................................. (59) Digitaria aristulata
1b. Culms not prostrate ............................................................................. 2
2a. Leaf blade bases cordate ..................................................................... (190) Urocloa lata
2b. Leaf blade bases not cordate ............................................................... 3
3a. Ligules eciliate membranes ................................................................ 4
3b. Ligules ciliate membranes or a fringe of hairs .................................. (15) Anthephora pubescens
4a. Leaf blades filiform, wiry ................................................................. (1) Acrachne racemosa
4b. Leaf blades not filiform, wiry ............................................................. 5
5a. Ligules ciliate membranes .................................................................. 6
5b. Ligules a fringe of hairs ....................................................................... 7
6a. Leaf blade margins glabrous ............................................................... (166) Sporobolus ioclados
6b. Leaf blade margins not glabrous ......................................................... 7
7a. Culm lower nodes rooting ................................................................ (194) Urocloa stigmatisata
7b. Culm lower nodes not rooting ............................................................. 8
8a. Leaf blade bases broadly rounded ...................................................... (3) Alloteropsis paniculata
8b. Leaf blade bases tapering toward midrib ........................................... (196) Urocloa villosa

GROUP 6. LEAF BLADE BASES CORDATE OR AMPLEXICAULE
1a. Culms prostrate, wiry ......................................................................... (131) Panicum callosum
1b. Culms not prostrate, not wiry ............................................................. 2
2a. Ligules ciliate or ciliolate membranes ................................................ (103) Hackelochloa granularis
2b. Ligules not ciliate or ciliolate membranes .......................................... 3
3a. Ligules a fringe of hairs ...................................................................... 4
3b. Ligules not a fringe of hairs
4a. Nodes pubescent
4b. Nodes glabrous
5a. Culm lower nodes rooting
5b. Culm lower nodes not rooting
6a. Leaf blade apices attenuate, culms with prop roots
6b. Leaf blade apices attenuate, culms without prop roots
7a. Leaf blades lanceolate, ligule truncate
7b. Leaf blades linear, ligule obtuse

GROUP 7. LEAF BLADE APEX ABRUPTLY ACUTE

1a. Culms wiry
1b. Culms not wiry
2a. Leaf blade bases narrower than sheath apex
2b. Leaf blade bases the same width as sheath apex
3a. Culms robust prop rooted, leaf blades sharply scabrid
3b. Culms not robust nor prop rooted, leaf blades smooth to finely scabrid
4a. Culm internodes elliptical in section, blades conduplicate
4b. Culm internodes not elliptical in section, blades flat

GROUP 8. LEAF BLADE APEX OBTUSE

1a. Ligules eciliate membranes
1b. Ligules not eciliate membranes
2a. Culm nodes pubescent
2b. Culm nodes glabrous
3a. Leaf blade margins pubescent, perennials
3b. Leaf blade margins glabrous, annuals
4a. Leaf blades spreading, sheath surfaces glabrous
4b. Leaf blades ascending, sheath surfaces scabrous

GROUP 9. LEAF BLADE BASE NARROWER THAN SHEATH APEX

1a. Leaf blades plicate
1b. Leaf blades not plicate
2a. Rhizomes present
2b. Rhizomes absent
3a. Oral hairs ciliate
3b. Oral hair lacking
4a. Leaf blades lanceolate
4b. Leaf blades linear or filiform
5a. Leaf blades conduplicate
5b. Leaf blades flat
6a. Leaf blade apices attenuate
6b. Leaf blade apices acute
7a. Ligules eciliate membranes
7b. Ligules ciliate membranes
8a. Leaf sheath surfaces glabrous
8b. Leaf sheath surfaces hairy
9a. Leaf blade apex acuminate
9b. Leaf blade apex acute
10a. Culms unbranched, ligule apices acute
10b. Culms branched, ligule apices erose

(195) Urochloa trichopus
(32) Cenchrus biflorus
(2) Acroceras amplexicaulis
(51) Cymbopogon caesius
(47) Coix lacryma-jobi
(72) Dibetropogon bagerupii
(6) Andropogon africanus
(151) Schizachyrium ruderalis
(80) Eleusine indica
(153) Schizachyrium sanguineum
(105) Schizachyrium sanguineum
(13) Andropogon pseudapricus
(10) Andropogon gayanus
(57) Dietctomis fastigiata
GROUP 10. CULMS WIRY
1a. Culm lower nodes rooting ................................................................. 2
1b. Culm lower nodes not rooting ........................................................... 3
2a. Culms prostrate, leaf blade margins hairy ........................................ (181) *Trichanthecium parvifolium*
2b. Culms decumbent, leaf blade margins glabrous .............................. (68) *Digitaria leptorachis*
3a. Culm nodes pubescent .................................................................... 4
3b. Culm nodes glabrous ...................................................................... 5
4a. Ligules eciliate membranes .............................................................. 6
4b. Ligule a fringe of hairs or ciliate membrane ..................................... 7
5a. Leaf blade apex acuminate .............................................................. 8
5b. Leaf blade apex acute ................................................................... 9
6a. Culm internodes hairy, leaf sheath keeled ....................................... (33) *Cenchrus ciliaris*
6b. Culm internodes glabrous, leaf sheath not keeled ............................ 10
7a. Rhizomes present ......................................................................... 11
7b. Rhizomes absent ......................................................................... 12
8a. Ligule a fringe of hairs .................................................................. 13
8b. Ligule not fringe of hairs ................................................................. 14
9a. Leaf blades filiform ...................................................................... 15
9b. Leaf blades linear ......................................................................... 16
10a. Leaf blades spreading, culms geniculately ascending ..................... (56) *Dichanthium foveolatum*
10b. Leaf blades ascending, culms erect .............................................. 17
11a. Leaf blade apices pungent ............................................................ 18
11b. Leaf blade apices not pungent ..................................................... 19
12a. Leaf sheath surfaces glabrous, perennials ..................................... (183) *Tripogonella minima*
12b. Leaf sheath surfaces scabrous, annuals ........................................ (120) *Microchloa indica*

GROUP 11. RHIZOMES PRESENT
1a. Rhizomes scaly ............................................................................ 20
1b. Rhizomes not scaly ..................................................................... 21
2a. Culms wiry, internodes hairy ........................................................ 22
2b. Culms not wiry, internodes not hairy ............................................. 23
3a. Culm internodes solid .................................................................. 24
3b. Culm internodes not solid ............................................................. 25
4a. Leaf blades distichous, coriaceous ................................................ 26
4b. Leaf blades not distichous or coriaceous ...................................... 27
5a. Leaf blade apex hardened, almost pungent ................................. (132) *Panicum fluvicola*
5b. Leaf blade apex not hardened ....................................................... 28
6a. Leaf blade apex attenuate or filiform ............................................. 29
6b. Leaf blade apex not attenuate or filiform ...................................... 30
7a. Ligules eciliate membranes ............................................................ 31
7b. Ligules a fringe of hairs ................................................................ 32
8a. Leaf blade margins hairy ............................................................... 33
8b. Leaf blade margins not hairy ......................................................... 34
9a. Ligules ciliate membranes ............................................................. 35
9b. Ligules not ciliate membrane ........................................................ 36
10a. Leaf blade bases narrower than sheath apex ............................... (129) *Panicum anabaptistum*
10b. Leaf blade bases broadly rounded ............................................. (145) *Sacciolepis chevalieri*
11a. Culm nodes pubescent ................................................................. 37
11b. Culm nodes not pubescent .......................................................... 38
12a. Culms spongy ............................................................................. 39
12b. Culms not spongy ...................................................................... 40
13a. Ligules fringe of hairs .............................................................. (78) Echinochloa stagnina

13b. Ligule eciliate membrane .......................................................... (144) Sacciolepis africana

14a. Collars white in color ............................................................... (159) Setaria sphacelata var. anceps

14b. Collars not white in color ............................................................ 15

15a. Ligules eciliate membranes .......................................................... (161) Sorghastrum stenopoides

15b. Ligules not eciliate membranes ................................................... 16

16a. Culms very slender, awns straight .............................................. (44) Chrysopogon fulvibarbis

16b. Culms somewhat spreading, awns flexuous ............................... (45) Chrysopogon nigritanus

GROUP 12. CULM NODES HAIRY

1a. Culm lower nodes rooting ........................................................... (63) Digitaria deliciatula

1b. Culm lower nodes not rooting ...................................................... 2

2a. Culm internodes hairy ............................................................... 3

2b. Culm internodes not hairy ............................................................ 4

3a. Culms erect ............................................................................... (55) Dichanthium annulatum

3b. Culms decumbent ................................................................. (20) Aristida bordeacea

4a. Ligules eciliate membranes .............................................. (5) Digitaria barbinonis

4b. Ligules not eciliate membranes ................................................ 6

5a. Culms geniculately ascending .................................................. (60) Digitaria barbinonis

5b. Culms erect .......................................................... (81) Elionurus elegans

6a. Leaf blade bases broadly rounded ............................................. (195) Urochloa trichopus

6b. Leaf blade bases not broadly rounded ....................................... 7

7a. Leaf blade bases lanceolate/linear ........................................... (192) Urochloa orthostachys

7b. Leaf blades not lanceolate/linear .............................................. 8

8a. Ligules a fringe of hairs ........................................................... 9

8b. Ligules not fringe of hairs ........................................................... 10

9a. Leaf blades flat ............................................................... (169) Sporobolus pyramidalis

9b. Leaf blades involute ...................................................... (118) Loudetiopsis kerstingii

10a. Leaf blades flaccid ............................................................. (114) Digitaria fragilis

10b. Leaf blades not flaccid ............................................................ 11

11a. Leaf blade surfaces scarbid ................................................... (24) Aristida rhiniochloa

11b. Leaf blade surfaces not scarbid .............................................. 12

12a. Leaf blade bases narrowed, but sheaths woolly ......................... (116) Loudetia simplex

12b. Leaf blade bases barely rounded, but sheaths not woolly ................. 13

13a. Leaf sheaths glabrous, perennials ........................................ (177) Themeda triandra

13b. Leaf sheaths involute ...................................................... (114) Loudetia bordeiformis

GROUP 13. CULM LOWER NODES ROOTING

1a. Culm internodes elliptical in section ........................................ (79) Eleusine africana

1b. Culm internodes not elliptical in section .................................... 2

2a. Leaf blades ribbed or plicate .................................................... (156) Setaria barbata

2b. Leaf blades not ribbed or plicate .............................................. 3

3a. Basal innovation present, suberete or flabellate ......................... (42) Chloris virgata

3b. Basal innovation absent ............................................................ 4

4a. Leaf blades ovate, lanceolate .................................................. 5

4b. Leaf blades not ovate, lanceolate ............................................... 6

5a. Leaf sheath surfaces glabrous ................................................... (181) Trichanthesium parvifolium

5b. Leaf sheath surfaces hairy ...................................................... (121) Oplismenus hirtellus

6a. Ligules a fringe of hairs ........................................................... 7

6b. Ligules not fringe of hairs ........................................................ 8

7a. Leaf sheath margins glabrous, culm nodes dark color ................. (187) Urochloa arrecta

7b. Leaf sheath margins hairy, culm nodes not dark color .................. (191) Urochloa mutica
8a. Leaf blade margins glabrous .............................................................. (16) Aristida adscensionis
8b. Leaf blade margins not glabrous ........................................................... 9
9a. Ligules ciliate membrane ...................................................................... 10
9b. Ligules eciliate membrane ................................................................... 11
10a. Leaf sheaths keeled ........................................................................... (172) Stapfochloa lamproparia
10b. Leaf sheaths not keeled ........................................................................ (40) Chloris pilosa
11a. Culms prostrate .................................................................................. (102) Euclasta condylotricha
11b. Culms erect .......................................................................................... 12
12a. Leaf blades with distinctive white midrib ½ its length ......................... (58) Digitaria acuminatissima
12b. Leaf blades without distinctive midrib .................................................. (74) Dinebra coerulescens

GROUP 14. ORAL HAIR CILIATE

1a. Ligules eciliate membranes ................................................................... 2
1b. Ligules ciliate membranes or a fringe of hairs .......................................... (7) Andropogon canaliculatus
2a. Leaf blade bases narrower than sheath apex ........................................... 3
2b. Leaf blade bases not narrower than sheath apex ..................................... 4
3a. Ligules 6–8 mm long .............................................................................. (29) Avena sativa
3b. Ligule 3 mm long or less ......................................................................... (107) Hyparrhenia subplumosa
4a. Leaf blade margins glandular .................................................................. 5
4b. Leaf blade margins not glandular ............................................................. 6
5a. Leaf blade apices pungent ....................................................................... (173) Stipagrostis acutiflora
5b. Leaf blade apices not pungent ................................................................. 7
6a. Leaf blade base cordate .......................................................................... (32) Cenchrus biflorus
6b. Leaf base not cordate .............................................................................. 8
7a. Culms usually 1–3 m tall, robust .............................................................. (10) Hyparrhenia subplumosa
7b. Culms usually less than 1 m tall, not robust ............................................. (163) Sorgbium bicolor
8a. Culms solitary, ligules ciliate membrane ............................................... 9
8b. Culms caespitose, ligules fringe of hairs ................................................ (31) Cenchrus americanus
9a. Ligules a fringe of hairs .......................................................................... 10
9b. Ligules not a fringe of hairs ..................................................................... 11
10a. Leaf blades spreading, margins glabrous ................................................ (21) Aristida kunthiana
10b. Leaf blades ascending, margins scabrous ................................................ (26) Aristida stipoides
11a. Basal innovations present ..................................................................... (186) Urelytrum muricatum
11b. Basal innovations absent ...................................................................... 12
12a. Leaf blade apex attenuate/filiform .......................................................... 13
12b. Leaf blade apex acuminate ................................................................... 14
13a. Culms erect, collars white in color .......................................................... 15
13b. Culms geniculately ascending, collars not white in color ...................... (91) Elymandra androphila
14a. Leaf blade margins scabrous .................................................................. 16
14b. Leaf blade margins glabrous .................................................................. 17
15a. Leaf sheath slightly compressed, ribbed, flaccid ................................... 18
15b. Leaf sheath not compressed, not ribbed, stiff ...................................... (85) Eragrostis aegyptiaca
16a. Perennials, leaf blades apex attenuate ................................................... 19
16b. Annuals, leaf blades apex acuminate ...................................................... (87) Eragrostis atrovirens
17a. Ligules less than 0.5 mm long, culms slender ......................................... (98) Eragrostis tenella
17b. Ligules 1–2 mm long, culms not slender ............................................... (94) Eragrostis pilosa

GROUP 15. LEAF BLADE APEX ATTENUATE OR FILIFORM

Ligules fringe of hairs .................................................................................. SUBGROUP A
Ligules membrane .......................................................................................... SUBGROUP B
Ligules ciliate or ciliolate membrane .............................................................. SUBGROUP C
### SUBGROUP 15A

1a. Leaf blades spreading ............................................................... (175) *Sipagrostis uniplumis*  
1b. Leaf blades not spreading .......................................................... 2  
2a. Collars white color ................................................................. (164) *Sporobolus pectinellus*  
2b. Collars not white color ............................................................  

### SUBGROUP 15B

1a. Leaf blades chartaceous ........................................................... (52) *Cymbopogon schoenanthus*  
1b. Leaf blades not chartaceous ....................................................... 2  
2a. Collars white color, perennials .................................................... (82) *Elymandra androphila*  
2b. Collars not white color, annuals .................................................. 3  
3a. Culms robust with prop roots ..................................................... (51) *Cymbopogon caesius*  
3b. Culms not robust and without prop roots ..................................... 4  
4a. Culms erect, slender ................................................................. (135) *Panicum tenellum*  
4b. Culms geniculately ascending, not slender .................................. 5  
5a. Leaf sheath margins hairy, blade margins scabrous .................. (48) *Ctenium elegans*  
5b. Leaf sheath margins glabrous, blade margins glabrous ................ (50) *Ctenium villosum*  

### SUBGROUP 15C

1a. Leaf sheaths keeled ............................................................... (21) *Aristida bordeacea*  
1b. Leaf sheaths not keeled ........................................................... 2  
2a. Leaf sheath surfaces hairy ....................................................... (4) *Anadelphia afzeliana*  
2b. Leaf sheath surfaces not hairy .................................................. 3  
3a. Leaf blades spreading ............................................................. (97) *Eragrostis tremula*  
3b. Leaf blades ascending ............................................................. 4  
4a. Leaf blades chartaceous .......................................................... (154) *Schoenefeldia gracilis*  
4b. Leaf blades not chartaceous ..................................................... 5  
5a. Leaf blades coriaceous ............................................................. (96) *Eragrostis prolifer*  
5b. Leaf blades not coriaceous ....................................................... 6  
6a. Leaf blade surfaces hairy ....................................................... (11) *Andropogon ivorensis*  
6b. Leaf blade surfaces not hairy ................................................... 7  
7a. Leaf blade surfaces puberulous ................................................. (142) *Rhytachne triaristata*  
7b. Leaf blade surfaces not puberulous ......................................... 8  
8a. Leaf blade margins scabrous .................................................... (40) *Chloris pilosa*  
8b. Leaf blade margins glabrous .................................................... 9  
9a. Leaf sheath ribbed ................................................................. (141) *Rhytachne rotboellioides*  
9b. Leaf sheath not ribbed ........................................................... 10  
10a. Collars white color .............................................................. (87) *Eragrostis atrovirens*  
10b. Collars not white color .......................................................... 11  
11a. Leaf blades involute .............................................................. (119) *Micrachne obtusiflora*  
11b. Leaf blades not involute .......................................................... 12  
12a. Leaf blades conduplicate ........................................................ (146) *Sacciolepis microcoleca*  
12b. Leaf blades not conduplicate .................................................. 13  
13a. Culms slender ................................................................. (18) *Aristida diminuta*  
13b. Culms not slender ............................................................... (17) *Aristida cumingiana var. uniseta*  

### GROUP 16. LEAF BLADE MIDRIB CONSPICUOUS

1a. Ligules absent ................................................................. (76) *Echinochloa colona*  
1b. Ligules present ................................................................. (86) *Eragrostis aspera*  
2a. Leaf blades spreading ...........................................................  
2b. Leaf blades not spreading ...................................................... 3
3a. Ligules ciliate membrane ............................................... (148) *Schizachyrium exile*
3b. Ligules not ciliate membrane ........................................ (75) *Echinochloa callopus*

4a. Leaf blade margins glabrous, ligules apex erose ........................ (108) *Hyperthelia dissoluta*
4b. Leaf blade margins scabrous, ligules apex acute ............................................. (62) *Digitaria debilis*

5a. Ligules eciliate membrane ........................................ (189) *Cymbopogon caesius*
5b. Ligules a fringe of hairs .................................................. (117) *Loudetia togoensis*

6a. Leaf sheath margins glabrous ........................................ ..... (171) *Sporobolus stolzii*
6b. Leaf sheath margins hairy ........................................ (188) *Urochloa deflexa*

GROUP 17. LIGULES FRINGE OF HAIRS

1a. Leaf blades conduplicate ........................................................................... (75) *Echinochloa callopus*
1b. Leaf blades not conduplicate ..................................................................... (37) *Cenchrus prieurii*
2a. Leaf sheaths conspicuously keeled ......................................................... (64) *Sporobolus festivus*
2b. Leaf sheaths not conspicuously keeled ..................................................... (164) *Sporobolus festivus*

3a. Butt sheaths investing base of culm ............................................................ (189) *Cymbopogon caesius*
3b. Butt sheaths not investing base of culm .................................................... (117) *Digitaria debilis*

4a. Leaf sheath ribbed ....................................................................................... (92) *Eragrostis japonica*
4b. Leaf sheath not ribbed ................................................................................. (188) *Urochloa deflexa*

5a. Leaf blades linear ....................................................................................... (178) *Tragus berteronianus*
5b. Leaf blades filiform .................................................................................... (174) *Stipagrostis birtigluma*

6a. Leaf blades chartaceous, margins hairy ................................................... (178) *Tragus berteronianus*
6b. Leaf blades not chartaceous, not hairy ..................................................... (178) *Tragus berteronianus*

7a. Leaf blades lanceolate ................................................................................. (178) *Tragus berteronianus*
7b. Leaf blades linear/lanceolate ..................................................................... (179) *Tragus racemosus*

8a. Culms slender ............................................................................................. (179) *Tragus racemosus*
8b. Culms not slender ....................................................................................... (179) *Tragus racemosus*

9a. Culm nodes dark color, perennials ............................................................ (73) *Dilophotriche tristachyoides*
9b. Culm nodes not dark color, annuals ............................................................ (73) *Dilophotriche tristachyoides*

10a. Leaf blades convolute .................................................................................. (168) *Sporobolus pectinellus*
10b. Leaf blades flat ........................................................................................... (168) *Sporobolus pectinellus*

11a. Leaf blade margins tuberculate ................................................................ (167) *Sporobolus microprotus*
11b. Leaf blade margins not tuberculate ........................................................... (167) *Sporobolus microprotus*

12a. Leaf sheath margins glabrous ................................................................. (101) *Eriochloa fatmensis*
12b. Leaf sheath margins hairy ....................................................................... (101) *Eriochloa fatmensis*

13a. Leaf sheath surfaces glabrous ................................................................. (189) *Urochloa jubata*
13b. Leaf sheath surfaces hairy ........................................................................ (189) *Urochloa jubata*

14a. Culm nodes dark color .............................................................................. (38) *Cenchrus violaceus*
14b. Culm nodes not dark color ........................................................................ (38) *Cenchrus violaceus*

15a. Leaf blade bases cordate .......................................................................... (197) *Urochloa xantholeuca*
15b. Leaf blade bases not cordate ..................................................................... (197) *Urochloa xantholeuca*

16a. Leaf blades lanceolate, bases broadly rounded ........................................ (193) *Urochloa arundina*
16b. Leaf blades linear, bases simple ................................................................. (171) *Sporobolus stolzii*

GROUP 18. LIGULES ECILIATE MEMBRANE

1a. Plants monoecious, culm internodes solid .................................................. (199) *Zea mays*
1b. Plants not monoecious, culm internodes not solid ...................................... (199) *Zea mays*
2a. Culm internodes elliptical in section ........................................................... (80) *Eleusine indica*
2b. Culm internodes terete in section ................................................................ (80) *Eleusine indica*

3a. Basal innovations present ............................................................................ (4) *Schizachyrium gresicola*
3b. Basal innovations absent ........................................................................... (4) *Schizachyrium gresicola*

4a. Basal innovations flabellate ............................................................... (149) *Schizachyrium gresicola*
4b. Basal innovations extravesicular ............................................................... (149) *Schizachyrium gresicola*

5a. Ligules eciliate membrane ........................................................................ (51) *Cymbopogon caesius*
5b. Ligules a fringe of hairs .............................................................................. (51) *Cymbopogon caesius*
5a. Leaf bases broadly rounded ................................................................. (67) Digitaria gayana
5b. Leaf bases simple .................................................................................. 6
6a. Collars white color .................................................................................. (61) Digitaria ciliaris
6b. Collars not white color ............................................................................ 7
7a. Leaf blades spreading, surfaces glabrous ................................................ (182) Trichoneura mollis
7b. Leaf blades ascending, surfaces not glabrous .......................................... 8
8a. Leaf blade margins glabrous ..................................................................... (46) Coelachrysum brevifolium
8b. Leaf blade margins scabrous .................................................................. 9
9a. Ligules apex lacerate ............................................................................... (83) Elytrophorus spicatus
9b. Ligules apex erose or acute .................................................................... 10
10a. Leaf blade surfaces hairy ...................................................................... (150) Schizachyrium nodulosum
10b. Leaf blade surfaces glabrous .................................................................. 11
11a. Culms slender, ligules apex acute .......................................................... (71) Digitaria terna
11b. Culms not slender, ligules apex erose .................................................... (65) Digitaria exilis

GROUP 19. LIGULES CILIATE OR CILIOLATE MEMBRANE

1a. Butt sheaths woolly or pubescent .......................................................... (116) Loudetia simplex
1b. Butt sheaths not woolly or pubescent ....................................................... 2
2a. Culms robust .......................................................................................... 3
2b. Culms not robust ...................................................................................... 4
3a. Leaf margins glabrous, perennials .......................................................... (132) Panicum fluvicola
3b. Leaf margins hairy, annuals ...................................................................... (131) Panicum callosum
4a. Culm internodes striate ........................................................................... (160) Setaria verticillata
4b. Culm internodes not striate ..................................................................... 5
5a. Collars white color .................................................................................. 6
5b. Collars not white color ........................................................................... 7
6a. Leaf blade margins glabrous ..................................................................... (100) Eragrostis turgida
6b. Leaf blade margins scabrous .................................................................. 8
7a. Culms soft or spongy ................................................................................ (145) Saccioleps chevalieri
7b. Culms not soft or spongy ........................................................................ 8
8a. Culm internodes pubescent ..................................................................... 9
8b. Culm internodes glabrous ....................................................................... 10
9a. Leaf sheath surfaces scabrous ................................................................. (38) Cenchrus violaceus
9b. Leaf sheath surfaces hairy ...................................................................... (20) Aristida bordeae
10a. Butt sheaths persisting and investing base of culms, compacted dead sheaths ......................................................................................... 11
10b. Butt sheaths not investing base of culms, without compacted dead sheaths ......................................................................................... 12
11a. Basal innovations flabellate .................................................................... (9) Andropogon festuciformis
11b. Basal innovations subterete ................................................................... (180) Trichanthecium brazzaillense
12a. Leaf blades conduplicate ........................................................................ (143) Rottboellia afrarutia
12b. Leaf blades not conduplicate .................................................................. 13
13a. Culms disarticulate at the nodes .............................................................. (16) Aristida adscensionis
13b. Culms not disarticulate at the nodes ......................................................... 14
14a. Leaf blades spreading ............................................................................. (41) Chloris prieurii
14b. Leaf blades ascending ............................................................................ 15
15a. Leaf sheath ribbed .................................................................................. 16
15b. Leaf sheath not ribbed ............................................................................ 17
16a. Leaf blades reflected or drooping ............................................................ (97) Eragrostis squamata
16b. Leaf blades straight ................................................................................ (158) Setaria pumila
17a. Leaf blades involute ............................................................................... (95) Eragrostis plurigluma
17b. Leaf blades not involute ......................................................................... 18
18a. Leaf blades linear-lanceolate ................................................................... (133) Panicum laetum
18b. Leaf blades linear .................................................................................... 19
19a. Culms with prop roots ................................................................. 20
19b. Culms without prop roots ............................................................ 21
20a. Culms erect ........................................................................... (35) *Cenchrus pedicellatus*
20b. Culms geniculately ascending .................................................. (162) *Sorghum arundinaceum*
21a. Culm nodes dark color, butt sheaths with white hairs .................. (152) *Schizachyrium rupestre*
21b. Culm nodes not dark color, butt sheaths without white hairs ........ (22)
22a. Leaf sheath surfaces hairy ....................................................... 23
22b. Leaf sheath surfaces not hairy .................................................. 24
23a. Leaf sheath surfaces hairy all their length ................................. (34) *Cenchrus bordeoides*
23b. Leaf sheath surfaces hairy \( \frac{1}{2} \) their length ................................. (93) *Eragrostis lingulata*
24a. Leaf blade margins scabrous .................................................... 25
24b. Leaf blade margins glabrous .................................................... 26
25a. Culms erect, unbranched ......................................................... (5) *Anadelphla leptocoma*
25b. Culms geniculately ascending, ample branching ..................... (36) *Cenchrus polystachios* subsp. *atrichus*
26a. Leaf blade margins hairy ......................................................... (17) *Aristida cumingiana* var. *uniseta*
26b. Leaf blade margins glabrous ................................................. (177) *Themeda triandra*
1. **Acrachne racemosa**
   *(B. Heyne ex Roem. & Schult.) Ohwi*


   Common name: goosegrass.

