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POACEAE

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POACEAE

A.S. SHERIF & M.A. SIDDIQI

Poaceae can be readily distinguished from other related families by its unique and unusual vegetative and floral structure. In general, members of this family are mostly annual or perennial herbs, rarely woody. Roots are usually fibrous. Underground stems (rhizomes) frequently are confused with true roots. The grass stems (culms) are erect, decumbent or prostrate, jointed, often cylindrical, rarely flat or angular; nodes solid, internodes usually hollow or less frequently solid. Leaves alternate, two ranked, simple, divided into a sheath and blade, venation parallel. A membranous or hairy structure (ligule) usually present on the inner surface at the junction of the sheath and blade, sometimes a membranous projection (auricle) present on either side of the ligule. Inflorescence various, most likely raceme, simple or compound panicle or a spike of spikelets. Spikelets (the basic unit of the inflorescence) consists of a contracted axis, the rachilla, upon which are borne one to several florets, and a pair of glumes (empty bracts) rarely one or absent. Flowers (florets) hermaphrodite or less commonly unisexual; perianth parts reduced to 2 hyaline and scale like lodicules (sometimes absent); each floret enclosed between two bracts, the outer lemma and the inner palea; stamens hypogynous, anthers versatile on long filaments, mostly 3 stamens in each floret, 6 stamens were reported from the most primitive group in grasses as in *Bamboo*; pistil with one locule and one ovule; styles usually 2, rarely 1 or 3; stigma plumose; fruit a caryopsis.

A large cosmopolitan family with about 600 genera and nearly 7500 species; represented by 93 genera and 228 species in Libya.

It is of great economic importance because of the cereals, fodder, sugar, paper, edible and essential oils obtained from its members. Although the grass flowers are highly reduced and different from other flowers in general apperance, yet, the grasses are considered as a highly evolved group of plants.

POACEAE

Evidence from cytology, anatomy, embryology and floral morphology has played a very important role in the classification of grasses. Because the structure of the grass flowers is uniform, the floral structure can not be used to distinguish among the different grass genera and species; therefore, inflorescence, structures of glume, lemma, palea and lodicules are of great taxonomic importance.

Most of the specimens cited here are present in the Herbarium, Faculty of Science, Tripoli (ULT), those seen elsewhere are so indicated. Taxa marked with an asterisk (*) are known only from cultivation in Libya.

1.	+ Inflorescence with all spikelets bearing unisexual florets	92. **Zea**
	— Inflorescence with many or all spikelets bearing at least one bisexual floret	2
2.	+ Spikelet solitary enclosed within a spathe - like sheath	55. **Lygeum**
	— Spikelets not solitary, if solitary, then not enclosed within spathe-like sheath	3
3.	+ Spikelets in pairs, one sessile, the other pedicellate (sometimes one sessile and two pedicellate)	4
	— Spikelets not in pairs (if appearing paired, then both pedicellate or both sessile)	13
4.	+ Panicle dichotomously branched	7. **Cutandia**
	— Panicle not dichotomously branched	5
5.	+ Pedicellate spikelets with several distinct lemmas	19. **Cynosurus**
	— Pedicellate spikelets with 2 or less lemmas, sometimes highly reduced or completely absent	6
6.	+ Spikelets all alike (sessile and pedicellate spikelets perfect)	7
	— Spikelets not all alike (sessile spikelets perfect, pedicellate spikelets staminate, neuter, rudimentary or absent and represented by pedicel only)	8

7.	+ Inflorescence spicate; callus hairs much longer than spikelets; spikelets awnless	90. **Imperata**
	— Inflorescence paniculate; callus hairs usually as long as spikelet or shorter; spikelets awned	89. **Saccharum**
8.	+ Inflorescence paniculate	88. **Sorghum**
	— Inflorescence spicate, racemose, digitate-subdigitate	9
9.	+ Lemma of sessile spikelet awnless	91. **Lasiurus**
	— Lemma of sessile spikelet awned	10
10.	+ Inflorescence subtended by spatheoles	11
	— Inflorescence not subtended by spatheoles	12
11.	+ Awn glabrous; plant aromatic	85. **Cymbopogon**
	— Awn hairy; plants non-aromatic	84. **Hyparrhenia**
12.	+ Culm nodes conspicuously bearded; lower glume truncate with long bulbous based hairs above	87. **Dichanthium**
	— Culm nodes glabrous; lower glume acuminate, glabrous or with shorter appressed hairs	86. **Andropogon**
13.	+ Spikelets with lower lemma (s) empty or sterile and upper lemma (s) fertile	14
	— Spikelets with lower lemma (s) fertile and upper lemma (s) sterile (frequently sterile lemma (s) absent)	23
14.	+ Tall reed-like grasses with broad leaf blades and plumose panicle	57. **Phragmites**
	— Not tall reed-like grasses	15
15.	+ Spikelets subtended by one or more bristles or flattened spines, these distinct or united at base, forming an involucre or spine bur	16
	— Spikelets not subtended by bristles or flattened spines	18

16. + Bristles (spines) united or fused at the base, forming a spine bur like involucre or cup — **83. Cenchrus**
— Bristles not united or fused at base but rather distinct and free — 17

17. + Spikelets and bristles falling together; plants perennials — **82. Pennisetum**
— Spikelets falling, leaving the bristles behind; plants annuals — **81. Setaria**

18. + Spikelets crowded in rows or fascicles on short, unbranched primary branches; glumes awned, acuminate; lemma of lower (sterile) floret cuspidate, mucronate or awned — **80. Echinochloa**
— Spikelets solitary or paired, in panicle or 2-several slender spicate racemes; glumes awnless; lemma of lower (sterile) floret not cuspidate, mucronate or awned — 19

19. + Spikelets arranged on flattened branched rachis; spikes solitary, digitate, or racemose — 20
— Spikelets not arranged on flattened rachis; spikes paniculate (open or contracted panicle) — 22

20. + Spikelets lanceolate to elliptical; margins of fertile lemma flat, membranous and not inrolled over palea — **77. Digitaria**
— Spikelets plano-convex; margins of fertile lemma indurate and inrolled over palea — 21

21. + First glume present on all spikelets — **79. Paspalidium**
— First glume absent on some or all spikelets — **78. Paspalum**

22. + Spikelets in open panicle — **76. Panicum**
— Spikelets in cylindrical, tightly contracted panicle — **54. Phalaris**

23. + Spikelets with only one floret (no reduced or sterile floret) — 24

— Spikelets with more than one floret 48

24. + Spikelets in clusters of 2 or more per node of continuous or disarticulating rachis 25
— Spikelets not in clusters of 2 or more per node of continuous or disarticulating rachis 26

25. + Lower glume highly reduced or sometimes absent, upper glume well developed, as long as spikelet and covered with stout, hooked spines arising from the nerves 93. **Tragus**
— Both glumes well developed, as long as spikelet, upper glume not covered with stout, hooked spines 32. **Hordeum**

26. + Inflorescence branches digitate; rachilla prolonged behind palea 73. **Cynodon**
— Inflorescence branches not as above; rachilla not prolonged behind palea 27

27. + Spikelets dimorphic, basal spikelets female and without glumes and upper ones hermaphrodite 55. **Libyella**
— Spikelets not dimorphic (all hermaphrodite) 28

28. + Both glumes absent 1. **Leersia**
— Both glumes or at least the upper one present 29

29. + Inflorescence terminal, curved or straight spike with spikelets seated or sunken in the cavities of the rachis 30
— Inflorescence open or contracted panicle, capitate or panicle-like raceme, if spike-like panicle, then spikelets not seated or sunken in the cavities of the rachis 32

30. + Both glumes present, placed side by side covering the floret 34. **Parapholis**
— Only the upper glume present, lower glume

	highly suppressed or absent except in terminal spikelets	31
31.	+ Upper glume entirely covering the floret; spike with tough rachis	33. **Hainardia**
	— Upper glume not covering the floret (much smaller than floret); spike with slender rachis	13. **Psilurus**
32.	+ Ligules large, thick and conspicuously two lobed; glumes very much shorter than spikelet and appear as a scale-like structure	2. **Oryza**
	— Ligules small, membranous or hairy but not two - lobed; glumes (at least upper glume) nearly as long as or just a little shorter than spikelet	33
33.	+ Leaf-blades c. 60 cm long or more; glumes c. 1 cm long or more	46. **Ammophila**
	— Leaf-blades and glumes much smaller	34
34.	+ Inflorescence capitate	35
	— Inflorescence not capitate	36
35.	+ Inflorescence not subtended by an inflated sheath; spikelets densely wooly; glumes longer than lemma	50. **Lagurus**
	— Inflorescence conspicuously subtended by an inflated sheath; spikelets not wooly; glumes shorter than lemma	74. **Crypsis**
36.	+ Spikelets in a contracted, cylindrical, spike-like panicle	37
	— Spikelets in an open or contracted panicle but never in spike-like panicle	41
37.	+ Disarticulation below glumes (spikelets falling entirely)	38
	— Disarticulation above glumes (spikelets not falling entirely)	39

38.	+ Glumes awnless	52. **Alopecurus**
	— Glumes awned	47. **Polypogon**
39.	+ Glumes awned; lemma awnless	51. **Phleum**
	— Glumes awnless; lemma awned	40
40.	+ Glumes swollen at the base; awn of the lemma dorsal-subapical	48. **Gastridium**
	— Glumes not swollen at the base; awn of the lemma sub-basal	49. **Triplachne**
41.	+ Spikelets dorsally compressed	42
	— Spikelets laterally compressed	43
42.	+ Spikelets awned	61. **Piptatherum**
	— Spikelets awnless	45. **Millium**
43.	+ Lemmas thin, membranous or hyaline at maturity	44
	— Lemmas indurate at maturity	46
44.	+ Glumes conspicuously awned	47. **Polypogon**
	— Glumes awnless	45
45.	+ Glumes usually unequal (at-least one shorter than lemma); rachilla disarticulating above the glumes	75. **Sporobolus**
	— Glumes equal, longer than lemma; rachilla disarticulating below the glumes	47. **Polypogon**
46.	+ Awn simple (lemma with a single awn)	60. **Stipa**
	— Awn trifid (lemma with 3-parted awns)	47
47.	+ All branches of the awn glabrous	64. **Aristida**
	— At least the central branch of the awn plumose	65. **Stipagrostis**
48.	+ Spikelets arranged on one side of a continuous rachis	49

	— Spikelets not arranged on one side of a continuous rachis	59
49.	+ Lemmas with capitate hairs at the base	8. **Desmazeria**
	— Lemmas glabrous, if hairy, then not capitate	50
50.	+ Spikelets of two kinds (fertile and sterile), arranged in fascicles, the terminal spikelet one-flowered, perfect, the lower one several-flowered, sterile	20. **Lamarckia**
	— Spikelets all alike, not arranged in fascicles	51
51.	+ Inflorescence branch(es) digitate or sub-digitate (aggregated near apex of the main axis)	52
	— Inflorescence branch(es) solitary (spikes arranged along central axis) or paired	54
52.	+ Spikelets with only one fertile floret (one or more rudimentary florets present above the fertile one)	71. **Chloris**
	— Spikelets with more than one fertile florets	53
53.	+ Rachis prolonged beyond terminal spikelet	66. **Dactyloctenium**
	— Rachis not prolonged beyond the terminal spikelet	68. **Eleusine**
54.	+ Spikelets appressed to rachis	55
	— Spikelets not appressed to rachis	58
55.	+ Spikelets awned	72. **Tetrapogon**
	— Spikelets awnless	56
56.	+ Plants annual	9. **Catapodium**
	— Plants perennial	57
57.	+ Culm procumbent; lemma 7-9-nerved	63. **Aeluropus**
	— Culm erect; lemma 3-nerved	67. **Desmostachya**
58.	+ Glumes very unequal, the lower glume very mi-	

	nute, the upper glume as long as the lowermost lemma or little shorter	12. **Ctenopsis**
	— Glumes subequal, much longer than lemmas	69. **Dinebra**
59.	+ Inflorescence a simple spike with spikelets sessile- subsessile (more or less embedded in the rachis) on opposite sides of the continuous or disarticulating rachis	60
	— Inflorescence with spikelets in contracted, racemose, cylindrical, or spike-like panicle but not embedded in the rachis	70
60.	+ Lemmas with globular or head-like hairs at the base	8. **Desmazeria**
	— Lemmas glabrous, if hairy, then not globular	61
61.	+ Spikelets in cluster of 2 at each node of the axis	31. **Crithopsis**
	— Spikelets solitary at each node of the axis	62
62.	+ Spikelets placed edgewise against the rachis; only upper glume present	4. **Lolium**
	— Spikelets placed flatly or laterally against the rachis; both glumes present	63
63.	+ Spikelets cylindrical, often fitting into the depressions or pockets of the rachis, appearing as part of its diameter; rachis breaking up into individual segments at maturity	27. **Aegilops**
	— Spikelets more or less flattened, but quiet distinct and not appearing as part of the diameter of the rachis; rachis not breaking up into individual segments at maturity	64
64.	+ Lemmas awnless	65
	— Lemmas awned	66
65.	+ Plants perennial with rhizomes	30. **Elytrigia**
	— Plants annual without rhizomes	11. **Micropyrum**

66. + Glumes narrowly subulate, 1-nerved; spikelets with 2-florets; lemmas scabrous along the keel — 29. **Secale**
— Glumes (at least the upper one) broad, ovate or lanceolate, 2-many nerved; spikelets with 3 or more florets; lemmas glabrous along the keel — 67

67. + Glumes very unequal (lower glume less than 1/2 as long as the lowermost floret and upper glume c. as long as the lowermost floret — 68
— Glumes equal-subequal — 69

68. + Annuals; leaves soft - villous — 38. **Gaudinia**
— Perennials; leaves glabrous - scabrous — 36. **Avenula**

69. + Mouth of leaf - sheath with an auricle — 28. **Triticum**
— Mouth of leaf - sheath without an auricle — 11. **Micropyrum**

70. + Tall, reed-like grasses with broad leaf blade — 71
— Not tall, reed - like grasses — 73

71. + Lemma glabrous on the dorsal surface; rachilla villous — 57. **Phragmites**
— Lemmas villous or long pilose on the dorsal surface; rachilla glabrous — 72

72. + Inflorescence dense, contracted, lax and plume-like panicle; ligule ciliate membranous, 1 mm or less long — 56. **Arundo**
— Inflorescence branched, not plume-like panicle; ligule membranous, 5-15 mm or more long — 23. **Ampelodesmos**

73. + Both glumes or at least one of them longer than the lowest floret (usually longer than the spikelet) — 74
— Both glumes shorter than the lowest floret (always smaller than the spikelet) — 83

74. + Inflorescence an open panicle — 75
— Inflorescence contracted panicle — 79

75.	+ Lemmas awnless	43. **Antinoria**
	– Lemmas awned	76
76.	+ Awn with a distinct ring of hairs in the middle and club - shaped above	44. **Corynephorus**
	– Awn neither with a distinct ring of hairs in the middle nor club - shaped above	77
77.	+ Spikelets very large, 10 or more mm long; glumes with 7-9 distinct nerves	37. **Avena**
	– Spikelets less than 10 mm long; glumes 1-3-nerved	78
78.	+ Lemma with one long central awn and two short lateral awns	39. **Trisetaria**
	– Lemma with only one awn and without lateral awns	42. **Aira**
79.	+ Lemmas awnless	59. **Schismus**
	– Lemmas awned	80
80.	+ Glumes very unequal (the lower glume short and 1-nerved, the upper glume long, broad, as long as the lowermost lemma or little longer and 3-nerved)	41. **Avellinia**
	– Glumes equal-subequal	81
81.	+ Lemmas with 9 awns	62. **Enneapogon**
	– Lemmas with only one awn	82
82.	+ Lemmas 7-9-nerved, conspicuously villous along the nerves; ligule a row of hairs	58. **Astenatherum**
	– Lemmas 1-3-nerved, glabrous-minutely scabrous on the nerves but never villous; ligule membranous	40. **Lophochloa**
83.	+ Spikelets of two kinds of florets (fertile and sterile), arranged in fascicles, the terminal one	

	1-flowered, perfect, the other several-flowered, sterile	20. **Lamarckia**
	— Spikelets all alike, not arranged in fascicles	84
84.	+ Panicle dichotomously branched	7. **Cutandia**
	— Panicle not as above	85
85.	+ Florets converted into bulbils at the base	18. **Poa**
	— Florets not converted into bulbils at the base	86
86.	+ Spikelets pyramidal in shape; lemmas as wide or wider than long	21. **Briza**
	— Spikelets not pyramidal in shape; lemmas as long or longer than wide	87
87.	+ Terminal floret sterile and club or knob-shaped	35. **Melica**
	— Terminal floret not sterile, if sterile, then not club or knob shaped	88
88.	+ Inflorescence globular (head-like)	89
	— Inflorescence not globular	90
89.	+ Inflorescence conspicuously prickly; lemma with 5-7 scabrid awns; palea 2-awned.	15. **Echinaria**
	— Inflorescence not prickly; lemma awnless or with only one short awn; palea awnless.	17. **Ammochloa**
90.	+ Spikelets densely clustered towards the end of branches; glumes hispid - ciliate on the keel	16. **Dactylis**
	— Spikelets not densely clustered towards the end of branches but rather evenly distributed in narrow or open panicle; glumes glabrous-scabrous on the keel	91
91.	+ Lemmas with capitate hairs at the base	8. **Desmazeria**
	— Lemmas glabrous at the base, if hairy, then not capitate	92

92. + Lemmas awnless — 93
— Lemmas awned — 99

93. + Lemmas densely tuberculate on the back (covered with tubercle-based hairs) — 10. **Castellia**
— Lemmas not densely tuberculate, glabrous-ciliate on the back — 94

94. + Glumes very unequal, both or at least the lower glume not nerved — 95
— Glumes equal-subequal, if unequal, then both nerved — 96

95. + Both glumes not nerved; lemmas (rounded at the back below, and keeled above) minutely scabrous on the back; spikelets seated on club-shaped pedicels — 14. **Sphenopus**
— Lower glume not nerved, upper glume 1-3-nerved; lemmas (rounded at the back) glabrous; spikelets not seated on club-shaped pedicel — 22. **Catabrosa**

96. + Leaf-sheaths all open — 97
— At least upper leaf-sheaths closed at the summit — 26. **Bromus**

97. + Lemmas rounded at the back; spikelets more or less appressed to the rachis; inflorescence contracted (pyramidal, ovate or oblong) panicle — 9. **Catapodium**
— Lemmas keeled at the back; spikelets not appressed to the rachis; inflorescence open or contracted panicle — 98

98. + Lemmas conspicuously 3-nerved; glumes 1-nerved; leaves without boat-shaped tips — 70. **Eragrostis**
— Lemmas 5-nerved (the two lateral nerves somewhat faint); glumes 3-nerved; leaves with boat-shaped tips — 18. **Poa**

99. + Spikelets dorsally compressed — 24. **Brachypodium**
— Spikelets laterally compressed — 100

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94. + Glumes very unequal, both or at least the lower glume not nerved — 95
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99. + Spikelets dorsally compressed — 24. **Brachypodium**
— Spikelets laterally compressed — 100

100.	+ Inflorescence spike-like with spikelets erect and appressed or sunken in the rachis; spikelets not more than 7 per axis	25. **Trachynia**
	— Inflorescence an open-contracted panicle with spikelets neither appressed nor embedded in the rachis; spikelets more than 7 per axis	101
101.	+ Leaf-sheaths all open	102
	— At least upper leaf-sheath closed at the summit	26. **Bromus**
102.	+ Lemmas awned at the tip; glumes very unequal (lower glume less than 1/2 as long as the upper glume)	5. **Vulpia**
	— Lemmas awned at the back and between the teeth; glumes equal-subequal (if unequal, then lower glumes about 1/2 as long as the upper)	103
103.	+ Plants perennial; ligules 3 mm or less long	3. **Festuca**
	— Plants annual; ligules 4 mm or more long	6. **Vulpiella**

1. **LEERSIA**

Swartz, Prodr. Veg. Ind. Occ. 21.1788 (*nom. cons.*)

Tall perennial, aquatic grass with strong rhizome. Inflorescence a loose panicle. Spikelets laterally compressed, 1-flowered, awnless; glumes absent; lemmas papery, boat shaped, 5-nerved, keel and margins finely ciliate; stamens 1-6.

