

# NEW WORLD GENERA OF THE PANICEAE (POACEAE: PANICOIDEAE)

ROBERT D. WEBSTER

*Agriculture Research Service, Systematic Botany  
& Mycology Laboratory, Bldg. 265, BARC-East  
Beltsville, MD 20705, U.S.A.*

JOSEPH H. KIRKBRIDE

*Agriculture Research Service, Systematic Botany  
& Mycology Laboratory, Bldg. 265, BARC-East  
Beltsville, MD 20705, U.S.A.*

JESUS VALDES REYNA

*Universidad Autonoma Agraria "Antonio Narro"  
Departamento de Botanica  
Buenavista, Saltillo, Coahuila  
C.P. 25315, MÉXICO*

## ABSTRACT

Fifty genera are recognized in a taxonomic account of the Paniceae for the New World. A description of the tribe, based on a summation of variation in the recognized genera, is presented. A bracketed key is given and based on a computer analysis of the variation among the genera. A set of synoptic descriptions is presented and based on an accumulation of diagnostic characters. *Panicum acostia* R. Webster is proposed as a new name. English, Portuguese, and Spanish versions of the character list, key, and comprehensive descriptions are included on an accompanying microfiche.

## INTRODUCTION

Webster (1988) and Webster & Valdes (1988) provided detailed taxonomic accounts of the genera in the Paniceae for the area north of South America. The generic concepts and data presented in these reports were analyzed using data recorded in DELTA format (Dallwitz 1974 & 1980) from which the keys and descriptions were generated. The database has been expanded to include the variation and genera occurring in South America. A total of 50 genera are recognized as native or introduced in the New World. The objective of this paper is to provide a synopsis of the 50 New World genera and to provide on microfiche a comprehensive set of data in English, Portuguese, and Spanish.

It seems appropriate to mention that this database or information retrieval system not only includes these 50 genera but ca. 30 genera restricted to the Australian and Asian regions and about 400 subgeneric taxa. Upon request, the senior author will provide special purpose keys, descriptions or special information retrieval systems for the New World genera. For example, it would be relatively easy to provide a key to the taxa of a specific geographical region and descriptions based on a subset of characteristics, such as vegetative or spikelet characters. Present studies are underway to include data for the endemic genera from the African region. The primary goal of these studies is to produce a comprehensive DELTA database from original data collections for the Paniceae genera of the world. These data will be used in a phenetic and cladistic analysis of the tribe. However, in the meantime it is worthwhile to make the collected generic data for the New World generally available.

A description of the Paniceae R. Br. is presented based on the variation exhibited by the New World genera. The description was generated by combining the technologies of INTKEY and CONFOR. Initially, a subset of taxonomically relevant characters was selected. INTKEY was used to combine the data of these characters for the 50 genera into one description in DELTA format which was then converted into a natural language description by CONFOR. In the description, each character state is followed by a fraction presenting the number of taxa exhibiting the state over the number of taxa recorded for the character. For example, "Plants annual (30/50) or perennial (45/50)" indicates that 30 of the 50 taxa are recorded as annual and 45 of the 50 taxa are recorded as perennial.

A bracketed key to the recognized genera is given. As in Webster (1988) and Webster & Valdes (1988), it was generated by KEY and is the result of numerous experimental trials to produce a mechanically efficient key reflecting the authors' concepts of character reliabilities and relationships among the genera.

A set of synoptic descriptions for the New World genera of the Paniceae is given. Selection of characters for inclusion in these descriptions was based on an analysis of the variation among the genera. Initially, a diagnostic subset of characters was selected for each genus. That is, the minimum set of characters needed to separate each genus from the other 49 were chosen. Selection of this subset by INTKEY was greatly influenced by the imposed concepts of character reliabilities. The number of characters required to distinguish a genus varied from one (e.g., *Sacciolepis* and *Reimirochloa*) to 12 in *Panicum*. For most genera two to four characters were required. The diagnostic characters for all genera were accumulated into one list and used in generation of the descriptions. Highlighted within



each description are the diagnostic characters for that genus. Implied characters are omitted from the descriptions. For example, the statement "first glume fused with the callus to form a cup-like structure" is given for *Eriochloa*, but the implied negative statement "first glume not fused with the callus to form a cup-like structure" does not appear in the other descriptions. In addition, for situations where a character is of diagnostic value for only one or two genera and of little value for others, then this relatively insignificant data was omitted. Therefore, in places where the descriptions are not fully comparative it can be assumed that the missing data is either a negative implied statement or data of limited value for the genus. The result of this exercise is the production, via CONFOR and INTKEY, of a set of descriptions suitable for a floristic account. Of course, the content of these descriptions would change if the analysis was performed on the genera from a different geographical region or from a region of more limited geographical coverage.

The accompanying microfiche contains the DELTA character files and comprehensive taxonomic treatments in English, Portuguese, and Spanish. First, the English version of the characters is presented and followed by Portuguese and Spanish translations. Each character file consists of a numbered sequence of characters for which the taxa were recorded. At present a total of 282 characters are included. Each character consists of a feature description (e.g., first glume) followed by associated states. Where necessary comments are included to define or clarify the application of terms. The character files are followed by an English taxonomic treatment (key and descriptions) for the 50 recognized genera. Design of the key (that is, the use of the characters and placement of taxa) is essentially identical to the version appearing in hardcopy. Descriptions were generated including the first 264 characters. Data for the remaining miscellaneous non-descriptive characters were not included in the descriptions. Character numbers corresponding to the numbers in the character files were included in the descriptions to facilitate locating and comparing information. The English treatment is followed by identical treatments in Portuguese and Spanish. The final page on the microfiche contains the important directives used in the key generating and information retrieval processes. These include KEY STATES, CHARACTER RELIABILITIES, IMPLICIT VALUES, and DEPENDENT CHARACTERS. KEY STATES defines how the character states were converted for key generation. For example, character 101 is a three state character, however, the statement "101, 1-2/3" in KEY STATES directs the program to treat this as a two state character by combining the first two states. CHARACTER RELIABILITIES define the relative character weights. For example, character 101 was assigned the



relatively high weight of "9" and character 99 the relatively weight of "4." IMPLICIT VALUES defines what character states are implied. DEPENDENT CHARACTERS defines which characters are dependent on preceding characters. For example, the statement "158,2:159-174" indicates that the first glume characters (159-174) are inapplicable if the first glume is absent (158,2).

#### TAXONOMY OF *ACOSTIA* SW.

Swallen (1968) described *Acostia* Sw. to account for the variation exhibited by a single specimen (*M. Acostia-Sols* 12131). Swallen suggested a close relationship of his new genus with *Digitaria* and *Panicum*, but excluded it from these genera based on the presence of involute margins on the upper lemma and the absence of a first glume. Since that time there have been no further known collections of the species and no new taxa have been described in the genus. A diagnosis of the specimen is given below. It possesses no characteristics that distinguishes it from *Panicum*. This conclusion necessitates the placement of *Acostia* as a synonym of *Panicum* and the following new name is proposed.

PANICUM *acostia* R. Webster, nom. nov. *Acostia gracilis* Sw., Bol. Soc. Arg. Bot. 12:109. 1968 (non *Panicum gracile* R. Br., 1810). TYPE: *M. Acostis-Solis* 12131 (HOLOTYPE: US).