   Caespitose or solitary, annuals. Culms up to 75 cm tall, weak, slender, geniculately ascending or decumbent; internodes glabrous; nodes dark, pubescent or bearded, occasionally rooting below; butt sheaths papery, glabrous, and sparsely hairy. Leaves mostly cauline; sheaths glabrous; collars glabrous or bearded; ligules 0.8–1.5 mm long, a ciliolate membrane; blades 13–27 cm long, 0.3–1.2 cm wide, flat, glabrous or sparsely hairy with slightly scabrid margins, cartilaginous, bases broadly rounded, apex attenuate to filiform. Inflorescences composed of racemes, digitate or subdigitately arranged, spikelets appressed, biseriate; racemes 1.5–10 cm long. Spikelets 5.5–13 mm long, 2.5–3 mm wide, 8–16-flowered, laterally compressed, breaking up at maturity; lemma mucronate, the mucro 0.3–0.9 mm long, apical, straight, clearly exserted from spikelets, without a column. Distribution: Africa, temperate Asia, tropical Asia, and Australasia.

2. **Acroceras amplectens** Stapf


   Common names: *diivoonu, niari*; *Jaieo millet*.

   Annual herbs with well-developed roots. Culms 30–100 cm long, weak, decumbent; internodes glabrous; rooting from lower nodes. Leaves cauline; sheaths open, hairy; ligules 0.5 mm long, eciliate membrane, apex entire or absent; blades 4–20 cm long, 3–10 mm wide, linear, flat, glabrous, without cross veins or
with obscure cross veins, bases cordate, or amplexicaul, margins slightly scabrid, apex acuminate. Inflorescences composed of racemes. Racemes 3–12 cm long, 4–6 in number, borne along central axis, distant, unilateral. Spikelets 4.5–6 mm long, falling entire, lax, in pairs, awnless. Distribution: tropical Africa.

3. **Alloteropsis paniculata** (Benth.) Stapf


Common names: *horí, subu*.

![Figure 12](image1.jpg)


4. **Anadelphia afzeliana** (Rendle) Stapf


Common name: *thatchgrass*.

Annuals. Culms up to 100 cm high, solitary or in scanty fascicles, erect or geniculately ascending; internodes glabrous, finely striate; often rooting from the lower nodes; simple or very sparingly branched below. Leaves cauline; sheaths loose, much longer than blades, glabrous and smooth or shortly hispidulous; ligules reduced to ciliate rim; blades 5–15 cm long, 0.4–1 cm wide, midrib whitish indistinct, lanceolate, scabrous with cartilaginous margins, bases cordate or subcordate, apex acuminate. Inflorescences 9–20 cm long, a fastigate panicle of whorled or upward scattered racemes. Spikelets 3.5–4.5 mm long, clustered in pairs at each node, elliptic, dorsally compressed, falling entire; principal lemma awns 2.5–7 mm long, apical, straight. Distribution: tropical Africa and western Indian Ocean.
Caespitose perennials. Culms 100–200 cm high, erect; internodes hirsute or bearded. Leaves cauline; sheaths glabrous, softly hairy to villous with the exception of the glabrous bases; ligules 1 mm long, ciliolate membrane; blades 10–25 cm long, 0.2–0.4 cm wide, midribs fine white, linear, flat, softly hirsute to villous on both sides, margins slightly scabrid, bases simple and apex long–tapering to fine point. Inflorescence a spatheate panicle. Spikelets 5–7 mm long, in pairs; lemma awns geniculate, with twisted column. Distribution: tropical Africa.


Caespitose perennials. Culms 50–250 cm high, erect, glabrous; nodes glabrous; branching arising from the lower culms. Leaves basal and cauline; sheaths firm, glabrous, the lower keeled upward; ligules ciliolate membrane; blades 10–40 cm long; 2–7 mm wide very short, linear, flat, or conduplicate, glabrous with distinct recessed protruding midribs, margins glabrous, bases simple, apex abruptly acute canoe-shaped point. Inflorescences composed of racemes; terminal and axillary; subtended by a spatheole; spatheoles 7–10 cm long, linear. Spikelets 4–7 mm dorsally compressed in pairs; principal lemma awns geniculate, arising from the sinus with twisted column. Distribution: tropical Africa.

7. *Andropogon canaliculatus* Schumach.


Caespitose perennials. Culms 25–200 cm high, erect, glabrous, branching upper part; nodes glabrous; branches ample at the base. Leaves basal and cauline; sheaths open; oral hairs ciliate; auricles erect or absent; ligules up to 2 mm long, an eciliate membrane; blades 10–40 cm long, 1–5 mm, wide, linear, flat, or partially folded, the basal ones are folded and compressed, narrow, glabrous, inconspicuous whitish hyaline midrib slightly recessed above and protruding below on the lower ⅔, simple bases, margins slightly scabrid, acute apex. Inflorescences of paired racemes 3–9 cm long, occasionally terminal, spatheate. Spikelets 3.5–6 mm long, in pairs, dorsally compressed; principal lemma awns geniculate, arising from the sinus with twisted column. Distribution: tropical Africa.
8. *Andropogon chevalieri* Reznik


Caespitose annuals; branching sparse. Culms 200–250 cm high, erect, internodes, glabrous; nodes glabrous. Leaves mostly cauline; sheaths glabrous; auricles erect, 3–9 mm long; ligules eciliate membrane, 2–10 mm long; blades linear, flat or involute, glabrous and smooth, simple bases, apex acute or filiform. Inflorescences of paired racemes, 4–6 cm long, occasionally terminal, subtended by a spatheole. Spikelets in pairs, sterile spikelets 5–10 mm long, fertile spikelets 5.5–10 mm long, dorsally compressed; principal lemma awns 18–25 mm long overall, from a sinus, geniculate, with twisted glabrous column. Distribution: tropical West Africa.

9. *Andropogon festuciformis* Rendle


Caespitose perennials. Culms up to 140 cm high, erect, reddish throughout; branches ample, arising from upper culm; butt sheaths persistent and investing base of culm, with compacted dead sheaths. Leaves cauline; sheaths glabrous, laterally compressed and keeled, basal sheaths distichous; ligules ciliolate membrane, 0.5 mm long; blades 5–28 cm long, 1.8–4 mm wide, stiff, linear, flat, conduplicate, glabrous with narrow bases and acuminate apex. Inflorescences 3–4 cm long, solitary racemes in fascicles of 1–6 at regular intervals along the culm. Sterile spikelets


3.5–4.5 mm long, lanceolate, dorsally compressed, fertile spikelets 3.5–4.5 mm long, lanceolate, dorsally compressed. Distribution: widespread across tropical parts of Africa, Asia, and the Americas.

10. *Andropogon gayanus* Kunth

Common names: guelori, nguon; Rhodesian blue grass, tambuki grass.

Caespitose perennials. Culms up to 400 cm high, erect, glabrous; branches sparse, arising from the lower culms. Leaves basal and cauline; sheaths open, keeled toward the tops, glabrous, ribbed; ligules eciliate brownish membrane, less than 3 mm long; blades linear, flat, glabrous, tuberculate-ciliate margins, base attenuate tapering to midrib with or without a false petiole, acute apex. Inflorescences paired racemes subtended by a spatheole. Fertile spikelets 5–8 mm long, in pairs, oblong, dorsally compressed, sterile spikelets 5–8 mm, elliptic, dorsally compressed; principal lemma awns 10–30 mm long overall, from a sinus, geniculate, with twisted glabrous column. Distribution: throughout tropics of Old and New Worlds.

11. *Andropogon ivorensis* Adjan. & Clayton


Caespitose annuals. Culms erect; internodes glabrous. Leaves cauline; sheaths open, glabrous; ligules ciliolate membrane, less than 3 mm long; blades linear, flat, sparsely hairy with scabrous margins and attenuate apex. Inflorescences paired, racemes 9–11 cm long, hidden in sheaths. Fertile spikelets 8 mm long, lanceolate, dorsally compressed, sterile spikelets 12 mm long.
long; principal lemma awns geniculate, arising from the sinus with twisted column. Distribution: tropical West Africa.

12. *Andropogon perligulatus* Stapf


Common name: bushy bluestem grass.

Caespitose perennials. Culms up to 150 cm high, erect, bases with fibrous dead leaf sheaths; branches ample at the base; internodes glabrous. Leaves basal and cauline; sheaths glabrous, auricles erect; ligules (1.5−)2.5–6 mm long, eciliate membrane with truncate apex; blades linear 7.5–33 cm long, 0.1–0.32 mm wide, revolute with conspicuous keel, shortly and densely pilose, margins tuberculate-ciliate, tapering to a very fine point at the apex. Inflorescences composed of racemes. Racemes 1.5−7.5 cm long, in pairs, exserted from the spatheoles; spatheoles 8–14 cm long, linear. Fertile spikelets 5–6 mm long, sterile spikelets 4–5 mm long; principal lemma awns geniculate, arising from the sinus with twisted column. Distribution: tropical and temperate Africa.

13. *Andropogon pseudapricus* Stapf


Caespitose annuals. Culms up to 150 cm high, stout, geniculately ascending, sometimes with prop roots, internodes glabrous; branched upper nodes. Leaves basal and cauline; sheaths...
glabrous or rarely loosely pilose; ligules up to 2 mm long, an eciliate membrane, pinkish color and fused with auricles; blades 8–40 cm long, 0.1–0.5 cm wide, linear, flat, glabrous with a pale hyaline midrib and slightly scabrid margins with bases narrower than the sheaths apex. Inflorescences of paired racemes 2–4 cm long, linear to narrowly lanceolate; spatheoles 5 cm long. Fertile spikelets 5–6 mm long, laterally compressed, sterile spikelets 4–5 mm long, elliptic, dorsally compressed; principal lemma awns 30–50 mm long, geniculate, from the sinus with twisted column. Distribution: West Africa, from Senegal to Chad and Cameroon; probably introduced in Mexico and Brazil.

14. **Andropogon tectorum** Schum. & Thonn.

Common names: *wara*; horse grass.

Caespitose perennials. Culms 20–50 cm high; internodes smooth, glabrous, branched upward with or without prop roots. Leaves basal and cauline; sheaths glabrous; ligules 1–2 mm long, an eciliate membrane or ciliolate membrane; blades 30–45 cm long, 2–3 cm wide, lanceolate, glabrous or puberulous at the tips, markedly finely nerved with a conspicuous white midrib protruding prominently below with margins scabrous or spinulously ciliate bases attenuated narrowing toward midrib with a false petiole, acute apex. Inflorescences composed of paired racemes, 3–4 cm long. Fertile spikelets 4–5 mm long, oblong, dorsally compressed, sterile spikelets 4–5 mm long, oblong, dorsally compressed; principal lemma awns 15–20 mm long overall, from sinus, geniculate, with twisted column. Distribution: tropical Africa.

15. **Anthephora pubescens** Nees

**FIGURE 23**

Common names: bottle brush grass, cat’s tail grass, wool grass.

**FIGURE 24**

Caespitose perennials; rhizomes short, wiry. Culms up to 200 cm long, unbranched, erect or geniculately ascending; internodes glabrous; butt sheaths persistent and investing base of culms. Leaves mostly basal; sheaths glabrous, sometimes scantily bearded at the mouth, or more or less pubescent to villous all over; upper sheaths hairy or glabrous; auricles erect or absent; ligules 2–8 mm long, eciliate membrane, obtuse; blades 10–40 cm long and 0.2–0.6 cm wide, linear, flaccid, flat, margins thickened, crinkled, apex attenuate. Inflorescences 5–15 cm long, 0.5–1 cm wide, straw-colored cylindrical spike, comprising clusters of 3–11 spikelets surrounded by an involucre of stiff, narrowly elliptic bracts on reduced axis along a main axis. Spikelets 6–11 mm long, lanceolate to narrowly ovate, awnless. Distribution: tropical Africa.

16. *Aristida adscensionis* L.

*FIGURE 25*

*Aristida adscensionis* L., Sp. Pl. 1: 82. 1753.
Common names: *allomoze*, *dugun bee*; annual bristle grass, broomstick grass.

Caespitose annuals. Culms 15–50 cm tall, erect, weak, geniculate; nodes dark; internodes glabrous; sometimes rooting at lower nodes; butt sheaths glabrous. Leaves basal and cauline; sheaths open, glabrous, margins membranous; ligules 0.5–1 mm long, ciliolate membranes; blades 5–15 cm long, 1–2.5 mm wide, linear, conduplicate, stiff, sparsely hairy, margins smooth, apex acuminate. Panicles 4–14 cm long, 0.5–3 cm wide, erect, terminal and axillary, rachis fragile at the nodes, ciliate on margins. Spikelets 6–12 mm long, lanceolate, subterete; lemmas 3–awned, the awns 5–25 mm long. Distribution: tropics and subtropics.

17. *Aristida cumingiana* var. *uniseta* Stent & J. M. Rattray

*FIGURE 26*


Solitary or densely caespitose, annuals. Culms 5–10(–25) cm high, erect; branching ample from lower culms; internodes glabrous; nodes glabrous. Leaves mostly cauline; sheaths smooth or minutely pubescent, striate, keeled; collars glabrous or minutely pubescent; ligules short-ciliate membrane; blades up to 6 cm long, 0.1 cm wide, linear, involute, scabrous, bases simple with attenuate apex. Inflorescences panicle 3–8 cm, lax, or effuse, somewhat contracted. Spikelets 2–2.5 mm long, dark purple or greenish tinged with purple narrowly lanceolate, awns 3, unequal, delicate, scabrid, the central awn 4.5–6 mm long, slightly recurved, the lateral awns 2.5–4 mm long, suberect. Distribution: Africa.

18. *Aristida diminuta* (Mez) C. E. Hubb.

*FIGURE 27*


Slender tufted annuals. Culms 15–30 cm high, erect; simple or branched at the bases, glabrous; internodes smooth. Leaves mostly cauline; sheaths glabrous, smooth or minutely pubescent, striate, keeled; collars glabrous or minutely pubescent; ligules a short ciliate rim; blades 2–7(–10) cm long, 0.1 cm wide, involute, scabrous and with long scattered hairs above, glabrous, smooth beneath, apex attenuate. Panicles 4–10 cm long, open, elliptic, loose, or effuse; panicle branches capillary. Spikelets 2.5–3 mm long, solitary, lanceolate, subterete; principal lemma awns 7–10 mm long, curved, delicate, scabrous, the lateral awns absent. Distribution: tropical and temperate Africa.

*Fig. 28*


Caespitose annuals. Culms 15–25 cm tall, erect, week, wiry, geniculate; internodes glabrous; butt sheaths glabrous, forming bulbs. Leaves mostly basal; sheaths open, glabrous, margins smooth; ligules 0.5–1 mm long, fringe of hairs; blades 5–20 cm long, 1–3 mm wide, linear, convolute or folded, stiff, appressed, glabrous, margins smooth, bases simple, apex acuminate. Panicles 5–10 cm long, contracted, scarcely exerted from the uppermost sheath, terminal and axillary, erect. Spikelets 20–30 mm long, lanceolate, subterete; lemmas 3-awned, the awns 35–45 mm long, the column 2–4.5 cm long, twisted. Distribution: tropical Africa to India.

20. *Aristida hordeacea* Kunth

*Fig. 29*


Solitary or caespitose annuals. Culms 10–90 cm high, slender, erect or ascending; branched from the base and lower nodes;
Internodes glabrous; nodes glabrous or pubescent. Leaves mostly basal; sheaths keeled, pubescent; auricles shortly barbate; collars glabrous; ligules shortly ciliate membrane; blades ca. 30 cm long, 1 cm wide, glaucous, linear, flat or folded, scabrous to hirtellous above, becoming glabrous beneath, bases simple, apex acuminate or attenuate apex. Inflorescence paniculate spiciform. Spikelets 6–9 mm long, linear-lanceolate; lemmas with 3 apical awns, principal lemma awns 2.5–3.5 cm long without column spreading. Distribution: throughout tropical Africa.


Caespitose annuals. Culms 30–45 cm long, erect; internodes distally glabrous; butt sheaths glabrous. Leaves mostly basal; sheaths glabrous; oral hairs bearded; ligules fringe of hairs; blades 5–20 cm long, 0.2–0.3 cm wide, linear, flat or convolute. Inflorescences 10–15 cm long, open panicles. Spikelets
6–12 mm long, solitary, lanceolate, subterete; principal lemma awns 3-branched, with 15–25 mm long limb, without a column, deciduous, abscissing from top of lemma. Lateral lemma awns 10–20 mm long; subequal to principal, or shorter than principal. Distribution: Mali and Senegal.

22. **Aristida mutabilis** Trin. & Rupr.


2–7 cm long, 1–2 mm wide, linear, convolute, stiff, glabrous, margins smooth, bases slightly narrower than sheath apex, apex acuminate. Panicles 5–10 cm long, open, linear, erect, terminal and axillary. Spikelets 6–7 mm long, lanceolate, subterete; lemmas 3-awned, awns 10–30 mm long, the column 3.5−6.8 mm long, twisted. Habitat: sandy soils. Distribution: tropical Africa to India.

23. **Aristida recta** Franch.

**FIGURE 32.**


Caespitose perennials. Persistent basal leaf sheaths breaking up into fibres and forming a dense tuft at the base of the culms; roots wiry. Culms 10–30 cm high, erect; internodes glabrous. Leaves mostly basal; sheaths glabrous, basal ones somewhat compressed; ligules a fringe of hairs; blades 5–20 cm long, 0.1 cm wide, filiform, wiry, scabrous above, setaceous, bases simple and apex acuminate. Inflorescences 3–8 cm long, ovate-lanceolate panicle. Spikelets 5–7.5 mm long, solitary, lanceolate, subterete;
principal lemma awns 3-branched; with 6–8 mm long limb; without a column. Distribution: tropical and temperate Africa.


Common name: large-seeded three-awn.

Caespitose annuals. Culms up to 65 cm high, erect or geniculately ascending; sparse branching from the lower and middle nodes; internodes scabrid; nodes pubescent. Leaves basal and cauline; sheaths laxly embracing the culm, keeled, scabrous; auricles long-barbate; collars bearded or glabrous; ligules ciliate membrane; blades 10–20 cm long and 0.2–0.4 cm wide, linear, flat, glaucous, scabrous, apex acuminate. Panicle up to 20 cm long, effuse or contracted. Spikelets 6–17 mm long, solitary, lanceolate, subterete; principal lemma awns 3-branched, persistent, lateral lemma awns 15–30 mm long, subequal to principal without a column. Distribution: from Mauritania in West Africa to Eritrea, Tanzania, and the Transvaal.


Common names: *amadzarne*, *okras*.
Caespitose perennials. Culms up to 100 cm high; erect, woody, branches ample, arising from mid culms; internodes glabrous. Leaves basal and cauline; sheaths glabrous, ribbed; ligules fringe of hairs; blades 5–30 cm long, mostly involute and narrow, glabrous, glaucous with narrow bases and acuminate apices. Panicle 8–25 cm long, loosely contracted to open. Spikelets 15–20 mm long, solitary, lanceolate, subterete; principal lemma awns 3-branched with 45–85 mm long limb, column twisted, deciduous, abscissing from top of lemma, lateral lemma awns 30–70 mm long. Distribution: Kenya; also from Senegal and Cameroon to Somalia northward to Tunisia and Palestine.

26. Aristida stipoides Lam.

Aristida stipoides Lam., Encycl. 1: 157. 1783.
Common names: teloloud, telolud.

Caespitose annuals. Culms 90–150 cm long, erect; internodes distally glabrous, solid; branches ample, rising from upper culms. Leaves basal and cauline; sheaths scabrous; oral hairs woolly; ligules fringe of hairs; blades 15–30 cm long, 0.2–0.4 cm wide, linear, flat or involute, scabrous, apex acuminate. Panicles 20–50 cm long, open, elliptic, effuse, equilateral, or nodding. Spikelets 14–20 mm long, solitary, lanceolate, subterete; principal lemma awns 3-branched with 35–60 mm long limb with twisted column, deciduous, abscissing from top of lemma, column of lemma awns 15–30 mm long; lateral lemma awns 30–50 mm long, shorter than principal. Distribution: tropical and South Africa; Asia to Australia.

27. Arthraxon lancifolius (Trin.) Hochst.

Arthraxon lancifolius (Trin.) Hochst., Flora 39: 188. 1856.
Mat-forming annuals; stolons present. Culms 5–20 cm high, slender, procumbent or prostrate, much branched from lower culm; internodes glabrous. Leaves mostly cauline; sheaths short lax, the uppermost slightly inflated, finely hairy especially toward the base; ligules membranous, short, less than 3 mm long; blades 3 cm long, 0.6–0.8 cm wide, lancelate-ovate, flaccid, glabrous or softly hairy on both sides, barely scabrid margins, hairy, bases cordate or well rounded and apex acuminate. Inflorescences of paired racemes or up to 9, borne along central axis 1–2 cm long. Spikelets 2–3 mm long in pairs, laterally compressed; principal lemma awns 6–10 mm long, arising from near the base, very delicate, bent and twisted below the middle. Distribution: tropical and temperate Africa and Asia to India.
long, in pairs, lanceolate; principal lemma awns 4–6 mm long overall, from a sinus, geniculate, with twisted column. Distribution: tropical and temperate Africa, eastward to China and Australia.

29. *Avena sativa* L. subsp. *sativa*

Common name: oats.

Caespitose annuals. Culms 30–100 cm tall, erect; nodes dark; internodes glossy; butt sheaths glabrous. Leaves mostly basal; sheaths glabrous, margins membranous; oral hairs present; ligules 6–8 mm long, membranous, apex lacerate; blades 5–30 cm long, 5–20 mm wide, linear, flat, spreading, scaberulous, margins scabrous, apex acute. Panicles 10–15 cm long, erect, terminal, open drooping, linear, equilateral or nodding. Spikelets 22–27 mm long, cuneate, laterally compressed; lemmas 2.0–3.2 cm long, awns 2.5–3.5 cm long, geniculate, column twisted. Habitat: weed in cultivated areas. Distribution: Eurasia.

30. *Bambusa vulgaris* Schrad. ex J. C. Wendl.

*Bambusa vulgaris* Schrad. ex J. C. Wendl., Coll. Pl. 2: 26, pl. 47. 1808.
Common names: common bamboo, striped bamboo.

Densely caespitose perennials with short rhizome. Culms woody up to 20 m tall and 4–10 cm thick, erect or geniculately ascending bamboo-like, several branches develop from mid-culm nodes and above; internodes smooth; nodes are slightly inflated. Leaves mostly cauline, deciduous; sheaths scabrous or

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**FIGURE 38. Avena sativa.** A. Habit. B. Ligule, sheath, and blade. C. Spikelet. A, B drawn from *L. F. Ward s.n.* (US-156655); C modified from *Baum (2007).*

hispid; auricles falcate; oral hairs ciliate; ligules 3–8 mm long, an eciliate membrane; blades 7–23 cm long, 1–5 cm wide, with a brief petiolelike connection to sheath, lanceolate, glaucous, scabrous, or pubescent, bases cordate, tapering toward midrib, apex acute-acuminate. Panicles 10–40 cm long with spathaceous subtending bracts. Spikelets 10–20 mm long, oblong, laterally compressed, lemma awnless. Distribution: throughout the tropics and sub tropics.

31. Cenchrus americanus (L.) Morrone


Common names: dakhn; cattail millet, pearl millet.

Caespitose annuals. Culms up to 300 cm tall robust, rough; but shear flattened, hairy on basal ½, margins smooth; oral hairs ciliate; collars dark; ligules fringe of hairs; blades 20–100 cm long, 8–50 mm wide, linear, flat or conduplicate, spreading, flaccid, scabrous, hairy on basal ½, margins smooth, apex acute. Panicles 4–20 cm long, 0.8–5.5 cm wide, spiciform, linear, elliptic or ovate, partially included in the sheath. Spikelets 3–6 mm long, obovate, dorsally compressed, subtended by involucres of bristles; lemmas awnless. Habitat: weed in cultivated cereal fields. Distribution: Asia.

32. Cenchrus biflorus Roxb.

Cenchrus biflorus Roxb., Fl. Ind. 1: 238. 1820.

Common names: cram-cram, uzaq; burgrass, India sandbur.

Caespitose annuals. Culms 10–90 cm tall, erect or ascending; internodes glabrous, glossy, or pubescent; nodes dark

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FIGURE 40. Cenchrus americanus. A. Flag leaf blade and inflorescence. B. Ligule, sheath, and blade. C. Spikelets with lower (left) and upper (right) glumes. A modified from Ibrahim and Kabuye (1988); B drawn from R. Dummer s.n. (US-634944); C modified from Hitchcock (1951).

colored; lateral branches ample, extravaginal, arising from lower culms or mid culms; butt sheaths glabrous. Leaves basal and cauline; sheaths open for most of their length, flattened, keeled, glabrous, margins smooth; oral hairs present or bearded; collars white, pubescent; ligules 2 mm long, fringe of hairs; blades 2–20 cm long, 1–5 mm wide, linear or lanceolate, sparsely hairy, scabrous, bases simple, broadly rounded or cordate, margins scabrous, apex acuminate. Panicles 2–15 cm long, spiciform; involucres 0.4–1.1 cm long, ovoid; inner bristles flattened united at the base to form a shallow disc 2–4 mm in diameter. Spikelets 3.5–6 mm long, 1–1.5 mm wide, ovate, dorsally compressed, acuminate, subtended by involucres of bristles; lemmas awnless. Distribution: tropical Africa to India.

### 33. Cenchrus ciliaris L.

*Cenchrus ciliaris* L., Mant. Pl. 2: 302. 1771 [Pennisetum ciliare (L.) Link].

Common names: *ebanau, habinni; biloela buffel grass, blue buffal草*.

Caespitose perennials; rhizomes short. Culms 10–50 cm tall, 1–4 mm in diameter, wiry, erect, geniculate; internodes sparsely hairy; culms grooved, opposite branches; nodes bearded, sometimes rooting below; butt sheaths pubescent. Leaves basal and cauline; sheaths loose, strongly compressed, open, sparsely hairy, margins smooth; oral hairs present; ligules 1 mm long, fringe of hairs; blades 4–20 cm long, 2–8 mm wide, linear, flat, ascending, stiff, ribbed, scabrous, pilose or glabrous, and glaucous, midribs conspicuous, prominent beneath, margins scabrous, apex acuminate. Panicles 2–14 cm long, 1–2.6 cm wide; involucres 0.6–1.6 cm long, elongated; inner bristles much exceeding the spikelets, one longer and stouter than the rest. Spikelets 2–5.5 mm long, lanceolate, dorsally compressed, acute, subtended by an involucre of bristles; lemmas awnless. Distribution: tropical and southern Africa to India.

### 34. Cenchrus hordeoides (Lam.) Morrone


Caespitose annuals. Culms 25–120 cm long, geniculately ascending, slender; lateral branches ample arising from mid culms. Leaves mostly basal; sheaths keeled, loose, hirsute with spreading hairs sometimes tubercle based, often ciliate on the margins, or glabrous and smooth; ligules ciliate membrane, truncate, very short, densely ciliate or reduced to a densely ciliolate rim; blades 3–30 cm long; 0.15–1.5 cm wide, linear or linear-lanceolate, flat, green, firm or flaccid, densely hirsute with short spreading tubercle-based hairs, pubescent or glabrescent, scaberulous above and on the margins, gradually narrowed or contracted at bases, apex acute. Panicles 3.5–9 cm long, 0.4–0.6 cm wide (excluding bristles), spiciform, straight, or curved. Spikelets 2.5–4.5 mm long, solitary, subtended by an involucre of bristles, oblong; involucral bristles deciduous; lemma apex obtuse, awnless. Distribution: tropical Africa and Asia.