Differs from *Oryza* in the absence of glumes.

c. 15 species, from tropics and warm temperate regions of the world; 1 species is recorded from Libya.

Leersia hexandra Swartz, Nov. Gen. et Sp. Pl. 21.1788; Corti, Fl. Veg. Fez. 41, 1942; Maire, Fl. Afr. Nord. 2: 11, 1953; Keith, Prelim. Check List Lib. Fl. 604. 1965; Scholz in Willdenowia 7: 429. 1974.

Oryza hexandra (Swartz) Doel in Mart., Fl. Bras. 2, 2: 10, 1871.

A rhizomaceous perennial grass, up to 1 m tall, nodes with appressed hairs facing

downwards. Leaves flat, lanceolate; leaf sheath and blade with minute hairs facing downwards. Inflorescence a lax panicle about 10 cm long. Spikelets short, pedicelled, caducous c. 4 mm, 1-flowered; glumes absent; lemmas laterally compressed, boat-shaped with prickly ciliated keel and margins, tip a blunt mucro; stamens 6; ovary glabrous.
2n = 48

Type: Described from Jamaica.

E-1 El Barkat, Ghat, 1.3.1934, *Corti* 932, 933 (FI); *ibid,* 2.3.1934, *Corti* 934 & 935 (FI).

Distribution: Trop. & subtrop. Africa, Eurasia, C. America & Australia.

Fl.: Feb.-Mar.

2. **ORYZA***

L., Sp. Pl. 333. 1753; Gen. Pl. ed. 5: 155. 1754.

Annual or perennial grasses. Culms unbranched. Leaf blade flat. Inflorescence a loose panicle with shortly pedicelled spikelets. Spikelets laterally compressed; glumes equal, reduced to 2 flattened, semicircular lips at the tip of pedicel; the two lower lemmas sterile, narrow, without a palea, the third hermaphrodite, strongly 5-nerved; palea and lemma of the same length and texture; stamens 6; lodicules 2; caryopsis laterally compressed, hilum linear, as long as the grain.

About 25 species distributed in the tropics of the Old World; known from one cultivated species in Libya.

***Oryza sativa** L., Sp. Pl. 333.1753; Durand & Barratte, Prodr. Fl. Lib. 250. 1910; Maire, l.c. 10; Keith, l.c. 720; Scholz, l.c. 429.

Annual cultivated grass with culms up to 1 m tall. Leaf blade up to 60 cm long, glabrous, scabrid on the margins. Inflorescence a lax and nodding panicle. Spikelets laterally compressed, 3-flowered, flower disarticulating above the glume, awned or awnless; glumes reduced to two semicircular lip at the tip of pedicel; two lower lemmas sterile without a palea, the third hermaphrodite, keeled, awned or awnless, lemma 7-9 mm long, stamens 6, lodicules 2, 2-lobed or entire.
2n = 12, 24, 36, 48.

Type: From the seed of Ethiopian origin, cultivated in India, Herb. Linn. 460/1 photo (LINN).

Durand and Barratte (l.c.) reported it to be cultivated in Sokna and Keith (l.c.) in Sokna and Cyrenaica on a limited scale.

Distribution: East and S.E. Asia, India, Pakistan, Afghanistan, Iran, Central Asia, Tropical Africa and in the tropics and subtropics of the world.

Rice is the most important crop plant since it produces more than any other cereal crop. It is the staple food of a large world population. The unpolished rice is rich in vitamin B_1 which is lost during the polishing process. The disease 'Beri-Beri' became quite serious when polished rice were supplied to people in the East.

Besides human food, rice straw is used as an important animal feed. Moreover, its straw is used for making paper pulp and husk for making boards. A great number of articles of daily and household use, such as mats, hats, baskets, shoes etc. are also made in some places.

Fl.: Sept.-Oct.

Vern. Uruz, Urz, Aruz and Ruz from which the Greek Oruza and the generic name *Oryza* were derived.

3. FESTUCA

L., Sp. Pl. 73. 1753; Gen. Pl. ed. 5: 33. 1754.

Erect and tufted perennials with green or glaucous culms. Leaf blades flat, folded or rolled. Inflorescence a panicle. Spikelets several-flowered, all hermaphrodite; glumes subequal, narrow; lemmas rounded at the back, 5-nerved, awned or awnless; palea 2-keeled; stamens 3, lodicules 2, each two toothed; grain fusiform, grooved on the adaxial surface, hilum in the groove, as long as the grain.

A cosmopolitan genus with about 80 species; 1 species is recorded from Libya.

Festuca arundinacea Schreb., Spicil. Fl. Lips. 57. 1771; Durand & Barratte, l.c. 268; Pamp., Fl. Trip. 22.1914; Prod. Fl. Cir. 122. 1931; Maire l.c. 149; Keith, l.c. 496; Scholz, l.c. 429. (Fig. 1)

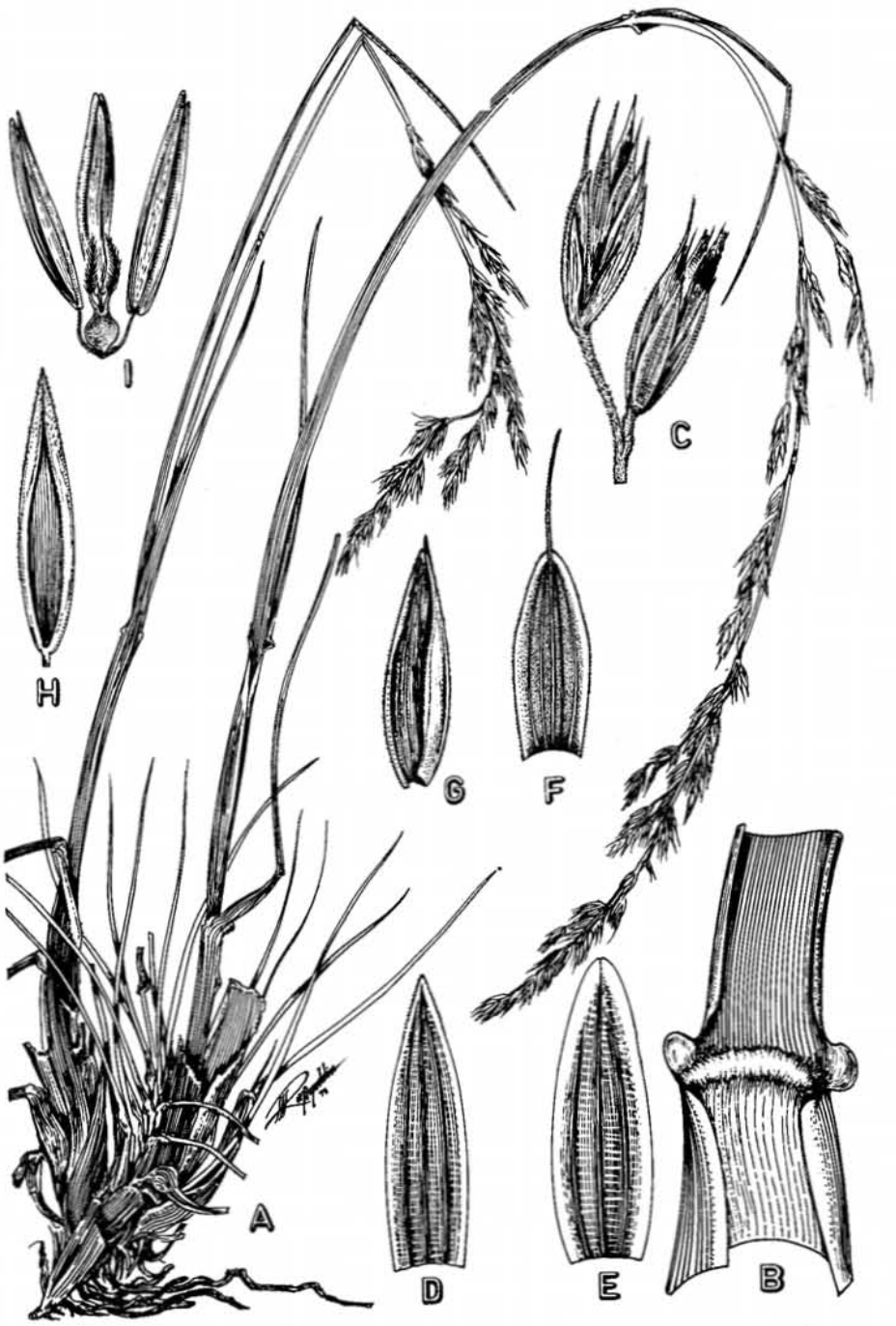


Fig. 1 **Festuca arundinacea**: A, habit × 0.5; B, lamina base, sheath and ligule × 5; C, spikelets × 3; D, lower glume × 8; E, upper glume × 8; F & G, lemma × 5; H, palea × 8; I, stamens and pistil × 10.

F. elatior L. ssp. *arundinacea* (Schreb.) Hack., Monogr. Fest. 156. 1882.

Perennial, about 1 m tall, erect, tufted; base rhizomaceous, ribbed. Leaf flat, green to glaucous, glabrous, linear acuminate, up to 50 cm long, 3-12 mm broad; leaf sheath glabrous, ribbed, covering the entire length of the culm up to the base of inflorescence. Panicle highly branched, loose, nodding, branches puberulent, base usually covered by the leaf sheath, 20-30 cm long. Spikelets 8-12 mm long, elliptic-oblong, 3-10-flowered; glumes 2, subequal-equal, the inner single nerved, keeled, outer 3-nerved, prominently grooved between the nerves, lanceolate, glabrous to finely puberulent, 5 mm long; lemma linear-lanceolate, puberulent, 5-7 mm long, in the upper florets awned, lower ones awnless; awns originate below the tip.
2n = 28, 42, 42 + 1-3B, 70.

Type: Behind the meadow slope of Biniz in humid locality, *Schreber*.

A-7 Gubba-Ain Mara, 28.4.1934, *Pampanini & P.-Sermolli* 688 (FI); Ain Mara, 5.5.1978, *Faruqi* 1770.
Also reported from Tripolitania by Pampanini (l.c.).

Distribution: Europe, N. Africa and temperate Asia; introduced into Australia, New Zealand and N. America.

A highly polymorphic species. In Libya it is represented by ssp. **fenas** (Lag.) Arcangeli. The polymorphism seems to originate from interspecific hybridization. Hubbard (1954) mentions hybrids between *F. arundinacea* and *Lolium perenne* and *F. arundinacea* and *L. multiflorum*. Since both the species of *Lolium* are present in Libya, it is quite likely that such hybrids are found here as well. Both of these hybrids are reported to have hairy auricles, but the last hybrid may have awns on lemmas up to 5 mm long.

A pasture grass, is being used for the same purpose in the Ain Mara area of Libya.

Fl.: Apr.-July

4. LOLIUM

L., Sp. Pl. 83. 1753; Gen. Pl. ed. 5: 36. 1754.

Annual or perennial, glabrous. Leaves flat. Inflorescence a spike of spikelets. Spi-

kelets sessile, 3-22-flowered, flat and alternately arranged in the cavities of a long axis; flowers hermaphrodite or upper florets more or less reduced; only outer glume of the lateral spikelets well developed, the inner reduced or absent; lemmas 5-7-nerved, awnless or sometimes awned; palea keeled, scabrid on the keels; stamens 3, lodicules 2, glabrous, grain enclosed within hardened palea and lemma.

A temperate Eurasian genus with 6 species of which only 4 are recorded from Libya.

1.	+ Glume as long or longer than the spikelet; central axis thick and tapering	4. **L. loliaceum**
	— Glume shorter than the spikelet; central axis neither thick nor cylindrical	2
2.	+ Spikelets with 11-22 florets; lemmas usually awned, awns up to 15 mm long, sometimes awnless; glume 1/4-1/2 the spikelet length; immature leaves rolled in young shoots	2. **L. multiflorum**
	— Spikelets with 11 or less florets; lemmas awned or awnless, if awned, then awns 8 or less mm long; glume 1/2-3/4 the spikelet length; immature leaves folded	3
3.	+ Plants tufted perennial; lemmas usually awnless, when awned, awns 4-8 mm long	1. **L. perenne**
	— Plants annual; lemmas shortly awned, awns 1-2 mm long	3. **L. rigidum**

1. **Lolium perenne** L., Sp. Pl. 83. 1753; Scholz in Willdenowia, 7: 429. 1974.

L. marschallii Steven in Bull. Soc. Nat. Mosc. 30: 103. 1857.

A tufted perennial, up to 60 cm (80 cm) tall, glabrous. Leaf flat, glabrous, conduplicate in bud; sheath glabrous, ligule 2 mm long, membranous. Inflorescence up to 20 cm (30 cm) tall. Spikelets with 11 or less florets alternating on opposite sides of the axis, up to 2 cm, usually smaller, flat; glumes c. 8 mm, lower glume present only on terminal spikelet, upper glume persistent, shorter than the spikelet, smooth, 5-7-nerved; lemmas awnless, when awned, awns 4-8 mm, blunt or slightly pointed, overlapping, 5-nerved; paleas as long as lemmas; anthers 3-4 mm long; caryopsis enclosed within the hardened palea and lemma. 2n = 14, 28.

palea and lemma. 2n = 14, 28.

Lectotype: Europa ad agrorum versuras solo fertili, Herb. Linn. 99/1 photo (LINN).

A-7 Faidiya, 23.5.1977, *Faruqi* 1369; c. 16 km from Labrag (c. 30 km from Lamluda), 19.6.1972, *S.I. Ali* 730, 739. Also reported from Tripoli by Scholz (l.c.)

Distribution: Europe, N. Africa and temperate Asia; introduced into America, Australia and New Zealand.

This species is commonly known as perennial rye grass and it is among the first of the grasses of cultivated pasture. It is highly polymorphic and hybridizes in nature with other species of *Lolium* as well as with the species of *Festuca*. True *L. perenne* is an awnless plant. When awned it is referred to as forma *aristatum* (Schu.) Terell.

Fl.: Mar.-May

2. **Lolium multiflorum** Lam., Fl. Franc. 3: 621. 1778; Pamp., Pl. Trip. 28. 1914; Corti, l.c. 58; Maire, l.c. 288; Keith, l.c. 622; Scholz, l.c. 430.

L. italicum A. Braun in Flora 17: 259. 1834; *L. gaudini* Parl., Fl. Ital. 1: 532. 1848.

An annual to perennating grass. Culm up to 1 m tall, geniculately ascending, tufted or solitary, usually smooth. Leaves glabrous, linear-acuminate, up to 25 cm long, 10 mm wide, rolled when young. Inflorescence a spike of spikelets, axis slender to somewhat stout, compressed. Spikelets sessile, 11-22 florets. Lower glume absent, present in terminal spikelet, upper glume about 1/2 the length of spikelet, persistent; lemmas overlapping, awned, awns up to 15 mm long, sometimes awnless; palea as long as lemma; anthers 3-4.5 mm long; caryopsis enclosed within the hardened palea and lemma. 2n = 14.

Type: Described from Peronne, France.

A-3 Tripoli University, 6.5.1976, *Faruqi* 588; 56 km from Tripoli, towards Bu-Ghelan, 20.5.1976, *Faruqi* 706; **B-4** Abu-Grain, 27.3.1975, *Zenab Abu Raya* 143; Abu-Njaim, 27.3.1975, *Amna Gammudi* 109; **D-3** Sebha, city lawn, 6.3.1978, *Faruqi* 1570 and 1572; Brak, 7.3.1978, *Faruqi* 1601; 41 km from Brak on way to Hun, 7.3.1978, *Faruqi* 1604.

Al-Abiad, cultivated ground near water course, 20.3.1973, *S.I. Ali* 1331. Also reported from S. Libya and Tibesti by Corti (l.c.).

Distribution: Most of Europe (incl. S.W. Russia). N. Africa and temperate Asia; introduced into China, Japan, S. Africa, S. America, N. America and Australia.

Also polymorphic like the preceding one, with interspecific and intergeneric hybridization with the genus *Festuca*.

Fl.: Mar.-May

3 . **Lolium rigidum** Gaud., Agrost. Helvet. 1: 334. 1811; Durand & Barratte, l.c. 276; Pamp., Pl. Trip. 29. 1914; Prod. Fl. Cir. 133. 1931; Corti, l.c. 59; Maire, l.c. 292; Keith, l.c. 622; Scholz, l.c. 430. (Fig. 2)

Annual, 35-80 cm tall, branched at the base, geniculately ascending, glabrous. Leaf linear-acuminate, up to 20 cm long, 3-7 mm wide, basal leaves narrower, folded when young. Inflorescence stiff, flattened, 20-30 cm long. Spikelets 20 mm long; upper glume ± 10 mm long with hyaline and wing like margin, central nerve pointed, awn like, smooth, glabrous; lemma up to 8 mm long, glabrous, glaucous, shortly awned, awns 1-2 mm long; caryopsis enclosed within the persistent palea and lemma. 2n = 14, 14 + 1-2B.

Type: Described from Switzerland Gaudin (holo-LAU).

A-2 Hinshir, 25 km from Garian, 8.4.1974, *S.I.Ali* 1747; **A-3** Msallata, Gurmat area c. 4 km. S.W. of Gusbat, Sandy soil 14.4.1978, *A. El-Gadi* 1008; Elouinia 14 km from Garyan, 11.4.1974, *M. Godeh* 216; Tripoli, 18.4.1967, *L. Boulos* 1696; Tripoli, near Leper hospital (Bir El-Osta Milad), 6.3.1976, *Faruqi* 1210; 20-23 km east Tripoli, coastal road to Khoms, 8.3.1967, *L. Boulos* 1579; **A-6** Benghazi, 31.11.1883, *Rhumer* 402; *79 km* from Ajdabia on way to Benghazi, 3.5.1978, *A. El-Gadi, Jafri and others* 1308; **A-7** Wadi Derna, 14.3.1968, *L. Boulos* 2447; **B-2** 15 km from Kaleba towards Mizda, 10.4.1974, *S.I. Ali* 2011; 7 km from Zintan towards Tripoli, 8.4.1974, *Milad Khair* 412.

Distribution: Europe, Mediterranean region, Middle East, Asia and Caucasus region.