Perennial; erect; about 3 dm tall. Internodes glabrous; hollow. Nodes glabrous. Ligule a membrane; about 0.3 mm long; erose. Leaf blades conduplicate or flat; about 2 mm wide; 10 cm long; the surface glabrous; margins and midnerve usually with short bulbous-based hairs. Inflorescence a panicle. Main axis glabrous; about 8 cm long; primary branches 3 to 5; with appressed secondary branches; about 2 cm long. Spikelets lanceolate; 2.3-2.6 mm long; paired. First glume a small nerveless scale about 0.3 mm long. Second glume 5-nerved; sparsely pubescent; subequal to spikelet length; apiculate at the apex. Lower floret lacking a palea. Lower lemma sparsely pubescent. Upper floret about 0.8 times the length of the lower floret; cartilaginous; with involute margins; with a few hairs at the apex.

#### PANICEAE R. BR.

Plants annual (30/50) or perennial (45/50). Flowering culms lignified (1/50) or not lignified. Internodes solid (12/49), spongy (13/49), or hollow (34/49). Ligule a membrane (18/50), a ciliate membrane (24/50), a fringe of hairs (28/50), or absent (3/50). Inflorescence a panicle (49/50), a raceme (4/50), or a solitary spikelet (1/50). Main axis present or absent (7/50); with distichous primary branches (8/49), with secund primary branches



(10/49), or with quaquaversal primary branches (37/49). Primary branches appressed to the main axis (32/48), spreading (34/48), divaricate (6/48), or reflexed (2/48); with appressed secondary branches (36/48), with spreading secondary branches (19/48), or reduced to a fascicle of spikelets (5/48); with secund spikelets (32/46), with distichous spikelets (2/46), or with spikelets neither secund nor distichous (15/46). Rachis terminating in a spikelet (41/50), terminating in an unmodified naked point (5/50), or terminating in a bristle (8/50). Pedicels present (48/50) or absent (4/50); perpendicular with the spikelet base (46/50) or oblique to the spikelet base (6/50); apex concave (35/43), flat (12/43), or convex (5/43). Disarticulation above the lower glume (4/50), at the spikelet base (43/50), at the base of the primary branches (5/50), at the nodes of the main axis (1/50), or at the base of the inflorescence (1/50). Callus differentiated (15/49) or not differentiated (40/49).

Spikelets divergent from the axis (7/50) or not divergent from the axis (48/50); adaxial (33/45) or abaxial (15/45); laterally compressed (11/50), dorsiventrally compressed (37/50), planoconvex (12/50), or terete (3/50). First glume present (44/50) or absent (14/50); encircling the spikelet base (20/43) or not encircling the spikelet base (23/43); muticous (37/43) or awned (9/43). Rachilla pronounced between the florets (9/50) or not pronounced between the florets (45/50). Second glume present (49/50) or absent (1/50); 0.05 – 0.8932 – 1.3 times spikelet length; saccate (1/50), gibbose (2/50), or neither saccate nor gibbose (48/50); 0 – 7-nerved (46/49), 8 – 13-nerved (13/49), or more than 13-nerved (2/49). Fertile florets 1 or 2 (1/50). Sterile florets one. Lemma of lower floret hyaline (4/50), membranous (42/50), chartaceous (15/50), coriaceous (3/50), or cartilaginous to indurate (6/50); with a central longitudinal groove (4/50) or lacking a central longitudinal groove (48/50). Palea of lower floret with nerves not pronounced (2/50), with nerves pronounced but not winged (46/50), or with nerves pronounced into obvious wings (2/50). Upper floret 0.4 – 0.8841 – 1.2 times the length of the lower floret. Lemma of upper floret hyaline (4/50), membranous (5/50), chartaceous (17/50), coriaceous (1/50), cartilaginous (24/50), or indurate (14/50); smooth (37/50), scabrous (3/50), striate (8/50), muricate (10/50), rugose (7/50), or papillate (1/50); with flat margins (22/50) or with involute margins (32/50); with margins thinner in texture than the body (10/50) or with margins of the same texture as the body (45/50); with basal scars or appendages (2/50), constricted at the base (6/50), or without basal modifications (48/50); differentiated at the apex (7/50) or not differentiated at the apex (46/50); muticous (45/50), apiculate (5/50), mucronate (7/50), or awned (4/50). C-4 (33/49), or C-3 (18/49).



## KEY FOR THE NEW WORLD GENERA OF THE PANICEAE

- 1(0). Rachis terminating in a spikelet or terminating in an unmodified  
naked point ..... 2  
Rachis terminating in a bristle ..... 56
- 2(1). Disarticulation above the lower glume or at the spikelet base ..... 3  
Disarticulation at the base of the primary branches or at the nodes of  
the primary branches ..... 55
- 3(2). Palea of lower floret with nerves not pronounced or with nerves  
pronounced but not winged ..... 4  
Palea of lower floret with nerves pronounced into obvious wings ... *Otachyrium*
- 4(3). Inflorescence a panicle ..... 5  
Inflorescence a raceme or a spike ..... 52
- 5(4). Lemma of upper floret with flat margins ..... 6  
Lemma of upper floret with involute margins ..... 24
- 6(5). Primary branches with secund or distichous spikelets ..... 7  
Primary branches with spikelets neither secund nor distichous ..... 16
- 7(6). Second glume saccate or gibbose ..... 8  
Second glume neither saccate nor gibbose ..... 9
- 8(7). Spikelets laterally compressed; second glume indumentum uncinatè;  
lemma of lower floret with a hyaline area at the base ..... *Pseudechinolaena*  
Spikelets dorsiventrally compressed; second glume indumentum not  
uncinate; lemma of lower floret consistent in texture ..... *Sacciolepis*
- 9(7). Ligule a membrane or a ciliate membrane ..... 10  
Ligule a fringe of hairs or absent ..... 12
- 10(9). Spikelets adaxial ..... 11  
Spikelets abaxial ..... *Digitaria*
- 11(10). First glume present; primary branches appressed to the main axis;  
primary branches with loosely arranged spikelets ..... *Hymenachne*  
First glume absent; primary branches spreading; primary branches  
with tightly appressed spikelets ..... *Axonopus*
- 12(9). Lemma of lower floret with a hyaline area at the base; spikelets  
abaxial ..... *Alloteropsis*  
Lemma of lower floret consistent in texture; spikelets adaxial ..... 13
- 13(12). First glume present; primary branches with loosely arranged  
spikelets ..... 14  
First glume absent; primary branches with tightly appressed spikelets *Axonopus*
- 14(13). First glume muticous; first glume encircling the spikelet base ..... *Scutachne*  
First glume awned; first glume not encircling the spikelet base ..... 15
- 15(14). Spikelets laterally compressed; lemma of upper floret linear to oblong;  
lemma of upper floret hyaline ..... *Reynaudia*  
Spikelets dorsiventrally compressed; lemma of upper floret lanceolate;  
lemma of upper floret cartilaginous ..... *Chaetium*
- 16(6). Spikelets laterally compressed ..... 17  
Spikelets dorsiventrally compressed or planoconvex ..... 20
- 17(16). First glume present; pedicels discoid at the apex ..... 18  
First glume absent; pedicels cupuliform at the apex ..... *Antbaenantia*
- 18(17). First glume muticous; second glume up to 1 times the length of the  
lower floret; lemma of upper floret lanceolate to elliptic ..... 19