### 35. Cenchrus pedicellatus (Trin.) Morrone


Caespitose annuals. Culms 30–150 cm long, geniculately ascending, slender to stout; lateral branches ample, arising from mid culms; internodes glabrous; nodes glabrous, lower nodes rooting; butt sheaths glabrous, scarious. Leaves basal and cauline; sheaths shorter than the internodes, loose, glabrous or pubescent and ciliate on the margins or loosely hairy with tubercle-based hairs; oral hairs present or bearded; ligules 2 mm long, fringe of hairs; blades 2–20 cm long, 1–5 mm wide, linear or lanceolate, sparsely hairy, scabrous, bases simple, broadly rounded or cordate, margins scabrous, apex acuminate. Panicles 2–15 cm long, spiciform; involucres 0.4–1.1 cm long, ovoid; inner bristles flattened united at the base to form a shallow disc 2–4 mm in diameter. Spikelets 3.5–6 mm long, 1–1.5 mm wide, ovate, dorsally compressed, acuminate, subtended by involucres of bristles; lemmas awnless. Distribution: tropical Africa to India.

*Common names: ebanau, habinni; biloela buffel grass, blue buffal草.*
hairs; ligules ciliate membrane; blades 5–25 cm long, 0.4–1.5 cm wide, flat, linear to linear-lanceolate, rather flaccid, green, glabrous or loosely hairy with tubercle-based hairs, scabrous, or smooth below, inconspicuous midrib slightly recessed above and protruding slightly below, margin tuberculcate-ciliate, cartilaginous, apex acuminate. Panicles 5–15 cm long, spiciform, linear, straight, or curved. Spikelets 5–10 mm long, subtended by an involucre, composed of bristles, ovate, base obtuse, involucral bristles deciduous with the fertile spikelets; lemma apex obtuse.

Distribution: tropical Africa, western Indian Ocean, tropical Asia, Australia, and South America.

36. *Cenchrus polystachios* subsp. *atrichus* (Stapf & C. E. Hubb.) Morrone.


*polystachion* subsp. *atrichum* (Stapf and C. E. Hubb.) Brunken]

Caespitose annuals or short-lived perennials. Culms 30–150 cm long, geniculately ascending; branching ample, arising from lower culms often with prop roots; internodes glabrous; nodes dark. Leaves basal and cauline; sheaths keeled, glabrous; ligules ciliate membrane, whitened collar; blades 5–25 cm long, 0.4–1.5 cm wide, lanceolate, scabrous to sparsely hairy, apex acute. Panicles 5–15 cm long, spiciform, linear, straight, or curved. Spikelets 5–10 mm long, subtended by an involucre of bristles, ovate, base obtuse; involucral bristles deciduous with the fertile spikelets; lemma apex obtuse, awnless. Distribution: tropical Africa, western Indian Ocean, tropical Asia, Australia, and South America.
37. *Cenchrus prieurii* (Kunth) Maire

Common names: *beskanit, wesedj*.

Caespitose annuals. Culms 30–75 cm high, erect or geniculately ascending, moderately slender; branching spreading ample, arising from the mid culms; internodes glabrous; nodes dark. Leaves basal and cauline; sheaths compressed and keeled, scabrous with entire margins; ligules fringe of hairs; blades 9–30 cm long, 0.5–1 cm wide, linear, flat, glaucous, ribbed, scabrous or hairy on basal ⅔, margins, scabrous, crenate, apex acute.

Inflorescences 6–14 cm long, spiciform panicle. Spikelets 4–5 mm long, in clusters, subtended by involucres of bristles, ovate, dorsally compressed, acuminate; lemma apex obtuse, or acute, mucronate; lemmas awnless. Distribution: tropical Africa to India.

38. *Cenchrus violaceus* (Lam.) Morrone


Caespitose annuals forming cushions. Culms 30–300 cm long, erect, or geniculately ascending or decumbent; branched from most nodes; internodes glabrous, semiterete; nodes dark,
lower nodes rooting. Leaves basal and cauline; sheaths flattened, loose, terete, sparingly to densely hirsute with deciduous tubercle-based hairs on lower \( \frac{1}{3} \); oral hairs present; collars dark; ligules fringe of hairs; blades 15–100 cm long, 0.3–2.5 cm wide, linear, flat, flaccid, green, loosely hirsute with long white hairs, margins cartilaginous and smooth, apex acute. Panicles 2.5–20 cm long, 0.8–2 cm wide, spiciform, linear. Spikelets solitary or paired, subtended by an involucre of bristles; lemma apex obtuse or acute, aawnless. Distribution: tropical Africa.

### 39. Chloris gayana Kunth


Chloris gayana Kunth, Révis. Gramin. 1: 293, pl. 58. 1830.

Common names: Hunyani grass, Rhodes grass.

Caespitose perennials; stolons present. Culms up to 200 cm tall, erect, geniculate; internodes glabrous, striate; with or without lower nodes rooting; butt sheaths glabrous. Leaves basal and cauline; sheaths strongly compressed, keeled, glabrous, margins smooth; oral hairs present; ligules 1–2 mm long, ciliate membranes; blades 15–25 cm long, 2–9 mm wide, linear, flat, ascending, hairy on the basal \( \frac{1}{3} \), margins smooth, apex attenuate. Inflorescences 4–15 cm long, with (5–)7–20 digitately arranged racemes; racemes spreading or ascending. Spikelets 2.5–4 mm long, 3–4 flowered, packed broadside to rachis, cuneate, laterally compressed; fertile lemmas 2.9–3.2 mm long, awns 1.5–5.5 mm long, straight, bristly. Distribution: tropical and southern Africa.

### 40. Chloris pilosa Schumach.


Common names: babunsi, mbonsi; goat’s beard.
Caespitose annuals. Culms 30–100 cm high, robust, erect or geniculately ascending or decumbent, with or without rooting from the lower nodes; branching ample, arising from mid nodes. Leaves basal and caudine; sheaths flattened or keeled, glabrous with entire margins; collars whitened, ciliate; ligules ciliate membrane; blades 5–30 cm long, 0.2–0.5 cm wide, flat or folded, glabrous, bases slightly rounded tapering to a fine point. Inflorescences with 6–13 loosely digitate racemes; racemes 2.5–8.5 cm long. Spikelets 2.5–3 mm long, solitary, cuneate, laterally compressed; principal lemma awns 2.5–5 mm long, subapical. Distribution: tropical Africa to Australia.

41. *Chloris prieurii* Kunth

*Chloris prieurii* Kunth, Révis. Gramin. 2: 441, t. 134. 1831. [*Enteropogon prieurii* (Kunth) Clayton]

Caespitose annuals. Culms 40–85 cm long, erect, or geniculately ascending; branching from lower culms; internodes glabrous; butt sheaths glabrous. Leaves basal and cauline; sheaths glabrous; ligules ciliate membrane; blades 10–30 cm long, 0.2–0.5 cm wide, linear, flat, glaucous, glabrous, apex acuminate. Racemes 4–12 cm long, 4–9 in number, digitate, unilateral, rachis angular. Spikelets 3–5 mm long, packing broadside to rachis, regular, 2-rowed, lemma apex dentate, bifid, awned, 1-awned, principal lemma awns 7–25 mm long. Distribution: tropical Africa, Macronesia, temperate and tropical Asia to India.

42. *Chloris virgata* Sw.

*Chloris virgata* Sw., Fl. Ind. Occid. 1: 203. 1797.

Common names: feather finger grass, white grass, windmill grass.
Caespitose annuals. Culms up to 100 cm tall, erect, geniculate; internodes glabrous, straw colored; nodes dark, occasionally lower nodes rooting; butt sheaths glabrous. Leaves basal and cauline; sheaths longer than blades, strongly compressed, keeled, glabrous, margins hairy at junction between blade and sheath; oral hairs present; ligules 1–2 mm long, ciliate membranes; blades 10–25 cm long, 2–6 mm wide, linear, flat, ascending, glabrous, margins smooth, apex attenuate. Inflorescences composed of 4–12 racemes; racemes 2−10 cm long, digitate, spreading. Spikelets 2.5–4.5 mm long, 3-flowered, cuneate, laterally compressed; fertile lemmas 2−3.6 mm long with a crown of hairs at the apex, the hairs 1.5−4 mm long, awns 5–12 mm long, straight. Distribution: throughout the tropics.

43. Chrysochloa hindsii C. E. Hubb.


Variable solitary or caespitose, usually stoloniferous. Culms up to 70 cm high geniculately ascending or decumbent, wiry, branching spreading, arising from midculm, rooting at lower nodes. Leaves basal and cauline; sheaths glabrous, keeled or strongly compressed; ligules ciliate membrane; blades 0.8–15 cm long, 0.2–0.6 cm wide, flat, glabrous, margins smooth or slightly scabrid, apex abruptly rounded. Inflorescences composed of 2−4(−5) digitately arranged racemes; racemes 1−12 cm long. Spikelets 3−4 mm long, solitary, ovate, laterally compressed, compressed strongly; principal lemma awns 1−2.5 mm long overall, subapical. Distribution: tropical Africa.

44. Chrysopogon fulvibarbis (Trin.) Veldkamp

FIGURE 53


Caespitose perennials with short rhizomes. Culms erect, basal innovation intravaginal, flabellate. Leaves cauline; sheath glabrous; ligules fringe of hairs; blades linear, flat, scabrous,
margins scabrous, apex acuminate. Panicles 10–20 cm long, open, lanceolate; racemes 4–8 cm long linear; laterally slightly compressed. Spikelets 6–8 mm long in pairs; principal lemma awns 10–20 mm long overall, from a sinus, geniculate, clearly exserted from spikelet, with a straight or slightly twisted column. Distribution: tropical West Africa.

### 45. Chrysopogon nigritanus (Benth.) Veldkamp


Caespitose perennials with short rhizomes. Culms 150–300 cm high, erect, unbranched; internodes glabrous. Leaves basal and cauliine; sheaths glabrous; ligules scarios with shortly ciliate margins or a line of hairs on an extremely short scarios rim; blades up to 90 cm long, 0.7 cm wide, linear, flat, scabrid, apex acuminate. Inflorescence an open panicle, 15–40 cm long, lanceolate. Spikelets 7 mm long in pairs, narrowly linear-lanceolate; principal lemma awnless. Distribution: tropical Africa.

### 46. Coelachyrum brevifolium Hochst. & Nees

*Coelachyrum brevifolium* Hochst. & Nees, Linnaea 16: 221. 1842.

Caespitose annuals; stolons present. Culms 10–50 cm tall, geniculate; internodes glabrous, striate, straw colored; nodes dark; butt sheaths glabrous. Leaves basal and cauliine; sheaths longer than blades, glabrous, margins membranous; ligules 1–2 mm long, membranous, apex dentate; blades 2–5 cm long, 1.5–4 mm wide, glabrous, margins wavy, smooth, bases rounded, apex acuminate. Inflorescences 1–5 cm long with 3–5 digitate racemes. Spikelets 3.5–4 mm long, ovate, laterally compressed, subsessile; lemmas 1.6–2.2 mm long, membranous,

47. Coix lacryma-jobi L.

Common names: corn bead, Job’s tears, pearl barley.

Caespitose annuals; plants monoecious. Culms up to 200 cm tall, erect, geniculate; internodes glabrous; butt sheaths glabrous. Leaves mostly cauline; sheaths strongly compressed, keeled, glabrous, margins smooth; ligules 1–2 mm long, membranous, apex truncate; blades 10–50 cm long, 2–5 cm wide, linear-lanceolate, flat, spreading, flaccid, glabrous, margins cartilaginous, bases cordate, apex acute. Inflorescences axillary, compound; male and female racemes subtended by the same spatheole; female racemes sessile subtended by a bony utricle comprising 1 spikelet, male racemes pedunculate projecting from the mouth of the utricle comprising 3 or 2 spikelets. Fertile utricles 0.5–1.5 cm long, globose; male racemes 3–5 cm long, the spikelets 7–9 mm long, dorsally compressed; lemmas awnless. Habitat: cultivated or escaped. Distribution: tropical Asia.

48. Ctenium elegans Kunth

Common names: samu saana, wolo kaman.

Caespitose annuals. Culms 90–120 cm long, geniculately ascending; branching ample, arising from the lower culms. Leaves basal and cauline; sheaths scabrous; ligules eiliate membrane, apex erose; blades 20–30 cm long, 0.1–0.3 cm wide, aromatic, linear, flat, flaccid, scabrous, apex acuminate.
Inflorescence a single raceme; racemes 20–30 cm long, straight, unilateral. Spikelets 4–6 mm long, solitary, packed broadside to rachis, crowded, regular, 2-rowed; principal lemma awns 6–10 mm long overall, subapical. Distribution: tropical Africa, temperate Asia.

49. *Ctenium newtonii* Hack.

*FIGURE 58*

*Ctenium newtonii* Hack., Bol. Soc. Brot. 5: 220. 1887.

Common name: *wolo kaman*.

Caespitose perennials. Culms 50–100 cm high, wiry, geniculately ascending; branching ample arising from the lower nodes. Leaves basal and cauline; sheaths glabrous to hairy; ligules eciliate membrane with erose apex; blades 5–25 cm long; 0.2–0.4 cm wide, aromatic, linear, involute, glabrous, margins scabrous, apex attenuate. Inflorescence a single raceme; racemes (5)7–20(–30) cm long, straight or almost straight to coiled, unilateral. Spikelets 4–7 mm long, solitary; principal lemma awns 2.5–3 mm long, apex minutely bidentate. Distribution: tropical East and West Africa.

50. *Ctenium villosum* Berhaut

*FIGURE 59*


Caespitose delicate annuals. Culms 40–70 cm high, glands wartlike, geniculately ascending. Leaves basal and cauline; sheaths glabrous; ligules eciliate membrane; blades 5–10 cm long; 0.1–0.2 cm wide, linear, involute, glabrous to hairy, margins slightly scabrid, apex acuminate. Inflorescence composed of a single raceme; racemes 2–10 cm long, tightly spiraled, unilateral. Spikelets 5 mm long, solitary, packed broadside to rachis, crowded, regular, 2-rowed; principal lemma awns 2 mm long, subapical. Distribution: tropical West Africa.
51. Cymbopogon caesius (Nees ex Hook. & Arn.) Stapf


Common names: buchu grass, inchi grass, kachi grass.

Caespitose perennials. Culms 100–300 cm long, with prop roots, erect, robust; branching ample, arising from lower culms; butt sheaths withering; internodes glabrous; nodes dark. Leaves basal and caudinal; sheath glabrous, ribbed, the basal sheaths soon falling away; ligules 0.3–2 mm long, eiliate membrane, truncate, scarious; blades 15–60 cm long, 0.8–3 cm wide, linear or lanceolate, herbaceous, dark green, aromatic, glabrous and smooth, bases cordate to subamplexicaul, apex attenuate. Inflorescences composed of racemes, subtended by a spatheole; racemes 10–15 mm long. Spikelets 3.5–5 mm long, in pairs; principal lemma awns 10–17 mm long, from a sinus, geniculate, with twisted column. Distribution: tropical Africa.

52. Cymbopogon schoenanthus (L.) Spreng.

Common names: *lemmad, taberimt*; camel grass, gingergrass, lemon grass.

Caespitose, aromatic perennials. Culms 30–80 cm tall, erect; internodes glabrous, glossy; nodes dark, bearded; butt sheaths glabrous, persistent. Leaves basal and cauline; sheaths glabrous, margins smooth; ligules 1–3 mm long, membranous with erose apex; blades 10–35 cm long, 1–4 mm wide, filiform, spreading, involute, scaberulous, margins scabrous, bases narrow, apex attenuate to spiny, pungent. Panicles 5–40 cm long, dense, composed of racemes 1–3 cm long, terminal and axillary, subtended by a spatheole, enclosed in the sheath, paired, deflexed. Spikelets 4–7 mm long, in pairs, lanceolate, dorsally compressed; principal lemma awns 5–9 mm long, straight. Distribution: Sahara to Arabia.


Common names: *kiki, zozoubu*; Bahama grass, Bermuda grass, Scotch grass.

Mat-forming perennials; stolons present; rhizomes elongated. Culms 10–40 cm tall, erect; internodes glabrous, glossy; lower nodes rooting; butt sheaths glabrous, persistent. Leaves basal and cauline; sheaths longer than adjacent internodes, glabrous, ribbed, margins smooth; ligules 0.3 mm long, ciliate membrane; oral hairs present; blades 3–15 cm long, 2–4 mm wide, linear or loosely convolute, spreading, scaberulous, glabrous or
pilose, margins sparsely hairy and scabrous, apex acuminate. Racemes 1.5–6–(8) cm long, 4–6 in number, digitately arranged, erect, unilateral. Spikelets 2–2.6 mm long, lanceolate, laterally compressed; lemmas silky pubescent on the keel, awnless. Distribution: tropical and warm temperate regions; cosmopolitan.


Mat-forming or caespitose annuals; stolons present. Culms 10–50 cm tall, erect, geniculate; internodes glabrous; lower nodes rooting; butt sheaths glabrous. Leaves basal and cauline; sheaths open, somewhat glabrous, compressed, the basal ones keeled, inconspicuously sparsely hairy, margins smooth; ligules 1–3 mm long, membranous; blades 3–20 cm long, 25–50 mm wide, broadly linear, flat, ascending, margins ciliate with bulbous base hairs, apex acuminate. Inflorescences with 3–9 digitately arranged, unilateral racemes 1.2–6.5 cm long, spreading or ascending. Spikelets 3.5–4.5 mm long, laterally compressed; upper glumes 1.5–2.2 mm long with a terminal, flexuous awn, the awn 0.8–4 mm long; lemmas 2.6–4 mm long, mucronate. Distribution: tropical and warm temperate regions of Eastern Hemisphere.

55. *Dichanthium annulatum* (Forssk.) Stapf


**FIGURE 63.** *Dactyloctenium aegyptium.* A. Habit. B. Ligule, sheath, and blade. C. Spikelet. A drawn from *L. Boulos s.n.* (CAI); B drawn from *S. Laegaard 16166B* (US-3292800); C modified from Hatch (2003).

Common names: *ebastan*; Angleton grass, Delhi grass, Santa Barbara grass,

Caespitose perennials. Culms 20–100 cm tall, decumbent; internodes hirsute; nodes conspicuously bearded; butt sheaths glabrous. Leaves basal and cauline; sheaths open, glabrous, striate, margins hairy; oral hairs present; ligules 3–6 mm long, membranous, apex obtuse; blades 3–30 cm long, 2–6 mm wide, linear, flat; ascending to appressed, pilose above, margins cartilaginous, bases cordate, apex acuminate. Inflorescence composed of (1–)2–15 subdigitately arranged racemes; racemes 3–7 cm long. Spikelets 2–6 mm long, in pairs, oblong, dorsally compressed; lower glume of sessile spikelet not pitted; principal lemma awns 8–25 mm long, column twisted. Distribution: tropical Africa and Indonesia.

**56. Dichanthium foveolatum** (Delile) Roberty

*Figure 65*

Common names: *okras, tirichit, tirikit*.


Caespitose perennials. Culms 10–50 cm tall, erect, geniculate, wiry; internodes glabrous, glossy; nodes bearded; butt sheaths scarious, pubescent. Leaves basal and cauline; sheaths longer than blades, glabrous, basal hairy and striate, margins membranous; auricles clawlike; ligules 1–3 mm long, ciliate membrane; blades 3–20 cm long, 1–4 mm wide, linear, flat, flaccid, spreading, glabrous, margins smooth, bases narrow, apex acuminate. Inflorescence a single raceme, spatheolate; spatheoles 3.5–5 cm long; racemes 1.5–4.5 cm long, partially enclosed in the sheath. Spikelets 2.5–4 mm long, in pairs, elliptic, dorsally compressed; lower glume of sessile spikelet pitted; principal lemma awns 12–18 mm long, geniculate, column twisted. Distribution: East Africa to India.

**57. Diectomis fastigiata** (Sw.) P. Beauv.

*Figure 66*

*Diectomis fastigiata* (Sw.) P. Beauv., Ess. Agrostogr., 132, 160. 1812. [*Andropogon fastigiatus* Sw.]
Common name: foldedleaf grass.

Caespitose or solitary annuals. Culms 15–200 cm high, erect; branches lacking. Leaves mostly cauline; sheaths glabrous; ligules more than 6 mm long, eciliate membrane with acute apex and pink color; blades 5–30 cm long, 1–4 mm wide, linear, flat or conduplicate, smooth margins, bases almost with false petioles, apex attenuate. Inflorescence a single raceme; racemes 2–5 cm long gathered into a leafy panicle; subtended by a spatheole. Fertile spikelets 4–5 mm long, elliptic or oblance, dorsally compressed, sessile; sterile spikelets 5–9 mm long; principal lemma awns 25–40 mm long from a sinus, geniculate, with twisted glabrous column. Distribution: Western Hemisphere.

58. Digitaria acuminatissima Stapf


Caespitose annuals. Culms over 60–120 cm high, rather stout; erect or decumbent; internodes glabrous; nodes glabrous, dark; lower nodes rooting. Leaves basal and cauline; sheaths longer than blade, somewhat loose and firm, glabrous and smooth or with a very few tubercle-based hairs near the mouth; ligules about 2 mm long, short, rounded, membranous; blades 3–25 cm long, 0.3–1 cm wide, flat, rather firm, linear from slightly narrowed base, distinct white midrib for ½ their length, gradually tapering to a very acute point, flexuous, quite glabrous or with a few tubercle-based hairs near the base, slightly rough on both sides, margins finely cartilaginous and rough. Inflorescence composed of 2)5–14 racemes; racemes 12–20 cm long. Spikelets 2.8–3.7 mm long, oblance-lanceolate, in pairs; lemmas awnless. Distribution: tropical Africa.

59. Digitaria aristulata (Steud.) Stapf


Caespitose annuals. Culms 5–20 cm high, slender; internodes glabrous; nodes dark, pubescent, or bearded; lower nodes rooting and branching. Leaves mostly cauline; sheaths longer than leaf blade, somewhat loose, the lower of the primary culms usually slipping off the culms, softly hairy; ligules ciliolate membrane; blades 1–3 cm long, 0.2–0.3 mm wide, linear, flat, softly

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and loosely hairy, margins finely cartilaginous and scaberulous, sometimes slightly rounded base, tapering to an acute point. Inflorescences digitate racemes; racemes 3–5, sessile, 3–5 cm long. Spikelets 1.7 mm long, in pairs, oblong, dorsally compressed, acuminate, falling entire; principal lemma awns subapical, straight without column. Distribution: tropical West Africa.

60. Digitaria barbinodis Henrard

Digitaria barbinodis Henrard, Monogr. Digitaria, 67. 1950.

Caespitose annuals. Culms 30–50 cm long, geniculately ascending. Internodes glabrous; nodes bearded. Leaves mostly cauline; sheath glabrous; ligules 1–2 mm long, eciliate membrane; blades 5–10 cm long, 0.2–0.4 cm wide, linear, glabrous, flat. Inflorescences composed of 4–5 racemes, digitately inserted; racemes 5–10 cm long, unilateral. Spikelets 5–10 cm long, in pairs; lemmas awnless. Distribution: tropical West Africa.

61. Digitaria ciliaris (Retz.) Koeler

Digitaria ciliaris (Retz.) Koeler, Descr. Gram. 27. 1802.

Common names: bamboo grass, summer grass, wild crab grass.

Caespitose annuals. Culms 10–80 cm tall, decumbent; internodes glabrous, tough; nodes dark; butt sheaths glabrous. Leaves basal and cauline; sheaths pubescent, margins smooth; oral hairs present; ligules 1–3 mm long, membranous, apex obtuse, lacerate; blades 3–20 cm long, 3–8 mm wide, linear, flat, ascending, glabrous, margins wavy, smooth, apex acuminate. Inflorescence composed of 2–12 digitately or subdigitately arranged, unilateral racemes; racemes 6–22 cm long. Spikelets (2–)2.5–3.3(–3.7) mm

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FIGURE 70. Digitaria ciliaris. A. Habit. B. Ligule, sheath, and blade. C. Spikelets with lower (left) and upper (right) glumes. A drawn from S. Soliman s.n. (CAI); B, C drawn from S. Laegaard & S. Traore s.n. (US-3595166).
long, in pairs, elliptic, dorsally compressed, sharply acute; lemmas awnless. Distribution: tropics, worldwide.


*Digitaria debilis* (Desf.) Willd., Enum. Pl. 91. 1809.
Common names: *musa ladel, narkata*; finger grass.

Straggling annuals. Culms 20–60 cm high, geniculately ascending from a prostrate base; branching ample from lower nodes; internodes glabrous, striate; nodes glabrous; butt sheaths hairy. Leaves basal and cauline; sheaths pubescent, striate; ligules up to 2 mm long, eciliate membrane, apex truncate; blades 3–13 cm long, 0.2–0.6 cm wide, flat, flaccid, hairy, with fine white midribs about $\frac{1}{3}$ of their length, margins scabrid or pubescent, bases subcordate tapering to a fine point. Inflorescences 7–20 cm long, with 3–17 racemes 3–16 cm long, subdigitately borne on a short, central rachis. Spikelets (2–)2.4–3.6(–4.5) mm long, paired on a triquetrous rachis, lanceolate; lemmas awnless. Distribution: southern Europe, tropical Africa, and western Indian Ocean.

63. *Digitaria delicata* Goetgh.


Caespitose annuals. Culms 20–30 cm long; erect, or geniculately ascending; branching sparse; internodes glabrous; nodes glabrous. Leaves basal and cauline; sheaths glabrous; ligules 1–1.5 mm long, ciliolate membrane, apex truncate; blades 3–10 cm long, 0.2–0.4 cm wide, linear, flat or convolute, midribs conspicuous, scaberulous or sparingly hairy on basal $\frac{1}{3}$; margins

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cartilaginous, scaberulous, apex attenuate. Inflorescence composed of 2–3 racemes, digitate, unilaterally; rachis 3–6 cm long, rachis narrowly winged, angular. Spikelets 2–2.2 mm long, in threes, elliptic, dorsally compressed, falling entire; lemmas awnless. Distribution: tropical West Africa.

**64. Digitaria delicatula Stapf**


Caespitose or solitary annuals. Culms up to 60 cm high, erect or slightly geniculate, slender; branching ample arising from near the base; internodes very smooth, shining, glabrous; nodes bearded. Leaves mostly cauline; sheaths somewhat loose, the lower ones often slipping off the internodes, coarsely striate, glabrous but basal ones usually conspicuously hairy; nodes bearded; oral hairs bearded; ligules ciliolate membrane; blades 10–20 cm long, 0.1–0.2 cm wide, flaccid, narrowly linear, flat or convolute, scabrous or sparingly hirsute, with a fine white midrib visible for ⅓ their length, margins scabrous, apex attenuate. Inflorescence composed of 2–3, rarely 4, digitately arranged racemes on a very slender subangular rachis; rachis 10–15 cm long. Spikelets up to 2 mm long, appressed; lemma awnless. Distribution: tropical West Africa.

**65. Digitaria exilis (Kippist) Stapf**


Common names: *fani, tau*; black fonio, hungry millet, white acha.

Annuals. Culms over 45 cm tall, erect or geniculate-ascending; branching simple or sparingly branched from below. Leaves basal and cauline; sheaths firm below and somewhat loose and slipping off above; internodes glabrous, smooth, striate; lower sheaths more or less keeled; ligules eciliate membrane; blades 5–15 cm long, 0.3–0.6 cm wide, linear, flat or convolute, scabrous or slightly hairy, gradually tapering to an acute point.
Racemes 2–4, sessile, digitate, suberect or erect, very slender; racemes 4–10 cm long. Spikelets 1.5–2 mm long, elliptic-oblong, acute; lemmas awnless. Distribution: tropical West Africa.