Fl.: Mar.-Apr. *Vern.* Bomanjor

A most common species in Libya. The species is also quite variable and several va-

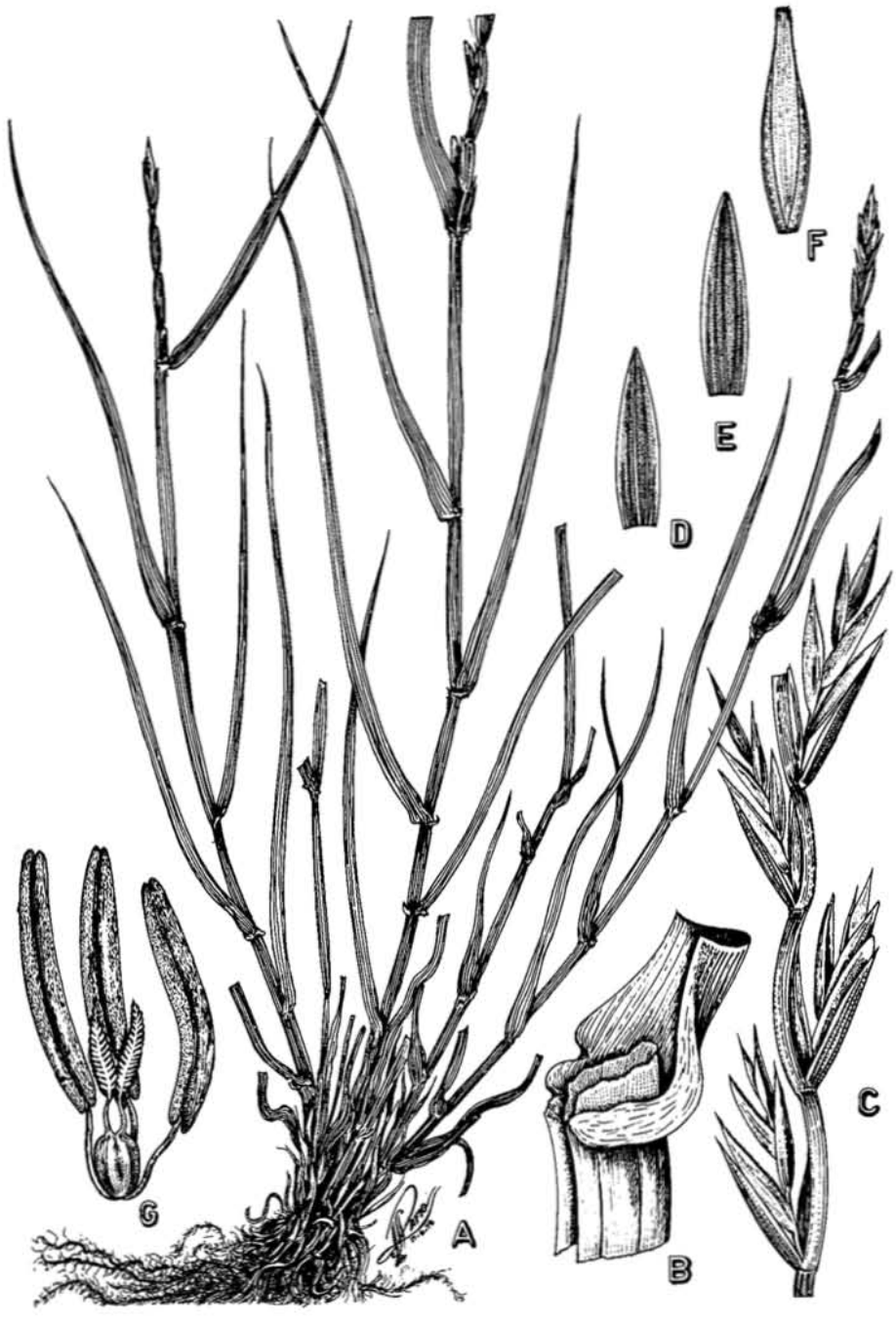


Fig. 2 **Lolium rigidum**: A, habit × 0.5; B, portion of lamina, ligule and sheath × 5; C, portion of spike × 2; D & E, upper glumes × 5; F, palea × 5; G, stamens and pistil × 10.

rieties are recognized by Maire (l.c.).

4 . **Lolium loliaceum** (Bory & Chaub) Hand Mazz. in Ann. Nat. Hofmus. Wien 28: 32. 1914; Maire, Fl. Afr. Nord. 3:295.1955; Bor in Rech. f. Fl. Iran. 92:70:30.1970; Scholz, in Willdenowia 7: 430. 1974. (Fig. 3)

Rottboellia loliacea Bory & Chaub., Exped. Sc. Moree 3: 46. 1832; *Lolium subulatum* Vis., Fl. Dalm. 1: 90, tab 3. 1842; *L. rigidum* Gaud. var. *rottboelloides* Heldr., ex Boiss., Fl. Or. 5: 680. 1884; Icon.: Bor, Fl. Iraq 9: tab. 31. 1968.

A usually stout annual, sometimes slender, tufted, erect or geniculately ascending. Culm glabrous, up to 35 cm tall. Leaf linear-lanceolate, acuminate, auricled, scabrid. Inflorescence a cylindrical spike 10-20 cm long, central axis thick and tapering; glume longer or equal to the spikelet; lemma not awned. 2n = 14.

Type: Described from Jugoslavia.

A-7 5 km from At Tamimi on way to Darna, 20.4.1978, *Ramadan, Fathi & Siddiqi* 701.

Distribution: Mediterranean region, Balkan Peninsula, Caucasus, Turkey, Iraq, Persia and Afghanistan.

Fl.: Mar.-Apr.

5. VULPIA

C.C. Gmel, Fl. Bad. 1: 8. 1806.

Small annual herbs. Leaves narrow, convolute or rolled; basal sheaths more or less flat. Inflorescence paniculate, usually very narrow, branches small; racemes turned to one side, spikelets in two rows. Florets usually hermaphrodite (in *V. ciliata* and *V. inops* the upper most spikelets with the lowest 1-2 florets hermaphrodite and the remainder sterile); rachilla disarticulating above the glume and below each floret; glumes very unequal, generally linear-acuminate; lemmas terete, lanceolate, tip extending into a fine scabrid awn; stamens 2, rarely 3; ovary glabrous; lodicules with one large and the other small teeth, lanceolate; caryopsis linear and adherent to palea and lemma.

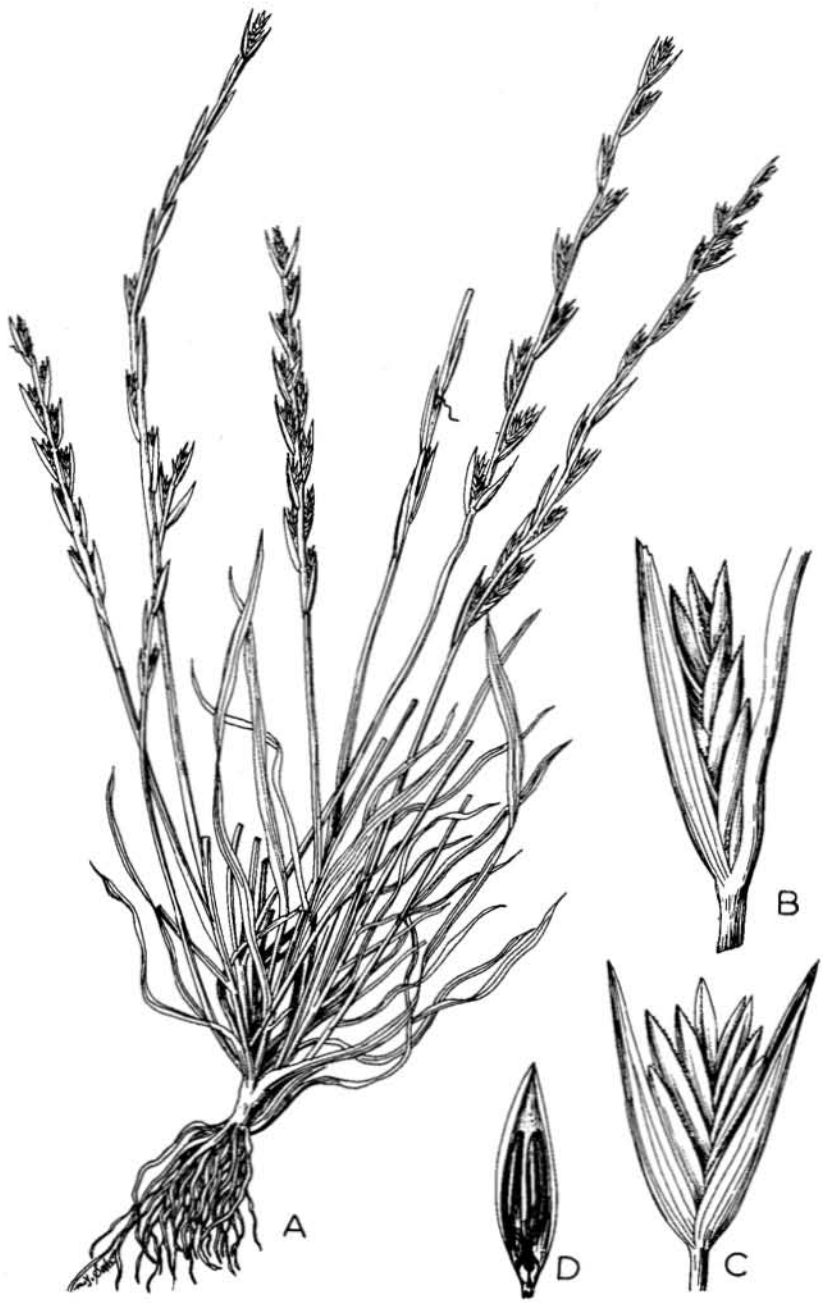


Fig. 3 **Lolium loliaceum**: A, habit × 0.5; B, lateral spikelet showing upper glume × 3; C, terminal spikelet showing both glumes × 3; D, palea, stamens and pistil × 6.

POACEAE

A genus of 25-30 species from temperate Europe, Mediterranean, North and South America; represented by 7 species in Libya. Differs from *Festuca*, in having clearly unequal glumes and being all annuals.

1.	+ Both glumes well-developed, somewhat equal and awned	7. **V. inops**
	— Glumes very unequal, at least lower glume reduced, awnless (rarely with a minute mucro)	2
2.	+ Both glumes awnless; lemma densely ciliate	5. **V. ciliate**
	— Only upper glume awned; lemma not ciliate	3
3.	+ Upper glume (including awn) 3 cm long or more	2 **V. gracilis**
	— Upper glume (including awn) up to 2.5 cm long	4
4.	+ Spikelets (excluding awns) 1.5-6 mm long	5
	— Spikelets (excluding awns) 10(-9) mm long or more	6
5.	+ Upper glume conspicuously 3-nerved; panicle contracted, with spikelets overlapping	4. **V. bromoides**
	— Upper glume hyaline, 1-nerved (if 3, then the lateral ones faint); panicle linear, with spikelets spaced	3. **V. myuros**
6.	+ Anthers 2 mm long or more	6. **V. ligustica**
	— Anthers less than 2 mm long	1. **V. membranacea**

1. **Vulpia membranacea** (L.) Dumort., Agrost. Belg. 100. 1824; Maire, Fl. Afr. Nord. 3: 147. 1955; Keith, Prelim. Check List Lib. Fl. 2: 1017. 1965; H. Scholz in Willdenowia 7: 430. 1974.

Stipa membranacea L., Sp. Pl. 560. 1753; *V. uniglumis* (Ait.) Dumort., Agrost. Belg. 100. 1824; Durand & Barratte, l.c. 269; Pamp., Pl. Trip. 41. 1914; Prod. Fl. Cir. 124. 1931; *Festuca uniglumis* Ait., Hort. Kew, 108. 1789; *V. fasciculata* (Forssk.) Fritsch., Excfl. Osterr. ed. 3: 674. 1922.

Annual herb. Culm glabrous, glaucous, geniculately ascending. Leaf linear, acu-

minate, up to 10 cm long. Inflorescence paniculate, 5-10 cm long or more, partly enclosed in a prominent spathe-like leaf sheath. Spikelets 9-15 mm long (excluding awns), 3-8flowered, upper floret sterile. Glumes 2, unequal, outer rudimentary, inner awned, up to 2.5 cm long; lemma 7-15 mm long (excluding awns), awned, not ciliate; ovary pubescent at the apex, anthers less than 2 mm long. 2n = 14.

Type: Described from Spain. *'Loefling'*.

A-3 Tajura, Tripoli, 24.3.1076, *Faruqi* 423, 430, 431 and 432; *ibid.*, 6.3.1977, *Faruqi* 1218, 1219; c. 20 km from Tripoli on old Airport Road, 7.5.1976, *Faruqi* 611, 612, 613, 614, 623 and 624; University, Tripoli, 23.2.1977, *Faruqi* 1143; *ibid.*, 24.2.1977, *Faruqi* 1147.

Also reported from Benghazi and Tripoli by Keith, l.c.

Distribution: W. Mediterranean region.

Fl. Feb.-Mar.

While Gmelin in Tutin et al, Fl. Europ. 5: 154. 1980, described the ovary in *V. membranacea* as being glebrous, Maire, l.c. 147, described the ovary of the same species as being pubescent; Libyan specimens listed above, however, are all characterized by having pubescent ovary.

2. **Vulpia gracilis** H.Scholz in Willdenowia 5: 109. 1968. (Fig. 5, I-N)

V. uniglumis auct. non (Soland.) Dumort. Observ. Gram. Fl. Belg. 101. 1823; Durand & Barratte, l.c. 269; Pamp., Pl. Trip. 41. 1914; Fl. Cir. 124. 1931.

Annual, 10-30 cm tall, tufted (an aspect of *Stipa capensis*). Culm ribbed and glabrous, covered by leaf sheath, erect to geniculately ascending. Leaves linear-lanceolate, acuminate, up to 10 cm long, 2 cm broad; sheath of basal leaf flat and pealing. Panicle up to 10 cm long, linear lanceolate, branches scabrous. Spikelets with awns up to 5 cm long, situated on 5-7 mm long pedicel, 3-6 flowered, upper 1-2 florets reduced; glumes 2, outer rudimentary, 1 mm long, inner large and awned, 3 cm long or more, linear-narrowly lanceolate, scabrous; lemma callus pointed and not ciliate.

Type: Described from jabal El Keliat, N.W. Hammamet, Tunis, *Scholz* 601 (B).

A-3 Road side, Jadida, Tripoli, 6.3.1977. *Faruqi* 1206; Road side, 1 km from Bilashhar on Leper Hospital Rd. (Bir El Osta Milad), Tripoli, 6.3.1977, *Faruqi* 1207.
Also reported from Cyrenaica by Scholz (l.c.)

Distribution: Libya and Tunis.

Fl.: Feb.-Apr.

3 . **Vulpia myuros** (L.) C.C. Gmel., Fl. Bad. 1: 8. 1805; Durand & Barratte, l.c. 268; Pamp., Prod. Fl. Cir. 123. 1931; Maire, l.c. 176; Keith, l.c. 1017; Scholz, l.c. 430.

Festuca myuros L., Sp. Pl. 74. 1753.

Annual 60 cm tall. Culm solitary - (tufted), slender, erect, glabrous. Leaves filiform, folded, up to 25 cm long; basal sheath loose and flat. Panicle linear, with short appressed branches, base enclosed within a leaf sheath, up to 25 cm long, sterile zone on axis about 1/3 the fertile zone. Spikelets of 1-3 florets, pedicelled, 1.5-2.5 mm long; glumes wedge-shaped, acuminate, glabrous, unequal, the outer glume much shorter than the inner one; lemma scabrous, callus rounded, extends into an awn 5 mm long, not ciliate; anthers 0.4-2 mm long; ovary glabrous. 2n = 42.

Syntypes: Described from England & Italy.

Reported from former Tripolitania and Cyrenaica by Durand and Barratte, (l.c.) and others.

Distribution: Mediterranean region, Anatolia, Iraq, Iran, Afghanistan, Pakistan and N.E. India.

Fl.: Apr. & May.

A highly variable species whose existence in Libya is doubted by Scholz (l.c.).

4 . **Vulpia bromoides** (L.) S.F. Gray, Nat. Arr. Brit. Pl. 2: 124. 1821; Scholz, l.c. 430. (Fig. 4)

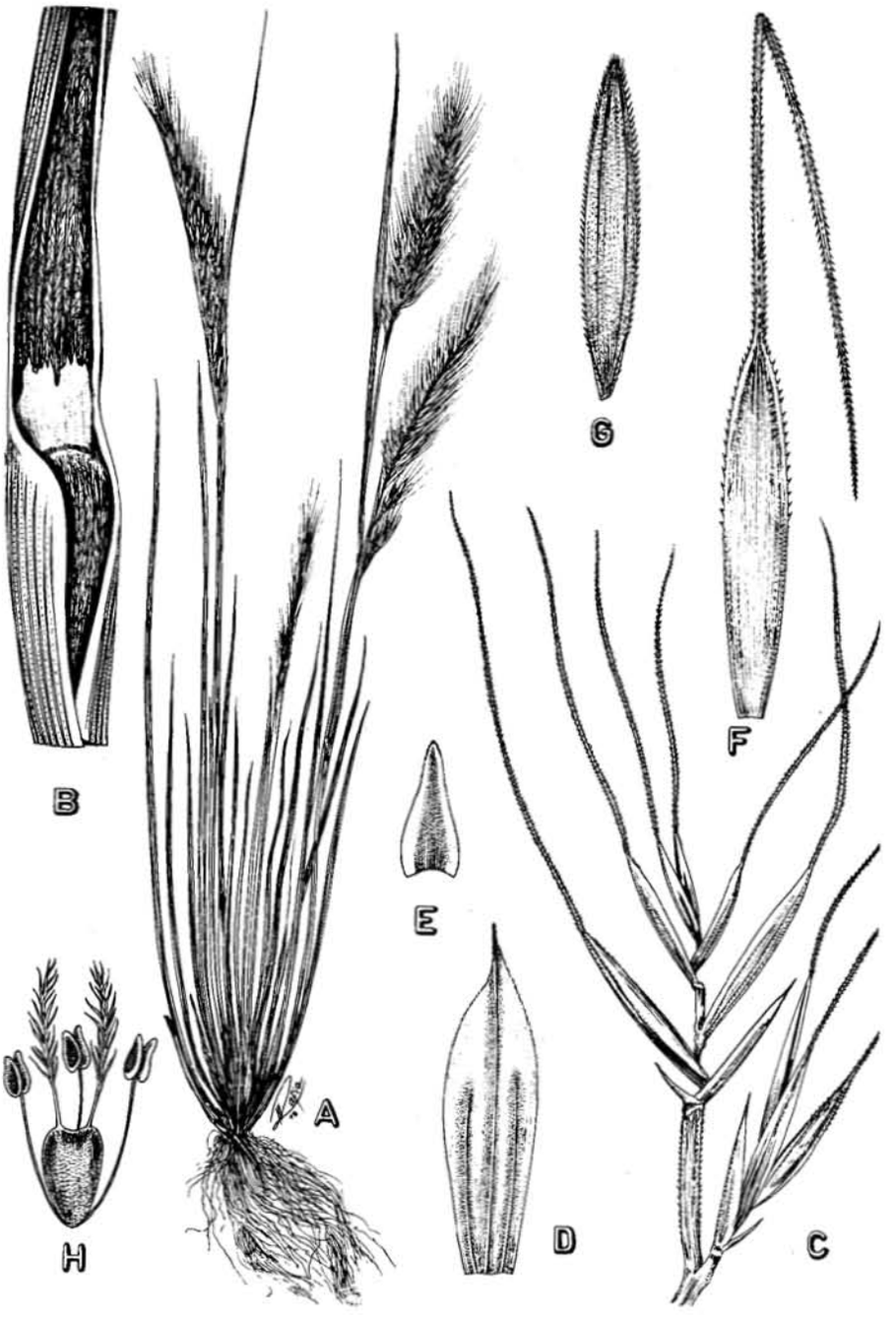


Fig. 4 **Vulpia bromoides**: A, habit × 0.5; B, portion of lamina, ligule and sheath × 10; C, spikelets × 5; D, upper glume × 10; E, lower glume × 10; F, lemma × 10; G, palea × 10; H, stamens and pistil × 15.

Festuca bromoides L., Sp. Pl. ed. 1: 75. 1753; *V. dertonensis* (All.) Gola, in Malpighia 18: 266. 1904; Durand & Barratte, l.c. 269. 1910; Pamp., Pl. Trip. 39. 1914; Prod. Fl. Cir. 123. 1931; *V. myuros* ssp. *sciuroides* (Roth) Rouy, Fl. Fr. 14: 256, 1913; Maire l.c. 178; *F. sciuroides* Roth, Cat. Bot. 2: 11. 1800.

Annual, delicate, 10-30 cm tall. Culm smooth, glabrous. Leaf linear (wiry) up to 12 cm long, 0.5-1 mm wide, glabrous, older sheaths peeling. Panicle 3-10 cm long, contracted and with branches one-sided. Spikelets situated on short pedicels, 2-6 mm long and with 4-6 florets; glumes 2, unequal, outer 2-3 mm, acuminate, inner glume (including awn) up to 2.5 cm long, glabrous; lemma awned from the tip, 5 mm long, awn 10 mm long, 3/4 or more of anterior end of lemma scabrous, basal portion glabrous, callus rounded; ovary glabrous, anthers 0.4-2 mm long. 2n = 14.

Syntypes: Described from Anglia and Gallia.

A-6 20 km from Tokra, towards Baida, 10.3.1978, *Faruqi* 1637.

Also reported from Tripolitania by Durand & Barratte, l.c..

Distribution: Europe, Mediterranean, Tropical Africa. Introduced into N. and S. America and S. Africa.