- First glume awned; second glume about 1.2 times the length of the lower floret; lemma of upper floret linear to oblong ..... *Arthropogon*
- 19(18). Second glume 5-nerved; internodes neither viscid nor glaucous ..... *Rhynchelytrum*
- Second glume 7-nerved; internodes viscid or glaucous ..... *Melinis*
- 20(16). Primary branches with appressed secondary branches; lemma of upper floret with margins of the same texture as the body ..... 21
- Primary branches with spreading secondary branches; lemma of upper floret with margins thinner in texture than the body ..... 23
- 21(20). Ligule a membrane or a ciliate membrane; second glume saccate; collar differentiated ..... *Sacciolepis*
- Ligule a fringe of hairs or absent; second glume neither saccate nor gibbose; collar not differentiated ..... 22
- 22(21). Cleistogamous inflorescence present; lemma of upper floret hairy; spikelets heteromorphic ..... *Amphicarpum*
- Cleistogamous inflorescence absent; lemma of upper floret glabrous; spikelets homomorphic ..... *Triscenia*
- 23(20). First glume present; ligule a membrane; lemma of upper floret yellow; sheaths not keeled ..... *Homolepis*
- First glume absent; ligule a ciliate membrane or fringe of hairs; lemma of upper floret brown; sheaths keeled ..... *Anthaeantia*
- 24(5). Primary branches with secund spikelets or with distichous spikelets ..... 25
- Primary branches with spikelets neither secund nor distichous ..... 48
- 25(24). Lemma of upper floret smooth, scabrous, striate, muricate, pitted, or papillate ..... 26
- Lemma of upper floret rugose ..... 47
- 26(25). Rachilla pronounced between the florets ..... 27
- Rachilla not pronounced between the florets ..... 31
- 27(26). Rachilla with lateral appendages ..... 28
- Rachilla without lateral appendages ..... 29
- 28(27). Pedicels concave at the apex; pedicels cupuliform at the apex; second glume subequal to spikelet length ..... *Ichnanthus*
- Pedicels flat or convex at the apex; pedicels discoid at the apex; second glume 0.5–0.9 times spikelet length ..... *Echinolaena*
- 29(27). Spikelets laterally compressed; upper floret 0.4–0.48 times the length of the lower floret ..... *Phanopyrum*
- Spikelets dorsiventrally compressed to planoconvex; upper floret more than 0.5 times the length of the lower floret ..... 30
- 30(29). Pedicels concave at the apex; lemma of upper floret differentiated at the apex; upper lemma lacking basal scars ..... *Acroceras*
- Pedicels flat or convex at the apex; lemma of upper floret not differentiated at the apex; upper lemma with basal scars ..... *Echinolaena*
- 31(26). Pedicels perpendicular with the spikelet base ..... 32
- Pedicels oblique to the spikelet base ..... *Spheneria*
- 32(31). Pedicels concave at the apex ..... 33
- Pedicels flat or convex at the apex ..... 40
- 33(32). Lemma of upper floret differentiated at the apex ..... 34
- Lemma of upper floret not differentiated at the apex ..... 35
- 34(33). Ligule a membrane or a ciliate membrane; upper lemma conduplicate



- at the apex; internodes hollow ..... *Acroceras*  
 Ligule a fringe of hairs or absent; upper lemma with the apex becoming membranous; internodes solid or spongy ..... *Echinochloa*
- 35(33). First glume present ..... 36  
 First glume absent ..... *Axonopus*
- 36(35). Ligule a membrane or a ciliate membrane ..... 37  
 Ligule a fringe of hairs or absent ..... 38
- 37(36). First glume mucous; pedicels cupuliform at the apex; rachilla not pronounced below the second glume ..... *Panicum*  
 First glume awned; pedicels truncate at the apex; rachilla pronounced below the second glume ..... *Oplismenopsis*
- 38(36). Lemma of lower floret with a hyaline area at the base; lemma of upper floret awned; spikelets abaxial ..... *Alloteropsis*  
 Lemma of lower floret consistent in texture; lemma of upper floret mucous; spikelets adaxial ..... 39
- 39(38). Lemma of upper floret glabrous; main axis with secund primary branches; pedicels discoid at the apex ..... *Brachiaria*  
 Lemma of upper floret hairy; main axis with quaquaversal primary branches; pedicels truncate at the apex ..... *Streptostachys*
- 40(32). Lemma of lower floret with the area between the central nerve and the first lateral nerve thinner in texture than the rest of the structure ..... 41  
 Lemma of lower floret consistent in texture ..... 42
- 41(40). Second glume 9 – 15-nerved ..... *Thrasyopsis*  
 Second glume 3 – 7-nerved ..... *Thrasya*
- 42(40). Lemma of upper floret glabrous; rachilla not pronounced below the second glume ..... 43  
 Lemma of upper floret hairy; rachilla pronounced below the second glume ..... *Streptostachys*
- 43(42). Lemma of upper floret chartaceous to cartilaginous ..... 44  
 Lemma of upper floret indurate ..... 46
- 44(43). First glume present and awned; plants lacking rhizomes; flowering culms rooting at the lower nodes ..... *Oplismenus*  
 First glume present or absent, but never awned; plants rhizomatous; flowering culms not rooting at the lower nodes ..... 45
- 45(44). Lemma of upper floret ovate to elliptic; lower floret with stamens; callus not differentiated ..... *Anthaenantiopsis*  
 Lemma of upper floret oblanceolate; lower floret without stamens; callus differentiated ..... *Centrocchloa*
- 46(43). Second glume 9 – 15-nerved ..... *Thrasyopsis*  
 Second glume less than 9-nerved ..... *Paspalum*
- 47(25). First glume fused with the callus to form a cuplike structure ..... *Eriochloa*  
 First glume not fused with the callus ..... *Urochloa*
- 48(24). Ligule a membrane or a ciliate membrane; first glume encircling the spikelet base ..... 49  
 Ligule a fringe of hairs or absent; first glume not encircling the spikelet base ..... 51
- 49(48). Spikelets dorsiventrally compressed or planoconvex; first glume not inflated at the base; lemma of upper floret chartaceous to cartilaginous . 50