**66. Digitaria fragilis** (Steud.) Luces

Digitaria fragilis (Steud.) Luces, J. Wash. Acad. Sci. 32(6): 160. 1942. [Digitaria argillacea (Hitchc. and Chase) Fernald]

Caespitose annuals. Culms 30–60 cm high, erect; internodes glabrous; nodes bearded. Leaves mostly basal; sheaths covered with short hairs; ligules ciliolate membrane; blades 15–25 cm long, 3–4 mm wide; flaccid, glabrous to hairy, margins scaberulous, bases barely rounded, apex acuminate. Inflorescence composed of 2–4 racemes, digitate, paired; racemes 10–15 cm long, erect, flexuous, unilateral. Spikelets in threes; fertile spikelets 1.8–2 mm long, oblong, dorsally compressed; lemmas awnless. Distribution: tropical West Africa, North America, Mexico, and South America.

**67. Digitaria gayana** (Kunth) Stapf ex Chev.

Digitaria gayana (Kunth) Stapf ex Chev., Sudania 1: 163. 1911.

Common names: debbo daneya, gague.

Loosely caespitose or solitary annual. Culms 30–60 cm high, erect, slender; yellowish, occasionally branching at base; internodes glabrous. Leaves basal and cauline; sheaths firm, the lower ones longer than the internodes, striate, short hirsute; ligule an eciliate membrane, collar whitened; blades 3–15 cm long, 2–8 mm wide, broadly linear, flat, scaberulous, margins scaberulous, sometimes with scattered bulbous-based bristles, bases slightly rounded, apex acute. Inflorescence of (1–)2–6 digitate racemes; racemes 3–18 cm long. Spikelets 2–3 mm long, narrowly
ovate, in clusters of 3 or 4 on a sharply triquetrous winged rachis; lemmas awnless. Distribution: tropical Africa.

68. Digitaria leptorachis (Pilg.) Stapf


Annuals, or short-lived perennials. Culms 30–100 cm high, wiry, ascending from a decumbent base, rooting at the lower nodes, branching from the lower nodes; internodes glabrous, glossy; nodes villous, rarely glabrous. Leaves basal and cauline; sheaths glabrous, smooth, striate, keeled; ligules eciliate membrane; blades 5–20 cm long, 2–6 mm wide, narrowly linear, pubescent or rarely glabrous, distinct white midrib visible ⅓ their length, bases slightly narrowed, apex attenuate. Inflorescence of 5–12(–17) racemes; racemes 4–11 cm long, subdigitate or arranged on a common axis up to 10 cm long. Spikelets 1.4–2 mm long, paired on a slender triquetrous rachis; lemmas awnless. Distribution: tropical Africa.

69. Digitaria longiflora (Retz.) Pers.


Common names: *saana voonu ana*; false couch finger grass, Indian crab grass.

Mat-forming annuals or short-lived perennials; sometimes with short slender stolons. Culms 10–60 cm high, erect, decumbent or prostrate; internodes glabrous; nodes dark, rooting at the nodes; branching sparse, arising from lower culms; butt sheaths glabrous. Leaves basal and cauline; sheaths ribbed, usually glabrous but occasionally hirsute, compressed and keeled; ligules 1–1.5 mm long, eciliate membrane; blades 5–10(15) cm long, 2–6 mm wide, broadly linear to narrowly lanceolate, flat or

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involute, glabrous to sparsely hirsute, ribbed, margins smooth, bases barely rounded, apex acute. Inflorescence of (1)2–4 digitate racemes; racemes 1–10 cm long. Spikelets 1.5–2.0 mm long, elliptic, in threes on a ribbonlike winged rachis; lemma awnless. Distribution: throughout the Eastern Hemisphere tropics; introduced to the Western Hemisphere.

70. Digitaria nuda Schumach.


Common names: hairy crab grass, naked crab grass, wild findi.

Annuals, sometimes mat forming. Culms 15–100 cm high, slender, creeping or decumbent; stolons present; branching sparse, arising from lower culms, internodes glabrous; nodes dark and subglabrous. Leaves mostly caudine; sheaths scabrous, sometimes loosely hairy, longer than leaf blades; ligules 1–2 mm long, eciliate membrane, truncate, erose; leaf blades 5–20 cm long, 0.3–1 cm wide, linear to linear-lanceolate, flat, scabrous, margins scaberulous, apex acuminate. Inflorescence of 2–10 digitately arranged racemes; racemes (3)7–12 cm long, in one or two whorls. Spikelets 2–2.8 mm long, in pairs, oblong to lanceolate; lemmas awnless. Distribution: tropical Africa, tropical Asia, and South America.

71. Digitaria ternata (A. Rich.) Stapf


Common names: black-seed crab grass, black-seed finger grass.

Caespitose annuals. Culms 20–100 cm high, geniculately ascending; branching sparse, arising from lower culms; internodes glabrous or sparsely hairy; nodes dark and glabrous; butt sheaths glabrous or sparsely hairy. Leaves basal and cauline; sheaths glabrous to sparsely hairy; oral hairs present; ligules short, membranous, truncate; blades, 5–40 cm long, 0.3–0.8 cm wide, broadly linear, flat, flaccid glabrous or with few fine, spreading hairs especially at the base, white fine midrib ⅓ of their length, margins glabrous to slightly pubescent, bases rounded and sparsely hairy, apex acute. Inflorescence of 2–11 subdigitate arranged racemes; racemes 3–23 cm long. Spikelets 1.8–2.7 mm long, in threes on a ribbonlike winged rachis, ovate-elliptic; lemmas awnless. Distribution: temperate and tropical Africa, North America, and South America.

72. Diheteropogon hagerupii Hitchc.


Caespitose or solitary annuals. Culms 100–150 cm high, erect, slender; branching sparse, arising from lower nodes; internodes glabrous. Leaves mostly caudine; leaf sheaths open, keeled, scabrous; ligules eciliate membrane, very short; blades 5–20 cm long, 0.5–2 cm wide, glaucous, linear-lanceolate, flat, scabrous, bases cordate, or amplexicaul. Inflorescences terminal and axillary, composed of racemes; racemes 2–6 cm long, 2 in number, paired. Spikelets 6–10 mm long, paired, dorsally compressed; principal lemma awns 60–110 mm long overall, arising from a sinus, bigeniculate, with twisted column, the column hirtellous with 0.5 mm long hairs. Distribution: West and west-central Africa.
73. *Dilophotriche tristachyoides* (Trin.) Jacq.-Fél.


Caespitose perennials. Culms 40–120 cm long, slender, solitary, erect; branches lacking. Internodes glabrous; nodes dark. Leaves mostly cauline; sheaths longer than leaf blades, keeled, scabrous, ligules fringe of hairs; blades 5–20 cm long, 0.4–0.9 cm wide, linear to linear-lanceolate, flat or convolute, scabrous, apex attenuate. Panicles 5–12 cm long, open, oblong. Spikelets 6–12 mm long, in threes, lanceolate, laterally compressed, breaking up at maturity; lemma 3-awned, apex lobed, bifid; principal lemma awns 15–30 mm long overall, from a sinus, geniculate, flat below with twisted column, the column 5–8 mm long, lateral lemma awns arising on apex of lobes, the lobes 4–8 mm long, shorter than principal. Distribution: tropical West Africa.

74. *Dinebra coerulescens* (Steud.)

P. M. Peterson & N. Snow

Solitary annuals. Culms 50–100 cm long, decumbent; internodes glabrous; nodes rooting below; butt sheaths glabrous. Leaves mostly cauline; sheaths glabrous; ligules 1–2 mm long, an eciliate membrane; blades 5–30 cm long, 0.1–0.8 cm wide, linear, flat or involute, glabrous with distinct white midribs for about ⅓ their length, apex attenuate. Racemes 2–8 cm long, numerous, borne along a central axis, flexuous, unilateral; lemma apex dentate, bifid, apex obtuse, awnless. Distribution: tropical Africa and western Indian Ocean.

75. *Echinochloa callopus* (Pilg.) Clayton


Caespitose annuals. Culms 20–120 cm high, erect or geniculately ascending with a few branches arising below; internodes glabrous; nodes dark. Leaves basal and cauline; sheaths glabrous, open; ligules fringe of hairs; blades 5–30 cm long, 4–10 mm wide, linear, flat or conduplicate, glaucous, scabrous, apex acuminate. Inflorescence with numerous racemes borne along a central axis; racemes 2–20 cm long, spreading, oblong to linear. Spikelets 3–4 mm long, ovate-elliptic, borne singly in 2 rows, appressed or spreading; lemmas awnless. Distribution: tropical Africa.

76. *Echinochloa colona* (L.) Link


Common names: *aseral, hudo belle; jungle rice grass, Kalahari water grass.*
Caespitose annuals. Culms 15–100 cm tall, decumbent; internodes glabrous; butt sheaths scarious, glabrous. Leaves basal and cauline; sheaths flattened, glabrous, margins smooth; ligules absent; blades 3–30 cm long, 2–6 mm wide, linear, flat, ascending, glaucescent, scabrous, with midrib protruding below, margins smooth, bases broadly rounded, apex acuminate. Racemes 0.5–3 cm long, borne along a central axis, ascending (rarely) or appressed. Spikelets 1.5–3 mm long, in pairs, ovate or orbicular, dorsally compressed, gibbous, apex acute or cuspidate; lemmas awnless. Distribution: tropics and subtropics.

**Echinochloa pyramidalis** (Lam.) Hitchc. & Chase


**FIGURE 85.** *Echinochloa colona*. A. Habit. B. Ligule, sheath, and blade. C. Spikelets with upper (right) and lower (left) glumes. A drawn from N. El Hadidi s.n. (CAI); B drawn from W. Burger 2167 (US-2465212); C modified from Michael (2003).

**77. Echinochloa pyramidalis** (Lam.) Hitchc. & Chase


Common names: *farka teli*, *fingui*; antelope grass, Limpopo grass.

Solitary reedlike perennials; rhizomes elongated. Culms up to 400 cm tall, bamboolicke, erect, robust firm; internodes glabrous, striate; nodes glabrous, lower nodes rooting; butt sheaths scarious, glabrous. Leaves basal and cauline; sheaths glabrous, glaucous, ribbed, margins membranous; auricles clawlike; oral hairs present; ligules 1 mm long, fringe of hairs; blades 5–50 cm long, 2–20 mm wide, linear, flat, spreading, scabrous, with a well-defined white midrib on lower ½, margins cartilaginous, base broadly rounded,
apex attenuate. Racemes 3–20 cm long, borne along a central axis, overlapping, ascending. Spikelets 2.5–3.5(–4) mm long, in pairs, elliptic or ovate, dorsally compressed, apex acute; lemmas usually unawned, sometimes mucronate or with awns 2–3 mm long. Distribution: tropical southern Africa and Arabia.

**78. Echinochloa stagnina** (Retz.) P. Beauv.

Common names: _aluala, birbou_; burgugrass, hippo grass.

Solitary perennials, sometimes behaving as annuals; rhizomes elongated. Culms up to 200 cm tall, spongy, decumbent; internodes glabrous; nodes dark, lower nodes rooting; butt sheaths scarious, glabrous. Leaves basal and cauline; sheaths glabrous, ribbed, margins smooth; auricles clawlike; oral hairs present; ligules fringe of hairs; blades 10–40 cm long, 2–10 mm wide, linear, flat, spreading, flaccid, glaucous with a fine white midrib, scabrous, margins scabrid, base broadly rounded, apex acuminate. Racemes 2–8 cm long, borne along a central axis, overlapping, flexuous. Spikelets 3.5–6 mm long, in pairs, elliptic, dorsally compressed, apex acuminate; principal lemma awns 3–20(–50) mm long. Distribution: tropical Africa to India.

**79. Eleusine africana** Kenn.-O’Byrne

Common name: wild African finger millet.
Caespitose annuals. Culms 20–90 cm tall, erect, straight, moderately robust; internodes glabrous; nodes dark, often lower nodes rooting; butt sheaths scarios or glabrous. Leaves mostly basal; sheaths keeled, open, glabrous, ribbed, margins membranous; oral hairs present; ligules 1–3 mm long, ciliate membrane; blades 10–60 cm long, 5–10 mm wide, flat or conduplicate, flaccid, pilose, margins ciliate, bases narrow, apex acuminate. Inflorescence with 3−15 digitately borne racemes; racemes 4–17 cm long, 4–8 mm wide, unilateral. Spikelets 4–8 mm long, 3−9-flowered, elliptic, laterally compressed; lemmas 3.7−5 mm long, awnless. Caryopsis oblong. Habitat: disturbed sites, roadsides, and a common weed of cultivation. Distribution: southern and East Africa.


**80. Eleusine indica (L.) Gaertn.**

Common names: gondnema, so pegou; Indian goosegrass, yardgrass.

Caespitose annuals. Culms 10–70 cm tall, erect, geniculate, suberote, usually branching at the base; internodes elliptical in cross section, minutely ciliolate; nodes dark; butt sheaths scarios, glabrous. Leaves mostly basal; sheaths keeled, stongly compressed, open, sparsely hairy, margins sparsely hairy; oral hairs present; ligules 0.5–1 mm long, membranous, apex truncate; blades 5–30 cm long, 2–5 mm wide, linear, flat or conduplicate, ascending, sparsely hairy, margins smooth, bases narrow, apex
abruptly acute. Inflorescence with 1–10(−17) digitately borne ra-
cemes; racemes 3.5–15.5 cm long, 3–3.5 mm wide, unilateral.
Spikelets 4.6–7.8 mm long, 3–9-flowered, elliptic, laterally com-
pressed; lemmas 2.1–3.6 mm long, awnless. Caryopsis elliptic.
Distribution: pantropical.

81. *Elionurus elegans* Kunth

Common names: kamere, kilaburu, sabi.

Annuals. Culms 30–60 cm high, slender, erect; branching
sparse from midculm or lacking, internodes glabrous; nodes
bearded. Leaves mostly basal; sheaths terete; ligules very short,
membranous, densely ciliate; blades 5–8(−13) cm long, 1–2.5 cm
wide, linear, flat or involute, flaccid, glabrous or sparingly hairy
to hirsute toward the bases. Inflorescences composed of racemes;
exserted; racemes 6–10 cm long, single, straight, or arcuate.
Spikelets 4 mm long, in pairs; sterile spikelets well developed,
staminate, lanceolate or ovate, dorsally compressed, shorter than
fertile, deciduous with the fertile; lemmas awnless. Distribution:
tropical Africa.

82. *Elymandra androphila* (Stapf) Stapf


Caespitose perennials. Culms 100–250 cm long, erect, terete,
rather slender; branching sparse, arising from the upper culms;
internodes glabrous; nodes glabrous; butt sheaths glabrous.
Leaves mostly basal; sheaths glabrous; oral hairs bearded; ligules

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1–2 mm long, ciliolate membrane, hyaline, pale brown, truncate; blades 30–60 cm long, 0.4–0.9 cm wide, narrowly linear, flat or revolute with wide bases, glaucous, scabrous with conspicuous white-hyaline midribs, margins scabrous, apex attenuate. Inflorescence with 2 racemes, paired; racemes 2–3 cm long, bearing few fertile spikelets, subtended by a spatheole; spatheoles 5–10 cm long, linear, scarious, glabrous. Spikelets 6–8 mm long, paired; lemmas awnless. Distribution: tropical Africa.

83. **Elytrophorus spicatus** (Willd.) A. Camus

*Elytrophorus spicatus* (Willd.) A. Camus, Fl. Indo-Chine. 7: 547. 1923.

Common name: spike grass.

Caespitose annuals. Culms 5–60 cm long, erect; branching sparse, arising from lower culms. Internodes glabrous; butt sheaths glabrous. Leaves mostly basal; sheaths loose, glabrous; ligules ciliate membrane; blades 5–25 cm long, 0.2–0.4 cm wide, linear, flat, or partially folded, glabrous with truncate bases and attenuate apex. Panicles 2–30 cm long, (0.3–)0.5–0.7 cm wide, glomerate, linear, continuous, or interrupted. Spikelets 2–3.5 mm long in clusters, subtended by an involucre composed of imperfect spikelets; lemma apex acuminate, 1-awned, principal lemma awns 1 mm long, straight, bristle like. Distribution: tropical Africa and temperate Asia.

84. **Enneapogon persicus** Boiss.


Caespitose perennials. Culms 10–60 cm tall, erect, geniculate, wiry; internodes glabrous; butt sheaths persistent, pubescent. Leaves basal and cauline; sheaths longer than blades, flattened, glabrous, ribbed, margins membranous; ligules fringe of hairs; blades 3–15 cm long, 2–3 mm wide, filiform, convolute,
ascending, stiff, pilose with capitate hairs, margins scabrous, bases narrow; apex acuminate, spiny, pungent. Panicles 3–10 cm long, 1.5–2 cm wide, loosely contracted to spiciform, linear or lanceolate. Spikelets 5.5–11.5 mm long, 4-flowered, oblong, laterally compressed; lemmas 1.2–5 mm long, 9-awned, awns 4–7 mm long, straight, bristly, ciliate below. Distribution: tropical Africa, southwestern Asia to India.

**85. Eragrostis aegyptiaca** (Willd.) Delile

*Eragrostis aegyptiaca* (Willd.) Delile, Descr. Égypte, Hist. Nat. 157, t. 4, f. 2. 1813.

Caespitose annuals. Culms 1–46(–60) cm tall, erect to decumbent and prostrate; internodes glabrous; nodes dark; butt sheaths glabrous. Leaves basal and cauline; sheaths much longer than blade, open, glabrous, margins smooth; oral hairs present; ligules 1–2 mm long, ciliate membrane; blades 8–25 cm long, 1–3 mm wide, linear, flat or involute, ascending or spreading, glabrous, margins scabrous, apex acuminate. Panicles 3–20 cm long, linear or lanceolate, open to somewhat contracted, embraced at base by subtending leaves; primary branches appressed or ascending, whorled at the lower nodes. Spikelets 3.5–15 mm long, 9–20-flowered, linear or oblong, laterally compressed; lemmas 1.5–1.8 mm long, awnless. Distribution: Senegal, Mali, northern Nigeria, Chad, Egypt, and Sudan.

**86. Eragrostis aspera** (Jacq.) Nees


Common name: rough lovegrass.
Caespitose annuals. Culms 20–70 cm tall, erect, rough, semiterete in cross section; internodes glabrous; butt sheaths glabrous. Leaves basal and cauline, glaucous; sheaths glabrous, margins smooth; ligules 1–2 mm long, ciliate membrane; blades 8–30 cm long, 3–10 mm wide, linear, flat or involute, flaccid, spreading, glabrous, with white midrib recessed above and protruding on lower ⅓, margins smooth, apex acuminate. Panicles 15–40 cm long, open, elliptic or ovate, diffuse; primary branches ascending, spreading. Spikelets 3–10 mm long, 1–1.5 mm wide, 5–20-flowered, linear, laterally compressed; lemmas 1.1–1.5 mm long, awnless. Habitat: sandy and moist soils. Distribution: tropical southern Africa to India.


Common names: *ngwose*; Thalia lovegrass.

Caespitose perennials. Culms 30–100 cm long, geniculately ascending; branching sparse, arising from the lower culms, internodes glabrous, semiterete, striate; nodes dark; butt sheaths glabrous. Leaves basal and cauline; sheaths keeled, glabrous; ligules ciliate membrane; blades 15–30 cm long, 0.2–0.4 mm wide, linear, flat or involute, glabrous or ciliate below; margins glabrous, apex attenuate. Panicles 4–40 cm long, open, oblong, or ovate, contracted about primary branches. Spikelets 3–20 mm long, solitary, oblong, laterally compressed; lemmas awnless. Distribution: tropical Africa, temperate and tropical Asia, Australia, North and South America.

88. *Eragrostis barteri* C. E. Hubb.


Caespitose perennials. Culms 80–100 cm long, geniculately ascending, woody, eventually collapsing and rooting from upper nodes; branching sparse, arising from midculm; butt sheaths glabrous. Leaves mostly cauline; sheaths glabrous; ligules ciliate membrane; blades 2–20 cm long, 1–3 mm wide, linear, flat, glabrous, glaucous, apex acuminate. Panicles 4–20 cm long, ovate. Spikelets 8–16 mm long, solitary, oblong, laterally compressed; lemmas awnless. Distribution: tropical Africa.

89. *Eragrostis cilianensis* (All.) Vignolo ex Janch.


Common names: *fitirde, samba gambi*; gray lovegrass, stink grass.

Caespitose annuals. Culms 10–70(−100) cm tall erect, geniculate; internodes glabrous, glossy; nodes dark; butt sheaths glabrous. Leaves basal and cauline; sheaths open, glabrous, ribbed, margins smooth; oral hairs present; ligules 1–2 mm long, ciliate membrane; blades 3–15 cm long, 2–6 mm wide, involute, spreading, glabrous below and scabrid above, margins glandular or eglandular and scabrid, apex acuminate. Panicles 4–30 cm long, open or contracted, ovate, dense or loose. Spikelets 3–20 mm long, 2–4 mm wide, 8–30-flowered, oblong or ovate, laterally compressed; lemmas 2–2.5 mm long, keel with 1–3 cratateiform glands, awnless. Distribution: tropical and warm temperate regions.
90. **Eragrostis ciliaris** (L.) R. Br.


Common names: *sorgobo, subu*; *gophertail lovegrass, woolly lovegrass*.

Caespitose annuals. Culms 5–50 cm tall, erect, geniculate; internodes glabrous; nodes dark; butt sheaths glabrous. Leaves mainly cauline; sheaths longer than blade, slightly compressed, open, glabrous, ribbed, margins smooth; oral hairs present; ligules 1–2 mm long, ciliate membrane; blades 2–12 cm long, 1–3 mm wide, linear, convolute, flaccid, glabrous, margins smooth or scaberulous, bases narrow, apex acuminate. Panicles 1–20 cm long, spiciform, linear or oblong, continuous or interrupted; branches stiff, glandular. Spikelets 2–4.5 mm long, 6–12-flowered, ovate, laterally compressed; lemmas 0.8–1.5 mm long, awnless; palea keels pectinate-ciliate. Distribution: throughout the tropics.

91. **Eragrostis gangetica** (Roxb.) Steud.


Common names: *fitti fitti, tadjit*; *slim-flower lovegrass*.

Loosely to densely caespitose annuals. Culms 15–60 cm high, geniculately ascending, slender; branching sparse from lower culms; internodes glabrous; nodes dark; butt sheaths glabrous. Leaves mostly basal; sheaths open, glabrous; oral hairs
present; ligules ciliate membrane; blades 3–15 cm long; 0.1–0.3 cm wide, linear, flat or involute, glabrous or scaberulous above, bases very slightly rounded, apex acuminate. Panicles 6–20 cm long, ovate, branches straight. Spikelets 3–10 mm long, solitary, oblong, laterally compressed; lemmas awnless. Distribution: tropical Africa, Asia, and South America.


Common names: Japanese lovegrass, pond lovegrass.

Caespitose annuals. Culms 10–80 cm tall, erect, geniculate; internodes glabrous, ribbed; nodes dark; butt sheaths glabrous.

Leaves basal and cauline; sheaths hairy, ribbed, margins smooth; oral hairs present; ligules 0.3–0.6 mm long, fringe of hairs; blades 3–25 cm long, 1–5 mm wide, linear, flat, flaccid, scabrous, bases narrow, apex acuminate. Panicles 4–50 cm long, open, lanceolate or ovate. Spikelets 1–2 mm long, 4–14-flowered, oblong or ovate, laterally compressed; lemmas 0.7–1 mm long, awnless. Habitat: sandy soils in alluvial flats and drainages. Distribution: tropical Africa to southeastern Asia.

93. *Eragrostis lingulata* Clayton

Caespitose annuals. Culms 20–30 cm high, erect, geniculate; internodes glabrous; butt sheaths glabrous, scarious. Leaves mostly cauline; leaf sheaths glabrous; ligules ciliate membrane; blades 4–8 cm long, 2–4 mm wide, linear, flat, glaucous, pilose above. Panicles 6–15 cm long, open, linear or elliptic, with short primary branches. Spikelets 7–35 mm long, solitary, linear, laterally compressed; lemmas awnless. Distribution: tropical West Africa.


*Eragrostis pilosa* (L.) P. Beauv., Ess. Agrostogr. 71, 162, 175. 1812.

Common names: *wolo gaman, wolo kaman*; Indian lovegrass, slender meadow grass.

Solitary annuals. Culms 8–70 cm tall, erect, branched; internodes glabrous; nodes dark; butt sheaths glabrous. Leaves basal and cauline; sheaths open, striated, glabrous, margins smooth; oral hairs present; ligules 1–2 mm long, ciliate membrane; blades 2–15 cm long, 1–3 mm wide, linear, flat, straight, spreading, glabrous, margins smooth, bases narrow, apex acuminate. Panicles 4–25 cm long, open, elliptic or ovate; primary branches whorled at lower nodes, eglandular, bearded in axils. Spikelets 3–7 mm long, 0.7–1.2 mm wide, 4–14-flowered, linear, laterally compressed; lemmas 1.2–1.7 mm long, awnless. Distribution: tropical and warm temperate regions.

95. *Eragrostis plurigluma* C. E. Hubb.

Densely caespitose, perennials. Culms 60–120 cm long, erect; glabrous at the nodes; branching sparse, rising from the lower culms or unbranched; butt sheaths glabrous, chartaceous, persistent. Leaves mostly basal; sheaths glabrous; ligules ciliate membrane; blades 25–45 cm long; 1–2.5 mm wide, tightly involute or convolute, glaucous, glabrous, apex attenuate or filiform. Panicles 10–30 cm long, an open panicle, effuse, branches capillary, flexuous. Spikelets 6–7.5 mm long, solitary, elliptic, or oblong, laterally compressed; lemmas awnless. Distribution: tropical Africa.

96. Eragrostis prolifera (Sw.) Steud.


Caespitose perennials. Culms 60–150 cm long, geniculately ascending; branching ample, arising from midculm, lateral branches fastigiated; butt sheaths glabrous. Leaves mostly cauline; sheath glabrous, ligules ciliate membrane, blades 5–20 cm long; 1–3 mm wide, convolute, coriaceous, stiff, apex acuminate. Panicles 7–17 cm long, open, oblong; branches 1–4 cm long, stiff, spreading, bearing spikelets almost to the base. Spikelets 4–15 mm long, solitary, linear, or oblong, laterally compressed; lemmas awnless. Distribution: tropical Africa and South America.

97. Eragrostis squamata (Lam.) Steud.

Caespitose perennials. Culms 30–120 cm long, erect. Leaves mostly cauline; sheaths glabrous or pilose; ligules ciliate membrane; blades 5–30 cm long; 1–3(–6) mm wide; glaucous, scabrous above, apex attenuate. Panicles 6–35 cm long, an open panicle, elliptic; primary panicle branches ascending, stiff, straight, bearing spikelets almost to the base. Spikelets 5–25 mm long, appressed, solitary, oblong, or ovate, laterally compressed; lemmas awnless. Distribution: tropical Africa.

98. Eragrostis tenella (L.) P. Beauv. ex Roem & Schult.

Caespitose annuals. Culms 5–40 cm tall, erect; internodes glabrous, glossy; nodes dark; butt sheaths glabrous. Leaves basal and cauline; sheaths glabrous, ribbed margins smooth; oral hairs present; ligules 0.2–0.3 mm long, ciliate membrane; blades 2–8 cm long, 1–3 mm wide, flat, spreading, straight, glabrous, margins smooth, apex acuminate. Panicles 2–14 cm long, open, narrowly ovate; primary branches spreading. Spikelets 1.5–2.5 mm long, 4–8-flowered, ovate or oblong, laterally compressed; lemmas 0.7–1.1 mm long, awnless. Distribution: throughout the tropics.