Fl.: Mar.-May

5 **Vulpia ciliata** Dumort, Obs. Gram. Belg. 100. 1824; Link, Hort. Berol. 1: 147. 1827; Maire, l.c. 180; Keith, l.c. 1016; Scholz, l.c. 430. (Fig. 5, A-H)

Festuca ciliata Danth. ex Lam. & DC., Fl. Fr. ed. 3, 3: 55. 1805, non Gouan 1762; *V. danthonii* (Asch. et Grb.) Volkart in Schinz et Kell., Fl. Schw. ed. 2: 57. 1905; Durand & Barratte, l.c. 269; Pamp., Pl. Trip. 39. 1914; Prod. Fl. Cir. 124. 1931.

Annual, geniculately ascending. Culms solitary or branched from the base, glabrous, mostly covered by sheath. Leaf blade linear, 5 x 1 cm; basal sheath peeling; ligule scarious, 0.5 mm. Panicle up to 10-(15) cm long, sometimes violet, somewhat dense; pedicel short, slightly hairy. Spikelets up to 15 mm long, 3-8-flowered, glumes 2, unequal, outer 1 mm long, inner 3-4 mm long, glabrous, not awned, linear-lanceolate; lemma densely ciliate on the back and on the margins, awned, linear-lanceolate; palea ciliate on the margins. 2*n* = 28.

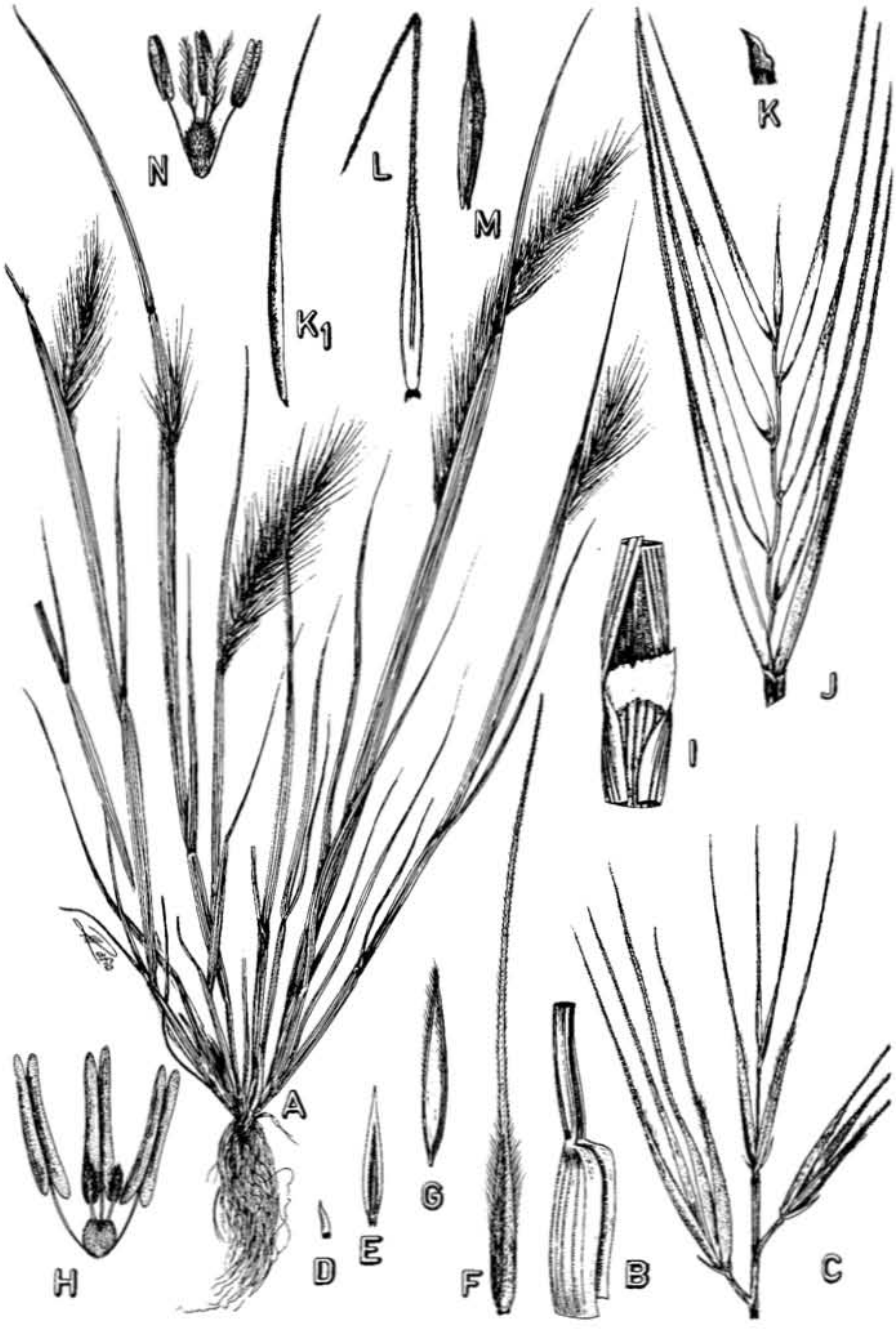


Fig. 5 **Vulpia ciliata**: A, habit × 0.75; B, portion of lamina and sheath × 5; C, spikelets × 2.5; D, lower glume × 5; E, upper glume × 5; F, lemma × 5; G, palea × 5; H, stamens and pistil × 20; **V. gracilis**: I, portion of lamina, sheath and ligule × 5; J, spikelet × 2.5; K, lower glume × 10; K_1, upper glume × 2.5; L. lemma × 2.5; M, palea × 2.5; N, stamens and pistil × 10.

Type: The figure (excl. deser.) in Host, Gram. Austr. 4: t.65. 1809 based on a plant collected from Jugoslavia, "Dalmatiae arenosis, herbidis ad mare: Copiose in isula Vergada, Vaena".

A-3 Ain Sharshara, Tarhuna, 23.3.1977, *Faruqi* 1299; Merj, Sidi Buzeid, 31.3.1922, *Maugini s.n.* (FI).

Distribution: Mediterranean region, Turkey, Palestine, Iraq, Iran, Afghanistan, Pakistan and N.E. India.

Fl.: Mar.-Apr.

6 . **Vulpia ligustica** (All.) Link, Hort. Berol. 1: 148. 1827; Pamp., Pl. Trip. 40. 1914; Prod. Fl. Cir. 123. 1931; Maire, l.c. 192; Keith, l.c. 1017; Scholz, l.c. 430.

Bromus ligusticus All., Fl. Pedem. 2: 249. 1785.

Annual, glabrous and glaucascent, tufted to few branched from the base, up to 40 cm tall. Basal leaves numerous, linear and narrow, 1 mm x 10 cm; cauline leaves up to 2.5 mm broad and up to 10 cm long. Panicle up to 10 cm long, one-sided, highly branched, compact, linear-elliptic, pedicel 3-4 mm long. Spikelets 10 mm long or more, 4-6 florets, lowest floret hermaphrodite, the middle ones male and the apical floret reduced, florets alternate on 2 mm long rachilla, the tip of rachilla forming a shiny collar at the base of floret; glumes 2, unequal, lower reduced, up to 2 mm long, narrow, lanceolate, the inner well-developed, 10 mm long, finely ciliate, awned; lemma glabrous, callus rounded, awned, 2 cm long, ovary pubescent at apex; anthers 2-3 mm long. 2n = 14.

Type: Described from Italy, in Liguria ad litora maris, Scheuchzer.

A-3 Wadi Mgenin, presso Ain Zara, 22.4.1913, *Pampanini* 3505 (FI); Tripoli, Sciara-Sciat, 23.4.1913, *Pampanini* 3513 (FI); **A-7** Baida, 3.5.1934, *Pampanini and Pichi-Sermolli* 1319 (FI); el Hania, 8.5.1934, *Pampanini and Pichi-Sermolli* 1320 (FI); Safsaf, 18.4.1933, *Pampanini* 1318 (FI).

Distribution: Mediterranean region.

Fl.: Apr.-May

7 . **Vulpia inops** (Del.) Hackel in Flora, 63: 467. 1880; Durand & Barratte, l.c. 269; Pamp., Prod. Fl. Cir. 124. 1931; Maire, l.c. 197; Keith, l.c. 1017.

Festuca inops Del., FI. Egy. tab. 63, fig. 1. 1824; *V. brevis* Boiss. et Kotschy, ex Boiss. Diag. Ser. 2.4: 139. 1859; Scholz, l.c. 430.

A very small and highly tufted annual. Culms erect, 10-15 cm tall, or less. Leaves much shorter in the plants with long or few culms (culm 13 cm/leaf 3 cm) and much longer in the plants with short and many culms (culm 9/cm leaf 12 cm), lamina linear and narrow, leaf base peeling. Panicle branches loose and nodding or compact, pedicels 2-3 mm long, 3 pedicels arise from one point each bearing a spikelet. Spikelet 4-8-flowered, lower 1-2 fertile, upper 2-6 reduced, 2-2.5 cm long; glumes 2, both awned and well-developed, scabrous, outer linear-lanceolate, 0.5 mm broad, 2 cm long, the inner 1 cm broad, 2 cm long, lanceolate; lemma glabrous, awned, keeled, 2 mm long. 2n = 14.

Type: Described probably from Egypt

A-3 Kasr Garian, 30.4.1913, *Pampanini* 4155 (FI); Tarhuna, Wadi Srat, 27.3.1913, *Pampanini* 4896 (FI); **A-7** Shahat, 28.2.1973, *S.I. Ali & Faruqi* 998; **A-8** Tobruk, 12.3.1914, *Vaccari* 309 (FI).

Distribution: N. Africa, Syria and Palestine.

Fl.: Feb.-Apr.

6. VULPIELLA

(Battand & Trabut) Andreanszky, Ind. Hort. Bot. Univ. Budapest 95. 1934.

Annual. Culm glabrous and erect. Leaves filiform. Inflorescence a branched panicle. Spikelets paired, one spikelet on three angled obtuse peduncle, the other subsessile, florets 6-16, laterally compressed; glumes unequal, much smaller than the spikelet; lemma 3-nerved, with an awn from the back and between the teeth; palea shorter than lemma; stamens 3; caryopsis linear.

A monotypic genus chiefly occuring in W. Mediterranean region.

Vulpiella tenuis (Tineo) Kerguelen, Fl. Europ. 1977. (Fig. 6)

Bromus tenuis Tineo, Pl. Rar. Sic. Pug. 1: 3. 1817; *Festuca incrassata* Salzm. ex Loisel., Fl. Gall. ed. 2, 1: 85. 1828; *Vulpia incrassata* Parl., Ann. Sc. 2, 15: 298. 1841; Durand & Barratte, Prodr. Fl. Lib. 270. 1910; Pamp., Pl. Trip. 39. 1914; *Cutandia incrassata* (Salzm.) Benth. in Journ. Linn. Soc. 19: 118. 1881; *Vulpia letourneuxii* Aschers. in Durand & Barratte, l.c. 270; *Vulpiella incrassata* (Salzm.) Andreanszky, Ind. Hort. Bot. Univ. Budapest 95: 134. 1934.

A tufted annual. Culms unbranched, geniculately ascending. Leaves filiform, folded or rolled; ligule 3 mm long and collar like, pointed and membranous. Inflorescence a panicle. One spikelet on a 9 mm long peduncle and the other subsessile, 5-10 florets (5-18 florets), 10-30 mm; peduncles scabrous, obtuse, 3-angled; glumes unequal, lanceolate, mucronate; lemma linear-lanceolate, scabrous, 3-nerved, extending into an awn; lodicules 2; anthers 3; ovary glabrous, caryopsis linear. 2n = 14.

Two subspecies are reported from Libya.

+ Spikelets with 8 or more florets; glumes 3-5 mm long	(a) ssp. **tenuis**
– Spikelets with 5-8 florets; glumes 5-7 mm long	(b) ssp. **letourneuxii**

(a) ssp. **tenuis**

Type: Described from Sicily.

A-2 Zentan, 11.4.1974, *M. Godeh* 240; **A-3** 22-23 km East Tripoli, 8.3.1967, *Boulos* 1573; 8 km West of Khoms, 25.4.1967, *Boulos* 1823; **B-1** Nalut, 22.5.1976, *Faruqi* 888; **B-2** Jinawan, 21.5.1976, *Faruqi* 812; Gwalish, 21.5.1976, *Faruqi* 776; Wadi Kabao, 5.5.1972, *S.I. Ali & M.M. Khalifa* 341, 363.

Distribution: N. Africa, Italy, Sicily and Sardinia.

Fl.: Mar.-May

(b) ssp. **letourneuxii** (Aschers.) Scholz, Wilidenowia, 7. 420. 1974.

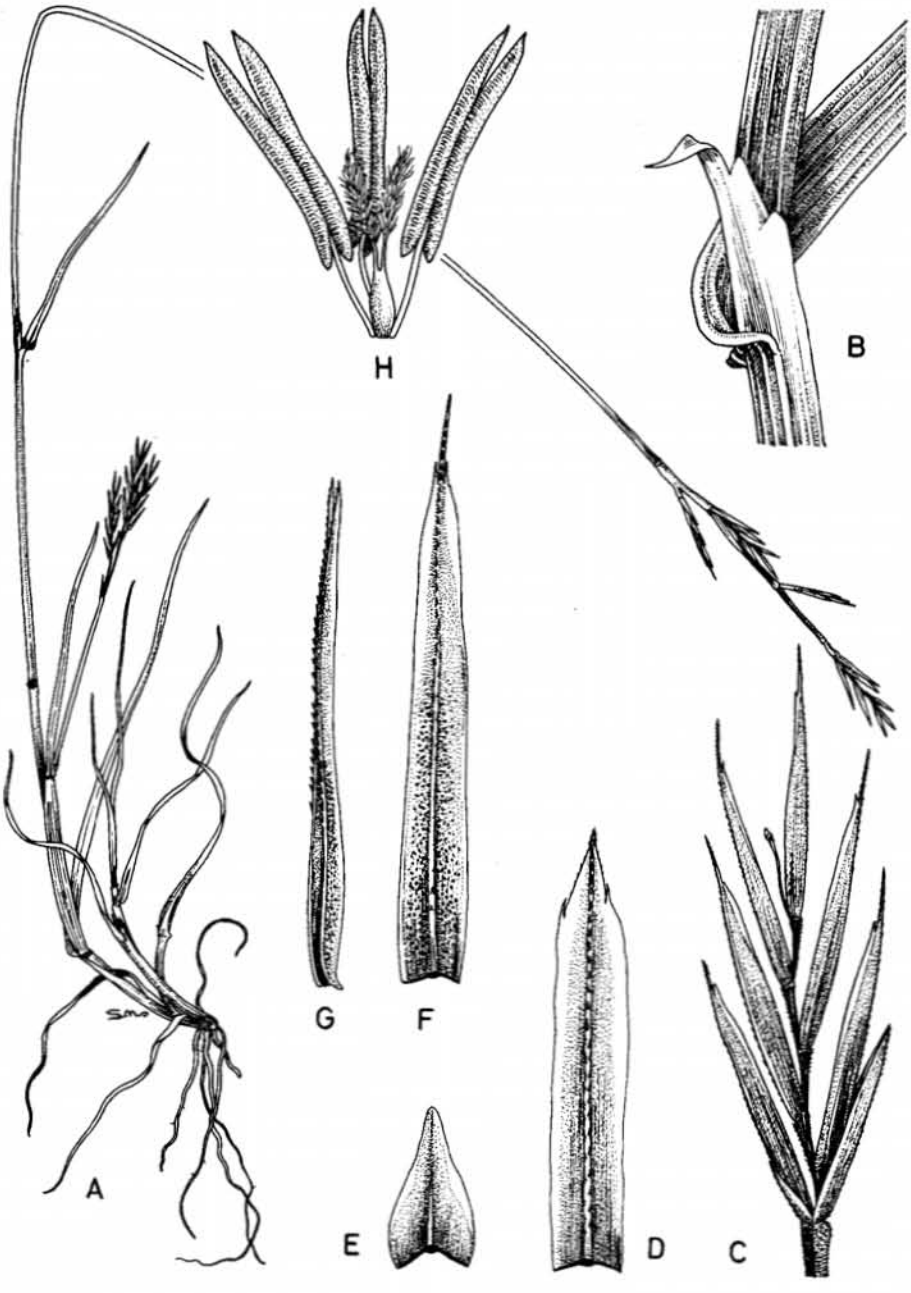


Fig. 6 **Vulpiella tenuis**: A, habit × 1; B, portion of culm, lamina, sheath and ligule × 10; C, spikelet × 5; D, upper glume × 10; E, lower glume × 10; F, lemma × 10; G, palea × 10; H, stamens and pistil × 15.

Vulpia letourneuxii Aschers. apud Durand & Barratte, Prodr. Fl. Lib. 270. 1910; *V. stipoides* (L.) Dumort ssp. *letourneuxii* (Aschers.) H. Scholz, Willdenowia 6: 295. 1971.

Type: Described from Libya.

Reported from Tripolitania and Cyrenaica by Pamp. (l.c.), Durand & Barratte (l.c.), Maire (l.c.) and Scholz (l.c.).

Distribution: Endemic.

7. CUTANDIA

Willk, Bot. Zeit. 18: 130. 1860

Small annuals, up to 30 cm tall. Culms branched. Leaves narrower than the sheath; ligule scarious, lacerated. Panicle with many branches, partially enclosed within the spathe-like leaf sheath, dichotomously branched, branches short, 3-angled and divaricating. Spikelets laterally compressed, the spikelet pairs situated on pedicels of unequal lengths, one almost sessile; glumes unequal, keeled, with one prominent nerve; lemma 3-nerved, with or without a short awn; stamens 3; ovary glabrous; lodicules 2; caryopsis linear.

6 species distributed in the Mediterranean region; 3 are found in Libya.

1. + Spikelets conspicuously dense along the main branches of panicle; glumes usually 3-5-veined — **3. C. maritima**
   — Spikelets lax along the main branches of panicle; glumes 1-veined — 2

2. + Main axis of panicle with internodes shorter than the length of a spikelet — **1. C. dichotoma**
   — Main axis of panicle with internodes longer than the length of a spikelet — **2. C. memphitica**

1. **Cutandia dichotoma** (Forsk.) Trabut in Batt. and Trab., Fl. Alg. Mon. 237. 1895; Maire et Weiller in Maire Fl. Afr. Nord. 3: 38. 1955; Keith, Prelim. Check List Lib. Fl. 410; Scholz, in Willdenowia 431. 1974.

Festuca dichotoma Forsk., Fl. Aeg. Arab. 22. 1775; *F. divaricata* Desf., Fl. Atlant. 1: 89. 1798; *Scleropoa divaricata* (Desf.) Parl., Fl. Ital. 1: 470. 1850; Durand & Barratte, l.c. 272; Pamp., Pl. Trip. 34. 1914; *C. divaricata* (Desf.) Benth., Journ. Linn. Soc. 19: 118. 1881, Maire, l.c. 38, Keith, l.c. 411.

Annual up to 30 cm tall. Culm highly branched, glabrous or with minute hairs. Leaves filiform, folded or rolled, sheath wider than the leaf, somewhat dilated. Inflorescence dichotomously divided panicle with internodes shorter than the length of a spikelet, mostly outside the leaf sheath. Spikelets of 2-8-(12) florets, lax, 8-18 mm long; florets appressed, the lowest floret usually not overlapping more than half of the next floret, usually borne at different levels; rachilla 2-4 mm long; glumes unequal, 1-veined, 4-5 mm long, acute with a small mucro or obtuse; lemma 4-6 mm, glabrous-puberulent, acute with a small mucro-(muticous); stamens 3; ovary glabrous; lodicule 2; caryopsis linear. 2n = 14.

Type: Described from Alexandria (Egypt), (holo. C-*Forssk.* 47).

A-3 Tarhuna, Ras Bu Tauil, 21.3.1913, *Pampanini* 4410 (FI).

Also reported from the former Tripolitania and Cyrenaica by Durand & Barratte (l.c.).

Distribution: Cyprus, Syria, Palestine, Jordan, Sinai, Egypt, Iran, C. Asia, N. Africa, Spain and Italy.