- Spikelets terete; first glume inflated at the base; lemma of upper floret indurate . . . . . *Lasiacis*
- 50(49). Lemma of lower floret with a central longitudinal groove; lemma of upper floret differentiated at the apex; pedicels discoid at the apex . . . . . *Plagiantha*
- Lemma of lower floret lacking a central longitudinal groove; lemma of upper floret not differentiated at the apex; pedicels cupuliform at the apex . . . . . *Panicum*
- 51(48). Pedicels perpendicular with the spikelet base; rachilla pronounced between the florets; lemma of lower floret consistent in texture . . . *Isachne*
- Pedicels oblique to the spikelet base; rachilla not pronounced between the florets; lemma of lower floret with a hyaline area at the base . . *Tatianyx*
- 52(4). Pedicels perpendicular with the spikelet base . . . . . 53
- Pedicels oblique to the spikelet base . . . . . *Mesosetum*
- 53(52). Primary branches with secund spikelets; spikelets dorsiventrally compressed or planoconvex; lemma of upper floret with involute margins . . . . . 54
- Primary branches with spikelets neither secund nor distichous; spikelets laterally compressed; lemma of upper floret with flat margins . . . . . *Arthropogon*
- 54(53). Rachilla pronounced between the florets; lemma of lower floret consistent in texture; lemma of lower floret lacking a central longitudinal groove . . . . . *Echinolaena*
- Rachilla not pronounced between the florets; lemma of lower floret with a hyaline area at the base or with the area between the central nerve and the first lateral nerve thinner in texture than the rest of the structure; lemma of lower floret with a central longitudinal groove . . . . . *Thrasya*
- 55(2). Second glume present; first glume present; stamens 3 . . . . . *Stenotaphrum*
- Second glume absent; first glume absent; stamens 2 . . . . . *Reimarochloa*
- 56(1). Disarticulation above the lower glume or at the spikelet base; lemma of upper floret rugose . . . . . 57
- Disarticulation at the base of the primary branches or at the nodes of the primary branches; lemma of upper floret smooth, scabrous, striate, muricate, pitted, or papillate . . . . . 60
- 57(56). Palea of lower floret with nerves not pronounced or with nerves pronounced but not winged; bristles antrorsely or retrosely scabrous; first glume encircling the spikelet base . . . . . 58
- Palea of lower floret with nerves pronounced into obvious wings; bristles smooth; first glume not encircling the spikelet base . . . . *Ixophorus*
- 58(57). Lemma of lower floret with a hyaline area at the base; first glume 13 – 23-nerved . . . . . *Setariopsis*
- Lemma of lower floret consistent in texture; first glume less than 9-nerved . . . . . 59
- 59(58). Main axis with distichous or secund primary branches . . . . . *Paspalidium*
- Main axis with quaquaversal primary branches . . . . . *Setaria*
- 60(56). Second glume up to 0.1 times spikelet length; cleistogamous inflorescence present . . . . . *Paratheria*



- Second glume 0.2 times spikelet length or more; cleistogamous inflorescence absent ..... 61
- 61(60). Spikelets in clusters of 4 with each opposite a flared bract ..... *Anthephora*  
Spikelets not consistently in clusters of 4 with each opposite a flared bract ..... 62
- 62(61). Callus flared to form a discoid receptacle ..... *Cenchrus*  
Callus not flared to form a discoid receptacle ..... *Pennisetum*

## SYNOPTIC DESCRIPTIONS FOR THE NEW WORLD GENERA OF THE PANICEAE

### Acroceras Stapf

Internodes hollow. Ligule a membrane or a ciliate membrane. Main axis with quaquaversal primary branches. Primary branches with appressed secondary branches; with secund spikelets. Rachis terminating in a spikelet. Pedicels concave at the apex. Disarticulation at the spikelet base. Spikelets adaxial; dorsiventrally compressed, but approaching lateral compression. First glume encircling the spikelet base; muticous. Rachilla pronounced or not pronounced between the florets. Second glume subequal to spikelet length. Lemma of upper floret indurate; *smooth*; with involute margins; constricted at the base or without basal modifications; *differentiated at the apex; conduplicate at the apex*; muticous or apiculate.

### Alloteropsis Presl

Internodes hollow. Ligule a fringe of hairs with a small membranous part at the base. Primary branches with appressed secondary branches; with secund spikelets. Rachis terminating in a spikelet. Pedicels concave at the apex. Disarticulation at the spikelet base. Spikelets abaxial; dorsiventrally compressed. First glume not encircling the spikelet base; muticous to awned. Rachilla not pronounced between the florets, but close examination will reveal a minute stipe ca. 0.3 mm long. Second glume subequal to spikelet length. *Lemma of lower floret with a hyaline area at the base*, frequently splitting at the base at maturity. Lemma of upper floret chartaceous to cartilaginous; striate to muricate; with flat or involute margins; *awned*.

### Amphicarpum Kunth

Internodes hollow. Ligule a fringe of hairs. Inflorescence a panicle for the aerial spikelets or a solitary spikelet for the subterranean cleistogamous spikelets. Main axis with quaquaversal primary branches. Primary branches with appressed secondary branches; with spikelets neither secund nor distichous. Rachis terminating in a spikelet. Pedicels concave at the



apex. Disarticulation at the spikelet base. *Spikelets heteromorphic*, referring to the presence of differentiated cleistogamous spikelets; adaxial; dorsiventrally compressed. First glume present or absent; not encircling the spikelet base; muticous. Second glume 0.92 – 1 times spikelet length. Lemma of upper floret chartaceous; smooth or faintly striate; with flat margins; muticous.

#### **Anthaenantia** P. Beauv.

Internodes spongy to hollow. Ligule a ciliate membrane or a fringe of hairs. Main axis with quaquaversal primary branches. *Primary branches with spreading secondary branches; with spikelets neither secund nor distichous*. Rachis terminating in a spikelet. Pedicels concave at the apex. Disarticulation at the spikelet base, frequently with a secondary point of disarticulation at the base of the caryopsis. Spikelets laterally compressed, dorsiventrally compressed, or planoconvex. *First glume absent*. Second glume 0.9 – 1 times spikelet length. Lemma of upper floret chartaceous; smooth; with flat margins; differentiated or not differentiated at the apex; the apex becoming flared and hyaline; muticous.

#### **Anthaenantiopsis** Pilger

*Internodes hollow*. Ligule a ciliate membrane or a fringe of hairs. *Main axis with distichous primary branches*. Primary branches with appressed secondary branches; with secund spikelets. Rachis terminating in a spikelet. *Pedicels flat at the apex*. Disarticulation at the spikelet base. Spikelets adaxial; dorsiventrally compressed. First glume present or absent; not encircling the spikelet base; muticous. Second glume 0.8 – 1 times spikelet length. Lemma of lower floret consistent in texture; *lacking a central longitudinal groove*. Lemma of upper floret chartaceous; smooth or minutely striate; *without basal modifications*; with involute margins; not differentiated at the apex; muticous.

#### **Anthephora** Schreb.

Internodes hollow. Ligule a membrane. Main axis with quaquaversal primary branches. Primary branches reduced to a fascicle of spikelets; with spikelets neither secund nor distichous. Rachis terminating in a bristle. Disarticulation at the base of the primary branches. Callus differentiated. *Spikelets in clusters of four, each opposite a flared bract*; adaxial; dorsiventrally compressed. First glume absent. Second glume 0.75 – 1 times spikelet length. Lemma of upper floret chartaceous; smooth; with flat margins; muticous.



**Arthropogon** Nees

Internodes spongy or hollow. Ligule a ciliate membrane or a fringe of hairs. Inflorescence a panicle or a raceme. Main axis with quaquaversal primary branches. Primary branches with appressed to spreading secondary branches; with spikelets neither secund nor distichous. Rachis terminating in a spikelet. Pedicels concave at the apex. Disarticulation at the spikelet base. *Callus differentiated*. Spikelets adaxial; laterally compressed. First glume not encircling the spikelet base; *awned*. Second glume subequal to spikelet length. *Lemma of upper floret hyaline to membranous*; smooth; with flat margins; muticous.

**Axonopus** P. Beauv.

Internodes solid or spongy. Ligule a ciliate membrane or a fringe of hairs. Main axis with quaquaversal primary branches. Primary branches with appressed secondary branches; with secund spikelets. Rachis terminating in a spikelet. *Pedicels concave at the apex. Disarticulation at the spikelet base. Spikelets adaxial*; dorsiventrally compressed or planoconvex. *First glume absent*. Second glume subequal to spikelet length. *Lemma of upper floret cartilaginous*; smooth or muricate; with flat or involute margins; muticous.