Caespitose annuals. Culms up to 35 cm tall, erect, geniculate; internodes glabrous; butt sheaths glabrous. Leaves basal and cauline; sheaths glabrous with a whitened collar, margins smooth; oral hairs present; ligules 2 mm long, ciliate membrane; blades 8–25 cm long, 1–3 mm wide, convolute; straight; spreading, glabrous, with a whitened collar, base slightly rounded and hairy, apex attenuate. Panicles 7–30 cm long, ovate; branches flexuous, eglindrical, glabrous or bearded in axils. Spikelets 5–25 mm long, 1.5–2 mm wide, 10–60-flowered, linear, laterally compressed; lemmas 1.5–1.7 mm long, awnless. Distribution: tropical Africa to India.


Loosely tufted annuals. Culms 8–60 cm high, erect, or geniculately ascending; internodes glabrous; branching sparse, arising from the lower culms. Leaves basal and cauline; sheaths longer than leaf blades, compressed or keeled, glabrous; ligules ciliate membrane; blades 4–18 cm long, 0.2–0.8 cm wide, relatively broad leaves, linear, flat, glabrous with a whitened collar, apex acuminate. Panicles 3–14 cm long, open, oblong or ovate; branches few flowered. Spikelets 3–20 mm long, solitary, oblong-ovate; lemmas awnless. Distribution: tropical Africa to temperate Asia.


**101. Eriochloa fatmensis** (Hochst. & Steud.) Clayton


Common names: ants millet, tropical cup grass.

Caespitose variable annuals. Culms 10–120 cm long, erect, or geniculately ascending; internodes glabrous, striate; nodes dark; branching ample, arising from mid culm; butt sheaths glabrous. Leaves basal and cauline; sheaths glabrous, finely nerved; ligules fringe of hairs; blades 3–30 cm long, 2–10 mm wide, linear-lanceolate, flat or folded, glabrous, bases slightly rounded, apex acuminate. Inflorescence 3–20 racemes borne along a central axis, unilateral; racemes 1–5 cm long. Spikelets (2.5–)3–5 mm long, solitary, lanceolate, dorsally compressed, acuminate; principal lemma mucronate, the mucros 0.3–1 mm long. Distribution: tropical Africa, temperate Asia, India, and Australia.
102. *Euclasta condylotricha* (Hochst. ex Steud.) Stapf


Common name: mock bluestem.

Caespitose annuals. Culms 25–200 cm long, prostrate; internodes glabrous; nodes bearded, lower nodes rooting; branching sparse on the lower culms; butt sheaths glabrous. Leaves basal and cauline; sheaths glabrous with sparsely hairy shoulders; ligules 0.2 mm long, ciliate membrane; blades 5–25 cm long; 0.2–1 cm wide, glabrous, distinct white midrib visible for about ½ their length, bases rounded, margins scabrous, apex attenuate. Inflorescences composed of racemes. Racemes 2–5 cm long, 2–15, digitate, drooping. Spikelets 3–4 mm long, paired, elliptic, dorsally compressed; lemma apex entire, 1-awned; principal lemma awns 20–40 mm long, geniculate with a twisted column. Distribution: tropical Africa, Asia, Central America, and South America.

103. *Hackelochloa granularis* (L.) Kuntze


Common names: *bambari ladde, ngoriri; hare’s maze, lizard-tail grass.*

Coarse annuals. Culms 5–50 cm high, erect; internodes glabrous, glossy; nodes bearded; branching sparse, arising from...
midculm; butt sheaths sparsely hairy. Leaves mostly cauline; leaf sheaths loose or inflated, slightly compressed or keeled, hirsute with tubercle-based hairs, margins ciliate; ligules 2–3 mm long, ciliolate membrane; blades 2–15 cm long, 0.4–1.2 cm wide, linear to lanceolate, flat, hirsute or coarsely hispid with tubercle-based hairs, with finely recessed midribs, margins ciliate, bases subamplexicaul or cordate, acute apex. Racemes 0.5–1.5 cm long, exserted or embraced at base by subtending spatheole. Spikelets 1.6–2.2 mm long, pedicellate, in pairs; lemma apex obtuse, awnless. Distribution: throughout the tropics.


Common names: Batavian quick grass, red swamp grass, snake grass.

Caespitose perennials, stolons present. Culms 100–250 cm tall, decumbent or prostrate; branching from midculm; internodes glabrous; nodes bearded, dark, lower nodes rooting; butt sheaths glabrous. Leaves basal and cauline; sheaths hairy on the upper ⅓, margins smooth, collars ciliate; ligules 1–2 mm long, ciliolate membrane; blades 5–15 cm long, 2–4 mm wide, linear, flat, spreading, flaccid, glabrous, margins cartilaginous, apex acute. Racemes 4–10 cm long, single, erect, partially enclosed in sheaths, smooth. Spikelets 4–6 mm long, in pairs, lanceolate, dorsally compressed; lemma apex acute, awnless. Distribution: southern Europe and Africa.

105. *Hyparrhenia cyanescens* (Stapf) Stapf


Caespitose perennials, rhizomes short. Culms 200–300 cm long, 4–8 mm in diameter, erect or geniculately ascending, robust; internodes smooth, solid; butt sheaths glabrous. Leaves mostly cauline; sheaths firm, terete, glabrous; auricles 1–6 mm long, sometimes absent, erect; ligules 2–3 mm long, membranous, scarious, truncate; blades 15–50 cm long, 3–8 mm wide,
linear, flat, glaucous, glabrous, midrib whitish above and prominent below, margins scabrous, bases tapering toward midrib, apex attenuate. Inflorescence terminal and axillary, subtended by a spatheole, exserted or embraced at base by subtending leaf; spatheoles 3.5–5 cm long, linear, or lanceolate, membranous, glaucous, purple, glabrous; racemes 1.7–2.5 cm long, 2 in number, paired, deflexed. Spikelets 4.5–6 mm long, in pairs, lanceolate, dorsally compressed; lemma apex dentate, bidentate, awned; principal lemma awns 28–34 mm long from the sinus, geniculate, with a twisted column; column with hairs 0.2–0.4 mm long. Distribution: tropical Africa.

106. *Hyparrhenia rufa* (Nees) Stapf


Common names: jaragua grass, thatching grass.

Caespitose perennials, rhizomes short. Culms 30–250 cm tall, 2–6 mm in diameter near base, robust, erect, lateral branches fastigiated, arising from lower culms; internodes glabrous, solid; nodes dark; butt sheaths glabrous. Leaves mostly cauline; sheaths glabrous; wider than blades at the collar; ligules 2–3 mm long, eciliate membrane; blades 30–60 cm long, 2–8 mm wide, linear, flat, rigid, scabrous, margins smooth, apex attenuate. Inflorescence composed of racemes, subtended by a spatheole, exserted; spatheoles 3–5 cm long, linear to lanceolate, membranous; racemes 2–2.5 cm long, paired, erect, unilateral. Spikelets 3.5–4.5 mm long, in pairs, lanceolate, dorsally compressed; lemma apex dentate; bidentate, awned; principal lemma awns 20–30 mm long from the sinus, geniculate, with a twisted, pubescent column. Distribution: tropical Africa and southern Africa; introduced in tropical America and Australia.

107. *Hyparrhenia subplumosa* Stapf


Caespitose perennials. Culms 200–300 cm tall, erect, robust; branching ample, arising from lower culms; internodes glabrous; butt sheaths glabrous. Leaves mostly cauline; sheaths terete, firm, pale green or glaucous, glabrous or pilose; oral hairs bearded; ligules 2–3 mm long, ciliate membrane, scarious, truncate; blades 20–60 cm long, 0.3–1 cm wide, linear, flat, or slightly folded, glaucous; midribs prominent beneath, whitish, glabrous above, hirsute or sparingly hairy below, margins scabrous, bases narrowed, simple or slightly narrowed bases, apex acuminate. Inflorescences synflorescence compound, paniculate 20–50 cm long. Spatheoles 3–7 cm long, lanceolate, membranous, glaucous, or purple. Spikelets 6.5–7.5 mm long, in pairs, lanceolate, dorsally compressed; principal lemma awns 45–75 mm long overall, from a sinus, geniculate, with twisted column. Distribution: tropical Africa.

108. *Hyperthelia dissoluta* (Nees ex Steud.) Clayton


Common names: *neanso, ntaso*; yellow hard grass, yellow thatching grass.

Caespitose perennials. Culms 100–300 cm long, erect; branches arising from the lower culms; internodes glabrous; butt sheaths glabrous. Leaves mostly basal; sheaths keeled, scabrous with membranous margins; auricles erect or absent; ligules 2–3(–24) mm long, membranous, apex lacerate; blades 15–30 cm long, 3–6 mm wide, glaucous, flat, scabrous with pale
whitish midribs slightly recessed above and protruding below on the lower ½, margins smooth, apex attenuate. Racemes 2–3 cm long, embraced at base by subtending leaf; spatheoles 5–7 cm long, lanceolate, scarious, glabrous or hirsute; racemes 2–3 cm long, paired, erect. Spikelets 10–14 mm long, in pairs, linear, subterete; principal lemma awns 50–100 mm long from a sinus, geniculate, the column twisted, hirtellos. Distribution: tropical Africa to western Indian Ocean; North and South America.

**Imperata cylindrica** (L.) P. Beauv.

Caespitose perennials with elongated, scaly rhizomes. Culms 10–100 cm tall, erect; internodes glabrous; nodes bearded; butt sheaths glabrous. Leaves mostly basal; sheaths sparsely hairy on the upper ⅓, margins sparsely hairy; ligules 1–2 mm long, ciliate membrane; blades 3–80 cm long, 2–20 mm wide, flat or conduplicate, ascending, scabrous, margins scaberulous, apex acute. Panicles 3–22 cm long, spiciform, linear; primary branches appressed to a central axis, with evident branchlets on axis, each branch bearing few fertile spikelets; rachis tough, subterete;
internodes filiform. Spikelets 2.2–6 mm long, in pairs, lanceolate, subterete, falling entire; callus bearded, hairs white, base truncate; lower lemmas about 1.4 mm long, awnless. Distribution: tropical and warm temperate regions in the Eastern Hemisphere; introduced in North America.

110. *Ischaemum polystachyum* J. Presl


Common name: paddle grass.

Perennials with elongated rhizomes. Culms 30–150 cm long, decumbent, or prostrate; branching from midculm; internodes glabrous; nodes without roots or rooting from below; butt sheaths glabrous. Leaves mostly cauline; sheaths glabrous; ligules 2.5 mm long, membranous; blades 5–25 cm long, 0.3–2 cm wide, linear-lanceolate, glabrous or pubescent, apex acuminate. Inflorescence with 2–5(–8) paired or digitate racemes; racemes 3–15 cm long, unilateral. Spikelets 4–7 mm long, in pairs, lanceolate or oblong, dorsally compressed; principal lemma awns 5–20 mm long from a sinus, geniculate, column twisted, glabrous. Distribution: tropical Africa to western Indian Ocean, temperate Asia and Australia.

111. *Lasiurus scindicus* Henrard

*Lasiurus scindicus* Henrard, Blumea 4: 514. 1941.

Common name: sewan grass.
Caespitose perennials with short, thick, woody, scaly rhizomes. Culms 30–100 cm tall, erect, straight, often woody below; branching sparsely below, simple or suffruticose; internodes glabrous; nodes dark; butt sheaths sparsely hairy, often silky. Leaves mostly cauline; sheaths longer than blade, flattened, ribbed, hairy on the upper \( \frac{1}{3} \), margins smooth; ligules fringe of hairs; blades 8–30 cm long, 1–3(–6) mm wide, flat or involute, spreading, flaccid, glaucous, glabrous, margins smooth, apex attenuate. Racemes 5–12 cm long, single, surrounded by hairs, partially included in the sheath; rachis fragile at the nodes, flattened, glabrous, pubescent or villous, ciliate on margins; rachis internodes cuneate, disarticulating horizontally. Spikelets 7–9 mm long, lanceolate, dorsally compressed, 3 at a node, falling as a unit; lemmas awnless. Distribution: tropical East Africa, temperate Asia, and northwestern India.

**FIGURE 120. Lasiurus scindicus.** A. Habit. B. Ligule, sheath, and blade. C. Spikelet. A drawn from L. Boulou s.n. (CAI); B, C drawn from A. Rawi, R. Jalili & A. Amer s.n. (US-2970973).


**112. Leersia hexandra Sw.**


Common names: rice grass, southern cut grass, white grass.

Mat-forming perennials with long, stout-branched, elongated rhizomes. Culms 20–100 cm tall, erect, geniculate, slender, weak or stout; branching sparse, arising from midculm or unbranched; internodes pubescent or smooth, striate; nodes bearded, dark, lower nodes rooting; butt sheaths glabrous. Leaves mostly basal; sheaths glabrous or scabrous, margins smooth;
auricles clawlike; ligules 1–2(–4) mm long, a ciliate membrane, truncate; blades 5–20 cm long, 1–3(–8) mm wide, flat, spreading, flaccid, glaucous, scabrous, midribs indistinct and slightly recessed above and protruding below with scabrid retrorse hairs, margins scabrous, apex acute-acuminate. Panicles 5–12 cm long, 1–4 cm wide, open, elliptic or oblong; primary branches bearing spikelets almost to the base. Spikelets (3.2–)3.4–4.8(–5.2) mm long, (1–)1.2–1.4(–1.7) mm wide, oblong, laterally compressed, falling as a unit; lemmas awnless, anthers 6 in number. Distribution: throughout the tropics.

113. *Leptothrium senegalense* (Kunth) Clayton


Common names: *ainguiem, firri*; hook grass.

Caespitose, short-lived perennials. Culms up to 75 cm tall, wiry, erect, geniculate; internodes glabrous; nodes dark; butt sheaths glabrous. Leaves basal and cauline; sheaths whitish, longer than the blade, flattened, ribbed, glabrous, margins membranous; ligules a fringe of hairs; blades 2–10 cm long, 1–2 mm wide, involute, spreading, straight, scabrous, margins smooth, apex attenuate. Inflorescence composed of racemes borne along a central axis; racemes 2–17 cm long, spreading, cuneate, bearing few fertile spikelets. Spikelets 2.5–8 mm long, linear to lanceolate, laterally compressed, in pairs, gibbous; lemmas awnless. Distribution: tropical Africa and southwestern Asia.

114. *Loudetia hordeiformis* (Stapf) C. E. Hubb.


Caespitose annuals. Culms 40–150 cm tall, slender, erect; internodes glabrous; nodes bearded; butt sheaths glabrous. Leaves mostly cauline; sheaths finely striate with short, stiff, tuberculate hairs; ligules with densely ciliate rims; blades 15–30 cm long,
4–8 mm wide, flat, loosely to densely hairy, minutely tuberculate, purplish above, margins tending to roll inward, scabrid, bases narrowed to barely rounded, apex acute, sometimes setaceous. Panicles 15–30 cm long, 0.4–2 cm wide. Spikelets 12–20 mm long, solitary, lanceolate, laterally compressed; lemma apex dentate, with triangular lobes, acute, awned; principal lemma awns 8–10 mm long from a sinus, geniculate, flattened below, column twisted and deciduous. Distribution: tropical Africa.

115. **Loudetia phragmitoides**  
(Peter) C. E. Hubb.


Common name: erapo grass.

Perrenials, reedlike. Culms 200–400 cm long, erect, stout, woody; sparsely branching below; internodes distally glabrous or hirsute; nodes bearded; butt sheaths glabrous. Leaves basal and cauline; sheaths longer than the internodes, tough, coarsely striate upward, densely pilose, villous, or hispid and tuberculate especially near summit; ligules a fringe of hairs; blades 50–100 cm long, 1–2 cm wide, flat or convolute, stiff, erect, strongly nervet, densely and softly pilose or glabrous, scaberulous above, margins scabrid, apex attenuate. Panicles 40–60 cm long, oblong. Spikelets 6–7 mm long, solitary, laterally compressed; lemma apex dentate, bidentate with triangular lobes, acute, awned; principal lemma awns 10–20 mm long from a sinus, geniculate, flattened below, column 1.5–3 mm long, twisted, persistent. Distribution: tropical Africa.

116. **Loudetia simplex**  
(Nees) C. E. Hubb.


Common names: besem grass, russet grass.
Caespitose perennials. Culms 30–150 cm long, erect; branching below; internodes glabrous, pubescent or pilose; nodes black, glabrous or bearded; butt sheaths pubescent or woolly, persistent with fibrous dead sheaths. Leaves mostly basal; sheaths glabrous; ligules densely ciliolate rim; blades 10–30 cm long, 2–5 mm wide, flat or convolute, scabrous, sometimes almost falsely petiolated, apex attenuate. Panicles 10–30 cm long, linear to ovate. Spikelets 8–13 mm long, solitary, lanceolate, slightly laterally compressed; lemma apex bidentate with triangular lobes, acute, the lobes 0.2–1 mm long, awned; principal lemma awns 25–50 mm long from a sinus, geniculate, flat below, column twisted and deciduous. Distribution: tropical Africa to western Indian Ocean.

117. **Loudetia togoensis** (Pilg.) C. E. Hubb.

**FIGURE 126**


Common names: *frala nkasan, gombi sogo, nkasan.*

Caespitose or solitary annuals. Culms 30–100 cm tall, erect, or geniculately ascending; branching below; butt sheaths glabrous. Leaves basal and cauline; sheaths glabrous; ligules fringe of hairs; blades 2.5–20 cm long, 0.2–1 cm wide, flat, pubescent, white midrib recessed above and protruding below on lower $\frac{3}{4}$, apex attenuate. Panicles 6–25 cm long, lanceolate; spikelets 22–27 mm long, in threes, lanceolate, laterally compressed; lemma margins involute and interlocking with palea keels; principal lemma awns 9–20 mm long from a sinus, geniculate, subterete below, column twisted, deciduous, the column 1.5–4 mm long, hirsute. Distribution: tropical Africa.

118. **Loudetiopsis kerstingii** (Pilg.) Conert

**FIGURE 127**


Caespitose or solitary annuals. Culms 45–100 cm long; geniculately ascending or decumbent; branching below; internodes glabrous; nodes bearded, dark; butt sheaths glabrous. Leaves basal and cauline; sheaths glabrous except for a densely velvety hairy covering at the base; ligules fringe of hairs; blades 10–20 cm long; 1.5–2.5 mm wide, aciculate or linear, flat or involute. Panicles 5–12 cm long, oblong. Spikelets 14–17 mm long, in threes, lanceolate, slightly laterally compressed; lemma apex lobed; principal lemma awns 70–120 mm long from a sinus, geniculate, flat below, column twisted, deciduous, the column 30–40 mm long, pubescent. Distribution: tropical West Africa.

119. **Micrachne obtusiflora** (Benth.) P. M. Peterson

**FIGURE 128**

*Brachyachne obtusiflora* (Benth.) P. M. Peterson, Taxon 64(3): 459. 2015. [*Brachyachne obtusiflora* (Benth.) C. E. Hubb.]

Caespitose annuals. Culms 10–20(–25) cm tall, slender, erect or geniculately ascending, leafy throughout; branching below; internodes glabrous; nodes dark. Leaves basal and cauline; sheaths longer than leaf blades, glabrous; ligules ciliolate membrane; blades 0.5–3.5(–5) cm long, needlelike, spreading, strongly revolute, often recurved, glabrous with apiculate apex. Inflorescence composed of a single raceme; racemes 3–6 cm long,
slender, erect or slightly curved, unilateral. Spikelets 2.2–2.5 mm long, packed broadside to rachis, crowded, regular, 2-rowed, with a single fertile floret, oblong, laterally compressed; lemma apex emarginate, awnless. Distribution: tropical Africa.

120. Microchloa indica (L.f.) P. Beauv.

Common names: dugu konsina, fukobi, kulumbi.

Caespitose annuals or perennials. Culms 5–50 cm tall, erect, wiry, forming small dense mats; with a few branches below; butt sheaths withering. Leaves mostly basal; sheaths glabrous, slightly compressed; ligules ciliolate membrane; blades 1–8(–11) cm long, 0.3–2 mm wide, filiform, flat, or conduplicate, apex abruptly acute or obtuse. Racemes, 1.4–15 cm long, solitary, unilateral.

Spikelets 1.7–2.9 mm long, solitary, lanceolate, slightly dorsally compressed; lemma apex obtuse, awnless. Distribution: tropical Africa, temperate Asia, South America, and Australia.

121. Oplismenus hirtellus (L.) P. Beauv.

Oplismenus hirtellus (L.) P. Beauv., Ess. Agrostogr. 54, 168, 170. 1812.
Common names: basket grass, ribbon grass, woods grass.

Caespitose perennials. Culms 15–100 cm long, prostrate, solitary; internodes glabrous, ribbed; nodes pubescent, lower nodes rooting. Leaves mostly cauline; sheaths glabrous to sparsely hairy, ribbed, margins ciliate, collars ciliate; ligules ciliolate membrane; blades 1–13 cm long, 0.4–2 cm wide, lanceolate to ovate, glabrous to sparsely hairy, bases almost petiolated, apex acuminate. Inflorescences 3–15 cm long, comprising 3–9 racemes, racemes...
0.5–3 cm long. Spikelets 2–4 mm long, in pairs, lanceolate, laterally compressed. Lemma apex acute, awnless. Distribution: tropics, worldwide.

122. Oropetium aristatum (Stapf) Pilg.

Common names: dedu ia, dedu na, dedu ya.

Mat-forming annuals. Culms 5–10 cm long, erect or geniculate; branching below. Leaves mostly cauline; sheaths tightly rolled, glabrous; ligules ciliolate membrane; blades 1–2 cm long, about 0.5 mm wide, involute, filiform, needlelike, glabrous, apex acuminate. Racemes 1–2 cm long, single; rachis fragile at the nodes, subcylindrical, the spikelets embedded in two rows.

Spikelets 3–3.5 mm long, 1-flowered, lanceolate, dorsally compressed; callus pubescent; lemma apex bidentate, awned; principal lemma awns 2–2.5 mm long from a sinus. Distribution: tropical West Africa.

123. Oropetium capense Stapf

Oropetium capense Stapf, Fl. Cap. 7: 742. 1900.
Common names: dedu ia, dedu na, dedu ya; dwarf grass.

Loosely to densely caespitose perennials. Culms 3–14 cm long, erect; branching below; internodes glabrous; butt sheaths persistent and investing base of culms, with fibrous dead sheaths. Leaves mostly basal; sheaths glabrous; ligules
ciliolate membrane; blades 1-4 cm long, 0.5-1.2 mm wide, filiform, flat or conduplicate, stiff, apex obtuse or acute. Racemes 2-3(–10) cm long, single, straight or curved, rachis fragile at the nodes, subcylindrical. Spikelets 2-3(–4) mm long, embedded in two rows, 1-flowered, lanceolate, dorsally compressed; callus pubescent; lemma apex bidentate, awnless. Distribution: tropical and temperate Africa.

124. Oryza barthii A. Chev.

Common names: kumo ara pilu; Mandinka rice, wild rice.

Caespitose annuals. Culms 60–120 cm long, geniculately ascending, or decumbent, spongy; branching below; internodes glabrous; nodes glabrous, rooting below. Leaves basal and cauline; sheaths scarious, striate, somewhat firm when young later loose and usually wrinkled with age, smooth, glabrous, slightly compressed toward apex; auricles erect; ligules 2–6 mm long, eciliate membrane, truncate or obtuse; blades 15–45 cm long, 0.4–1.3 cm wide, scaberulous, margins scabrous, apex acute to acuminate. Panicles 20–35 cm long, 3–7.5 cm wide, open, obovate. Spikelets 7–11 mm long, solitary, oblong, laterally compressed; lemma apex with a small beak, awned; principal lemma awns (65–)80–160(–190) mm long, pink, hispidulous, stiff. Distribution: tropical and temperate Africa.

125. Oryza brachyantha A. Chev. & Roehr.


Caespitose annuals. Culms 30–80(–100) cm tall, decumbent, or prostrate; internodes glabrous; nodes dark, rooting below. Leaves basal and cauline; sheaths smooth, glabrous; auricles falcate; ligules 1–2 mm long, eciliate membrane, entire or lacerate, truncate; blades 7–19 cm long, 1–5 mm wide, linear, glabrous or scaberulous below, scaberulous above, tapering to an acute point, green often tinged with purple, flaccid, smooth or somewhat asperulous above and along the margins, margins scaberulous, apex acute. Panicles 13–30 cm long, 2.5–5 cm wide,
open, ovate. Spikelets 6.5–9.25 mm long, solitary, oblong, laterally compressed; principal lemma awn 7–17 cm long, very slender, straight or somewhat wavy in upper ⅓, scabrous. Distribution: tropical and temperate Africa.

126. Oryza longistaminata A. Chev. & Roehr.


Common names: bahure, ndiga; African rice, red rice.

Robust perennials with long, creeping, branched rhizomes. Culms up to 250 cm, 5–10 mm in diameter near base, geniculately ascending or decumbent, spongy; internodes glabrous; nodes dark, rooting below. Leaves basal and cauline; sheaths smooth, glabrous, scariosus and spongy; auricles 10–15 mm long, erect; ligules 15–45 mm long, eciliate membrane, entire, lacerate or acute; blades 10–75 cm long, 5–25 mm wide, linear-lanceolate to very narrowly elliptic, broadest below the middle, bright to dark green, somewhat flaccid, scaberulous, midrib indistinct or evident, margins scabrous, bases narrowed or tapered to a false petiole, apex acuminate. Panicles 16–40 cm long, open, elliptic, or oblong. Spikelets 7–12 mm long, oblong, laterally compressed; principal lemma awn (26–)40–75 mm long. Distribution: tropical and temperate Africa to west Indian Ocean.

127. Oryza sativa L.


Common names: malo; Asian rice, paddy.

Caespitose annuals. Culms up to 150 cm tall, erect, geniculate; internodes glabrous; butt sheaths glabrous. Leaves basal and cauline; sheaths flattened, ribbed, glabrous, margins smooth; auricles clawlike or erect; ligules up to 10 mm long, membranous, apex lacerate, acute; blades 10–50 cm long, 4–10 mm wide, flat, spreading, straight, scaberulous, glabrous or pubescent, margins scabrous, apex acuminate. Panicles 20–50 cm long, lanceolate, equilateral or nodding. Spikelets 8–11 mm long, 2.5–3.5 mm wide, elliptic or oblong, laterally compressed; lemma unawned or awned, the awns up to 16 mm long; stamens 6. Distribution: Warm temperate regions.
128. *Oxytenanthera abyssinica* (A. Rich.) Munro


Common names: *bo, dianacare, kore*: Bindura bamboo, Holy Venda bamboo, savanna bamboo, wine bamboo.

Caespitose perennials with short rhizomes. Culms 3–10 m tall, 5–10 cm thick, robust, woody, erect, bamboolike, lateral branches well developed from midculm nodes and above; internodes solid or thick walled, smooth; nodes slightly inflated. Leaves mostly cauline, deciduous; sheaths hispid with dark brown stiff hairs when young, later glabrous; oral hairs ciliate; ligules eciliate membrane; blades 5–25 cm long, 1–3 cm wide, constricted at base to a petiolelike connection, linear-lanceolate to lanceolate, surfaces glaucous, glabrous or with few appressed hairs below near the midvien, stiff, venation with obscure veins, bases broadly rounded, margins scabrous, apex acuminate, pungent. Inflorescence a dense globose cluster of spikelets 7–9 cm in diameter, each head consisting of several spikelet clusters subtended by papery ovate sheath with reduced blades. Spikelets 15–45 mm long, lanceolate, laterally...
compressed; lemma awned, the awns 2–7 mm long. Distribution: tropical Africa.

129. *Panicum anabaptistum* Steud.


Common names: *infane, paguiri mayo, suebee*.

Caespitose perennials with short rhizomes. Culms 100–150 cm long, erect, or geniculately ascending, branching; internodes glabrous, smooth, dark. Leaves basal and cauline; sheaths firm, usually glabrous and smooth, rarely hirsute, closely striate; oral hairs sometimes bearded; ligules ciliate membrane; blades 10–30(–40) cm long, 4–6 mm wide, linear, flat, glaucous, glabrous with simple or slightly narrowed base, apex acute. Panicles


15–30 cm long, oblong. Spikelets 3.6–4.3 mm long, solitary, oblong, dorsally compressed, acuminate; lemma apex obtuse, awnless. Distribution: tropical Africa.