According to Tackholm the difference between *C. maritima* and the other two species is in the number of florets which in the former is 5-8 per spikelet and the latter 2-4. This, however, is not the case in Libyan *C. dichotoma* where the number of florets range from 2-8. Similarly Bor in Fl. Iran. 70: 11. 1970 differentiates *C. memphitica* from *C. dichotoma* on the basis of presence of awn on lemma in one and its absence in the other. Lemmas of both the species from Libyan region are awned. It seems that on the whole this genus is highly variable and most likely these variations have some correlation with their distribution.

Fl.: Mar.-June *Vern.* Zewahn, bu'rukba

2 . **Cutandia memphitica** (Spreng.) Richter, Pl. Europ. 1: 77. 1890; Scholz, l.c. 431. (Fig. 7)

Dactylis memphitica Spreng; Bot. Gart. Halle, Nachtr. 1: 20. 1801: *Scleropoa memphitica* (Spreng.) Parl., Fl. Ital. 1: 470. 1848; Boiss., Fl. Or. 5: 363. 1884; Durand & Barratte, l.c. 272; Pamp., Pl. Trip. 35. 1914; Prodr. Fl. Cir. 125. 1931; Corti, Fl. Veg. Fezz. 58. 1942; *C. dichotoma* var. *memphitica* (Roth.) Maire et Weiller in Maire l.c. 38.

Annual erect to geniculately ascending, up to 30 cm tall. Culms branched, glabrous. Leaf filiform, folded or rolled, sheath much dilated. Panicle dichotomously branched with internodes longer than the length of a spikelet, part of the panicle concealed within a spathe-like leaf sheath. Spikelets of 2-3 florets, lax, 6-8 mm long, florets appressed, the lowest floret reaching more than half the length of the upper florets and all the florets reaching more or less the same level; rachilla 1.5-3 mm long; glumes unequal 4-5 mm long, 1-veined, acute with small mucro, glabrous; lemma 6-8 mm long, glabrous, acute with a small awn; stamens 3; ovary glabrous; caryopsis linear. 2n = 14, 14 + 1B.

Type: Described from Egypt.

A-2 El Sidra, 9.3.1968, Boulos 1957; Kaleba, 10.4.1974, *S.I. Ali* 1888; *ibid*, 10.4.1974, *Gassem & H. Faris* 426 & 451; *ibid*, 10.4.1975, *ign.* 385; Awainia, 11.4.1974, *A.S. Sherif* 345; *ibid, S.I. Ali* 1992; 8 km after Ghanam, 17.4.1975, *S.I. Ali* 2756; Tiji, 23.5.1976, *Faruqi* 952; Cabaw, 7.6.1974, *B. Faris* 498; **A-3** Airport Road, Tripoli, 5.3.1977, *Faruqi* 1182 and 1192; Tripoli, Faculty of Agriculture Farm, 3.4.1978, *El-Gadi* 959; 44 km from Tripoli on way to Khomos, 5.4.1977, *S.A. Alavi and Faruqi* 1208-s; Tripoli, University campus, 15.2.1976, *Jafri* 6286; Hashan, 28.1.1979, *Khairi Saghir s.n.*; 6 km from Tarhuna, 7.4.1972, *S.I. Ali* 197; Wadi Majinin, 20.3.1974, *Milad Kheir* 60; *ibid*, 20.3.1974, *M. Godeh* 56; Fondak Tugar, c. 32 km from Tripoli, 6.4.1972, *S.I. Ali* 112; Tripoli, Airport road, 7.5.1964, *Faruqi* 634; **A-4** Al Kararim, 8.3.1968, *Boulos* 1904-b; 25 km west of Sirte, 8.3.1968, *Boulos* 1944; **A-6** 2 km from Benghazi, 4.3.1978, *Faruqi* 1552, 1553; **B-1** c. 11 km from Nalut on Nalut-Ghadamas road, 18.4.1975, *S.I. Ali* 2839; **B-2** 50 km from Jadu to Yefren, 18.3.1970, *Davis* 49709; **B-3** 99 km from Mizda, towards Al Ghariat, 13.2.1977, *A. El Taif, M.A. Siddiqi and M. Ahmad* 1109; **B-4** 2 km from Bughrain to Hun, 4.3.1978, *Faruqi* 1551; 23 km before Sirt, 1.8.1977, *Faruqi* 1051; 24 km from Sirt towards Bughrain, 14.3.1978, *Faruqi* 1699; 25 km from Bughrain on way to Hun, 4.3.1978, *Faruqi* 1557. **B-5** 40 km from Sirt, towards Ben Jawad, 9.3.1978, *Faruqi* 1621; 66 km E. of Sirt, 9.5.1978, *EL-Gadi, Jafri & others* 2107-G. **B-6** 17 km from Ajdabia on way to Ojla, 16.4.1978, *Ramadan, Fathi and Siddiqi* 350-z and 351-z; 70 km from Ajdabia, towards Gamines, 13.3.1978, *Faruqi*

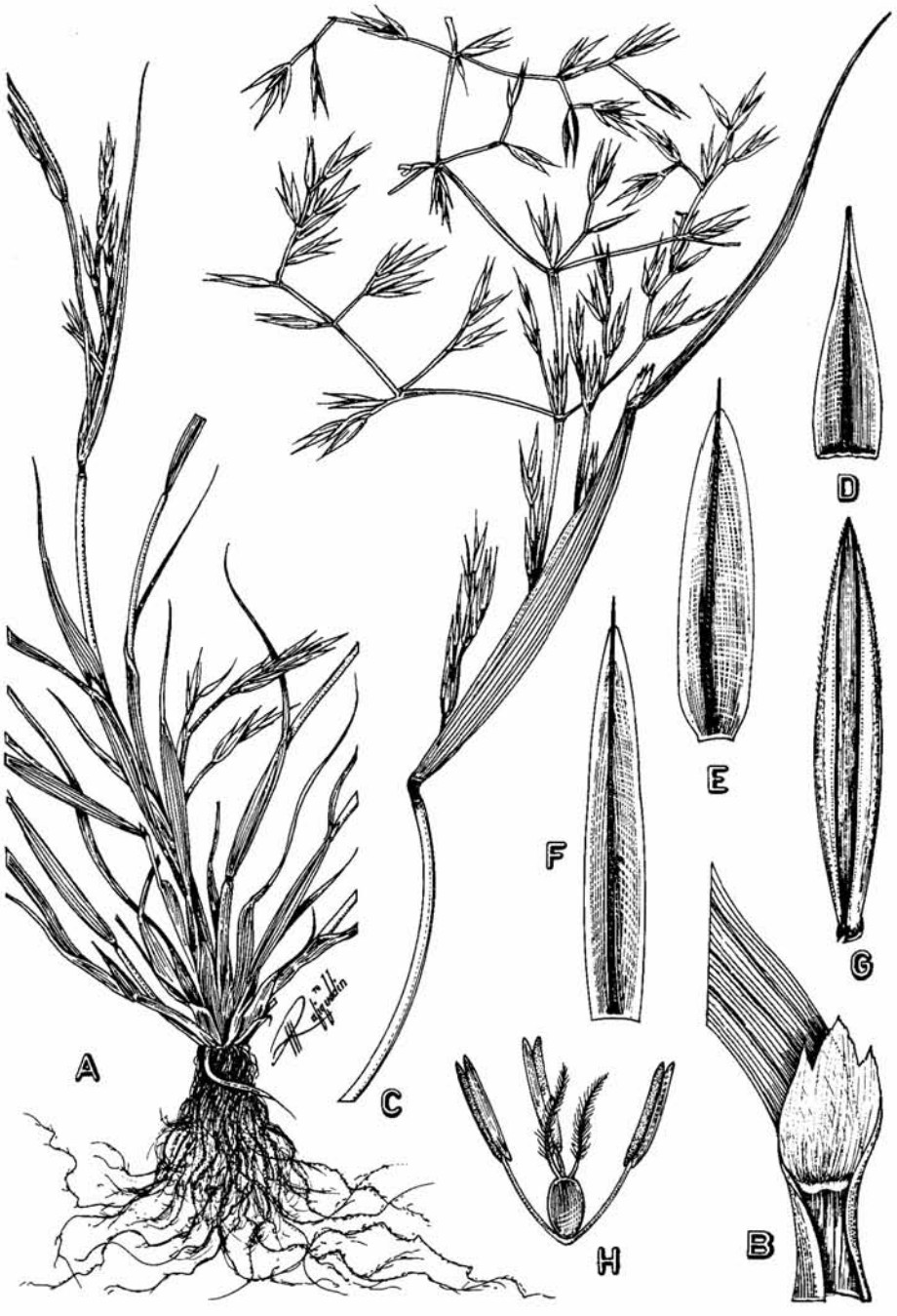


Fig. 7 **Cutandia memphitica**: A, habit × 1; B, portion of lamina, ligule and sheath × 5; C, a flowering branch × 1; D, lower glume × 10; E, upper glume × 10; F, lemma × 8; G, palea × 10; H, stamens and pistil × 10.

1694; **C-5** Zalla, outskirts, 19.2.1978, *S.A. Alavi* 1845; **E-1** Al Barkat, Ghat, 19.2.1977, *A. El Taif, M.A. Siddiqi and M. Ahmad* 1133.

Distribution: Mediterranean Europe and N. Africa, Syria, Lebanon to W. Pakistan, Afghanistan and Central Asia.

Fl.: Feb.-May

3 . **Cutandia maritima** (L.) Barbey, Fl. Sard. Comp. 72: 1885. (Fig. 8)

Triticum maritimum L., Sp. Pl. ed. 2: 128. 1762; *Scleropoa maritima* (L.) Parl., Fl. Ital. 1: 468. 1850; Durand & Barratte, l.c. 272; Pamp., Pl. Trip. 35. 1914; Prodr. Fl. Cir. 125. 1931.

Annual, erect and spreading, up to 30 cm tall. Culm branched, glabrous. Leaf filiform, folded, up to 10 cm long, 1-1.5 cm wide, sheath dilated. Panicle of many branches, dichotomously branched. Spikelets 8-10 mm long, conspicuously dense, 6-8 florets, lower glume 4 mm, long, 3-5-veined, glabrous; rachilla 1.5 mm wide; lemma glabrous, 5 mm long with a prominent mucro or short awn. 2n = 14.

Lectotype: Herb. Linn. 104. 11 (LINN).

A-3 Shati Zanzur, 9.3.1977, *Faruqi* 1231; **A-6** Benghazi, 2.3.1883, *Ruhmer* 386-a.

Distribution: Mediterranean region.

Fl.: March

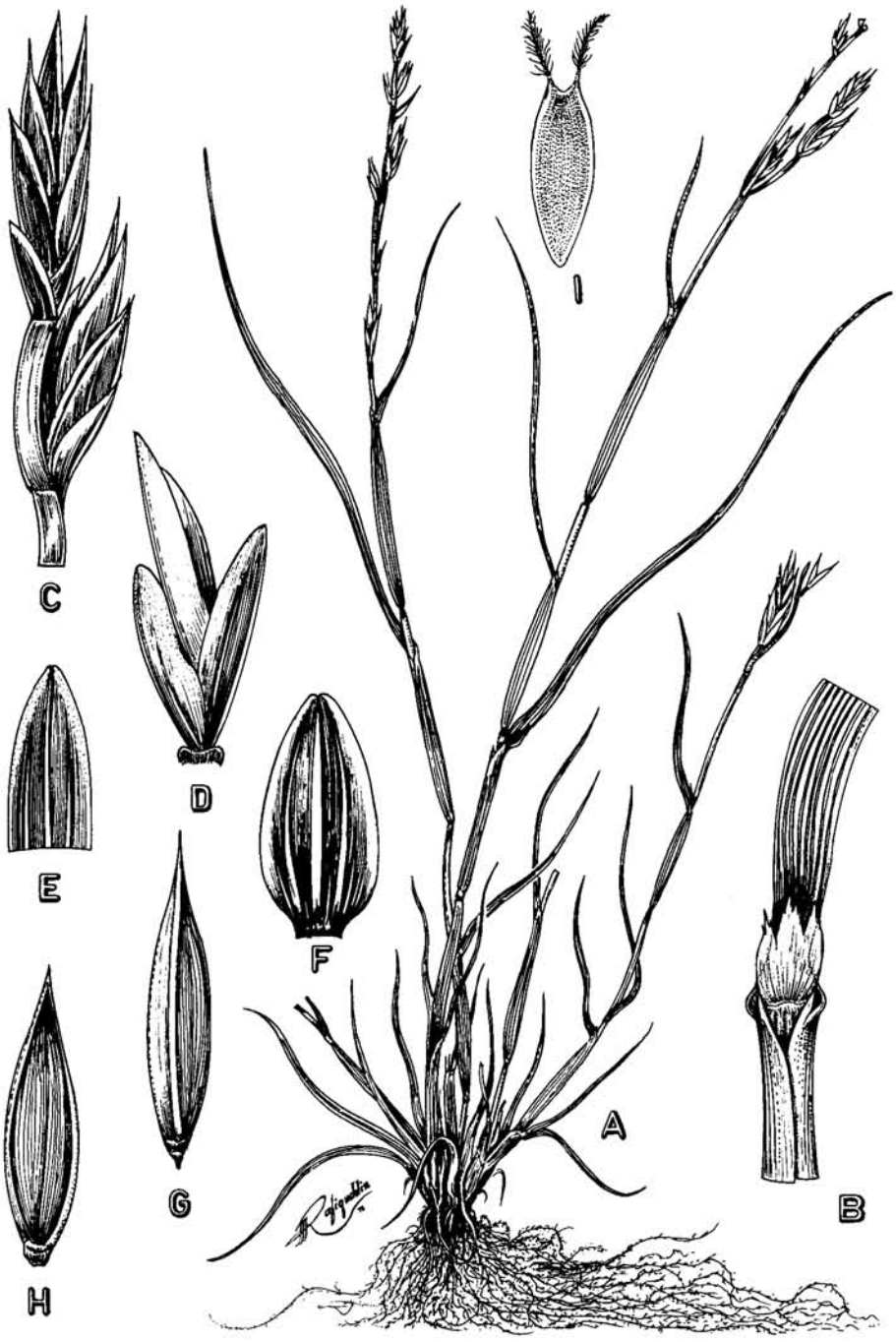


Fig. 8 **Cutandia maritima**: A, habit × 1; B, portion of lamina, ligule and sheath × 10; C, portion of spike × 5; D, portion of spikelet × 8; E, lower glume × 8; F, upper glume × 8; G, lemma × 8; H, palea × 8; I, pistil × 10.

8. DESMAZERIA

Dumort. Obs. Gram. Belg. 46: 1824.

Annual herbs. Inflorescence a spike of spikelets, more or less sub-unilateral. Spikelets of many flowers, dense, alternate, sessile-subsessile; glumes unequal; lemmas coriaceous, with glandular hair at the base; lodicules 2, glabrous; anthers 3; ovary glabrous; caryopsis somewhat dorsally compressed, ventrally concave.

The unicellular, capitate trichomes present on the palea and lemma differentiate this genus from the related *Cutandia* and *Catapodium*.

3 species, distributed in the Mediterranean region and S.Africa; all the three occur in Libya.

1.	+ Rachis and rachilla glabrous	2. **D. sicula**
	— Rachis and rachilla scabrous	2
2.	+ Mature spikelets 10 mm or more long, with 6 or more florets, and at least lower spikelets pedicellate	1. **D. philistaea**
	— Mature spikelets 8 mm or less long, with 5 or less florets, and all spikelets sessile	3. **D. lorentii**

1. **Desmazeria philistaea** (Boiss.) H. Scholz, in Willdenowia, 6: 291. 1971; l.c. 7: 431. 1974.

Scleropoa philistaea Boiss., Diagn. Pl. Or. Nov. Ser. I, 13: 60. 1853; Durand & Barratte, l.c. 271; Pamp., Pl. Trip. 35. 1914; Prod. Fl. Cir. 125. 1931; Keith, l.c. 877; *Cutandia philistaea* (Boiss.) Benth. in Jour. Linn. Soc. 19: 118. 1881; Maire, l.c. 3: 34.

Annual, 10-25 cm tall, glabrous, branched. Culms erect or geniculately ascending. Basal leaves linear, folded or rolled, cauline flat and lanceolate; ligule 3 mm long, pointed, membranous, lacerated. Inflorescence 8 cm long, spike of spikelets, panicle of few branches, axis angular. Spikelets pedicellate, oblong, ovate-oblong, elliptic, 1-3 cm long and 3-7 mm broad; rachis and rachilla zigzag, pubescent, hairs glandular, glumes unequal, 3-4 mm long, keeled, 3-nerved; florets 6 or more, alternating, 2-ranked; lemmas scabrous on the keel; stamens 3, ovary glabrous, lodicules 2, glabrous, 2 stigmas arising from the ovary tip, caryopsis glabrous, oblong-elliptic. 2n = c. 13.

Two subspecies are reported from Libya.

+ Lemma broadly membranous on margins; florets highly imbricate	(a) ssp. **philistaea**
– Lemma hardly membranous on margins; florets slightly imbricate	(b) ssp. **rohlfsiana**

(a) ssp. **philistaea**

Type: Described from Gaza, *Boissier*.

A-3 Tripoli, Hadba Sharqia-University lane, 25.3.1976, Jafri 6459.

Distribution: Libya, Egypt, Palestine, Syria.

(b) ssp. **rohlfsiana** (Cosson) Scholz. Willdenowia, 6: 291. 1971. (Fig. 9, A-D)

Festuca rohlfsiana Cosson, Bull. Soc. Bot. Fr. 19: 83. 1872; *Scleropoa philistaea* Boiss. var. *rohlfsiana* (Cosson) Ascherson et Schweinf. Bull. Herb. Boiss. 1: 676. 1893; Durand & Barratte l.c. 271; Pamp. Pl. Trip. 36. 1914; *Cutandia philistaea* (Boiss.) Bentham var. *rohlfsiana* (Cosson) Maire et Weiller, Bull. Soc. Hist. Nat. Afr. Nord. 30: 309. 1909; Maire, l.c. 35.

Type: Described from North Africa.

A-2 Jodaem, 15.3.1974, *Gassem & H. Faris* 69; **A-3** Tripoli, 18.4.1967, *Boulos* 1680; Tripoli, 24.3.1967, *Boulos* 1637; Zanzur, 9.3.1977, *Faruqi* 1237; Tripoli, 25.3.1976, *Faruqi* 500-a; Zanzur beach, 26.3.1976, *Faruqi* 524 & 526; Leptis Magna, 7.1.1977, *Faruqi & K. Maghboob* 1043; University Campus, Tripoli, 23.2.1977, *H.B. Quraish and M. Ahmad* 1138; Tripoli, Tourist City beach, Tajura, *Faruqi* 1265; 13-16 km South of Gusbat, 26.3.1979, *El-Gadi* 2603-G; **A-6** Tokra, near sea shore, 10.3.1978, *Faruqi* 1624; Benghazi, 2.3.1887; *Ruhmer* 386.

Distribution: N. Africa.

Fl.: Mar.-Apr.