**Brachiaria** (Trin.) Griseb.

Internodes hollow. *Ligule a fringe of hairs*. Main axis with secund primary branches. *Primary branches with appressed secondary branches*; with secund spikelets. Rachis terminating in a spikelet. Pedicels concave at the apex. Disarticulation at the base of the upper floret or at the spikelet base. Spikelets adaxial; planoconvex. *First glume 0.1 – 0.2 times spikelet length*; encircling the spikelet base; muticous. Second glume subequal to spikelet length. Lemma of upper floret chartaceous; smooth; *white*; with involute margins; muticous.

**Cenchrus** L.

Internodes solid to spongy. Ligule a ciliate membrane or a fringe of hairs. Main axis with quaquaversal primary branches. Primary branches reduced to a fascicle of spikelets; with spikelets neither secund nor distichous. *Rachis terminating in a bristle. Disarticulation at the base of the primary branches*. Callus differentiated; *flared to form a discoid receptacle*. Spikelets dorsiventrally compressed. First glume present or absent; not encircling the spikelet base; muticous. Second glume 0.3 – 1 times spikelet length. Lemma of upper floret chartaceous to cartilaginous; smooth to muricate;

with flat margins; constricted at the base or without basal modifications; muticous.

### **Centrochloa Swallen**

Internodes hollow. Ligule a ciliate membrane. Main axis with quaquaversal primary branches. Primary branches with appressed secondary branches; with secund spikelets. Rachis terminating in a spikelet. Pedicels convex at the apex. Disarticulation at the spikelet base. Callus differentiated. *Spikelets adaxial*; dorsiventrally compressed. First glume absent. Second glume subequal to spikelet length, excluding the callus. Lemma of upper floret cartilaginous; smooth or faintly striate; *oblanceolate*; with involute margins; muticous to apiculate.

### **Chaetium Nees**

Internodes spongy. Ligule a fringe of hairs. *Inflorescence a panicle*. Main axis with quaquaversal primary branches. Primary branches with appressed secondary branches; with secund spikelets. Rachis terminating in a spikelet. *Pedicels oblique to the spikelet base* and modified with the oblique callus; flat at the apex. Disarticulation at the spikelet base. *Callus differentiated*, ca. 0.5 mm long. Spikelets adaxial; dorsiventrally compressed. First glume not encircling the spikelet base; *awned*. Second glume subequal to spikelet length. Lemma of upper floret cartilaginous; striate to muricate; with flat margins; mucronate to awned.

### **Digitaria Haller**

Internodes hollow. *Ligule a membrane or a ciliate membrane*. Main axis with quaquaversal primary branches. Primary branches with appressed or spreading secondary branches; *with secund spikelets*. Rachis terminating in a spikelet. Pedicels concave at the apex. Disarticulation at the spikelet base. Spikelets homomorphic; *abaxial*; planoconvex. First glume present or absent; not encircling the spikelet base; muticous. Rachilla not pronounced between the florets, however some members of section *Trichachne* possess a short stipe at the base of the upper floret. Second glume 0.3 – 1 times spikelet length. Lemma of upper floret cartilaginous; smooth, striate, or muricate; *with flat margins*; *with margins thinner in texture than the body*; muticous or mucronate.

### **Echinochloa P. Beauv.**

Internodes spongy. Ligule a fringe of hairs or absent. Main axis with secund or quaquaversal primary branches. Primary branches with



appressed secondary branches; with secund spikelets. Rachis terminating in a spikelet. Pedicels concave at the apex. Disarticulation at the spikelet base. Callus differentiated (referring to fused portion at the base of the first glume) or not differentiated. Spikelets adaxial; dorsiventrally compressed to planoconvex. First glume encircling the spikelet base; muticous or mucronate. Second glume present; subequal to spikelet length. Lemma of upper floret indurate; smooth; with involute margins; differentiated at the apex; *the apex becoming membranous*; muticous.

### **Echinolaena Desv.**

Internodes hollow. Ligule a ciliate membrane or a fringe of hairs. Inflorescence a panicle or a raceme. Main axis with secund or quaquaversal primary branches. Primary branches with appressed secondary branches; *with secund spikelets*. Rachis terminating in a spikelet. Pedicels flat to convex at the apex. Disarticulation at the spikelet base, with a secondary point at the base of the primary branch. Spikelets adaxial or abaxial; dorsiventrally compressed. First glume encircling the spikelet base; muticous or awned. *Rachilla pronounced between the florets*. Second glume 0.5 – 0.9 times spikelet length. Lemma of upper floret cartilaginous; smooth; with involute margins; with basal scars or appendages; muticous.

### **Eriochloa Kunth**

Internodes hollow. Ligule usually a fringe of hairs with a minute membranous rim at the base. Main axis with distichous or quaquaversal primary branches. Primary branches with appressed secondary branches; with secund spikelets. Rachis terminating in a spikelet. Pedicels concave at the apex. Disarticulation at the spikelet base. Callus differentiated. Spikelets adaxial; dorsiventrally compressed. *First glume fused with the callus to form a cuplike structure*; typically absent, rarely present. Second glume 0.9 – 1.3 times spikelet length. Lemma of upper floret indurate; *rugose*; with involute margins; mucronate or awned.

### **Homolepis Chase**

Internodes hollow. *Ligule a membrane*. Main axis with quaquaversal primary branches. Primary branches with spreading secondary branches; with spikelets neither secund nor distichous. Rachis terminating in a spikelet. Pedicels perpendicular or oblique to the spikelet base; concave to flat at the apex. Disarticulation at the spikelet base. Spikelets adaxial; *dorsiventrally compressed*. *First glume subequal to or slightly longer than the length of the second glume*; not encircling the spikelet base; muticous. Rachilla pronounced or not pronounced between the florets. Second glume 0.9 – 1

times spikelet length. Lemma of upper floret chartaceous to coriaceous; smooth; *with flat margins*; muticous.

### Hymenachne P. Beauv.

Internodes spongy. *Ligule a membrane or a ciliate membrane*. Main axis with quaquaversal primary branches. *Primary branches with appressed secondary branches*; with secund spikelets. Rachis terminating in a spikelet. Pedicels concave to flat at the apex. Disarticulation at the spikelet base. Spikelets adaxial; dorsiventrally compressed. *First glume encircling the spikelet base*; muticous or apiculate. Second glume 0.8 – 1 times spikelet length; *not gibbose*. Lemma of upper floret membranous to chartaceous; smooth to scabrous; *with flat margins*; muticous.

### Ichnanthus P. Beauv.

Internodes hollow; rarely glaucous. *Ligule a membrane, a ciliate membrane, or a fringe of hairs*. Main axis with quaquaversal primary branches. Primary branches with appressed or spreading secondary branches; with secund spikelets. Rachis terminating in a spikelet. Pedicels concave at the apex. Disarticulation at the spikelet base. Spikelets adaxial; laterally compressed or dorsiventrally compressed. First glume encircling the spikelet base; muticous or apiculate. Rachilla pronounced between the florets; *geniculate*. Second glume subequal to spikelet length. Lemma of upper floret cartilaginous; smooth; with involute margins; *with basal scars or appendages*; muticous.