*Panicum antidotale* Retz., Observ. Bot. 4: 17. 1786. [*Panicum subalbidum* Kunth]

Common names: blue panic, blue panicum, giant panic grass.


FIGURE 139.
Robust annuals or short-lived perennials. Culms 60–200 cm high, wiry, erect or decumbent; internodes glabrous; lower nodes rooting or not, brown, glabrous; butt sheaths glabrous, papery. Leaves basal and cauline; sheaths glabrous, often purple, ribbed; ligules ciliate membrane; blades 10–60 cm long, 0.7–2 cm wide, linear, flat or involute, glabrous or pilose, ribbed, bases simple or cordate, apex acuminate. Panicles 10–45 cm long, oblong or ovate. Spikelets 2.4–3.4 mm long, solitary, ovate, dorsally compressed, acuminate; lemma apex obtuse, awnless. Distribution: tropical and temperate Africa and western Indian Ocean.

131. Panicum callosum Hochst.


Annuals. Culms 80–100 cm long, erect, robust. Leaves basal and cauline; sheaths hairy; ligules ciliate membrane; blades 5–40 cm long, 0.4–1 cm wide, linear, flat or involute, hairy, apex attenuate. Panicles 15–30 cm long, open, obovate; primary branches 10–20 cm long, whorled at lower nodes, stiff. Spikelets 5–6 mm long, solitary, lanceolate, dorsally compressed, acuminate; lemma apex obtuse, awnless. Distribution: tropical West Africa.

132. Panicum fluviicola Steud.


Common names: ghonya, gonya.
Robust to slender, tufted or solitary perennials with short rhizomes. Culms (30–)60–230 cm high, erect; branching sparsely from midculm; internodes glabrous; nodes dark; butt sheaths glabrous. Leaves basal and caudine; sheaths occasionally hairy, margins ciliate or glabrous, often purple tinged, ligules ciliolate membrane; blades (13–)25–50 cm long, 0.3–1.2 cm wide, linear, flat or partially folded especially toward the base, glabrous or pilose, with an inconspicuous greenish-white midrib slightly recessed above and protruding below; apex firm with a hardened point, almost pungent. Panicles 10–45 cm long, open, oblong. Spikelets 2–2.5(–3) mm long solitary, ovate, dorsally compressed; lemma apex obtuse, awnless. Distribution: tropical and temperate Africa.

**133. Panicum laetum Kunth**

Common names: balbaldi, paguiri; wild fonio, wild hungry rice, fonio of the birds.

Caespitose or solitary annuals. Culms 17–70 cm long, erect or geniculately ascending; butt sheaths glabrous. Leaves basal and caudine; sheaths glabrous, rarely pilose; ligules ciliate membrane; blades 4–24 cm long, 0.5–1 cm wide, linear or lanceolate, midrib scabrous, margins scabrid, bases broadly rounded, glabrous, apex acuminate. Panicles 7–20 cm long, open, ovate; primary branches spreading. Spikelets 2.5–3 mm long, solitary, ovate, dorsally compressed, acute; lemma apex obtuse, awnless. Distribution: tropical Africa and western Indian Ocean.

**134. Panicum repens L.**

Common names: bama subu; couch panicum, torpedo grass, Victoria grass.
Caespitose perennials; rhizomes elongated; stolons sometimes present. Culms up to 100 cm tall, erect, often with swollen bulblike base, glabrous; butt sheaths pubescent. Leaves distichous, basal and cauline; sheaths flattened, sparsely hairy, margins woolly at least when young; oral hairs present; ligules 1–2 mm long, ciliate membranes; blades 5–20 cm long, 2–6 mm wide, linear, flat or revolute, spreading, stiff, coriaceous, hairy, margins ciliate, apex attenuate and spiny, pungent. Panicles 3–11 cm long, open, oblong, or ovate; branches capillary. Spikelets 1–1.5 mm long, solitary, oblanceolate, ovate or orbicular, dorsally compressed; lemma apex obtuse, awnless. Distribution: tropical Africa.

**135. Panicum tenellum Lam.**


Caespitose annuals. Culms 10–35 cm long, erect, slender; branching ample, often fascicled, arising below. Leaves basal and cauline; sheaths longer than blade, striate glabrous; ligules eciliate membrane; blades 2.5–9 cm long, 1.5–3 mm wide, filiform, flaccid, flat or involute, glabrous, apex acuminate. Panicles 3–11 cm long, open, oblong, or ovate; branches capillary. Spikelets 1–1.5 mm long, solitary, oblanceolate, ovate or orbicular, dorsally compressed; lemma apex obtuse, awnless. Distribution: tropical Africa.

**136. Panicum turgidum Forssk.**

*Panicum turgidum* Forssk., Fl. Aegypt.-Arab. 18. 1775.

Common names: *afazo, afezu*; basket grass, desert grass, Sahara millet.

Caespitose perennial forming rounded bushes; rhizomes elongated. Culms up to 100 cm tall, solid, woody, erect, tough,
ribbed; internodes glabrous; nodes dark; butt sheaths sparsely hairy. Leaves distichous, glaucous, basal and cauline; sheaths much longer than blades, overlapping, ribbed, glabrous, margins membranous; oral hairs present; ligules ciliate membrane; blades 2–15 cm long, 1–6 mm wide, linear-lanceolate, convolute, spreading, stiff, coriaceous, glabrous, margins smooth, apex spiny, pungent. Panicles 2.5–15(–30) cm long, open, pyramidal. Spikelets (3.1–)3.4–4.5(–5) mm long, ovate, dorsally compressed, falling entire, apex acute or acuminate; lemma awnless. Habitat: sandy soils. Distribution: temperate and tropical Africa and Asia.

138. Parahyparrhenia annua (Hack.) Clayton


Caespitose annuals. Culms 18–70(–90) cm long, erect or geniculate, slender; sometimes quite short; internodes glabrous, smooth, often purplish, branched from all or most nodes, the branches often fascicled. Leaves mostly cauline; sheaths somewhat loose, striate, glabrous except at the upper margins, which are sometimes delicately ciliate; ligules ciliate membrane; blades 7–20 cm long, 2–6 mm wide, flat, flaccid, glabrous, margins scabrous, apex acute or acuminate. Panicles 5–15(–23) cm long, open, embraced at base by subtending leaf, oblong or ovate; primary branches ascending or spreading. Spikelets 1.5–2 mm long, solitary, ovate, dorsally compressed; lemma apex obtuse, awnless. Distribution: Temperate and tropical Africa, western Indian Ocean, and Asia.
blades 5–45 cm long, 1–6 mm wide, filiform with white midribs on lower ⅓, bases slightly or markedly narrowed, spatheolate. Racemes 2–6 cm long, paired or sometimes single. Spikelets in pairs, the basal sterile and the upper fertile. Fertile spikelets 5–11 mm long; callus 1–4 mm long, cuneate, pilose, pungent; lemma apex bidentate, awned; principal lemma awns 35–100 mm long from a sinus, geniculate, column twisted. Distribution: tropical Africa.

139. Paspalum scrobiculatum L.

Common names: barobia, parkatari; Indian crown grass, Indian paspalum, kodo millet, wild paspalum.

Mat-forming, caespitose perennials. Culms 10–150 cm long, erect, or geniculately ascending; with a few branches from mid culm; internodes glabrous; nodes dark, lower nodes rooting or not. Leaves basal and cauline; sheaths mostly shorter than adjacent culm internodes, open, glabrous; ligules eciliate membrane; blades 5–40 cm long, 0.3–1.5 cm wide, linear or linear-lanceolate, flat, glabrous or soft hairy, whitish hyaline midrib recessed above and protruding below on lower ⅓, base simple, rounded, tapering to a filiform-attenuate apex. Racemes 2–15 cm long, 1–20, digitate or borne along a central axis,
unilateral. Spikelets 1.4–3 mm long, solitary, obvate or orbicular, dorsally compressed, plano-convex, obtuse; lemma apex obtuse, awnless. Distribution: tropical Africa, western Indian Ocean, temperate and tropical Asia, Australia, North America, and South America.

140. Phragmites karka (Retz.) Trin. ex Steud.

**FIGURE 149**


Solitary perennials; rhizomes elongated. Culms 2–10 m tall, erect, reedlike; internodes glabrous; nodes dark. Leaves cauline; sheaths loose; collar dark; ligules ciliate membrane; blades 30–80 cm long, 1.2–4 cm wide, deciduous, flat, scaberulous below, hardened, apex attenuate. Panicles 30–50 cm long, 10–20 cm wide, open panicle, oblong. Spikelets 9–12 mm long, solitary, laterally compressed; floret callus with hairs 4–8 mm long; bisexual lemmas 8.5–10 mm long, apex acuminate, awnless. Distribution: tropical Africa, temperate and tropical Asia, and Australia.

141. Rhytachne rotboellioides Desv.

**FIGURE 150**


Caespitose perennials. Culms 20–100 cm tall; branches arising from the lower nodes; internodes glabrous; nodes dark; butt sheaths persistent and investing base of culm. Leaves mostly basal; sheath glabrous, the lower ones purplish or white, slightly compressed; ligules ciliate membrane; blades 5–25 cm long,
5–10 mm wide, tightly rolled, involute, filiform, margins smooth, apex apiculate. Inflorescence composed of single raceme; racemes 2–20 cm long, smooth, terete. Sessile spikelets 2–5(–6) mm long, oblong, or ovate, dorsally compressed; lower glumes 5–9-veined; lemma apex acute. Distribution: tropical Africa, western Indian Ocean, North America, and South America.

142. *Rhytachne triaristata* (Steud.) Stapf

*FIGURE 151*


Caespitose annuals. Culms 30–80 cm tall, slender, erect; branches arising from the lower nodes; internodes glabrous; nodes dark; butt sheaths glabrous. Leaves mostly basal; sheaths glabrous; ligules ciliolate membrane; blades 10–20 cm long, 1–2 mm wide, filiform, convolute, puberulous, apex acuminate. Inflorescence composed of single raceme; racemes 5–12 cm long, smooth, terete. Sessile spikelets 5 mm long, oblong, dorsally compressed; lower glumes 6- or 7-veined; lemma apex acute, awnless. Distribution: tropical Africa.

143. *Rottboellia afraurita* Stapf

*FIGURE 152*


Caespitose perennials. Culms up to 400 cm tall, robust, erect. Leaves cauline; sheaths keeled, basal ones strongly laterally compressed and flabellate; ligules ciliolate membrane; blades 30–100 cm long or more and 0.4–1.2 cm wide, conduplicate, apex acute. Inflorescences simple raceme embraced below by a spatheole; racemes 2–7 cm long. Spikelets 3–4.5 mm long, in pairs, ovate, dorsally compressed; lemma awnless. Distribution: throughout tropical Africa.

144. *Sacciolepis africana* C. E. Hubb. & Snowden

*FIGURE 153*


Common name: niepoto.

Caespitose perennials with short rhizomes. Culms 30–180 cm long, decumbent, spongy; branching from lower nodes; internodes glabrous, ribbed; nodes dark, lower nodes rooting. Leaves basal and cauline; sheaths loose, keeled, striate; collars dark; ligules ciliolate membrane; blades 30–100 cm long or more and 0.4–1.2 cm wide, conduplicate, apex acute. Inflorescences simple raceme embraced below by a spatheole; racemes 2–7 cm long. Spikelets 3–4.5 mm long, in pairs, ovate, dorsally compressed; lemma awnless. Distribution: tropical and temperate Africa and western Indian Ocean.

145. *Sacciolepis chevalieri* Stapf

*FIGURE 154*


Densely tufted perennials sometimes with short, oblique rhizomes. Culms 20–100 cm tall, firm, erect, very slender, soft or spongy below; branching from lower nodes; internodes smooth,
glabrous, ribbed, semiterete; nodes glabrous; butt sheaths scarious glabrous. Leaves mostly basal; sheaths glabrous; ligules ciliolate membrane; blades 5–20 cm long, 1–7 mm wide, convolute, strongly ribbed, papillose or not, margins smooth, inrolled, bases narrow, apex acuminate. Panicles 2–16 cm long, spiciform, narrow, continuous or interrupted below. Spikelets 1.5–2.2 mm long, solitary, ovate, laterally compressed, gibbous; lemma apex obtuse, awnless. Distribution: tropical and temperate Africa and western Indian Ocean.

146. Sacciolepis micrococca Mez


Caespitose annuals. Culms 15–70 cm tall, erect, wiry; internodes glabrous, striate; nodes dark. Leaves basal and cauline;
sheaths open, glabrous, ribbed; oral hairs bearded; ligules ciliolate membrane; blades 4–15 cm long; 1–2 mm wide, filiform, conduplicate, glabrous, papillose on veins above, bases narrower than sheath apex, apex acuminate. Panicles 2–15 cm long, spiciform, narrow. Spikelets 0.7–1 mm long, solitary, elliptic, slightly laterally compressed; lemma apex obtuse, awnless. Distribution: tropical and temperate Africa and western Indian Ocean.


147. Schizachyrium brevifolium (Sw.) Buse

Schizachyrium brevifolium (Sw.) Buse, Pl. Jungh. 359. 1854.

Caespitose annuals, often reddish in color. Culms 5–60 cm long; 1–2 mm in diameter, geniculate or prostrate, slender, weak; branching near the base; internodes glabrous, striate. Leaves basal and cauline; sheaths mostly shorter than adjacent internodes, keeled; ligules ciliolate membrane; blades 1–6 cm long, 1–7 mm wide, linear or linear-lanceolate flat, apex obtuse. Inflorescence composed of a single raceme, terminal and axillary;
racemes 1–2.5 cm long, subtended by a linear spatheole. Spikelets 1–1.5 mm long, in pairs, lanceolate, dorsally compressed; lemma apex entire (when awnless), or lobed, bidentate, incised 0.9 of lemma length, muticous (rarely) or awned; principal lemma awns 7–12 mm long from a sinus, geniculate, column twisted, glabrous. Distribution: tropical and temperate Africa, western Indian Ocean, temperate and tropical Asia to Western Hemisphere.


Loosely caespitose annuals, commonly reddish in color. Culms 10–120 cm tall, erect; with a few branches from the mid culms; internodes glabrous, with occasional prop roots below; roots fine, whitish. Leaves basal and cauline; sheaths much shorter than the internodes, glabrous, lower leaves strongly compressed, keeled toward apex; ligules ciliolate membrane; blades 2–15 cm long, 1–4 mm wide, glabrous or hairy on lower ⅔, with inconspicuous midribs above and protruding below, apex acute. Inflorescence composed of a single raceme, terminal and axillary; racemes 3–6 cm long, subtended by a linear or lanceolate, reddish spatheole. Spikelets 1–2(–3) mm long, in pairs, lanceolate, dorsally compressed; lemma apex lobed, bidentate, incised 0.75 of lemma length, awned; principal lemma awns (7–)10–25 mm long from a sinus, geniculate, column twisted, glabrous. Distribution: tropical and temperate Africa, western Indian Ocean, and tropical Asia.
149. Schizachyrium gresicola Jacq.-Fél.


Caespitose perennials, reddish in color; basal innovations flabellate. Culms 20–60 cm long; 1–1.5 mm in diameter, erect; internodes glabrous; nodes dark. Leaves basal and cauline; sheaths compressed, outer margins hairy; ligules 1 mm long, eciliate membrane; blades 10–15 cm long, 5–10 mm wide, filiform, convolute, apex acuminate. Inflorescences composed of single raceme, terminal and axillary; racemes 1–3.5 cm long, flexuous, subtended by a spatheole; spatheoles about 3 cm long, linear; peduncles 3–6 cm long. Spikelets 3.5–4 mm long, in pairs, dorsally compressed; lemma apex bidentate, incised 0.1–0.33 of lemma length, awned; principal lemma awns 12–15 mm long from a sinus, geniculate, column twisted, glabrous. Distribution: tropical West Africa.

150. Schizachyrium nodulosum (Hack.) Stapf


Caespitose annuals, reddish in color. Culms 15–45 cm long, erect, slender, solitary or fascicled, usually branched from the middle upward; internodes glabrous or pubescent below the nodes; nodes bearded or not. Leaves basal and cauline; sheaths somewhat loose, the lowest compressed and keeled, glabrous or very sparingly pubescent; ligules eciliate membrane, truncate; blades 3–8 cm long, 2–3 mm wide, narrowly linear, flat or folded, glabrous or sometimes with scattered long hairs near the junction with the sheaths, midribs indistinct, eventually drying white or reddish, margins slightly scabrid, apex acuminate. Inflorescence composed of single raceme, terminal and axillary;
racemes 2.5–5 cm long, smooth, terete, subtended by a spatheole; spatheoles 2.5–3 cm long, lanceolate, red. Spikelets 3 mm long, in pairs, lanceolate, dorsally compressed; lemma apex bidentate, incised 0.6–0.75 of lemma length, awned; principal lemma awns 10–12 mm long from a sinus, geniculate, column twisted, glabrous. Distribution: tropical West Africa.

151. *Schizachyrium ruderale* Clayton


Caespitose annuals. Culms 150–200 cm long, 3–4 mm in diameter near base, erect, reddish in color; often prop-rooted from lower nodes, the roots whitish. Leaves basal and cauline; sheaths glabrous toward the base, hairy toward apex; ligules ciliate membrane; blades 10–25 cm long, 3–6 mm wide, flat to partially folded, glabrous or pilose, sparsely hairy, hyaline mid-ribs recessed above and protruding below, apex acute. Inflorescence composed of single raceme, terminal and axillary; racemes 5–7 cm long, subtended by a spatheole; spatheoles about 3 cm long, linear, brown, or purple. Spikelets about 4.5 mm long, in pairs, lanceolate, dorsally compressed; lemma apex lobed, bidentate, incised 0.9 of lemma length, awned; principal lemma awns 14–20 mm long from a sinus, geniculate, column twisted. Distribution: tropical West Africa.

152. *Schizachyrium rupestre* (K. Schum.) Stapf


Caespitose perennials. Culms 90–150 cm long, slender, erect; internodes glabrous, reddish in color; roots fairly coarse and distinctively black. Leaves basal and cauline; sheaths firm, the lower compressed, keeled, dark brown, more or less hirsute, the upper usually a few loose hairs upward, finely striate, margins hairy; ligules ciliolate membrane, scarious; blades 15–30 cm long, 1–5 mm wide, folded or sometimes flat, keeled, glabrous except for a few hairs near the base, slightly glaucous when young, turning brown when old, slightly scaberulous above and on the margins, apex acute. Inflorescence composed of a single raceme, terminal and axillary; racemes 2–15(–20) cm long, subtended by a spatheole, exserted; spatheoles 4–7 cm long, linear, herbaceous. Spikelets 5–10 mm long, in pairs, laterally compressed. Distribution: tropics, worldwide.

153. Schizachyrium sanguineum (Retz.) Alston

Common names: crimson false bluestem, red autumn grass.

Caespitose perennials. Culms 70–300 cm high, reddish-purple, erect, slender; branching from lower nodes; butt sheaths glabrous or rarely sparsely pubescent. Leaves basal and cauline; sheaths glabrous, basal ones compressed; ligules ciliolate membrane; blades 6–30 cm long, 2–9 mm wide, apex acute. Inflorescence composed of single raceme, terminal and axillary; racemes 2–15 cm long, subtended by a spatheole, exserted; spatheoles 4–7 cm long, linear, herbaceous. Spikelets 5–10 mm long, in pairs, laterally compressed. Distribution: tropical and temperate Africa.

154. Schoenefeldia gracilis Kunth

*Schoenefeldia gracilis* Kunth, Révis. Gramin. 1: 283. 1830.
Common names: *burdi, furala, urga*.

Caespitose annuals. Culms 20–80 cm tall, erect, geniculate, or decumbent, weak; internodes glabrous; butt sheaths

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glabrous. Leaves basal and cauline; sheaths glabrous, ribbed, collar white, margins membranous; oral hairs present; ligules 1–2 mm long, ciliate membrane; blades 1–10 cm long, 2–3 mm wide, filiform, convolute with a distinct constriction midlength, ascending, hairy on basal ⅓, margins scabrous, apex attenuate. Racemes 6–15 cm long, 1–4, digitately inserted, curved, unilateral; rachis flattened. Spikelets 3–5 mm long, laterally compressed, cuneate; upper glume often mucronate; lemmas 1.5–2.5 mm long, 3-veined, awned, the awns 10–30(–40) mm long, flexuous, bristly. Distribution: tropical Africa, Arabia to Pakistan, and India.

155. **Sehima ischaemoides** Forssk.

*Sehima ischaemoides* Forssk., Fl. Aegypt.-Arab. 178. 1775.
Common name: *allomoze*.

Caespitose annuals. Culms 20–60 cm long, geniculately ascending, slender; branching from lower nodes; butt sheaths glabrous. Leaves basal and cauline; sheaths glabrous; ligules fringe of hairs; blades 5–30 cm long, 1–3 mm wide, flat, glaucous, margins cartilaginous, bases narrower than sheath, apex long-acuminate. Inflorescence a single raceme; racemes 3–15 cm long, straight or arcuate. Spikelets 9–15 mm long, in pairs, laterally compressed. Lemma apex bidentate, bifid; incised 0.25 of lemma length, awned; principal lemma awns 40–70 mm long from a sinus, geniculate, column twisted, ciliate. Distribution: tropical and temperate Africa and Asia.

156. **Setaria barbata** (Lam.) Kunth

*Setaria barbata* (Lam.) Kunth, Révis. Gramin. 1: 47. 1829.
Common names: bristly foxtail grass, corn grass, marvet.

Loosely caespitose annuals. Culms 10–150(–200) cm tall, with a few branches below; internodes ribbed; lower nodes

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**Figure 164.** *Sehima ischaemoides.* A. Habit. B. Ligule, sheath, and blade. C. Inflorescence. D. Spikelet. A, C drawn from Poilecot (1999); B, D drawn from Ibrahim and Kabuye (1988).

**Figure 165.** *Setaria barbata.* A. Habit. B. Ligule, sheath, and blade. C. Spikelet. A–C drawn from Carvalho 4152 (US-3328392).
somtimes rooting; but sheaths glabrous. Leaves basal and cauline; sheaths open, glabrous, slightly hairy at the apex, margins hairy; collars ciliate; ligules ringe of hairs; blades 5–30 cm long, 0.5–2(–3) cm wide, broadly linear to narrowly lanceolate, distinctively pleated fanwise from the base, dark green, hairy above with white midribs on lower ½, apex acuminate. Panicles 3–25 cm long, open, elliptic primary branches with secondary branches tightly appressed and contracted. Spikelets 2–3.2 mm long, elliptic, dorsally compressed, subtended by an involucre of bristles; bristles 1–15 mm long; lemma apex apiculate. Distribution: tropical and temperate Africa, Asia, Australia, and South America.

157. *Setaria geminata* (Forssk.) Veldkamp

Common name: Egyptian panic grass.

Mat-forming perennials with elongated, spongy rhizomes. Culms 10–150 cm high, spongy, prostrate; internodes glabrous; nodes dark, lower nodes rooting; but sheaths glabrous, scarios. Leaves basal and cauline; sheaths glabrous, keeled, margins smooth; collars white; ligules fringe of hairs; blades 3–25 cm long, 1–3 mm wide, flat or conduplicate, wiry, spreading, stiff, ribbed, scabrous with midrib apparent lower ½, margins smooth, bases cordate, apex acuminate, setaceous. Racemes 0.5–4 cm long, borne along a central axis, appressed, unilateral subtended by inflated leaf sheath, embraced at base by subtending leaves. Spikelets 1.6–2.6 mm long, ovate, dorsally compressed, subtended by an involucre of bristles; bristles 1–2 mm long, ciliolate membran or fringe of hairs; blades 2–30 cm long, 2–5(–10) mm wide, linear-lanceolate, loosely twisted, spreading, flaccid, glabrous, margins scabrous, apex acute. Panicles 1–10(–20) cm long, spiciform, terminal, ovate, gibbous. Spikelets 1.5–3.5 mm long, pedicelled, dorsally compressed, subtended by an involucre of 4–12 bristles; bristles 3–8 mm long, antorsely scabrous; lemmas anullless. Distribution: Old World tropics, western Indian Ocean, North America, and South America.


Common names: *laki davangel, ulu ndenku*; yellow foxtail.

Solitary annuals. Culms up to 130 cm tall, erect, geniculate, robust, ribbed; nodes dark, glabrous; but sheaths glabrous. Leaves basal and cauline; sheaths glabrous, ribbed, margins membranous; collars dark; ligules 1–2 mm long, ciliolate membranes or fringe of hairs; blades 2–30 cm long, 2–5(–10) mm wide, linear-lanceolate, loosely twisted, spreading, flaccid, glabrous, margins scabrous, apex acute. Panicles 1–10(–20) cm long, spiciform, terminal, ovate, gibbous. Spikelets 1.5–3.5 mm long, pedicelled, dorsally compressed, subtended by an involucre of 4–12 bristles; bristles 3–8 mm long, antorsely scabrous; lemmas anullless. Distribution: tropical and warm temperate Old World.

159. *Setaria sphacelata* var. *anceps* (Stapf) Veldkamp


Caespitose perennials with short or rarely elongated rhizomes. Culms 20–300 cm long, 3–6 mm in diameter, erect or geniculate; a few branches from mid culm; internodes glabrous, ribbed; nodes dark, glabrous; but sheaths withering or
persistent and investing base of culm with fibrous dead sheaths. Leaves basal and caudine; sheaths rather firm, the lower and those supporting branches soon loosened, laterally compressed, acutely keeled, glabrous or rarely loosely to densely hairy and tuberculate, finely striate; oral hairs present, ligules a fringe of hairs; blades 10–50 cm long, 0.2–1.7 cm wide, flat or convolute, scabrous, bases slightly narrowed, apex acuminate. Panicles 3–50 cm long, spiciform, narrow. Spikelets 1.5–12 mm long, subtended by an involucre of 6–15 bristles, the bristles 1.5–12 mm long, antrorsely scaberulous; lemma apex acute, awnless. Distribution: tropical and temperate Africa, western Indian Ocean, Asia, Australia, and Western Hemisphere.

160. Setaria verticillata (L.) P. Beauv.

_setaria verticillata_ (L.) P. Beauv., Ess. Agrostogr. 51. 1812.
Common names: _nornaba_; burr, burr bristle grass, foxtail grass, rough bristle grass.

Caespitose annuals. Culms 30–100 cm tall, erect, geniculate; internodes glabrous, robust, ribbed; nodes dark; butt sheaths glabrous. Leaves basal and caudine; sheaths flattened,
sparsely hairy, ribbed, margins hairy; ligules ciliolate membrane; blades 3–30 cm long, 4–10(−15) mm wide, broadly linear, flat, spreading, flaccid, scabrous, collar white and distinct, margins scabrous, apex acute. Panicles 2–15 cm long, 0.5−1.5 cm wide, spiciform, linear, continuous or interrupted. Spikelets 1.5–2.5 mm long, elliptic, dorsally compressed, pedicelled, each spikelet subtended by a solitary bristle, the bristles 4–7 mm long; lemmas awnless. Habitat: a weed of cultivation. Distribution: temperate and warm temperate regions Old World.