2 . **Desmazeria sicula** (Jacq.) Dumort., Comment. Bot. 26. 1822; Durand & Bar-

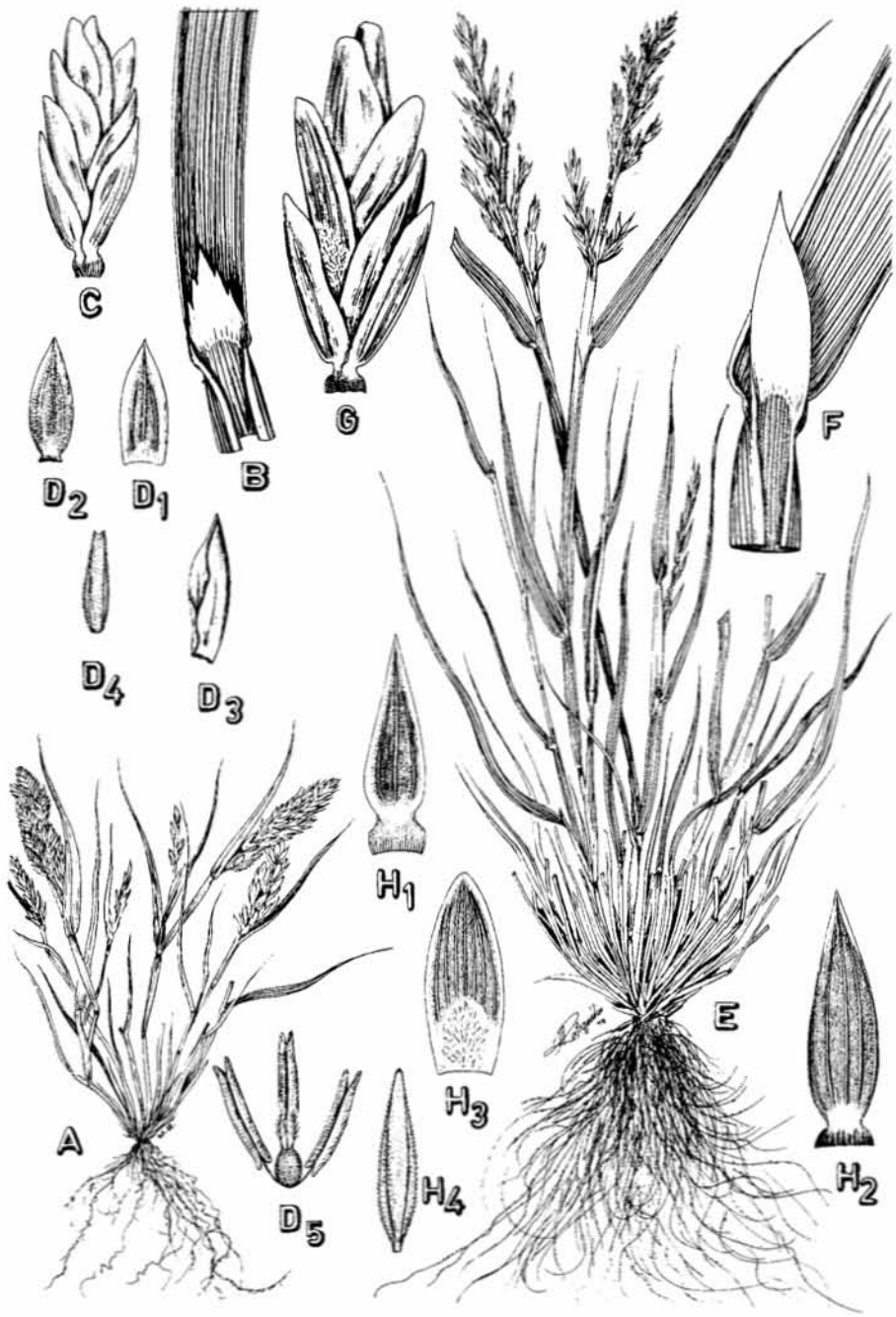


Fig. 9 **Desmazeria philistaea** ssp. **rholfsiana**: A, habit × 0.75; B, portion of lamina, sheath and ligule × 5; C, spikelet × 5; D_1 & D_2, upper and lower glumes × 5; D_3 lemma × 5; D_4, palea × 5; D_5, stamens and pistil × 10;. **D. lorentii**: E, habit × 0.75; F, portion of lamina, sheath and ligule × 5; G, spikelet × 5; H_1 & H_2, lower and upper glume × 5; H_3, lemma × 5; H_4, palea × 5.

2 . **Desmazeria sicula** (Jacq.) Dumort., Comment. Bot. 28. 1822; Durand & Barratte, l.c. 271; Pamp., Prod. Fl. Cir. 116. 1931; Maire, l.c. 202; Keith, l.c. 432; Scholz, l.c. 431.

Cynosurus siculus Jacq. Obs. Bot. 2: 22. 1771.

Annual, 10-20 cm tall, erect to geniculately ascending, branching from the base. Culm glabrous. Basal leaves folded, cauline flat, linear up to 6 cm long. Spikelets ovate-lanceolate, up to 10 mm long and 3-5 mm broad; pedicel glabrous; rachis and rachilla glabrous; glume winged, unequal 3.0 and 3.5 mm long, ovate, acute, glabrous; lemma 4 mm long, pubescent on the lower half, strongly keeled and winged, ovate, bluntly acute.
2n = 14.

Type: Described from Europe.

Reported from the former Tripolitania and Cyrenaica by Durand & Barratte (l.c.) etc.

Distribution: Mediterranean region.

Fl.: Apr.-July

3 . **Desmazeria lorentii** H. Scholz in Bot. Jahrb. Syst. 94: 556. 1974. (Fig. 9, E-H)

Annual herb. Culms branching from the base, erect or geniculately ascending, up to 15 cm tall. Leaves folded or flat, up to 6 cm long and 1-2 mm wide; ligule 6 mm long, pointed, smooth. Inflorescence up to 7 cm long, shortly branched below, axis flattened, scabrous. Spikelets alternate and two ranked, sessile, 8 mm or less long, 3-5 florets, distinctly compressed, rachis and rachilla puberulent; glumes unequal, the outer 3-4.5 mm long, the inner glume 3.5-5 mm long, obtuse; lemma 4-6 mm long, obtuse to shortly mucronate; palea smaller than lemma; stamens 3, ovary glabrous; lodicules 2.

Type: Described from Zaghwan in Tunisia.

A-3 University Campus, Tripoli, 23.2.1977, *H.B. Quraish and M. Ahmad* 1139.

Also reported from Benghazi by Scholz (l.c.)

Distribution: Tunisia and Libya.

Fl.: Feb.-March

9. CATAPODIUM

Link, Hort. Berol. 1: 44. 1845.

Annual, glabrous and small grass with flat leaves. Panicle stiff, linear to ovate, one sided, shortly branched, branches with 3-angles. Spikelets pedicelled above, 3-10-flowered; glumes more or less equal, acute, keeled; lemmas rather firm, rounded on the back, glabrous or hairy; rachilla hairy; palea as long as the lemma, 2-keeled, scabrid on keels; stamens 3; ovary glabrous; lodicules 2, bilobed, one lobe shorter than the other; caryopsis oblong-fusiform.

Differs from *Festuca* by its annual habit and the lemmas not awned or pointed. 4 species, distributed in Europe, Mediterranean region and Middle East, naturalized in Australia and N.S. temperate America; 3 are recorded from Libya.

1. + Panicle without secondary branches, spikelets originating from the main axis similar to *Lolium* — **3. C. marinum**
   — Panicle with secondary branches, spikelets originating from the branches of the main axis — 2

2. + Stem smooth below the panicle; lemma obtuse; spikelets pedicellate — **1. C. rigidum**
   — Stem scabrous below the panicle; lemma subacute; spikelets subsessile — **2. C. hemipoa**

1. **Catapodium rigidum** (L.) C.E. Hubbard in Dony, FI. Bedfordshire, 437. 1953; Scholz, in Willdenowia, 7: 431. 1974. (Fig. 10)

   Poa rigida L., Cent. Pl. 1:5. 1755; *Scleropoa rigida* (L.) Griseb., Spicil. FI. Rumel. 2: 431. 1846; Durand & Barratte, l.c. 273; Pamp., Pl. Trip. 37. 1914; Prod. Fl. Cir. 120. 1931; Maire l.c. 45; Keith, l.c. 878.

A small annual with erect or geniculately ascending branches. Culm smooth below the panicle. Leaves linear-lanceolate, flat or rolled. Panicle one sided, up to 10 cm long, ovate-lanceolate, branched. Spikelet seated on stout pedicel, 3-10-flowered; glumes 1-2 mm long, acute lanceolate, keeled; lemma obtuse, awnless. 2n = 14 + 1-5B.

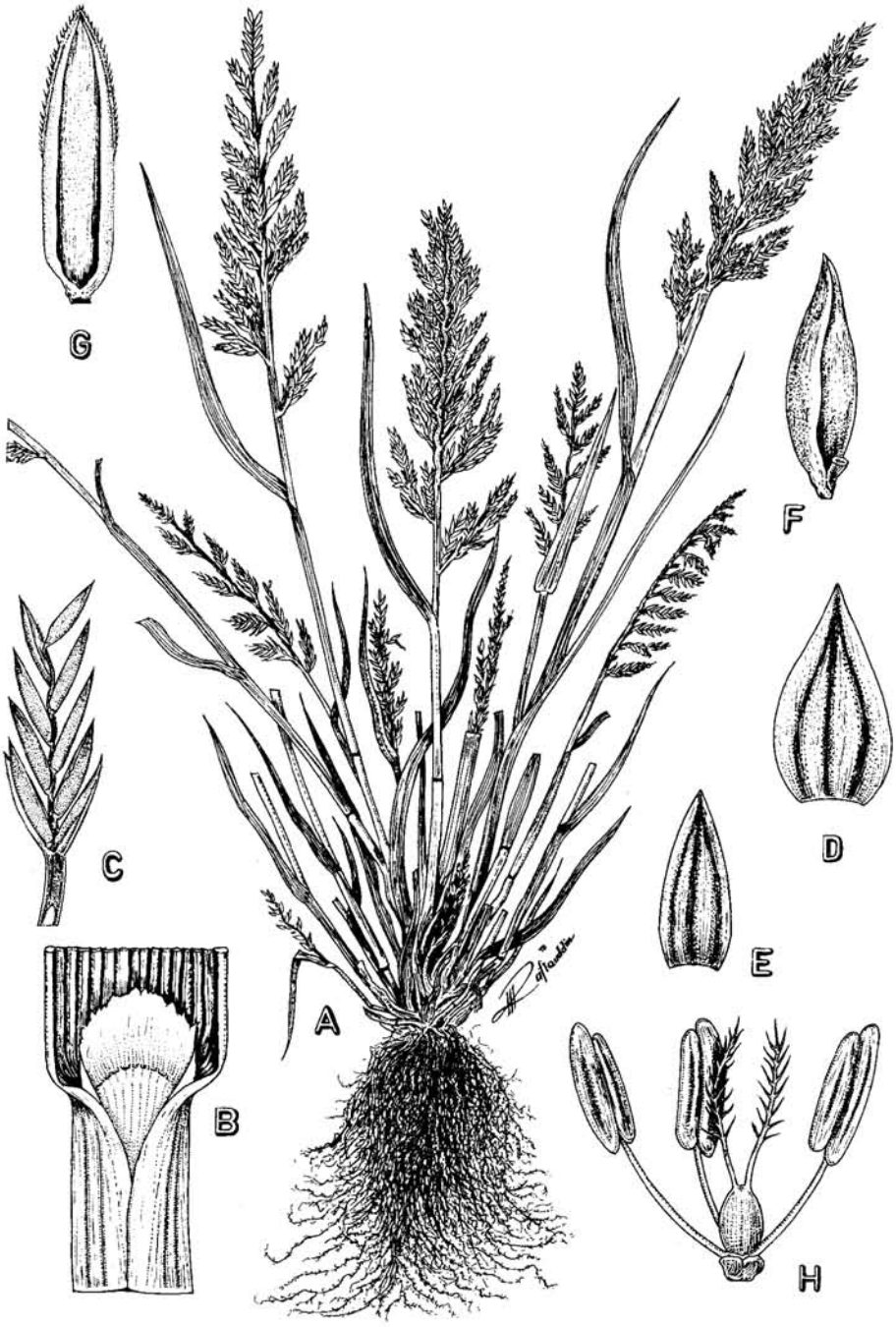


Fig. 10 **Catapodium rigidum**: A, habit × 1; B, portion of lamina, ligule and sheath × 3; C, spikelet × 5; D, upper glume × 10; E, lower glume × 10; F, lemma with rachilla × 10; G, palea × 20; H, stamens and pistil × 25.

Syntypes: Described from Gallia, Anglia.

A-3 Ain Sharshara, 23.3.1977, *Faruqi* 1298; **A-7** Wadi Derna, 14.3.1968, *Boulos* 2411; 5 km east of Wadi Kuf on main highway, 8.5.1978, *Faruqi* 1816; Ain Mara, 5.5.1978, *Faruqi* 1774; Shahat, 24.5.1977, *El-Gadi and Faruqi* 1376; Wadi Mahbool, Baida Derna Coastal Road, 1.3.1973, *S.I. Ali & S.A. Faruqi* 1085; Wadi Qala'a, above Ras Hilal, 27.3.1970, *Davis* 50154 b; **A-8** Near the highway to Tabruk, 25.3.1980, *A. El Gadi and M.A. Siddiqi* 3382.

Distribution: W. and S. Europe, Cyprus, Syria, Palestine, Lebanon, Jordan, N. Africa, Turkey, Iran and Caucasus. Naturalized in Australia, Tasmania, New Zealand, S. Africa and N. and South temperate America.

Fl.: Mar.-June

2. **Catapodium hemipoa** (Delile ex Spreng.) Lainz in An. Inst. For. Invest. and Exper. Madrid. 10, Ano 37: 30. 1966; Scholz, l.c. 431.

Festuca hemipoa Delile ex Spreng., Syst. 4, 2: 36. 1827; *Scleropoa hemipoa* (Delile ex Spreng.) Guss., Fl. Sic. Syn. 1: 93. 1843; Pamp., Pl. Trip. 35. 1914; Maire, l.c. 48; Keith, l.c. 877; *Desmazeria rigida* ssp. *hemipoa* (Delile ex Spreng.) Stace, in Bot. J. Linn. Soc. Lond. 76: 352. 1978; *Catapodium rigidum* ssp. *hemipoa* (Delile ex A. Sprengel) Stace, in Davis, Fl. Turk., 9: 464. 1985.

Annual with erect or geniculately ascending branches. Culm scabrous below the panicle. Leaves linear, flat or rolled, 10 cm long, 2 mm broad. Panicle up to 15 cm long. Spikelets subsessile on secondary branches, up to 5 mm long, 3-10-flowered; glumes 2-2.5 mm long, subacute, lemma subacute.

Type: Described from Sidi bel Abbas, Algeria. *Wariany*.

Reported from former Tripolitania by Pampanini (l.c.) and Maire (l.c.) etc.

Distribution: N. Africa.

Fl.: Apr.-June

3 . **Catapodium marinum** (L.) C.E. Hubbard in Kew Bull. 1954, 375. 1955; Scholz, l.c. 431. (Fig. 11)

Festuca marina L., Amoen. Acad. 4: 96. 1759; *Poa loliacea* Huds., Fl. Angl. 1: 43. 1762; *C. loliaceum* (Huds.) Link, Hort. Berol. 1: 145. 1827; Maire, l.c. 204; Keith, l.c. 338; *Desmazeria loliacea* (Huds.) Nym., Syll. 426. 1855; Durand & Barratte, l.c. 270. 1910; Pamp., Pl. Trip. 21. 1914; Prod. Fl. Cir. 115: 1931; *D. marina* (L.) Druce in Scott. Bot. Rev. 1: 156. 1912; *C. marinum* ssp. *syrticum* (Barr. et Murbeck) H. Scholz in Willdenowia, 6: 291. 1971; l.c. 7: 431. 1974.

A short annual 5-12 cm tall, erect to geniculately ascending. Culm smooth, glabrous. Leaf 5-8 cm long, 2-2.5 mm broad, ligule 1-1.5 mm long, lacerate or lobed. Panicle with an aspect of *Lolium*, without secondary branches, main axis flattened, margins barbed, spikelets alternately arranged on one side of 3-4 cm long axis; pedicel stout, 1 mm long or less. Spikelets 5-7 mm long, 4-8 florets; glumes 2, obliquely veined, 2 very thick veins present on glumes which taper towards the tip and make a very prominent groove in between, not awned, 3-4 mm long, lanceolate; lemma 3 mm long, not awned, very finely puberulent, blunt; palea little shorter than lemma. 2n = 14

Type: Described from Lancaster, England.

A-7 Wadi Derna, 14.3.1968, *L. Boulos*, 2411 A.

Also reported from former Tripolitania by Durand and Barratte, (l.c.) etc.

Distribution: Mediterranean region and Europe.

Fl.: Mar.-May

10. CASTELLIA

Tineo, Pl. Rar. Sicil. 2: 17. 1846.

Erect herb. Panicle branched. Spikelets subsessile, many-flowered, laterally compressed; glumes unequal; flowers caducous; lemma covered with hyaline tubercles, ovary pilose on top, caryopsis with linear hilum.

A monotypic genus; differs from *Catapodium* by tuberculate lemma.

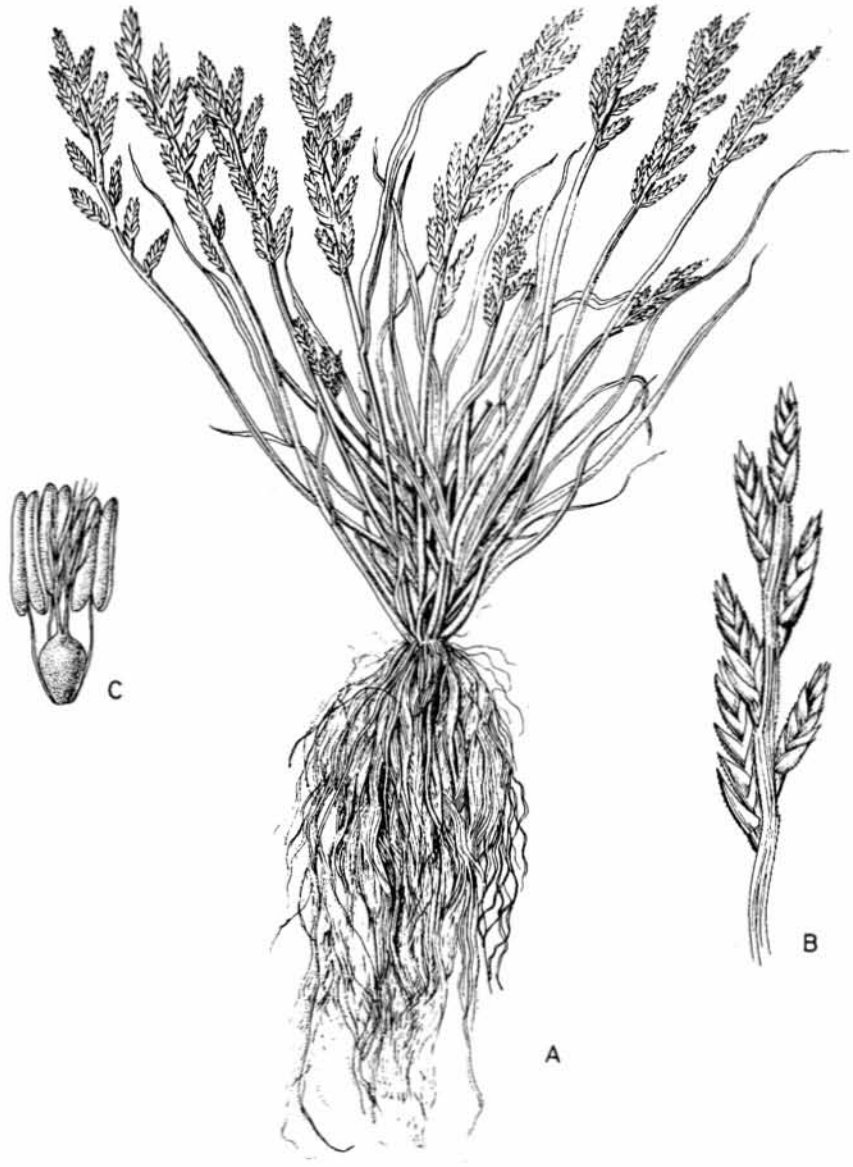


Fig. 11 **Catapodium marinum**: A, habit × 1; B, portion of the inflorescence × 3; C, stamens and pistil × 20.

Castellia tuberculosa (Moris) Bor in Ind. For. 74: 90. 1948; Scholz, l.c. 432: 1974.

Catapodium tuberculosum Moris, Atti Terz. Riun. Sc. Ital. 481. 1841; Maire, l.c. 213; Keith, l.c. 339; *Castellia tuberculata* Tineo, Pl. Rar. Sicil. 2: 18. 1846; *Desmazeria tuberculosa* (Moris) Bonnet, in B. et B., Cat. Tun. 482. 1896; Durand & Barratte, l.c. 271; Pamp., Pl. Trip. 20. 1914; Prodr., Fl. Cir. 116. 1931.