### Isachne R. Br.

Internodes hollow. *Ligule a fringe of hairs or absent*. Main axis with quaquaversal primary branches. *Primary branches with spreading secondary branches*; with spikelets neither secund nor distichous. Rachis terminating in a spikelet. Disarticulation above the lower glume. Spikelets abaxial; dorsiventrally compressed. First glume not encircling the spikelet base; muticous. *Rachilla pronounced between the florets*. Second glume 0.7 – 0.95 times spikelet length. Lemma of upper floret cartilaginous; smooth or striate; *with involute margins; without basal modifications*; muticous.

### Ixophorus Schlecht.

Internodes solid. *Ligule a membrane*. Main axis with quaquaversal primary branches. Primary branches with appressed secondary branches; with secund spikelets. Rachis terminating in a bristle. *Bristles smooth*. Pedicels concave at the apex. Disarticulation at the spikelet base. Spikelets abaxial; dorsiventrally compressed. First glume not encircling the spikelet



base; muticous. Second glume subequal to spikelet length. Palea of lower floret with nerves pronounced into obvious wings. Lemma of upper floret cartilaginous; faintly rugose; with involute margins; mucronate, the mucro ca. 0.15 mm long.

**Lasiacis** (Griseb.) Hitchc.

Internodes solid and lignified or hollow. Ligule a membrane. Main axis with quaquaversal primary branches. Primary branches with spreading secondary branches; with spikelets neither secund nor distichous. *Rachis terminating in a spikelet*. Pedicels concave at the apex. Disarticulation at the spikelet base, rarely disarticulating above the first glume. Spikelets divergent from the axis; adaxial; *terete*. First glume encircling the spikelet base; muticous. Second glume 0.85 – 1 times spikelet length. Lemma of upper floret indurate; smooth; with involute margins; constricted at the base or without basal modifications; differentiated at the apex; the apex crested with a tuft of hairs; muticous or apiculate.

**Melinis** P. Beauv.

Internodes spongy; *viscid*. Ligule a fringe of hairs. Main axis with quaquaversal primary branches. Primary branches with spreading secondary branches; with spikelets neither secund nor distichous. *Rachis terminating in a spikelet*. Pedicels concave at the apex. Disarticulation at the spikelet base. Spikelets laterally compressed. First glume not encircling the spikelet base; muticous. Second glume subequal to spikelet length; *7-nerved*. Lemma of upper floret hyaline to membranous; smooth; with flat margins; muticous.

**Mesosetum** Steud.

Internodes hollow. Ligule a fringe of hairs. *Inflorescence a raceme*. Main axis with secund primary branches. *Rachis terminating in a spikelet*. *Pedicels oblique to the spikelet base*; concave at the apex. Disarticulation at the spikelet base. Callus differentiated or not differentiated. Spikelets adaxial; laterally to dorsiventrally compressed. First glume not encircling the spikelet base; muticous or awned. Second glume 0.7 – 1 times spikelet length. Lemma of lower floret with the area between the central nerve and the first lateral nerve thinner in texture than the rest of the structure. Lemma of upper floret chartaceous to cartilaginous; smooth or striate; with flat margins; muticous or apiculate.

**Oplismenopsis** Parodi

*Internodes spongy*. Ligule a ciliate membrane. Main axis with quaquaversal primary branches. Primary branches with appressed secondary

branches; with secund spikelets. Rachis terminating in a spikelet. Pedicels concave at the apex. Disarticulation at the spikelet base. Spikelets adaxial; dorsiventrally compressed, somewhat laterally compressed at anthesis. *First glume 0.9 – 1.7 times the length of the second glume*; encircling the spikelet base; *awned*. Second glume subequal to spikelet length. Lemma of upper floret chartaceous to cartilaginous; smooth; *with involute margins*; muticous.

### **Oplismenus** P. Beauv.

Internodes solid. Ligule a ciliate membrane. Main axis with secund primary branches. Primary branches with appressed secondary branches or reduced to a fascicle of spikelets; with secund spikelets. Rachis terminating in a spikelet. Pedicels flat at the apex. Disarticulation at the spikelet base. Spikelets divergent or not divergent from the axis; adaxial; laterally or dorsiventrally compressed. *First glume not encircling the spikelet base; awned. Second glume 0.5 – 0.8 times spikelet length. Lemma of lower floret mucronate to awned.* Lemma of upper floret cartilaginous; smooth; with involute margins, rarely becoming flat at maturity; mucronate.

### **Otachyrium** Nees

Internodes hollow. Ligule a membrane or a ciliate membrane. Main axis with quaquaversal primary branches. Primary branches with appressed or spreading secondary branches; with secund spikelets. *Rachis terminating in a spikelet.* Pedicels perpendicular with the spikelet base; concave at the apex. Disarticulation at the spikelet base. Spikelets adaxial; dorsiventrally compressed to planoconvex. First glume encircling the spikelet base; muticous. Second glume 0.3 – 0.4 times spikelet length; gibbose or not gibbose. Lemma of lower floret with a hyaline area at the base; with or without a central longitudinal groove. *Palea of lower floret with nerves pronounced into obvious wings.* Lemma of upper floret chartaceous to indurate; smooth; with involute margins; muticous.

### **Panicum** L.

Internodes hollow to solid; neither viscid nor glaucous. *Ligule a membrane or a ciliate membrane. Inflorescence a panicle.* Main axis with quaquaversal primary branches. Primary branches with appressed or spreading secondary branches; with secund or quaquaversal spikelets. *Rachis terminating in a spikelet. Pedicels cupuliform at the apex; concave at the apex. Disarticulation at the spikelet base.* Spikelets adaxial; dorsiventrally compressed. *First glume present; encircling the spikelet base; muticous.* Rachilla pronounced or not pronounced between the florets. Second glume subequal to spikelet



length. *Lemma of lower floret consistent in texture; lacking a central longitudinal groove.* Lemma of upper floret cartilaginous; smooth to muricate; *with involute margins; without basal modifications*; muticous.

### **Paratheria** Griseb.

Internodes hollow. Ligule a ciliate membrane, the membranous part only about 0.2 mm long. Main axis with quaquaversal primary branches, possibly distichous but difficult to determine. Primary branches with appressed secondary branches. Rachis terminating in a bristle. Disarticulation at the base of the primary branches. Callus differentiated. Spikelets with lateral orientation or abaxial; dorsiventrally compressed. First glume not encircling the spikelet base; muticous. *Second glume 0.05 – 0.07 times spikelet length.* Lemma of upper floret chartaceous; smooth; with flat margins; muticous.

### **Paspalidium** Stapf

Internodes hollow. Ligule a ciliate membrane. *Main axis with distichous or secund primary branches.* Primary branches with appressed secondary branches; with secund or distichous spikelets. *Rachis terminating in a bristle.* Pedicels concave at the apex. *Disarticulation at the spikelet base.* Spikelets divergent or not divergent from the axis; abaxial; planoconvex or terete. First glume encircling the spikelet base; muticous. Lemma of upper floret cartilaginous to indurate; rugose; with involute margins; constricted at the base or without basal modifications; muticous or mucronate.