161. Sorghastrum stipoides (Kunth) Nash


Caespitose perennials with hard, creeping, short rhizomes. Culms 90–200 cm tall, erect, usually unbranched; internodes glabrous; nodes bearded. Leaves mostly cauline; sheaths glabrous; auricles erect or absent; ligules 1.5−4 mm long, eciliate membrane; leaf-blades 15–50 cm long, 0.3–0.7(−1.2) cm wide, linear-lanceolate, flat or convolute, stiff, rigid and conspicuously narrowed toward the base, glabrous. Panicles 15−40 cm long, open, linear-lanceolate; branches capillary. Spikelets 4–6(−6.5) mm long, in pairs, lanceolate, dorsally compressed; callus rounded, shortly bearded; lemma apex bilobed, incised 0.2 of lemma length, muticous or awned; principal lemma awns (0−)4–13(−25) mm long from a sinus, straight, or geniculate, column twisted, glabrous or hispidulous. Distribution: tropical and temperate Africa and South America.
162. *Sorghum arundinaceum* (Desv.) Stapf


Common names: Cameroon grass, common wild sorghum, Tunis grass.

Solitary annuals or short-lived perennials. Culms up to 400 cm tall, erect, robust, geniculate; internodes glabrous; nodes glabrous or pubescent, often lower nodes rooting; butt sheaths glabrous. Leaves basal and cauline; sheaths glabrous, ribbed, margins smooth; ligules 2–3 mm long, ciliate membrane; blades 5–70 cm long, 0.5–6 cm wide, linear, spreading, hairy on the basal ⅓, margins scabrous, white midribs recessed above and protruding below on lower ⅔, base cordate, apex attenuate. Panicles 10–60 cm long, open, linear, lanceolate or ovate; primary branches (rames) not whorled; rames 0.8–2 cm long, bearing 2–7 fertile spikelets. Fertile spikelets 4–9 mm long, lanceolate to ovate, dorsally compressed, acute; lemma awnless or awned, the awns 1–30 mm long. Pedicled spikelets staminate or sterile; lemmas awnless. Distribution: Africa to India and Australia.

163. *Sorghum bicolor* (L.) Moench

*Sorghum bicolor* (L.) Moench, Methodus 207. 1794.

Common names: *abora*, *gauri*, *nion*; broom millet, Sudan grass, sweet sorghum.

Caespitose annuals or short-lived perennials. Culms up to 250 cm tall, erect, robust, geniculate; internodes glabrous; butt sheaths glabrous. Leaves basal and cauline; sheaths glabrous, ribbed, margins membranous; oral hairs present; ligules 2–3 mm long, ciliate membrane; blades 30–70 cm long, 0.5–7 cm wide,
linear-lanceolate; spreading, glabrous, margins scabrous, bases cordate, apex acuminate. Panicles 4–50 cm long, 2–20 cm wide, open or contracted, lanceolate or ovate or globose, equilateral, or nodding, spreading; rames bearing few fertile spikelets. Fertile spikelets 3–10 mm long, in pairs, oblong or ovate or oblurate or orbicular, dorsally compressed; pedicled spikelets stamine or sterile; lemmas unawned or awned, awns 3–10(−30) mm long, geniculate, column twisted, pubescent. Habitat: cultivated cereal and weed. Distribution: tropical Old World.


Common names: *kafini, kononi*; bird’s broom, hare’s grass, red dropseed.

Densely caespitose perennials. Culms 10–60 cm, 1–2 mm wide high, erect or geniculate-ascending, slender; branching from lower nodes; butt sheaths glabrous, persistent, becoming fibrous with age. Leaves mostly basal; sheaths glabrous, margins glabrous or ciliate, ribbed; collar ciliate, not whitish; ligules a fringe of hairs; blades 2–7 cm long, 1–2 mm wide, convolute, sometimes flat, scabrous, apex attenuate. Panicles 3–22 cm long, narrowly ovate, open, very delicate and diffuse. Spikelets 1–1.5 mm long, 1-flowered, greyish green or purplish; lemmas apex acute; anthers 0.6–0.8 mm long, 3 in number. Distribution: tropical and temperate Africa and Asia.

165. Sporobolus helvolus (Trin.) T. Durand & Schinz


Common names: *afer, shakatee*; khev grass.

Tufted perennials with elongated rhizomes; stolons present or absent. Culms 15–60 cm long, 1 mm in diameter, wiry; branching from lower nodes. Leaves basal and cauline; leaf sheaths glabrous, ribbed; ligules fringe of hairs; leaf blades 2–15 cm long, 2–4 mm wide, linear, flat, glaucous, sparsely hairy adaxially, base subcordate, apex acuminate. Inflorescences 4–12 cm long, 5–20 mm wide, an open panicle, linear to narrowly lanceolate, usually distinctly branched. Spikelets 1.4–2 mm long, 1-flowered, lanceolate, greenish-brown; lemma apex acute; anthers 0.6–0.8 mm long, 3 in number. Distribution: tropical and temperate Africa and Asia.

166. Sporobolus ioclados (Nees ex Trin.) Nees


Common names: bushveld dropseed, pan dropseed.

Caespitose perennials; stolons sometimes present. Culms 10–80 cm tall, erect, geniculate; basal innovations subterete or flabellate; internodes glabrous, striped; nodes dark; butt sheaths glabrous. Leaves basal and cauline; flattened, ribbed, glabrous, margins membranous; oral hairs present; ligules fringe of hairs; blades 2–20 cm long, 1–3 mm wide, flat or convolute, straight, ascending, scabrous, margins cartilaginous, bases narrow, apex acuminate. Panicles 3–20 cm long, open to somewhat contracted, pyramidal. Spikelets 1.5–3(−3.3) mm long, 1-flowered, lanceolate, subterete; lemmas 1.5–3 mm long, awnless; anthers
0.7–1 mm long, 3 in number. Distribution: tropical Africa, Arabia to India.

167. *Sporobolus microprotus* Stapf


Loosely caespitose annuals. Culms 10–50 cm high, erect, or geniculately ascending; internodes glabrous; nodes dark; branching from lower nodes; butt sheaths glabrous. Leaves basal and cauline; sheaths glabrous, slightly compressed; collars whitish; ligules fringe of hairs; blades 2–14 cm long, 3–7 mm wide, hairy on basal , margins ciliate toward the base. Panicles 3–12 cm long, open, ovate; primary branches spreading, whorled at most nodes. Spikelets 1–1.2 mm long, 1-flowered, lanceolate, subterete; lemma apex acute, awnless; anthers 0.3–0.6 mm long, 2. Distribution: tropical Africa.

168. *Sporobolus pectinellus* Mez


Delicate, caespitose annuals. Culms 10–45 cm high, slender, erect or geniculate; branches arising from lower nodes; butt sheaths

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glabrous. Leaves mostly basal; sheaths glabrous; ligules fringe of minute hairs; collars whitish; blades 1–8 cm long, 1–3 mm wide, flat or convolute, rather stiff, margins scabrid, apex attenuate. Panicles 3–18 cm long, open, ovate-oblong; branches delicate and diffuse; pedicels capillary. Spikelets 0.8–1.2(–2) mm long, 1-flowered, lanceolate; lemma apex acute; anthers 0.5–0.6 mm long, 3 in number. Distribution: tropical Africa.


Common names: burdi, gansegui; cat's tail dropseed, giant rats grass, whorled dropseed.

Caespitose perennials. Culms 90–200 cm tall, 2–5 mm in diameter at the base; branches arising from the lower nodes or lacking; internodes and nodes pubescent; butt sheaths glabrous or pubescent, scarious. Leaves mostly basal; sheaths keeled, glabrous, lower ones compressed tending to become bulbous at the base; ligules fringe of hairs; blades 20–50 cm long, 0.3–1 cm wide, linear or filiform, flat or convolute when dry, scabrid or glabrous with distinct white midrib for ⅓ their length; margins cartilaginous; apex tapering to a flexuous filiform tip. Panicles 20–45 cm long, open, pyramidal; primary branches ascending, tightly contracted. Spikelets (1.4)1.7–2(2.3) mm long, 1-flowered, lanceolate, green to greyish or purplish; lemma apex acute; anthers 0.6−1.1 mm long, 3 in number. Distribution: tropical and temperate Africa, Asia, Australis, and South America.

170. Sporobolus spicatus (Vahl) Kunth

Common names: beurga; rat’s tail, salt grass.

Mat-forming perennials; stolons present. Culms 10–70 cm tall, erect, wiry, geniculate; internodes glabrous; nodes dark, lower nodes rooting; butt sheaths glabrous. Leaves basal and cauline; sheaths flattened, ribbed, glabrous, margins membranous; oral hairs present; ligules fringe of hairs; blades 2–25 cm long, 1–3 mm wide, flat or convolute, straight, ascending, hairy on basal ⅔, margins pubescent, apex spiny pungent. Panicles 1.5–20 cm long, 0.2–0.4 cm wide, spiciform, linear. Spikelets 1.4–2.2(–2.8) mm long, 1-flowered, lanceolate, subterete, appressed; lemmas 0.8–2.2 mm long, awnless; anthers 1–1.2 mm long, 3 in number. Distribution: tropical and temperate Africa, Asia, Australis, and South America.

171. Sporobolus stolzii Mez

Caespitose annuals. Culms 10–60 cm long, erect; internodes glabrous. Leaves mostly basal; sheaths hairy; margins hairy, ligules fringe of hairs; blades 1–6 cm long, 2–6 mm wide, lanceolate, pectinate-ciliate on the margins. Panicles 5–14 cm long, narrowly elliptic; branches in whorls and hispidulous bearing 6–30 spikelets. Spikelets 0.9–1.6 mm long, 1-flowered, glabrous or hispidulous; lemmas awnless; anthers 0.1–0.4 mm long, 3 in number. Distribution: Africa.

172. *Stafchochloa lamproaria* (Stapf) H. Scholz

*Stafchochloa lamproaria* (Stapf) H. Scholz, Willdenowia 34: 131. 2004. [Chloris lamproaria Stapf]

Caespitose annuals. Culms 30–60 cm high, erect, ascending or decumbent, with or without rooting at the lower nodes; a few branches from the lower nodes; internodes glabrous; nodes dark, lower nodes rooting or not. Leaves basal and cauline; sheaths keeled, open, glabrous, ribbed with membranous margins; ligules ciliolate membrane; blades 4–16(–20) cm long, 3–5 mm wide, flat or folded, apex acuminate. Inflorescences of 2–4, paired or closely digitate, silky, golden racemes, the racemes 4–11 cm long, embraced by an inflated leaf sheath. Spikelets 2–2.5 mm long, 4-flowered, 2-awned; fertile lemmas 3–4 mm long, coriaceous, ciliate on the keel, the cilia 1.5–4 mm long; principal lemma awns subapical, straight, the awns 2.5–4 mm long. Distribution: tropical Africa.

173. *Stipagrostis acutiflora* (Trin. & Rupr.) De Winter


Caespitose perennials; stolons sometimes present. Culms 20–60 cm tall, erect, weak; internodes densely pubescent; nodes dark; butts sheaths glabrous. Leaves basal and cauline; sheaths flattened, glabrous, margins membranous; oral hairs present; ligules 1 mm long, fringe of hairs; blades 4–6 cm long, 1–2 mm wide, filiform, convolute, straight or curved, stiff, scabrous,

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**FIGURE 182.** *Stipagrostis acutiflora*. A. Habit. B. Ligule, sheath, and blade. C. Glumes and floret. A, C drawn from E. Canon s.n. (US-152805), A. Amin s.n. (CAI); B drawn from L. Chevallier s.n. (US-550638).
margins scabrous, apex acuminate. Panicles 5–15 cm long, open, lanceolate, sometimes included in the sheath below. Spikelets 9 mm long, lanceolate, subterete; lemmas 5 mm long, 3-awned, central awns 10–15 mm long, feathery, column slightly twisted. Distribution: northern Africa and Arabia.

174. Stipagrostis hirtigluma
(Steud. ex Trin. & Rupr.) De Winter


Caespitose annuals or short-lived perennials. Culms 30–70 cm tall, erect, geniculate; internodes glabrous, ribbed; butt sheaths glabrous. Leaves basal and cauline; sheaths ribbed, glabrous, margins membranous; ligules fringe of hairs; blades 6–20 cm long, 1–2 mm wide, filiform, convolute, straight, stiff, scabrous, margins scabrous, apex acuminate. Panicles 10–15 cm long, open. Spikelets 10–13 mm long, lanceolate, subterete; lemmas 3.5–4 mm long, 3-awned, central awns 35–55 mm long, feathery, column twisted. Distribution: tropical and temperate Africa to Arabia and India.

175. Stipagrostis uniplumis (Licht.) De Winter


Caespitose perennials. Culms 30–80 cm tall, erect; internodes glabrous; nodes dark; butt sheaths glabrous. Leaves basal and cauline; sheaths ribbed, glabrous, margins membranous; ligules...
fringe of hairs; blades 5–15 cm long, 0.5–1.5 mm wide, filiform, convolute, curly, scabrous, margins smooth, apex attenuate. Panicles 10–15 cm long, open, terminal, partially included in the sheath. Spikelets 9–10 mm long, lanceolate, subterete; lemmas 2–3.5 mm long, central awns 20–35 mm long, feathery, column twisted. Distribution: temperate and tropical Africa and Asia.


Common name: *tadjemait*.

Caespitose annuals or short-lived perennials. Culms 30–60 cm tall, erect, geniculate, glabrous; nodes dark nodes; butt sheaths glabrous. Leaves basal and cauline; sheaths ribbed, glabrous, keeled or flattened basally, margins scabrous; oral hairs present; collars dark colored; ligules ciliolate membrane; blades 3–12 cm long, 2–4 mm wide, filiform, convolute, spreading, hairy on the basal ⅓, margins smooth, apex obtuse. Racemes 3–6 cm long, single or paired, ascending, unilateral, subtended by an inflated leaf sheath. Spikelets 7–12 mm long, cuneate, laterally compressed, surrounded by hairs; lemmas 4–6 mm long, awned, the awns 2–8 mm long, straight. Distribution: Macronesia, Africa, and Arabia.


Common names: angle grass, blue grass, kangaroo grass, red grass.
Caespitose perennials. Culms 60–200 cm tall, erect, geniculate, glabrous; nodes bearded; butt sheaths glabrous, withering. Leaves basal and cauline; sheaths flattened, glabrous, margins scabrous; ligules 1–2 mm long, ciliolate membrane; blades 10–30 cm long, 1–4 mm wide linear, ascending, glabrous, reddish, inconspicuous midrib drying white, margins smooth, apex acute. Inflorescences 10–30 cm long, composed of terminal and axillary racemes, subtended by a spatheole; spatheoles 1.5–3.5 cm long, lanceolate, scarious, brown or red, sometimes tuberculate. Spikelets borne in threes; sessile spikelets 6–11 mm long, elliptic, subterete, surrounded by hairs; fertile florets 6–11 mm long, sessile, awned; the awns 25–70 mm long, terminal, geniculate, bristly. Distribution: tropical and subtropical Old World.

178. Tragus berteronianus Schult.

Tragus berteronianus Schult., Mant. 2: 205.1824.
Common names: burgrass, carrot-seed grass, pricklegrass.

Caespitose annuals. Culms 5–20 cm tall, erect, geniculate, glabrous; butt sheaths glabrous, withering. Leaves basal and cauline, sheaths longer than blades, glabrous, margins sparsely hairy; oral hairs present; ligules fringe of hairs; blades 1–5 cm long, 1–5 mm wide, lanceolate, flat, scabrous, margins ciliate, bases cordate, apex acute. Inflorescences 2–7.5 cm long, composed of numerous racemes borne along a central axis, closely spaced in a multilateral false spike, spreading, oblong; racemes 3–7 mm long. Spikelets 2–3 mm long, lanceolate, subterete; lemmas 1.5–2.5 mm long, awnless. Distribution: Africa, southwestern Asia, China, and the Western Hemisphere.

179. Tragus racemosus (L.) All.

Common names: stalked bristle grass, stalked burgrass, sweetheart grass.
Caespitose annuals. Culms 5–20 cm tall, erect, geniculate, glabrous; butt sheaths glabrous, withering. Leaves basal and cauline; sheath longer than blade, glabrous, margins membranous; oral hairs present; ligules fringe of hairs; blades 3–5 cm long, 2–5 mm wide, lanceolate, flat, scabrous, margins ciliate, apex acute. Inflorescences 2–7.5 cm long, composed of numerous racemes borne along a central axis, closely spaced in a multilateral false spike, spreading; racemes 0.4–0.9 cm long, cuneate bearing 2–4 fertile spikelets. Spikelets 4–5.5 mm long, lanceolate, dorsally compressed; lemmas 3.5–5 mm long, awnless. Distribution: Europe, temperate Asia, and tropical northern Africa.

180. *Trichanthecium brazzavillense* (Franch.) Zuloaga & Morrone


Caespitose perennials. Culms (20–)60–80(–85) cm long, erect, or geniculately ascending, slender; a few branches from the lower nodes; internodes glabrous; butt sheaths persistent and investing base of culms with compacted dead sheaths or fibrous dead sheaths. Leaves mostly basal; sheaths glabrous; ligules ciliate membrane; leaf blades 10–20(–25) cm long, 1–3 mm wide, ascending, conduplicate or involute, stiff, glabrous, or pilose, straight at the bases, apex acuminate. Panicles 3–15(–20) cm long, open, oblong or ovate. Spikelets 1.2–1.7 mm long, solitary, ovate or orbicular, dorsally compressed; lemma apex obtuse, awnless. Distribution: tropical and temperate Africa.

181. *Trichanthecium parvifolium* (Lam.) Zuloaga and Morrone


Common name: small-flowered panic grass.

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**FIGURE 190.** *Trichanthecium parvifolium.* A. Habit. B. Ligule, sheath, and blade. C. Spikelet. A, C drawn from Ibrahim and Kabuye (1988); B drawn from *H. Humbert* 5753 (US-150688.)
Delicate perennials. Culms 8–50 cm long, prostrate, slender, wiry; branching below; internodes glabrous; lower nodes rooting. Leaves basal and cauline; sheaths glabrous; ligule a ciliate membrane; blades 1.5–3 cm long, 2–7 mm wide, ascending, or reflexed (at maturity), lanceolate to ovate, glaucous, venations with distinct cross veins, glabrous or pilose, bases cordate, apex acute. Panicles 1–3 cm long, open, exserted, or embraced at base by subtending leaf sheath, ovate; primary branches spreading or reflexed. Spikelets 1–2 mm long, solitary, oblong or ovate, dorsally compressed; lemma apex obtuse, awnless. Distribution: Tropical Africa, southern and western Indian Ocean, and Western Hemisphere.

182. *Trichoneura mollis* (Kunth) Ekman


Caespitose annuals. Culms 5–20 cm tall, erect, geniculate; internodes glabrous; butt sheaths glabrous. Leaves basal and cauline; sheaths sparsely hairy, margins membranous; ligules 1–2 mm long, membranous, apex erose, serrate; blades 2–15 cm long, 1–5 mm wide, linear, flat or involute, spreading, glabrous to pilose, margins scabrous, apex acute. Inflorescences 5–25 cm long with 10–40 racemes located along a central axis; racemes 1.5–4(–5) cm long. Spikelets 6.2–8 mm long, cuneate, laterally compressed; lower glumes 4.6–7 mm long, 1-awned, the awns 1–2 mm long; lemmas 2.5–3.5 mm long, mucronate or awned, the awns up to 2 mm long. Distribution: tropical Africa and Arabia.


Caespitose perennials. Culms 5–28 cm long, erect, very slender wiry; butt sheaths persistent and investing base of culm with fibrous dead sheaths; roots forming a fine dense mat. Leaves mostly

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basal; sheaths glabrous, often purple-tinged; ligules ciliolate membrane; blades 1–9 cm long, about 0.5 mm wide, filiform, pilose above and on margins, involute or conduplicate, curved or straight, apex acute. Single raceme 2–8 cm long, erect, straight, unilateral. Spikelets 2.6–8 mm long, solitary, elliptic, laterally compressed; lemma apex emarginate, mucronate or awned; principal lemma mucro/awns 0.1–0.7(–1.2) mm long from a sinus. Distribution: tropical and temperate Africa to western Indian Ocean.


Common names: giant trident grass, hairy trident grass.

Caespitose perennials with short rhizomes. Culms 120–240 cm long, erect, stout; a few branches arising from lower nodes; internodes glabrous or loosely pilose; nodes dark; butt sheaths thickened and forming bulbs, pubescent or woolly. Leaves mostly basal; sheaths tough, coarsely to finely striate, the lower overlapping, tomentose, upper glabrous rarely pubescent to villous; collar dark; ligules dense fringe of hairs; blades 30–60 cm long, 0.5–1.2 cm wide, linear-lanceolate, glaucous, flat, glabrous with prominent midribs below, slightly scabrid margins, sometimes involute. Panicles 20–40 cm long, contracted, linear, branches glabrous or villous. Spikelets 25–35 mm long, in threes, or in pairs (rarely), lanceolate, laterally compressed; lemma apex bilobed with lanceolate lobes; incised 0.2–0.3 of lemma length, acute, awned; principal lemma awns 40–120 mm long from a sinus, geniculate, subterete below, column twisted, deciduous, abscissing from tip of lemma. Distribution: tropical and temperate Africa.

185. *Triticum aestivum* L.*


Common names: *gemah, halkama*; bread wheat, silver tip wheat, volunteer wheat.
Caespitose annuals. Culms 60–100 cm tall, erect, geniculate; internodes glabrous; nodes bearded; butt sheaths glabrous. Leaves basal and cauline; sheaths glabrous, ribbed, margins smooth; auricles clawlike; collars dark; ligules 1–3 mm long, membranous, apex truncate; blades 10–60 cm long, 10–15 mm wide, linear; flat; spreading, sparsely hairy, margins scabrous, apex acute. Inflorescence a single bilateral spike, 5–18 cm long, linear or oblong. Spikelets 10–15 mm long, 9–18 mm wide, ovate, laterally compressed; glumes 6–12 mm long; lemmas 10–15 mm long, unawned or awned, the awns up to 15 cm long, straight, bristly. Distribution: worldwide.

186. *Urelytrum muricatum* C. E. Hubb.


Caespitose perennials. Culms 120–270 cm long; 3–5 mm in diameter below, erect; internodes glabrous; nodes dark; butt sheaths glabrous. Leaves basal and cauline; sheaths glabrous; oral hairs bearded; ligules ciliolate membrane; blades 45–90 cm long, 3–7 mm wide, linear, flat or convolute, glabrous with conspicuous broad white midrib, nerves prominent, margins scabrid, apex attenuate. Inflorescence with 2–4 paired or digitate racemes; racemes 15–26 cm long, straight, smooth terete. Spikelets 7–10 mm long, oblong, dorsally compressed; lemma apex obtuse, awnless. Distribution: tropical West Africa.


Common names: kussein; Joe Tanner’s grass, Tanner grass.
Perennials. Culms 30–130 cm long, prostrate; internodes smooth, angled, rooting at the lower nodes. Leaves basal and cauline; sheaths pubescent with hairy or glabrous margins; ligules fringe of hairs; blades, 5–25 cm long, 0.5–1.5 mm wide, lanceolate, flat base, bases cordate, apex acuminate. Inflorescences of 4–15 racemes borne along central axis; racemes 1–10 cm long. Spikelets 3–4 mm long, solitary, elliptic; lemma apex obtuse, muticous or mucronate, awnless. Distribution: tropical and South Africa, Indian Ocean; introduced to tropical America.

188. **Urochloa deflexa** (Schumach.) H. Scholz


Common names: *paguiri, yagué yagué ba*; false signal grass, Guinea millet.

Loosely caespitose annuals. Culms 15–70 cm high, weak, geniculately ascending. Leaves mostly cauline; sheaths pubescent with hairy margins; ligules fringe of hairs; blades 4–30 cm long, 0.3–2 cm wide, linear-lanceolate or broadly linear, sparsely hairy with fine midrids recessed above and protruding below, margins scabrid, base cordate, apex acute-acuminate. Inflorescence of 7–15 racemes; racemes 2–10 cm long. Spikelets 2.5–3.5 mm long, in pairs, broadly elliptic; lemma apex acute or mucronate. Distribution: throughout the tropics.

189. **Urochloa jubata** (Fig. & De Not.) Sosef

*Urochloa jubata* (Fig. and De Not.) Sosef, Fl. Trop. Afr. 9: 563. 1919. [Brachiaria jubata (Fig. & De Not.) Stapf]

Common names: *ban ngassan, handu nkasan*.

Caespitose perennials. Culms 25–120 cm high; branched from lower nodes; internodes glabrous, striate, lower nodes rooting. Leaves basal and cauline; sheaths glabrous to short...
hairy, often with purple bases below; ligules a fringe of hairs; blades 5–30 cm long, 0.3–1.5 cm wide, midrib inconspicuous, hyaline above and protruding below, hairy, margins slightly scabrid, bases rounded, often fringed with hairs, apex acute. Inflorescence composed of (3−)5–10(−15) racemes borne along central axis; racemes 1–6 cm long. Spikelets 2.5–3.8 mm, solitary, elliptic; lemma apex acute. Distribution: tropical Africa to western Indian Ocean.

190. Urochloa lata (Schumach.) C. E. Hubb.


*Brachiaria lata* (Schumach.) C. E. Hubb.

Common names: akaru, akasof, ichiban.

Caespitose annuals. Culms 30–150 cm long, erect, or geniculately ascending, robust, with or without rooting from lower nodes; branching from the mid culms; internodes glabrous, striate; nodes dark, pubescent. Leaves basal and cauline; sheaths folded, glabrous or hairy, ribbed, margin hairy; collars hirsute; ligules a fringe of hairs; blades 6–12 cm long, 0.8–2.5 cm wide, linear-lanceolate, scabrous or hirsute, with an inconspicuous midrib recessed above and protruding below, tuberculate-ciliate, sometimes undulated, bases broadly rounded or cordate, margins cartilaginous, apex acute. Inflorescence composed of 5–30 racemes borne along a central axis, closely spaced. Spikelets 2.5–3 mm long, in pairs, or clustered at each node, oblong, dorsally compressed, acute; lemmas apex obtuse, mucronate. Distribution: tropical and temperate Africa and Asia to India.

191. Urochloa mutica (Forsk.) T. Q. Nguyen

Brachiaria mutica (Forssk.) Stapf
Common names: konya, kussein; California grass, Carib grass, Dutch grass.

Stoloniferous perennials; sometimes stoloniferous. Culms 25–125 cm long, prostrate, sometimes rooting at the lower nodes; branching from the lower nodes; butt sheaths scarious. Leaves mostly cauline; sheaths much longer than blades, firm, te-rete, pubescent, margins glabrous or sparsely hairy; ligules fringe of hairs; blades 10–30 cm long, 0.3–1 cm wide, linear-lanceolate, scabrid or hirsute, margins scabrid or with tuberculate-ciliate hairs, base simple, apex acute. Inflorescence of 5–20 racemes on a central axis; racemes 2–10 cm long. Spikelets 2.5–3.5 mm long, in pairs, elliptic, dorsally compressed, acute; lemma apex obtuse, muticous or mucronate, aawless. Distribution: throughout the tropics.

192. Urochloa orthostachys (Mez)
Ibrahim & P. M. Peterson, comb. nov.


Caespitose annuals. Culms 20–60 cm long, geniculately ascending; culm internodes distally pubescent; nodes pubescent. Leaves basal and cauline; sheaths pubescent; ligules a fringe of hairs; blades 3–8 cm long, 2–7 mm wide, linear, flat, pubescent or densely hairy, apex acuminate. Inflorescences composed of 4–8 racemes borne along a central axis; racemes 5–10 cm long. Spikelets 2.5–3.5 mm long, solitary, elliptic, dorsally compressed, glabrous, acute; upper glumes 7-veined; lemma apex obtuse, aawnless. Distribution: throughout tropical Africa.

193. Urochloa ramosa (L.) T. Q. Nguyen

Common name: browntop millet.