An erect plant as high as 70 cm. Culms solitary or branched from the base, glabrous. Leaf flat, linear-lanceolate, acuminate, glabrous, up to 3 mm broad and up to 15 cm long. Panicle branched, open, branches spaced on the axis. Spikelets either sessile or on short pedicel (1-1.5 mm), up to 10 mm long, 5-10 florets; florets caducous; glumes unequal, 3 and 4 mm long, inner glume acute, outer obtuse, glabrous-frosty; lemma prominently veined, tuberculate, 4.5-5 mm long, subacute.

Type: Described from South Sardinia; *Moris*.

Reported from former Cyrenaica by Durand & Barratte, (l.c.) etc.

Distribution: Canaries, Mediterranean region, Sudan, Arabia, Iran, and Pakistan.

Fl.: Feb.-Mar.

11. MICROPYRUM

(Gaudin) Link in Linnaea, 17: 397. 1844.

Annual herbs with simple spike. Spikelets subsessile, many-flowered, laterally compressed, narrowed at the tip; glumes unequal; lemmas not notched; caryopsis fused with the palea and lemma.

3 species, distributed in the Mediterranean region and Central Europe; only 1 species is found in Libya.

Micropyrum tenellum (L.) Link, in Linnaea, 17: 398. 1843; Scholz, l.c. 432.

Triticum tenellum L., Syst. ed. 10. 880. 1759; *Catapodium tenellum* (L.) Trabut in Batt. et Trab., FI. Mon. 232. 1895; Maire, l.c. 211.

Annual, erect, glabrous, glaucous, up to 40 cm tall. Culms solitary or few branches from the base, slender. Leaves linear, acuminate, folded, 10 cm long, 1 mm wide. Inflorescence a spike (an aspect of *Lolium*), linear, up to 10 cm long. Spikelets on very short pedicel c. 1 mm long, spikelet 8 mm long; glumes little unequal, 3 and 4 mm long, with 2 strong lateral nerves and often grooved in the middle, obtuse; lemma 3-4 mm long, muticous or shortly awned.

Neotype: Described from Europe, Herb. Linn. 104/14 (LINN).

Scholz (l.c.) included it in his list of Libyan grasses, but regards its distribution doubtful in Libya.

Distribution: Mediterranean and Central Europe.

Fl.: Apr.-June

12. **CTENOPSIS**

De Not., Ind. Sem. Hort. Gen. 325. 1847.

Annual small grass. Leaf rolled and setaceous. Inflorescence one sided, spike of spikelets, spikelets arranged at right angles on a somewhat straight axis giving a comb-like appearance. Spikelets several-flowered, closely arranged at right angles to the axis; glumes very unequal, the lower minute; lemma smooth or scabrid, acute or awn tipped, palea as long as lemma, keeled; stamens 3; lodicules 2, with 2 unequal teeth; caryopsis fusiform.

A monotypic genus.

Ctenopsis pectinella (Del.) De Not., Ann. Sci. Nat. ser 3, 9: 325. 1848; Pamp., Pl. Trip. 18. 1914; Maire, l.c. 200; Keith, l.c. 398; Scholz, l.c. 432.

Festuca pectinella Del., Fl. Aeg. tab. 63, fig. 2. 1824, and Ind. Sem. Hort. Monspel. 24; 1836; *Vulpia pectinella* (Del.) Boiss., Fl. Orient. 5: 631. 1884.

A small annual 10-15 cm tall, erect, smooth, glabrous. Leaf blades involute or rol-

led, setaceous, glabrous on the outer surface. Spike 2-3 cm long, adaxially concave, spikelets arranged on concave side in two rows and at right angle to the axis. Spikelets 3-4-flowered; rachilla disarticulating above the glume; glumes persistent, very unequal, the upper very small and membranous; lemma very scabrid; palea subequal, 2-toothed, ciliolate on nerves.

Type: Described from Egypt.

A-3 Tarhuna, Uadi Tersiva, 1.4.1913, *Pampanini* 1953 & 4389 (Fl); E. di Kasr Tarhuna, 4.4.1913, *Pampanini* 2113 (FI); Tarhuna, Kasr Daun, 7.4.1913, *Pampanini* 2294 (FI).

Distribution: N. Africa, Syria and Palestine.

Fl.: Mar.-Apr.

Pampanini (l.c.) has recognized a var. *pubescens* with pubescent glume and branched inflorescence.

13. **PSILURUS**

Trin., Fund. Agrost, 93. 1822.

Annual herbs with filiform leaves. Spike very slender. Spikelets spaced, distichous, 1-flowered, with occasionally a terminal sterile floret seated on a long flexous rachilla; lower glume of terminal spikelet very small, those of lower spikelets usually absent (sometimes present); upper glume also small; lemma linear-lanceolate, prolonged into an awn, membranous, 2-keeled; stamen 1; lodicule 2-toothed, one tooth long, the other short; caryopsis as long as lemma; hilum linear.

A monotypic genus.

Psilurus incurvus (Gouan) Schinz et Thell., in Vierteljahrschr. Nat. Ges. Zürich, 58: 40, 1913; Maire, l.c. 303; Keith, l.c. 806; Scholz, l.c. 432. (Fig. 12)

Nardus incurvus Gouan, Hort. Monspel. 33. 1762; *N. aristata* L., Sp. Pl. ed. 2: 78. 1762; *P. aristatus* (L.) Duval-Jouve in B. Soc. France 13: 132. 1866; Pamp., Pl. Trip. 39. 1914.

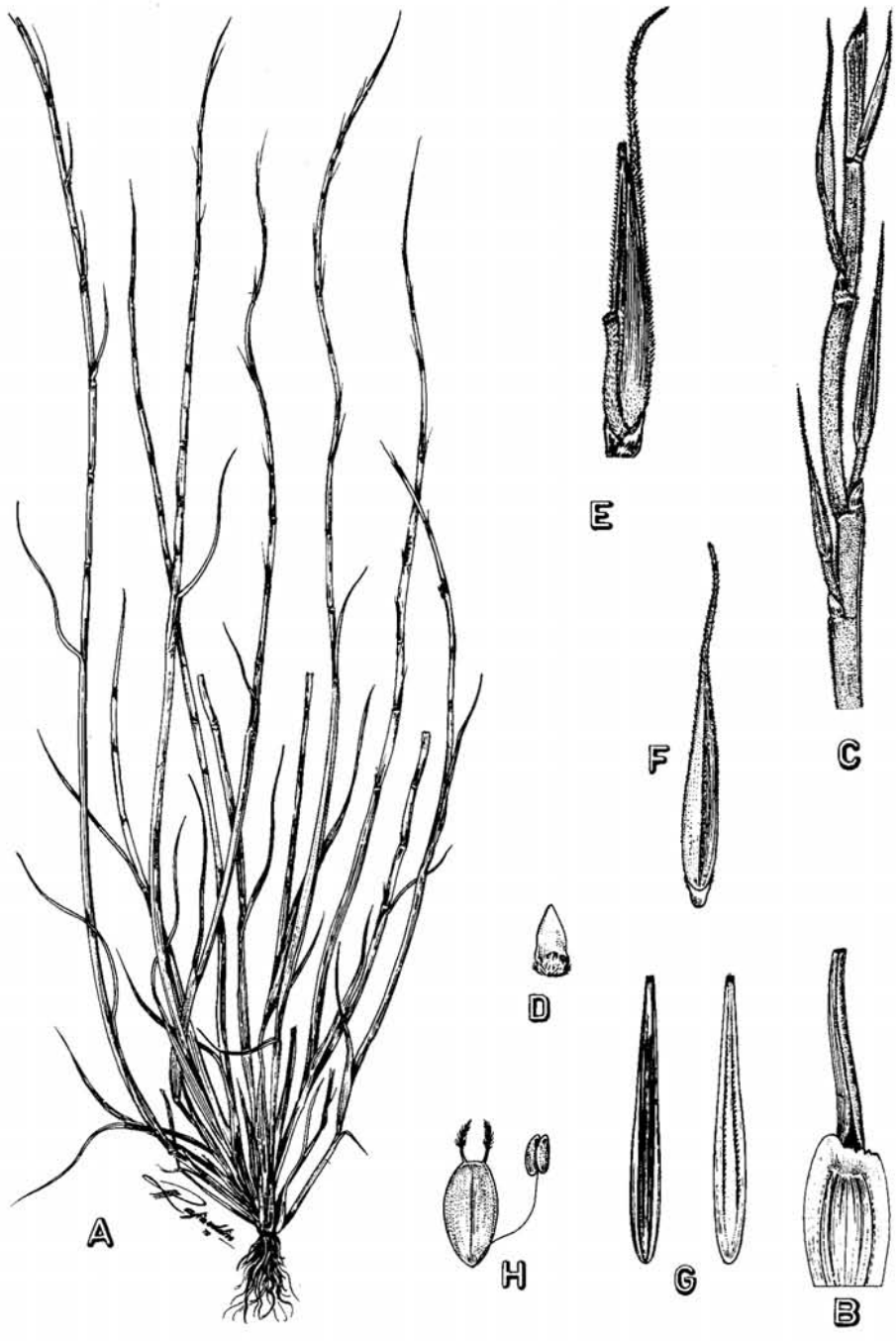


Fig. 12 **Psilurus incurvus**: A, habit × 1; B, lamina base, ligule and sheath × 8; C, portion of the spike × 5; D, upper glume × 10; E, spikelet with sessile floret and rachilla of the rachillate floret x 10; F, floret showing dorsal view of lemma x 10; G, palea dorsal and ventral view x 10; H, stamen and pistil x 20.

Annual, 15-30 cm tall. Culm delicate, erect, branching from the base, densely tufted, glabrous, smooth. Leaf filiform, 0.5 mm broad, 5 cm long. Spikes very slender, 10-20 cm long, flexuous, curved, axis covered with barbed hairs. Spikelets 4-5 mm long, sessile; lateral florets usually sessile; sometimes on a flexuous rachilla similar to the terminal floret or with one sessile and one rachillate; outer glume 1 mm long, inner absent or minute in lateral spikelets and clear in the terminal one; lemma awned, awns up to 10 mm in the terminal spikelet; anther 1. 2n = 14

Type: Described from Circa Cannelles, France (*Gouan*).

A-7 Shahat, 6.5.1978, *Faruqi* 1780; *id.* 7.5.1978, *Faruqi* 1794; Ruins of Shahat, 26.3.1970, *Davis* 50097 and 50098.

Also reported from Tripolitania by Maire (l.c.) etc.

Distribution: Mediterranean region, N. Africa, Syria, Transcaucasia, Iraq, Iran, Afghanistan and Pakistan. Naturalized in Australia.

Fl.: Apr.-May

14. SPHENOPUS

Trin., Fund Agrost. 135. 1820.

Weak annuals. Leaves conduplicate. Inflorescence a capillary branched panicle; pedicels club shaped. Spikelets 2-7-flowered, laterally compressed; rachilla disarticulating above the glume; glumes very unequal, nerveless, lemma 3-5-nerved, palea 2-keeled, 2-lobed; stamens 3, very small; lodicules 2, two toothed; caryopsis oblong-lanceolate.

2-3 Mediterranean species; 2 species are recorded from Libya.

+ Lemma 3-nerved	1. **S. divaricatus**
– Lemma 5-nerved	2. **S. ehrenbergii**

1. **Sphenopus divaricatus** (Gouan) Reichenb., Fl. Germ. Excurs. 45. 1830; Durand & Barratte, l.c. 264; Pamp., Pl. Trip. 37. 1914; Prodr. Fl. Cir. 114. 1931; Maire, l.c. 31; Keith, l.c. 929; Scholz, l.c. 432. (Fig. 13)

Poa divaricata Gouan, Illustr. Obs. Bot. 3: 4, pl. 2, f. 1. 1773.



Fig. 13 **Sphenopus divaricatus**: A, habit × 1; B, portion of lamina, ligule and sheath x 5; C, portion of panicle × 4; D, spikelet × 25; E, lower glume × 25; F, upper glume × 25; G, lemma × 25; H, palea × 25; I, stamens and pistil × 25.

A small annual with slender culms, erect or geniculately ascending, smooth, glabrous, 15-30 cm tall. Leaf linear, folded; panicle much branched. Spikelets divaricating or in groups of three, 2-4-flowered; pedicel club-shaped; flowers 1.5-1.8 mm, disarticulating above the glumes; glumes unequal, the shorter minute, membranous; lemma 3-nerved, keeled and blunt; stamens 3, anthers ovoid; lodicules 2, toothed; caryopsis ovoid oblong.
2n = 12.

Lectotype: Described from Montpellier region, France. (The illustration in Gouan, Obs. Bot. t. 2f. 1. 1773.)

A-4 Salt marsh, Al-Kararim, 8.3.1968; *Boulos* 1899; Tawargha, 14.3.1978, *Faruqi* 1702; **C-4** Sokna, 5.3.1978, *Faruqi* 1562. **B-5** 66 km E. of Sirt, 9.5.1978, *A. El-Gadi, Jafri and others,* 2118. Also reported from former Cyrenaica by Durand & Barratte (l.c.) and others.

Distribution: S.W. and Mediterranean Europe, Syria, Palestine, Jordan, Egypt, Arabia, Turkey, Caucasus, Iran, Gulf States, C. Asia, N. Africa, Canaries. Naturalized in S. Africa and Australia.

Fl.: Mar.-June

2 . **Sphenopus ehrenbergii** Hausskn., in Thur. B.V.N.F. 13-14: 57. 1899; Maire, l.c. 32; Scholz, l.c. 432.

S. syrticus (Murb.) Trabut in B. et T., Fl. Syn. 377. 1902; *S. divaricatus* ssp. *syrticus* Murb., Contr. Tun. 4: 19. 1900; *S. divaricatus* var. *ehrenbergii* (Hausskn.) Durand & Barratte, Fl. Lib. Prod. 265. 1910; Pamp., Pl. Trip. 37. 1914.

Annual, very small and delicate, 25 cm high, somewhat scabrous. Culms solitary or with few branches. Leaves filiform, up to 60 cm long, 0.25-1 mm broad, glabrous; panicle 7 cm long, dense when young, open at maturity, much branched, branches divaricating, terminal ones usually in 3; pedicel club-shaped; spikelets 2-3-flowered, 1-2 mm; glumes unequal, membranous, 0.5 x 1 mm, smaller one broad and obtuse, the larger one acute; lemma 5-nerved with a mucro like awn; stamens 3, anthers linear; caryopsis linear-oblong.

Type: Described from Egypt.

A-3 Tripoli, Mellaha, 22.3.1912, *Vaccari* 14 (FI); **B-6** Agdabiya and el-Agheila, 15.3.1933, *Pampanini* 1136 (FI); **C-3** Bu Njem, c. 50 km, 27.3.1975, *Amina Gammudi* s.n.; **C-4** Al Jufra, Fie; Oasis Waddan, 14.2.1978, *C. Ricceri & C.H. Steinberg* 109.

Distribution: Egypt, Tunisia and Libya.

Fl.: Mar.-Apr.

15. ECHINARIA

Desf., Fl. Atlant. 2:385.1799 (*nom. cons.*)

Annual herbs. Leaf blade flat, folded or convolute, scabrid. Inflorescence a dense, globose, prickly panicle seated at the tip of a long peduncle. Spikelets 3-4-flowered; pedicel very short and scabrid; florets hermaphrodite or the upper reduced; glumes equal in length, the lower with two strong nerves prolonged into a firm mucro, the upper emarginate (notched) with the median nerve prolonged into a firm mucro; lemma broadly elliptic, 5-7-nerved, scabrid and shortly hairy on the rounded dorsal surface, each nerve prolonged into a firm awn; palea as long as lemma, two-nerved, producing 2 awns; lodicules 2, lanceolate-acuminate, 1-2-toothed; caryopsis oblong-truncate, pubescent at the top.

A monotypic genus.

Echinaria capitata (L.) Desf., Fl. Atlant. 2: 385. 1799; Pamp., Pl. Trip. 21. 1914; Maire, l.c. 13; Keith, l.c. 441; Scholz, l.c. 432.

Cenchrus capitatus L., Sp. Pl. 1049. 1753.

A small plant, 10-15 cm high, erect-geniculately ascending, branching from the base, glabrous or pubescent below the node and scabrous below the panicle. Leaves up to 5 cm long and 2 mm broad, soft, tips slightly blunt, scabrous on margins, retrorsely hairy at the upper surface, and somewhat hairy on the lower surface. Inflorescence a stiff prickly head situated on a long axis, spicules coming out from the head in all directions, head about 2 cm long and 1.8 cm broad. Spikelets somewhat laterally compressed with 2 or sometimes 3-4 florets; glumes equal, obovate, the lower with 2 equal nerves produced as mucro; lemma broad, 5-nerved, nerves rarely 7, each nerve prolonged into

a flat scabrid awn, recurved at maturity; palea as long as lemma with two nerves, nerves looking like awns; anthers 3; ovary with a stylopodium and minutely hairy above. 2n = 18.

Type: Described from Narbonne (France) & Italy. Herb. Linn. 1217/6 (LINN).

A-3 Tarhuna, Uadi Srat, 27.3.1913, *Pampanini* 1710 (FI); Mesellata, Kasbat, Ras Gela, 13.4.1913, *Pampanini* 3086 (FI); Garian, Wadi Garian, 7.5.1913, *Pampanini* 4351 (FI).

Distribution: S. & W. Europe, N. Africa, Syria, Palestine, Jordan, Turkey, Iran to C. Asia.

Fl.: Mar.-May

16. **DACTYLIS**

L., Sp. Pl. 71. 1753; Gen. Pl. ed. 5: 32. 1754.

Perennial. Leaf flat. Inflorescence a spike-like panicle. Spikelets pedicelled and densely clustered, 2-5-flowered, laterally compressed; rachilla disarticulating above the glumes and between the florets; glumes unequal, keeled, ciliate on the keel; lemma 5-nerved, keeled, ciliate on the keel, chartaceous to coriaceous; stamens 3; lodicules 2, cuneate, 2-lobed; caryopsis elliptic to lanceolate.

An Eurasian genus with c. 5 species; represented by 1 species in Libya.

Dactylis glomerata L., Sp. Pl. 1: 71. 1753; Boiss. Fl. Or. 5: 596. 1884; Bor in Towns., Guest & Al-Rawi, Fl. Iraq 9: 76. 1968; Tzevelev, Poaceae, URSS. 516. 1976; Tutin in Tutin et al., Fl. Eur. 5: 171. 1980; Mill in Davis, Fl. Turk. 9: 510. 1985. (Fig. 14)

D. hispanica Roth, Cat. Bot. 1: 8. 1797; Scholz, in Willdenowia, 7: 432. 1974; *D. glomerata* var. *hispanica* (Roth) Koch, Syn. Fl. Germ. 808. 1837; Durand & Barratte, l.c. 266; Pamp., Pl. Trip. 20. 1914; Prod. Fl. Cir. 117. 1931; Maire, l.c. 68; Keith, l.c. 425; *D. glomerata* L. ssp. *hispanica* (Roth) Nyman, Consp. 819. 1882.

A perennial grass with short rhizome. Culms tufted, erect, 50-70 cm tall. Leaf 10-15 cm long and 2-3 mm broad, linear, leaf sheath keeled, glabrous, glaucous. Inflorescence

a flat scabrid awn, recurved at maturity; palea as long as lemma with two nerves, nerves looking like awns; anthers 3; ovary with a stylopodium and minutely hairy above. 2n = 18.

Type: Described from Narbonne (France) & Italy. Herb. Linn. 1217/6 (LINN).

A-3 Tarhuna, Uadi Srat, 27.3.1913, *Pampanini* 1710 (FI); Mesellata, Kasbat, Ras Gela, 13.4.1913, *Pampanini* 3086 (FI); Garian, Wadi Garian, 7.5.1913, *Pampanini* 4351 (FI).

Distribution: S. & W. Europe, N. Africa, Syria, Palestine, Jordan, Turkey, Iran to C. Asia.

Fl.: Mar.-May

16. **DACTYLIS**

L., Sp. Pl. 71. 1753; Gen. Pl. ed. 5: 32. 1754.

Perennial. Leaf flat. Inflorescence a spike-like panicle. Spikelets pedicelled and densely clustered, 2-5-flowered, laterally compressed; rachilla disarticulating above the glumes and between the florets; glumes unequal, keeled, ciliate on the keel; lemma 5-nerved, keeled, ciliate on the keel, chartaceous to coriaceous; stamens 3; lodicules 2, cuneate, 2-lobed; caryopsis elliptic to lanceolate.