### **Paspalum** L.

Internodes solid to hollow; glaucous or neither viscid nor glaucous. Ligule a membrane or a fringe of hairs. Main axis with quaquaversal primary branches. Primary branches with appressed secondary branches; with secund spikelets. Rachis terminating in a spikelet or in an unmodified naked point. *Pedicels flat or convex at the apex.* Disarticulation at the spikelet base. Spikelets homomorphic; *abaxial*; planoconvex. First glume usually absent, rarely present as a small nerveless scale; *not encircling the spikelet base*; muticous. Second glume 0.7 – 1 times spikelet length. Lemma of upper floret indurate; smooth or striate; with involute margins; constricted at the base or without basal modifications; muticous.

### **Pennisetum** Rich.

Internodes spongy or hollow; glaucous or neither viscid nor glaucous. Ligule a ciliate membrane or a fringe of hairs. *Main axis straight*; with quaquaversal primary branches. *Primary branches reduced to a fascicle of*

*spikelets. Rachis terminating in a bristle. Disarticulation at the base of the primary branches. Callus differentiated or not differentiated; not flared to form a discoid receptacle. Spikelets dorsiventrally compressed. First glume present or absent; not encircling the spikelet base; muticous. Second glume present, rarely absent; 0.5 – 1.1 times spikelet length. Lemma of upper floret chartaceous to cartilaginous; smooth or scabrous; with flat or involute margins; muticous.*

### **Phanopyrum Nash**

Internodes hollow. Ligule a membrane. Main axis with quaquaversal primary branches. Primary branches with appressed secondary branches; with secund spikelets. Rachis terminating in a spikelet. Pedicels concave at the apex. Disarticulation at the base of the upper floret or at the spikelet base. Spikelets adaxial; *laterally compressed*. First glume encircling the spikelet base; mucronate. Rachilla pronounced between the florets. Second glume 0.92 – 0.96 times spikelet length. *Lemma of upper floret 0.4 – 0.48 times the length of the lower floret*; indurate; smooth; with involute margins; muticous.

### **Plagiantha Renv.**

Internodes hollow. Ligule a ciliate membrane. Main axis with quaquaversal primary branches. Primary branches with spreading secondary branches; with spikelets neither secund nor distichous, or not distinctly secund. Rachis terminating in a spikelet. Pedicels concave at the apex. Disarticulation at the spikelet base. *Spikelets divergent from the axis*; adaxial; dorsiventrally compressed. First glume encircling the spikelet base; muticous. Second glume 0.8 – 0.86 times spikelet length. *Lemma of lower floret with a central longitudinal groove*. Lemma of upper floret chartaceous; muricate; with involute margins; differentiated at the apex (darker in color); muticous.

### **Pseudechinolaena Stapf**

Internodes solid. Ligule a membrane. Main axis with distichous primary branches. Primary branches with appressed or spreading secondary branches; with distichous spikelets. Rachis terminating in a spikelet. Pedicels concave at the apex. Disarticulation at the base of the upper floret or at the spikelet base. Spikelets adaxial or abaxial, depending on the development of the lower spikelet; *laterally compressed*. First glume encircling the spikelet base; muticous, mucronate, or awned. Rachilla pronounced between the florets, minute and positioned on the adaxial side of the spikelet. Second glume 0.95 – 1 times spikelet length; *gibbose*. Lemma of



lower floret with a hyaline area at the base. Lemma of upper floret cartilaginous; smooth; with flat margins; muticous.

### **Reimarochloa Hitchc.**

Internodes hollow. Ligule a membrane or a fringe of hairs. Main axis with distichous or quaquaversal primary branches. Primary branches with spreading secondary branches; with secund spikelets. Rachis terminating in a spikelet or in an unmodified naked point. Disarticulation at the base of the primary branches. Callus not differentiated, however the base of the primary branches are weaker and discolored especially at maturity. Spikelets abaxial; planoconvex. First glume absent. *Second glume absent* (rarely present). Lemma of upper floret chartaceous; smooth; with involute margins; without basal modifications; muticous.

### **Reynaudia Kunth**

Internodes solid. Ligule a fringe of hairs. Main axis with quaquaversal primary branches. Primary branches with appressed to spreading secondary branches; with secund spikelets. Rachis terminating in a spikelet. Pedicels perpendicular or oblique to the spikelet base; concave to flat at the apex. *Disarticulation at the spikelet base*. Spikelets divergent or not divergent from the axis; adaxial; laterally compressed. First glume not encircling the spikelet base; awned from between the lobes. Second glume subequal to spikelet length. Lemma of upper floret hyaline; smooth; with flat margins; muticous. *Stamens 2*.

### **Rhynchelytrum Nees**

Internodes solid to hollow. Ligule a fringe of hairs. Main axis with secund primary branches. Primary branches with spreading secondary branches; *with spikelets neither secund nor distichous*. Rachis terminating in a spikelet. Pedicels concave at the apex. Disarticulation at the spikelet base. Callus differentiated or not differentiated. Spikelets divergent or not divergent from the axis; *laterally compressed*. *First glume present*; not encircling the spikelet base; *muticous*. Rachilla pronounced or not pronounced between the florets, but frequently slightly developed between the second glume and lower floret. Second glume 0.95 times spikelet length; *5-nerved*. Lemma of upper floret membranous to chartaceous; smooth; with flat margins; muticous.

### **Sacciolepis Nash**

Internodes hollow. Ligule a membrane or a ciliate membrane. Main axis with quaquaversal primary branches. Primary branches with appressed

secondary branches; with secund or quaquaversal spikelets. Rachis terminating in a spikelet. Pedicels concave at the apex. Disarticulation at the spikelet base and with a secondary point at the base of the upper floret. Spikelets adaxial; dorsiventrally compressed. First glume not encircling the spikelet base; muticous. Rachilla pronounced or not pronounced between the florets. Second glume subequal to spikelet length; *saccate*. Lemma of upper floret cartilaginous; scabrous; with flat margins; muticous.

### Scutachne Hitchc. & Chase

Internodes hollow. *Ligule a fringe of hairs*. Main axis with quaquaversal primary branches. Primary branches with appressed or spreading secondary branches; with secund spikelets. Rachis terminating in a spikelet. Pedicels concave at the apex. Disarticulation at the spikelet base. *Spikelets paired*; adaxial; laterally to dorsiventrally compressed. First glume encircling the spikelet base; muticous. *Second glume 0.8–0.9 times spikelet length*. Lemma of upper floret cartilaginous; smooth or rugose; *with flat margins*; muticous.

### Setaria P. Beauv.

Internodes solid to hollow. *Ligule a ciliate membrane or a fringe of hairs*. *Main axis with quaquaversal primary branches*. Primary branches with appressed or spreading secondary branches, or reduced to a fascicle of spikelets; with secund spikelets. *Rachis terminating in a bristle*. Pedicels concave at the apex. *Disarticulation at the spikelet base* (or at the base of the upper floret in some cultivated taxa). Spikelets divergent or not divergent from the axis; abaxial; planoconvex to terete. First glume encircling the spikelet base; muticous or mucronate. Second glume present; 0.4–1 times spikelet length. *Lemma of upper floret subequal to the length of the lower floret*; cartilaginous to indurate; rugose; with involute margins; constricted at the base or without basal modifications; muticous.

### Setariopsis Scribn. & Millsp.

Internodes hollow. *Ligule a ciliate membrane*. Main axis with quaquaversal primary branches. Primary branches with appressed secondary branches; with secund spikelets. Rachis terminating in a bristle. Pedicels concave at the apex. Disarticulation at the spikelet base. Spikelets abaxial; dorsiventrally compressed. First glume encircling the spikelet base; *13–23-nerved*; muticous. Second glume 0.85–1 times spikelet length. Lemma of lower floret with a hyaline area at the base. Lemma of upper floret indurate; *rugose*; with involute margins; muticous or apiculate.