Loosely caespitose annuals. Culms 10–70 cm long, erect or decumbent; internodes glabrous or pubescent, striate; nodes

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glabrous or pubescent; a few branches arising from the lower nodes. Leaves mostly cauline; sheaths much longer than leaf blades, keeled, hairy; oral hairs present; ligules fringe of hairs; blades 2–25 cm long, 0.4–1.5 cm wide, linear or lanceolate, scabrid or sparingly hairy, base cordate, apex acute. Inflorescence of 3–15 acemes borne on a central axis; racemes 3–10 cm long. Spikelets 2.5–3.5 mm long, in pairs, elliptic to broadly elliptic; lemma apex acute, awnless. Distribution: tropical and temperate Africa, Arabia, Asia, and Western Hemisphere.

194. *Urochloa stigmatisata* (Mez) Ibrahim & P. M. Peterson, comb. nov.

Fig. 203


Common names: *labrba, larba, niarukebo*.

Solitary or caespitose, often mat-forming annuals with short stolons. Culms 30–60 cm long, decumbent; rooting at lower nodes. Leaves cauline; sheaths glabrous, basally compressed or keeled; ligules a fringe of hairs; blades 2.5–18 cm long, 6–12 mm wide, linear or lanceolate; flat, crenate; scabrous, margins cartilaginous, base broadly rounded, apex acute. Inflorescence composed of 1–3 racemes borne along a central axis; racemes 2–8 cm long. Spikelets 4–5 mm long, solitary, oblong, dorsally compressed, glabrous; upper glumes 9-veined; lemma apex obtuse, awnless. Distribution: tropical west, west-central, and northeast Africa.

195. *Urochloa trichopus* (Hochst.) Stapf

Fig. 204


Caespitose annuals. Culms 20–170 cm long, geniculately ascending or decumbent; branches arising from the mid culms; internodes glabrous; nodes pubescent; butt sheaths glabrous. Leaves basal and cauline; sheaths glabrous or pubescent, with tubercle-based hairs, ribbed, outer margins hairy; ligules fringe of hairs; blades 5–30 cm long, 0.5–2 cm wide, linear or lanceolate, glabrous or hispid with tubercle-based hairs, margins ciliate, base broadly rounded or amplexicaul, apex acute. Inflorescence with 3–20 unilateral racemes borne along a central axis; racemes 1–14 cm long, the spikelets 2-rowed. Spikelets 2.5–5.5 mm long, solitary, ovate, strongly dorsally compressed, plano-convex, apex acuminate; lemma apex obtuse, mucronate, principal lemma mucronate, the mucros 0.5–1 mm long. Distribution: Tropical and temperate Africa, Asia, and North America.

196. Urochloa villosa (Lam.) T. Q. Nguyen

Common name: hairy signal grass.

Loosely caespitose or creeping annuals. Culms 10–50 cm long, decumbent; branching from the base. Leaves cauline; sheaths with fine hairs, sometimes glabrous, margins hairy; ligules fringe of hairs; blades 1–7 cm long, 2–6 mm wide, lanceolate or linear-lanceolate, finely pubescent, margins cartilaginous, apex acute. Inflorescence of 5–10 racemes borne along a central axis; racemes 3–7 cm long. Spikelets 2–2.7 mm long, paired, elliptic, dorsally compressed, apex subacute or acute; lemma apex acute or apiculate, awnless. Distribution: tropical Africa and temperate Asia to India.

197. Urochloa xantholeuca (Hack. ex Schinz) H. Scholz

Common name: naanama.
Caespitose annuals. Culms 30–60 cm long, erect, geniculately ascending or decumbent, slender; rooting from lower nodes; branches arising from the base; internodes pubescent; nodes pubescent or bearded. Leaves basal and cauline; sheaths longer than blades, ribbed, velvety-hairy; ligules dense fringe of hairs; blades 3–15 cm long, 0.4–1 cm wide, broadly linear to narrowly lanceolate, softly pubescent to tomentose or velvety, margins scabrous and cartilaginous, bases broadly rounded, apex acute. Inflorescence composed of 2–8 racemes borne along a central axis; racemes 2–10 cm long. Spikelets 2.7–4 mm long, elliptic, dorsally compressed, apex acute or cuspidate; lemma apex apiculate, awnless. Distribution: tropical Africa and temperate Asia.

198. Vossia cuspidata (Roxb.) Griff.

FIGURE 207

Common names: temboro; floating grass, hippo grass.

Aquatic, spongy perennials with elongated rhizomes and fibrous roots. Culms up to 200 cm long, out of water, erect, geniculate; internodes glabrous; nodes dark, lower nodes rooting; butt sheaths glabrous. Leaves basal and cauline; sheaths longer than adjacent internodes, flattened, glabrous, margins smooth; ligules 1–3 mm long, ciliolate membrane; blades 30–100 cm long, 5–20 mm wide, flat, spreading, scabrous, margins scabrous, apex attenuate. Inflorescence with 1–12 digitately inserted racemes; racemes 10–30 cm long. Spikelets 20–40 cm long, in pairs, ovate, dorsally compressed; lower glumes with a long caudate apex; lemmas awnless. Distribution: tropical Africa and India.

199. Zea mays* L.

FIGURE 208

Common names: corn, maize.

Robust annuals with stilt roots; plants monoecious. Culms 2–3(–5) m tall, erect, 1–5 cm thick; internodes solid, ridged,
semiterete, glabrous; butt sheaths glabrous. Leaves cauline; sheaths longer than adjacent internodes, glabrous, ribbed, margins sparsely hairy; ligules 1–2 mm long, membranous, apex erose or lacerate; blades 30–100 cm long, 2.5–10 cm wide, flat drooping, hairy on basal ⅓, margins pubescent, bases cordate, apex acuminate. Female inflorescence axillary, subtended by one or more elliptic herbaceous spatheoles (sheaths), a cylindrical spike, 1–5(−10) cm thick with 2 or more rows of paired spikelets; male inflorescence terminal, paniculate; lemmas awnless. Habitat: cultivated fields. Distribution: originally from Mexico.
Glossary of Terms

adaxial. The side of an organ toward the axis, e.g., upper surface of a leaf. Opposite: abaxial.
adnate. Joined or united with a part or organ of a different kind, as stamens attached to petals.
adventitious root. A root that arises from any plant part other than the primary root.
ample. Large, copious; usually referring to a panicle.
amplexicaul. Used to describe a leaf blade that has a base clasping the stem.
annual. A plant that completes its life cycle from seed to maturity in one year.
apex. The tip or end point of a structure. Opposite: base.
apical. Located at the apex.
apiculate. Ending abruptly in a short, sharp point.
appressed. Keeping close to or lying flat against another organ. Compare: adnate.
aquatic. Living in water.
aristate. With a bristle at the end; stiff awned or stiff bristled.
aristulate. Bearing or terminating in a small awn or sharp bristle.
aromatic. Fragrant due to essential oils in the plant tissues.
articulate. Jointed; provided with joints or nodes where separation may naturally take place.
ascending. Rising upward and approaching erect; often used to describe branches that form an angle from the culm of less than 90°.
asymmetrical. With both sides of an organ not equal.
atenuate. Gradually tapering to a slender base or tip, long pointed.
auricle. A small, earlike appendage of the collar.
auriculate. Having an auricle; with earlike structures.
awn. A slender, bristlelike appendage ending in an organ; borne on the glume or lemma of grasses.
axil. The upper angle between a stem and its branch (or leaf).
axillary. Used in reference to structures attached in the axil.
axis. The main stem or culm, especially of an inflorescence.
barbed. With rigid points or short bristles pointing backward.
basal. At or toward the base. Opposite: apical.
bearded. With long or stiff hairs.
biennial. Taking two years of growth from seedling to maturity, usually producing only vegetative growth in the first season and flowering in the second.
bifid. Two clefts or two lobes at the tip; deeply divided into two parts.
bilateral. Two-sided, usually referring to the placement of spikelets along two sides of a branch.
bilobed. With two lobes at the tip of a lemma found in Trisetochloa.
blade. The final segment of grass leaf, above the sheath where the leaf clasps the stem.
bloom. Whitish waxy or powdery coating on a surface; see glaucous.
bract. A small modified leaf subtending pedicels or flowers; in grasses, this includes the glumes, lemma, and palea.
branch. Lateral growth from the axis.
bristle. A fine, stiff, hairlike structure; these are found subtending the spikelets of Setaria.
bulbous. A swollen, thickened structure often made of fleshy scales, usually at the base of a culm resembling a bulb.
bur. A spiny cluster of spikelets or fascicle that falls as a single unit.
butt sheath. The thick, basal remnant parts of leaves.
caducous. Falling off soon after formation, not persistent.
caespitose. Growing in low, tight groups or clumped; forming a tussock or tufted.
callus. A hard or firm structure; in grasses, the thick, hardened portion just below the lemma on the rachilla.
capitate. Forming headlike clusters; aggregated into a very dense or compact cluster.
cartilaginous. Hard and tough, gristly but elastic, like a cartilage.
caryopsis. A one-seeded, dry, indehiscent fruit with the seed coat adherent to the fruit wall; the grain of most grasses.
cataphyll. A scale leaf, usually on a rhizome at the base of the plant.
caudate spikelet. Having a narrow, taillike appendage; used to describe the long, linear, flattened apex of the lower glume in Vossia.
caudices. Short, thickened, verticillate or branched stems that are usually subterranean or at ground level; in grasses, found at the base of the culm.
cauline. Borne on or arising along the stem, compared with basal, where leaves are mainly near the base.
chartaceous. Of papery or tissuelike texture.
ciliate. Fringed with spreading stiff hairs on the margin.
ciliolate. Fringed with very small hairs, minutely ciliate.
classing. Leaf base surrounding and touching the stem closely on two sides; see amplexicaul.
clavate. Club shaped; the wider portion at the apex.
clumped. Growing in a tight group, or caespitose.
collar. A band of tissue situated at the junction of the blade and sheath, often lighter in color than the rest of the leaf.
column. The lower twisted part of a geniculate awn, or the portion below the awn branching point in Aristida.
compound. Referring to inflorescences made up of a number of small constituent inflorescences (as in some Andropogonaceae) or raceme or spike with some secondary branching.
compressed. Flattened, either laterally or dorsally.
conuplicate. Folded lengthwise down the middle; used when referring to a leaf blade.
confluent. Structure merging in one, or fusing.
connate. Union or fusion of like parts or organs.
constricted. Abruptly narrowed, tightened or drawn together.
contracted. A narrow, dense inflorescence, usually with apressed branches.
convex. Having a more or less rounded surface.
convolute. Rolled longitudinally; leaf blades having one edge rolled inside the other.
cordate. Shaped like a heart at the base of the leaf blades, which are often deeply notched with rounded lobes.
coriaceous. Leathery in texture.
corymbose. A flat-topped, open inflorescence where the lower branches are longer than the upper branches.
cosmopolitan. Found throughout the world.
crateriform. Saucer or cup shaped, used to describe gland shape in Eragrostis.
crested. With an elevated and irregular-toothed ridge.
crown. The persistent basal portion of a tufted, herbaceous, perennial grass; the region from which the culm and roots grow.
crustaceous. Of hard, thin, and brittle texture.
culm. The grass stem that will eventually bare the spikelets; also applies to sedges and rushes.
cuneate. Wedge shaped; with the acute angle at the attachment point.
cupule. An involucre composed of bracts usually adherent at the base.
cuspitate. Abruptly tipped with a sharp, rigid point, usually in reference to the apex of a leaf blade.
decumbent. Stems or culms having the basal part flat along the ground, then curving upward; reclining.
decurrent. A structure adnate to the stem with its margins extending down the stem or axis below the point of insertion; usually used to describe the sheath.
deflexed. Bent or turned abruptly outward or downward, but not to 180° (see reflexed).
dentate. Having a sharp-toothed margin, with teeth perpendicular to the margin. Compare: serrate.
depressed. More or less flattened from above.
dichotomous. With forked, paired branches or divisions of approximately equal size.
digicate. Arranged like the fingers of a hand, with the members arising from the same point; same as palmate.
disarticulate. The separation of a structure usually at a node or joint.
distant. Farther from the point of attachment. Opposite: proximal.
distichous. Two-ranked on the opposite sides of a stem or culm.
divaricate. Spreading wide apart and in different directions.
divergent. Spreading broadly, but less so than divaricate.
dorsal. The back; the face turned away from the culm axis (the term abaxial is preferable). Opposite: ventral.
eglanslar. Without glands.
elipsoid. An elliptical three-dimensional shape, more or less with identical ends.
elliptic. Shaped like an ellipse; the broadest point midway between the ends and the width about one-half the length.
emarginate. Having a shallow notch at the apex, usually in reference to a leaf blade.
enire. With an even margin without teeth.
ephemeral. A short-lived structure or organism.
erect. A plant that is quite upright, growing perpendicular to the ground.
erose. Having an irregular-toothed margin.
excurrent. Extending beyond the margin or tip.
exserted. Protruding; sticking out; projecting beyond the edge. Opposite: included.
extravaginal branching. Growth of the shoot initial when the tip emerges or breaks through or ruptures the enveloping sheath; this is usually distinguished by the occurrence of bladeless leaves found directly above the indistinct prophyl um. Opposite: intravaginal.
falcate. Sickle shaped; curved on distal end.
falske. A very narrow panicle with spikelets borne in tight clusters on much-reduced side branches as in some species of Setaria and Cenchrus.
fascicle. A fairly tight cluster.
fascicles. Spikelike panicles of highly reduced branches forming a “bur” in Cenchrus and cluster of bristles in Setaria.
fasciculate. Leaves or branches in a cluster or tight bundle.
fastigate branching. Branches or culms clustered or arising from a single point in a broomlike appearance; see Hyparrhenia rufa.
feathery. Resembling a feather.
fibrous. Furnished with fibers; often found in basal leaf sheaths.
filiform. Threadlike, long, slender, and cylindrical.
fimbriate. Fringed with long, slender hairs coarser than ciliate.
flabellate. Fanlike, applied to flattened basal leaf sheaths.
flaccid. Soft or weak, limp, wilted. Opposite: firm or stiff.
flexuous. A zigzag or wavy form; bent alternately one way then the other.
floret. A portion of a spikelet (grass inflorescence) that includes the lemma, palea, and reproductive structures.
foliaceous. Leaflike.
fulvous. Tawny, orangelike, or dull yellowish brown to nearly chestnut.
geniculate. Abruptly bent like a knee joint.
gibbous. Slightly pouches or swollen on one side.
glabrous. Without hairs or glands, but not necessarily smooth. Opposite: hairy.
gland. A secreting structure on the surface, but often used in the sense of a glandlike body; any protuberance of like nature that may not secrete.
glandular. Covered with glands.
glaucous. Covered with a grayish, whitish, or bluish waxy coating that readily rubs off.
globose. Spherical, nearly or quite globular.
globular. Spherical.
glomerate. In a compact cluster or group of clusters.
glossy. Refers to a surface that is lustrous or shiny.
glume. The bract, usually occurring in pairs, at the base of a grass spikelet.
granular. Covered in little knobs or tubercles; less pronounced than tuberculate.
habit. The general appearance of a plant.
habitat. The surroundings in which a plant grows.
hair. A cylindrical cell or a row of cells, often very fine and transparent. Synonym: trichome.
head. An inflorescence of closely packed spikelets that is more or less round.
herb. A nonwoody plant whose stem dies back to ground level at the end of the growing season.
herbaceous. Not woody, but soft and green.
heterophyllous. Having leaf blades of different sizes and shapes.
hirsute. With straight, long, coarse, and stiff hairs.
hirtellous. Minutely hirsute.
hispid. Beset with stiff hairs that are often strong enough to penetrate the skin.
hooded. Shaped like a hood or boat shaped; used to describe the leaf blade apex.
hook. A curved or bent part at the apex of a leaf blade.
hyaline. Colorless, thin and translucent or transparent.
imbricate. Partly overlapping, like the tiles of a roof.
incurved. Curving inward or bent inward.
domentum. Any hairy covering or pubescence.
domentum. A cover of hairs, scales, or bristles.
durated. Hardened at maturity.
inflated. Turned sharply inward.
inflorcence. The flowing part of a plant, categorized by the arrangements of flowers on the floral axis.
inflorcence unit. Term used to describe pairs of spikelets in the supertribe Andropogonodae, usually consisting of one sessile and one or two pedicellate spikelets.
inovation. A new vegetative shoot in a perennial grass.
inserted. Growing upon or attached to.
ternode. The portion of the stem or culm between two nodes.
terrupted. When continuity is broken, particularly in dense inflorescence whose form is not continuous.
intravaginal branching. Growth of the shoot initial within the sheath that envelops the node; usually distinguished by the absence of bladeless leaves and development of an obvious, often palealike phyllum. Opposite: extravaginal.
volute. Rolled from both margins toward the middle; the upper surface within; especially common in leaf blades.
joint. Node of the culm or internode of an inflorescence.
keel. The adaxial ridge or fold of a compressed sheath, blade, glume, lemma, or palea.
keeled. Ridged along the middle of a flat or convex surface.
key. An ordered series of alternatives used to facilitate the identification of organisms.
knee. An abrupt bend in a stem or culm.
lacerate. Torn at the margin or irregularly lobed, as if torn.
lamina. The flat part of a leaf. Synonym: leaf blade.
lanate. With a very dense, wooly indumentum of hairs.
lanceolate. Lance shaped; narrow, tapering at both ends with the broadest part below the middle, approximately three times longer than wide.
lateral. Relating to the side of an organ or structure.
leaf blade. The upper expanded part of the leaf beyond the leaf sheath.
leaf sheath. The lower part of the leaf clasping the adjacent part of the grass stem and terminating at a node below.
lemma. The lower (outer) of two bracts enclosing the grass flower; together with palea constitutes a floret.
ligule. An appendage (membrane) or ring of hairs on the adaxial leaf surface at the junction of the sheath and blade.
limb. The distant untwisted part of a geniculate awn above the column.
linear. Long and narrow with parallel margins, more than 10 times longer than wide; usually refers to the shape of the leaf blade.
lobed. A flat organ split in two or more subdivisions.
lobule. A small lobe.
loose. Refers to the branching pattern of inflorescences that are often open, but not dense or compact.
marginal. At or near the edge.
membranous. Thin, soft tissue, usually green or translucent; similar to a thin membrane.
midrib. The central vascular trace or vein in the leaf blade.
mucronate. A short, small, abrupt point (mucro) or minute awn less than 1 mm in length.
muricate. Rough, with short, hard points.
muticous. Blunt and without a mucro or awn.
nerve. A vein or vascular trace, often raised, usually running longitudinally on blades, glumes, and lemmas.
node. Point on the stem or culm axis at which leaves or branches originate; usually, these are swollen or knoblike.
notched. V-shaped cut from an entire edge.
oblique. Pertains to base of leaf blades where two sides of the lamina are unequal.
oblanceolate. Longer than broad, with the margins nearly parallel.
oboate. Reversed ovate, inverted ovate, the broadest part near the apex and the narrow side near the base.
obovoid. Egg shaped, but with the broadest part near the apex and the narrowest part near the base.
obtuse. With a blunt or rounded apex.
oral hairs or setae. Hairs on the margin of the distal end of leaf sheath; hairs adjacent to the ligule auricular region.
orbicular. Disk shaped, flat with a circular outline.
ovate. The shape of a longitudinal section of an egg, the broader end below the middle.
ovid. Egg shaped.
palea. The inner or upper bract enclosing the pistil and stamens of a grass.
pallid. Pale in color.
panicle. An inflorescence in which the main axis has several divided or subdivided branches.
paniculate. Resembling a panicle.
papillate. Bearing minute nipplelike projections.
pectinate. Comblike, with very close narrow divisions or parts.
pedicel. The stalk of an individual flower in an inflorescence; in grasses the stalk of a spikelet.
pedicellate. Borne on a pedicel.
peduncle. The stalk of an inflorescence or cluster of spikelets.
pedunculate. With a foot-stalk or peduncle.
perennial. A plant living for more than two years.
perfect. A floret (flower) with functional stamens and pistil.
persistent. Remaining attached, not falling off.
petirole. The stalk of a leaf blade.
pilose. Covered with loose, soft, long, straight hairs, not dense but somewhat shaggy.
pit glands. Small glandular depressions common on some species of Eragrostis.
plane. Level, flat surface.
pleated. Folded; see plicate.
plicate. Folded into pleats lengthwise several times, like a fan.
plumose. Covered with long, spreading, soft hairs, with each hair having side hairs along the main axis, like the plume of a feather.
procumbent. Prostrate, trailing or lying flat, usually not rooting at nodes. Compare: stolon.
prophyllum. An initial, usually two-keeled, bladeless, adaxial, protective bract surrounding an axillary vegetative or floral bud; usually well developed in intravaginal branching shoots.
prostrate. Lying flat on the ground.
puberulent. Minutely pubescent, with very short hairs barely visible to the eye.
pubescent. A generalized term for hairy; lacking definition of the type of hairs, but sometimes referring to fine short hairs.
punctate. With transparent or colored dots, depressions, or pits.
pungent. Ending in a rigid, sharp point.
pyriform. Pear shaped; used to describe grains of some species of Eragrostis.
raceme. A portion of an inflorescence with the spikelets borne on pedicels directly on the axis or peduncle; racemes may be solitary, digitate, or scattered.
racemose. Arranged like a raceme.
rachilla. The branching axis of the spikelet that bear florets.
rachis. The axis of an inflorescence that bares spikelets.
rhachis. A compound inflorescence in the supertribe Andropogonodae consisting of one to many units (branches) of one sessile and one or two pedicellate spikelets.
rectangular-prismatic. Having six more or less flat surfaces, such as a brick; used to describe the grain in Eragrostis.
reedlike. A semipersistent, aboveground stem that is not woody and is generally unbranched except in the inflorescence; in
grass. This refers to stems that are large, usually more than 2 m tall.

reflexed. Abruptly curved or bent downward or backward to about 180°; see deflexed.

retorse. Marginal spines or barbs bent abruptly downward or backward (away from the apex). Opposite: antorse.

revolute. Rolled or curled toward the abaxial (lower) surface. Opposite: involute.

rhizome. An underground stem, differing from a true root in the presence of buds or scalelike leaves.

rib. A prominent vein, usually on a leaf.

ridged. Having raised veins.

rootstock. A short, vertical, subterranean stem, bearing roots.

rosette. A spreading and radiating basal cluster of leaves at ground level.

rostrate. With a beak, narrowed into a slender tip or point.


rudimentary. Imperfectly or incompletely developed; vestigial and usually nonfunctional.

rufous. Rusty or brownish red.

rugose. Covered with wrinkles or creased surface.

rugulose. Finely wrinkled; diminutive of rugose.

runner. A creeping or prostrate lateral shoot; a very slender or filiform stolon.

sagittate. Shaped like an arrowhead; used to describe the base of a leaf blade that has two acute lobes that point backward.

scaberulous. Minutely scabrous, slightly rough.

scabrid. Rough to touch, usually caused by the presence of minute teeth or scattered short, stiff, broad-based hairs.

scabrous. Rough or harsh to touch, usually from short, stiff, broad-based hairs.

scales. Thin, dry, flat, almost leaflike structure protecting the rhizome or shoots.

scarios. Small, thin, dry, and shriveled, not green.

secund. One-sided; as when all branches or spikelets are borne to the same side of the axis.

sensu lato. A Latin phrase meaning “in a broad sense” (ab-breviated s.l.).

sensu stricto. A Latin phrase meaning “in a narrow sense” (ab-breviated s.s.).

sericeous. Silky, with closely appressed, soft, straight hairs.

serrate. Sharp toothed and angled, like a saw edge, with the teeth directed toward the apex.

serrulate. Serrate, with minute teeth.

sessile. Without stalk or pedicel.

seta. A bristle or stiff hair (pl. setae).

setaceous. Stiff and narrow, bristlelike.

setose. Bristly, beset with bristles.

sheath. A more or less tubular structure surrounding an organ or part, as the lower part of a grass leaf that wraps around the stem.

silky. A condition produced by a cover of soft, long, straight, fine hairs.

simple. Composed of not more than one anatomically or morphologically identical unit; not compound.


sinus. The notch between two lobes of a leaf or apex of a lemma.

slender. Slim, thin.

smooth. Referring to surfaces that are not rough, sometimes loosely used for the absence of hairs.

solitary. Borne singly or alone.

spathe. A leafy bract (in grasses formed by the sheath) that supports the branches of a spatheate inflorescence.

spatheate. With spathes or spatheoles.

spatheolate. Having spatheoles.

spatheole. A leafy bract (spathe) enclosing part of an inflorescence. In grasses, the leafy bract is usually the sheath.

spatulate. Spoon or spatula shaped.

spicate. With spikes, spike-like, or disposed in a spike.

spiciform. Spike-like, in the form of a spike.

spike. An inflorescence or branch with sessile spikelets on an axis; spikes may be solitary, digitate, or scattered.

spikelet. The unit of the inflorescence in grasses, consisting of two glumes and one or more florets; a diminutive of spike.

spine. A hard, sharp-pointed structure, often long and narrow.

spinoso. Spiny or spine-like.

spinulose. With small spines; diminutive of spine.

spreading. Referring to branches of an inflorescence having an outward direction at about right angles to the main axis.

stipe. A stalk to an organ that is part of the organ itself and not a separate branch.

stilt-root. Adventitious roots from the lower nodes of the culms.

stolon. A modified stem above ground (runner) that creeps and roots at the nodes and can give rise to new plants.

stoloniferous. Bearing stolons.

striate. With numerous longitudinal and parallel fine grooves, ridges, or lines of color.

strigose. With appressed, stiff, rather short hairs.

sub-. A prefix to denote somewhat, slightly, or to a lesser degree; as in subacute, subdigitate, suberect, subglabrous, sub-sessile, subspicate, and subobtuse.

subdigitate. With inflorescence branches arising predominantly at the one point (apex), but with one or a few branches clearly arising below these.

subtend. To be below and yet close to; to extend under another structure.

subulate. Awl shaped, very narrow and tapering to a fine tip from a broader base.

tapering. Gradually narrowing in width toward one end, not abrupt.

taxon. Any taxonomic unit into which living organisms are classified, such as species, genus, tribe, subfamily, or family.

terete. Circular in cross section, lacking grooves or ridges.

terminal. At the end of a branch, stem, or culm axis.

ternate. Arranged in a cluster of three.

tiller. A leafy, nonflowering shoot initiating from the base of the plant.
tomentose. Densely covered with matted, soft wool-like hairs.
toothed. Having teethlike protrusions.
truncate. Ending abruptly; cut squarely; with the apex flat as if cut across at the top.
tubercle. A small, rounded protruding body; a little tuber.
tuberculose. Furnished with small projections or tubercles.
tufted. Clustered, or clumped. Synonym: caespitose.
turgid. Swollen, inflated.
tussock. A tough, dense tuft of basal leaves found in perennial grasses (see caespitose).
unilateral. One-sided, usually referring to the placement of spikelets along one side of a branch.
urticle. A small bladderlike, one-seeded indehiscent fruit used to describe the globose-ovoid, bony, shining utricle enclosing the one-flowered spikelet of Coix lacryma-jobi.
vein. A strand of vascular tissue (a vascular bundle) usually found in leaves, glumes, lemmas, and paleae.
venation. The arrangement of the vascular bundles or veins in a leaf.
vernal. Occurring in the spring.
verrucose. Having a wartlike or nodular surface.
verticillate. Arranged in whorls.
villous. Densely covered with long, weak, silky, often curly hairs.
viscid. Sticky or gluelike.
viscous. Glutinous, or very sticky.
wanting. Lacking.
wart. A hard or firm excrescence.
webbed. A tuft of cottonlike hairs found just below the lemma in some species in the tribe Poeae.
whorl. Three or more structures arranged in a circular manner around a common insertion point.
whorled. Having whorls.
winged. With a thin projection or border resembling a wing.
wiry. Like a wire, thin and cylindrical.
woolly. Hairy with dense, long, soft, entangled, curled hairs not appressed to the surface. Synonym: lanate.
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