**Spheneria** Kuhlm.

Internodes hollow. Ligule a membrane, subtended by a line of setaceous hairs. Main axis with distichous primary branches. Primary branches with appressed secondary branches; with secund spikelets. Rachis terminating in a spikelet. *Pedicels oblique to the spikelet base*. Disarticulation at the spikelet base. Callus differentiated. Spikelets abaxial; dorsiventrally compressed. *First glume absent*. Second glume 0.95 – 1 times spikelet length. Lemma of upper floret indurate; papillate to slightly rugose; with involute margins; muticous and slightly mucronate and recurved.

**Stenotaphrum** Trin.

Internodes solid to spongy. Ligule a ciliate membrane. Main axis with distichous or secund primary branches. *Rachis terminating in an unmodified naked point*. Pedicels concave at the apex. *Disarticulation at the nodes of the main axis or at the base of the inflorescence*. Spikelets abaxial; dorsiventrally compressed. First glume not encircling the spikelet base; muticous. *Second glume present*; 0.9 – 1 times spikelet length. Lemma of upper floret cartilaginous; smooth or muricate; with flat or involute margins; without basal modifications; muticous.

**Streptostachys** Desv.

Internodes hollow. Ligule a fringe of hairs or absent. Main axis with quaquaversal primary branches. Primary branches with appressed secondary branches; with secund spikelets. Rachis terminating in a spikelet. Pedicels concave or flat at the apex. Disarticulation at the spikelet base. Spikelets adaxial; dorsiventrally compressed. *First glume encircling the spikelet base*; muticous. Second glume 0.9 – 1 times spikelet length. Lemma of upper floret indurate; smooth; *hairy*; with involute margins; muticous.

**Tatianyx** Zuloaga & Soderstrom

Internodes hollow. Ligule a fringe of hairs. Main axis with quaquaversal primary branches. Primary branches with spreading secondary branches; with spikelets neither secund nor distichous. Rachis terminating in a spikelet. *Pedicels oblique to the spikelet base*; slightly concave at the apex. Disarticulation at the spikelet base. Callus differentiated. Spikelets probably adaxial but difficult to determine; dorsiventrally compressed. First glume not encircling the spikelet base; muticous. Second glume 0.85 – 0.95 times spikelet length. *Lemma of lower floret with a hyaline area at the base*. Lemma of upper floret cartilaginous; minutely striate; with involute margins; muticous.

### Triscenia Griseb.

*Ligule a fringe of hairs.* Main axis with distichous primary branches. Primary branches with appressed secondary branches; with spikelets neither secund nor distichous. Rachis terminating in a spikelet. Pedicels concave at the apex. Disarticulation at the spikelet base. Spikelets adaxial; *dorsiventrally compressed*. First glume encircling the spikelet base; muticous. Second glume slightly longer than spikelet length. *Lemma of upper floret hyaline to membranous*; smooth; with flat margins; muticous.

### Thrasya Kunth

Internodes hollow. Ligule a membrane. Inflorescence a panicle or a raceme. Main axis with secund primary branches. Primary branches with appressed secondary branches; with secund spikelets. Rachis terminating in a spikelet or in an unmodified naked point. *Pedicels flat or convex at the apex*. Disarticulation at the spikelet base. Callus differentiated or not differentiated. Spikelets adaxial; dorsiventrally compressed to planoconvex. First glume fused or not fused with the callus; present or absent; not encircling the spikelet base; muticous. Rachilla generally not pronounced between the florets but slightly developed in some species, 0.1–0.2 mm long. Second glume 0.7–1.2 times spikelet length; 3–7-nerved;. Lemma of lower floret with a hyaline area at the base or with the area between the central nerve and the first lateral nerve thinner in texture than the rest of the structure; *with a central longitudinal groove*. Lemma of upper floret cartilaginous; striate or muricate; with involute margins; differentiated (hairy in some species) or not differentiated at the apex; muticous.

### Thrasyopsis Parodi

Internodes mostly spongy. Ligule a membrane and a fringe of hairs. Inflorescence a panicle but highly reduced. Main axis with secund primary branches; *with 1 or 2 primary branches*. Primary branches with appressed secondary branches; with secund spikelets. Rachis terminating in a spikelet or in an unmodified naked point. *Pedicels flat at the apex*. Disarticulation at the spikelet base. Spikelets adaxial; dorsiventrally compressed. First glume not encircling the spikelet base; muticous. Second glume 0.92–1 times spikelet length; 9–15-nerved. Lemma of lower floret with the area between the central nerve and the first lateral nerve thinner in texture than the rest of the structure or consistent in texture; with a central longitudinal groove or lacking a central longitudinal groove. Palea of lower floret with nerves pronounced and becoming indurate but not winged. Lemma of upper floret indurate; smooth or muricate; with involute margins; muticous.



**Urochloa** P. Beauv.

Internodes hollow. Ligule a fringe of hairs. Main axis with quaquaversal primary branches. Primary branches with appressed or spreading secondary branches; with secund spikelets. *Rachis terminating in a spikelet*. Pedicels concave, flat, or convex at the apex. Disarticulation at the spikelet base. Callus differentiated or not differentiated. Spikelets adaxial or abaxial; dorsiventrally compressed or planoconvex. *First glume not fused with the callus*; encircling the spikelet base; muticous. Second glume 0.95 – 1 times spikelet length. Lemma of upper floret cartilaginous to indurate; *rugose*; *with involute margins*; differentiated or not differentiated at the apex; muticous, mucronate, or awned.

## ACKNOWLEDGMENTS

Appreciation is extended to John Wiersema for making suggestions to improve the wording of the manuscript. Vittoria Hess provided technical assistance in all aspects of data collection, storage, analysis and presentation.

## REFERENCES

- DALLWITZ, M. J. 1974. A flexible program for generating identification keys. *Systematic Zoology* 23:50 – 57.
- . 1980. A general system for coding taxonomic descriptions. *Taxon* 29:41 – 46.
- SWALLEN, J. R. 1968. "*Acostia*," a new genus of grasses from Ecuador. *Bol. Soc. Arg. Bot.* 12:109.
- WEBSTER, R. D. 1988. Genera of the North American Paniceae (Poaceae: Panicoideae). *Syst. Bot.* 13(4):576 – 609.
- WEBSTER, R. D. and J. VALDEZ R. 1988. Genera of Mesoamerican Paniceae (Poaceae: Panicoideae). *SIDA* 13(2):187 – 221.



Webster, Robert D., Kirkbride, Joseph H., and Valdés-Reyna, Jesús. 1989. "NEW WORLD GENERA OF THE PANICEAE (POACEAE: PANICOIDEAE)." *SIDA, contributions to botany* 13, 393–416.

**View This Item Online:** <https://www.biodiversitylibrary.org/item/34595>

**Permalink:** <https://www.biodiversitylibrary.org/partpdf/162907>

**Holding Institution**

Missouri Botanical Garden, Peter H. Raven Library

**Sponsored by**

Missouri Botanical Garden

**Copyright & Reuse**

Copyright Status: In copyright. Digitized with the permission of the rights holder.

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.