An Eurasian genus with c. 5 species; represented by 1 species in Libya.

Dactylis glomerata L., Sp. Pl. 1: 71. 1753; Boiss. Fl. Or. 5: 596. 1884; Bor in Towns., Guest & Al-Rawi, Fl. Iraq 9: 76. 1968; Tzevelev, Poaceae, URSS. 516. 1976; Tutin in Tutin et al., Fl. Eur. 5: 171. 1980; Mill in Davis, Fl. Turk. 9: 510. 1985. (Fig. 14)

D. hispanica Roth, Cat. Bot. 1: 8. 1797; Scholz, in Willdenowia, 7: 432. 1974; *D. glomerata* var. *hispanica* (Roth) Koch, Syn. Fl. Germ. 808. 1837; Durand & Barratte, l.c. 266; Pamp., Pl. Trip. 20. 1914; Prod. Fl. Cir. 117. 1931; Maire, l.c. 68; Keith, l.c. 425; *D. glomerata* L. ssp. *hispanica* (Roth) Nyman, Consp. 819. 1882.

A perennial grass with short rhizome. Culms tufted, erect, 50-70 cm tall. Leaf 10-15 cm long and 2-3 mm broad, linear, leaf sheath keeled, glabrous, glaucous. Inflorescence

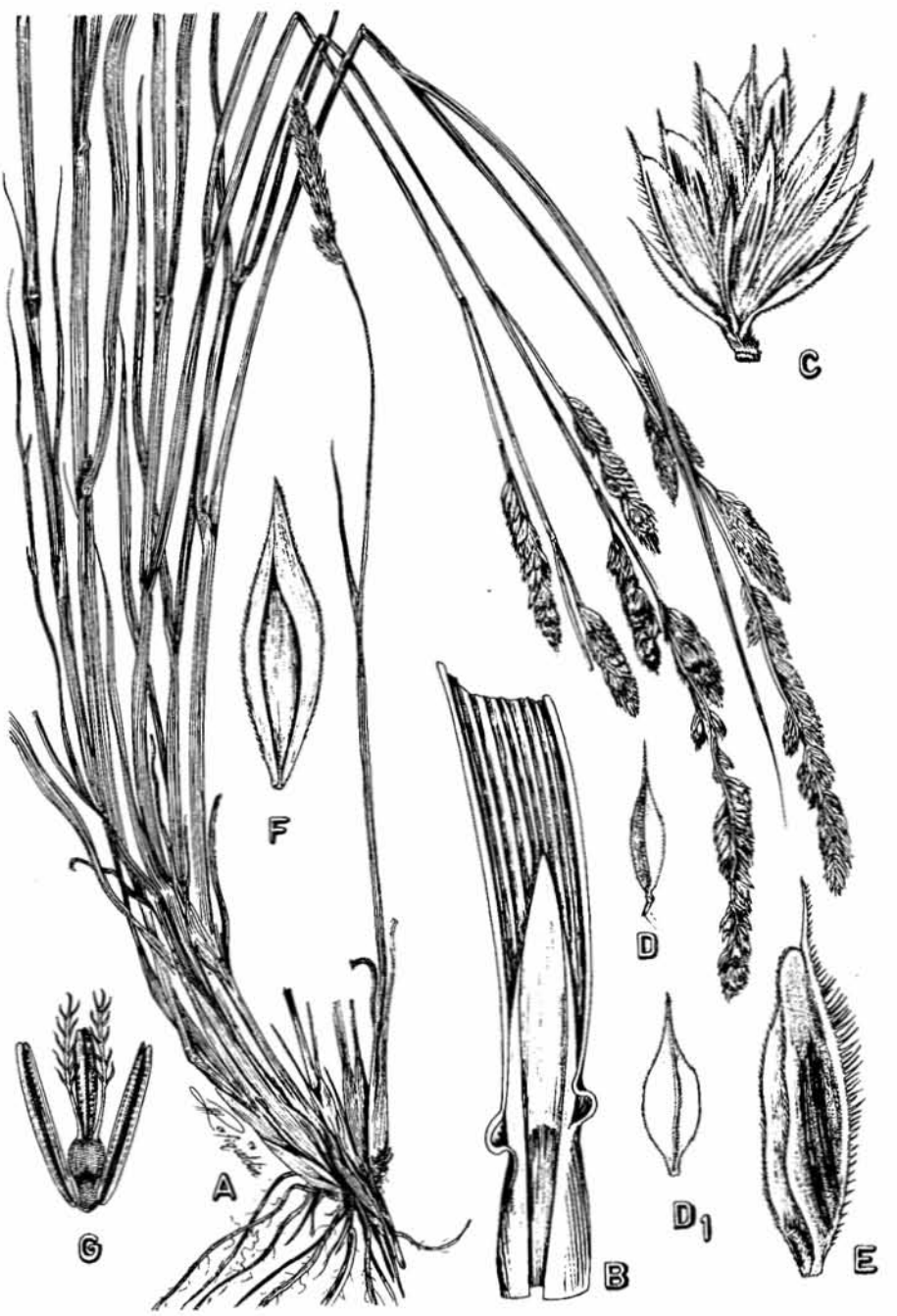


Fig. 14 **Dactylis glomerata**: A, habit × 0.5; B, portion of lamina, ligule and sheath x 5; C, group of spikelets × 5; D, lower glume × 5; D_1, upper glume × 5; E, lemma × 10; F, palea × 10; G, stamens and pistil × 10.

a spike-like panicle of erect and contracted spikelets on very short branches. Spikelets 2-5-flowered; glumes ciliate on keel, glabrous to scabrous; lemmas ciliate on keel, conspicuously emarginate and mucronate. 2n = 28.

Type: Described from Europe, Herb. Linn. 90/3 photo (LINN).

A-2 Bu-Ghelan Hills, near Gharian, 21.5.1976, *Faruqi* 738, 739; **A-3** 22 km west Khoms, 25.4.1967, *Boulos* 1807; 12 km west Tripoli, near seashore, 24.3.1967, *Boulos, Tawil & Bouni* 1608; Shati Zanzur, Main Highway, 24.3.1976, *Faruqi* 518; **A-7** Shahat ruins, 24.5.1977, *Faruqi* 1375; 3 km from Shahat on way to Derna, Main Highway, 4.5.1978, *Faruqi* 1750; 5 km E. of Wadi Kuf, on main highway, 8.5.1978, *Faruqi* 1817, 1828; Ras el Hilal, near coastal road, 6.5.1978, *A. El-Gadi, Jafri & others* 1618-G; **B-1** Valley 9 km from Nalut on way to Ghadamas, 22.5.1976, *Faruqi* 891; **B-6** 35 km from Gaminas towards Benghazi, 13.3.1978, *Faruqi* 1677.

Distribution: Mediterranean region, Anatolia, Caucasus, Iraq, Iran, Turcomania and Afghanistan.

Keith (l.c.) regards it as one of the most useful grass for forage and hay, which can grow in semi-arid areas as well.

Fl.: Mar.-May *Vern.* Adem, Nishia.

17. **AMMOCHLOA**

Boiss., Diag. Ser. 1, 13: 51. 1854.

Small annual. Leaf flat. Inflorescence globose-subglobose. Spikelets closely packed, laterally compressed, many-flowered; florets articulating with the rachilla; glume obliquely ovate, winged, wings membranous, one margin narrow, the other broad; lemma broadly ovate, slightly oblique, mucro recurved, 5-nerved; palea narrow, 2-keeled; stamens 3; styles very short, forming a short beak; lodicules absent; caryopsis elliptic-oblong.

3 Mediterranean species; represented by 2 species in Libya.

+ Head composed of several condensed spikes, radiating from the base; rays distinct and inflorescence shorter than the leaves 1. **A. palaestina**

– Head of condensed spikes forming a globose head; rays indistinct and inflorescence longer than the leaves. 2. **A. pungens**

1. **Ammochloa palaestina** Boiss., Diagn. Ser. 1. 13: 52. 1854; Pamp; Pl. Trip. 8. 1914; Maire, l.c. 9; Keith, l.c. 221; Scholz, l.c. 432.

A. subacaulis Balansa ex Cosson et Durieu, in Bull. Soc. Bot. France, 1: 317 (Dec.) 1854; Durand & Barratte, l.c. 261; Pamp., Prod. Fl. Cir. 111. 1931.

A very short annual. Culm either absent or up to 3-5 cm long, glabrous, erect to geniculately ascending. Leaves up to 6 cm long, longer than the panicle, linear, glabrous, mucronate; leaf sheath flat, glabrous; ligule up to 3 mm, membranous, lacerate. Inflorescence a head, of 3-6 spikelets, up to 13 mm long and as broad. Spikelets distinct, 8-14 florets; glumes 5-6 mm, broadly ovate, winged; lemma mucronate, glabrous-pubescent at the lower half; anthers small, 0.6-0.8 mm long; styles fused into a stylopodium, larger than the ovary.

Type: Described from Palestine, *Boissier* (holo.G).

A-3 Tripoli, Sciara-Sciat, 17.11.1913, *Pampanini* 51 (FI); Tarhuna, Uadi Tersive, 1.4.1913, *Pampanini* 1957 (FI); Tarhuna, Ras Ghenai, 25.3.1913, *Pampanini* 1618 (FI); Tarhuna, Ras Bu Tawil, 21.3.1913, *Pampanini* 1332 & 1333 (FI). **A-6** Marsa-Brega, 8.4.1934, *Pampanini & Pichi-Sermolli* 244 (FI); Agedabia ed el-Agheila, 15.3.1933, *Pampanini* 242 (FI); Trigh Enver Bei Sidi Resegh, 25.3.1933, *Pampanini* 243 (FI); Benghazi, 8.4.1913, *Vaccari* 891 (FI).

Distribution: Spain, Algeria, Tunisia, Libya, Egypt, Turkey, Caucasia, W. Syria, Palestine, Iraq, and S. Iran.

Fl.: Mar.-Apr. *Vern.* Zewan, Zewahn.

2. **Ammochloa pungens** (Schreb.) Boiss., Diagn. Ser. 1. 13. 52. 1854; Maire, l.c. 8; Scholz, l.c. 432. (Fig. 15)

Dactylis pungens Schreb., Gras. 2: 42, tab. 27, f. 1. 1772.

Annual, erect-geniculately ascending, up to 15 cm (25 cm) tall. Culms with panicle

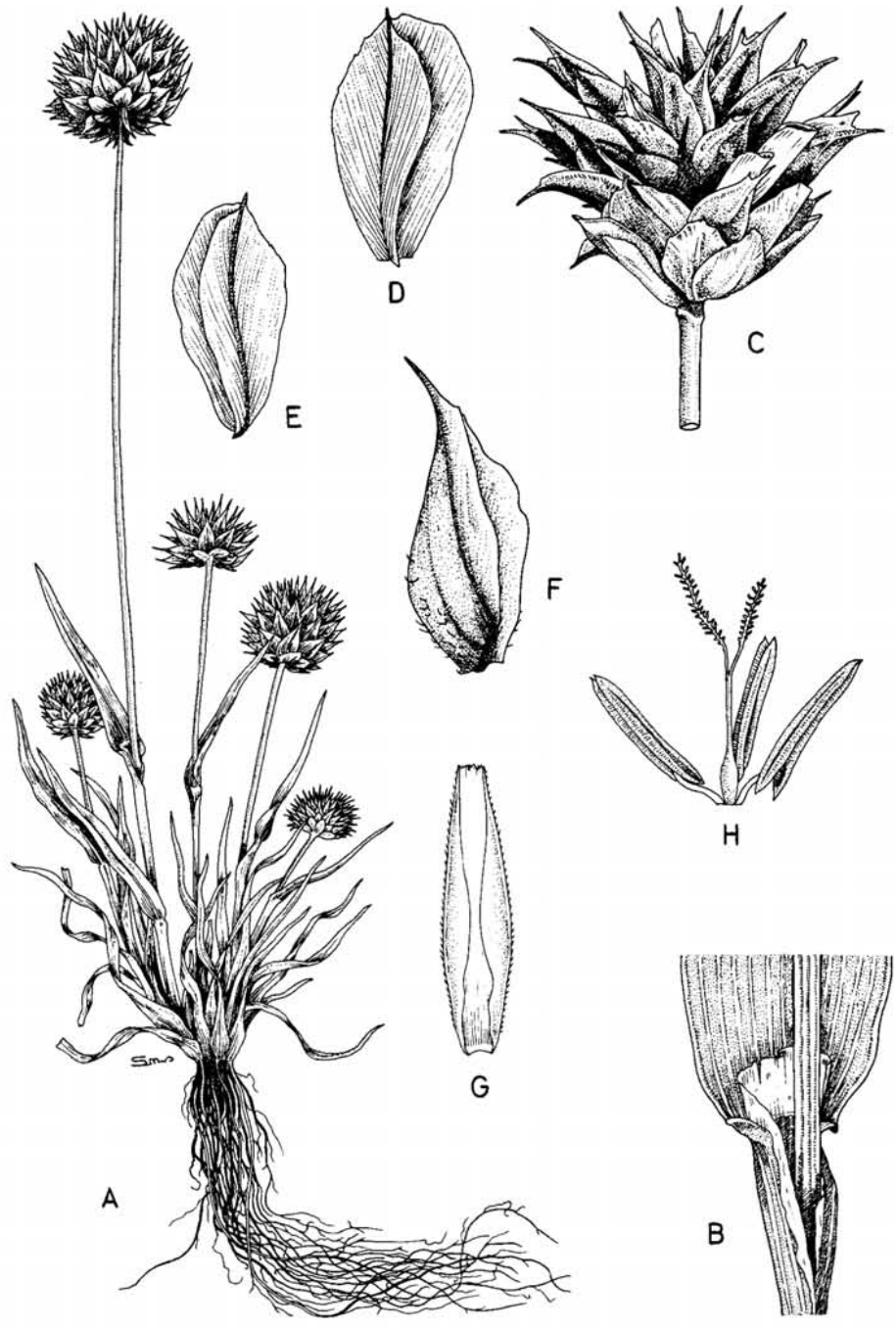


Fig. 15 **Ammochloa pungens**: A, habit × 1; B, portion of lamina, sheath, culm and ligule × 5; C, portion of head × 5; D, lower glume × 10; E, upper glume × 10; F, lemma × 10; G, palea × 10; H, stamens and pistil × 10.

longer than the leaves, highly ribbed, glabrous. Leaf flat, 5 cm × 2-4 mm, blade and sheath glabrous; ligule 1-3 mm, truncate, lacerate. Inflorescence a globose-subglobose head of sub-sessile spikelets, rays not conspicuous, up to 1.5 cm in diameter. Spikelets with 8-14 florets; glumes obliquely ovate, mucronate, membranous; lemma ovate, finely pubescent at the base, extending into a short recurved awn; stamens 3, large, 2.5-4 mm long; ovary glabrous, style fused at the base into a small stylopodium, less than 1/2 the ovary length.

Type: Described from Barbaria (Algeria).

Reported to be present in Tripolitania (Scholz, l.c.).

Distribution: Algeria.

Fl.: Apr.-May *Vern.* Zewan.

18. **POA**

L., Sp. Pl. 67. 1753; Gen. Pl. ed. 5: 31. 1754.

Annual or perennial. Leaf flat and long, when young folded on the midnerve. Panicle long or contracted. Spikelets compressed, 2-many florets, 2-ranked, rachilla articulated above the glumes and between the flowers; upper florets rudimentary or sometimes female; glumes unequal, the lower 1-nerved, the upper 3-nerved, awnless; lemma keeled, 5-nerved, pubescent or glabrous on nerves and wooly or glabrous on the callus, hyaline at the tip and at margins; palea hyaline, 2-keeled, half pilose or half scabrid on the keels; lodicules 2, lanceolate-acuminate, sometimes toothed; stamens 3; ovary glabrous; caryopsis elliptic-oblong.

A cosmopolitan genus with c. 300 species distributed in cooler climates; represented by 8 species in Libya.

1. + Spikelets proliferating (florets converted into bulbils) **4. P. bulbosa**
   — Spikelets not proliferating (florets not converted into bulbils) 2

2. + Lowermost lemma of each spikelet bearing cobwebby hairs at callus 3

	– Lowermost lemma of each spikelet glabrous at callus	5
3.	+ Ligule obtuse or blunt	1. **P. pratensis***
	– Ligule acute or pointed	4
4.	+ Panicle ovate - oblong, very compact with branches appressed to the rachis, 3-8 cm long. Base of the stem bulbous.	4. **P. bulbosa**
	– Panicle conspicuously open with spaced and spreading branches, 10 cm or more long. Base of stem not bulbous.	2. **P. trivialis**
5.	+ Base of stem bulbous. Perennial	6
	– Base of stem not bulbous. Annual	7
6.	+ Culm 7 cm or less long; glumes glabrous, if scabrous, then only on the upper part of mid-nerve	3. **P. vaginata**
	– Culm 10 cm or more long; glumes scabrous along mid-nerve and lateral nerves	5. **P. sinaica**
7.	+ Mature spikelets 3 mm or less long; florets 1-2	6. **P. pentapolitana**
	– Mature spikelets 3 mm or more long; florets 2-6	8
8.	+ Anthers (before anthesis) 0.2-0.3 mm long	8. **P. infirma**
	– Anthers (before anthesis) 1 mm or more long	7. **P. annua**

1. ***Poa pratensis** L., Sp. Pl. 67. 1753; Maire, Fl. Afr. Nord. 3: 99. 1955; Keith. Prelim. Check List Lib. Fl. 784. 1965; Scholz in Willdenowia, 7: 433. 1974.

A tufted grass, 30 cm tall, glabrous, glaucous. Leaf flat, up to 10 cm long, glabrous, linear, somewhat hooded, leaf sheath peeling, ligule obtuse, membranous. Panicle open, branched, up to 10 cm long, branches up to 65 mm long, lower most node of the main axis mostly with 4-6 branches. Glumes keeled, scabrous on keel, glabrous, elliptic, acute, 3 mm long; lemma glabrous between the nerves, 3.5 mm long, winged at the apex, granulate, wool present at callus, wooly on nerves. 2n = 25-124, 35 + 4B.

Type: Described from Europe, Herb. Linn. 87/16 (LINN).

A-3 Tripoli, Faculty of Science, Sidi El-Masri, 22.4.1967, *Boulos* 1739.

Distribution: Europe, N. Asia to Arctic, Caucasus, Central Asia, W. Asia to India. Morocco, Algeria. Naturalized in N. America.

Exotic species; introduced into Tripoli in 1928 (Keith, l.c.) collected by *Boulos* in 1967, which is probably an escape from Sidi Misri Exp. field.

It is a very important forage grass and it is cultivated for this purpose in many parts of the world, specially Europe. It is also used as turf grass. This species is highly polymorphic with n = 14, 16, 28, 32, 35 and 2n = 21, 33, 49, 67 and 85 chromosome numbers. The variation is due to apomictic mode of reproduction where both sexual and apomictic seed formation go on side by side.

Fl.: Mar.-Apr.

2 . **Poa trivialis** L., Sp. Pl. 67. 1753; Pamp., Prod. Fl. Cir. 120. 1931; Maire, l.c. 97; Keith, l.c. 784; Scholz, l.c. 433.

A tall grass up to 80 cm high, erect. Culm glabrous, basal few nodes short, thick, stolons slender or fleshy, terete or moniliform. Leaves pale green or bright green, up to 20 cm long, 3-4 cm broad, finely puberulent, linear, ligule 3.5-10 mm, membranous, pointed. Panicle up to 20 cm long, much branched, pyramidal or narrowly ovoid, open or somewhat contracted. Spikelets 2-4-flowered, glumes keeled (boat-like), acute, unequal, 2.5-3.5 mm long, wool copious, but wool on the veins not conspicuous. 2n = 14 + 1-4B, 28.

A very variable species, sometimes split into the following 2 ssp.

+ Stolons slender, terete	a. ssp. **trivialis**
– Stolons fleshy, moniliform	b. ssp. **sylvicola**

a. ssp. **trivialis** (Fig. 16)

Stolons slender, terete, ligules 3.5-10 mm. Panicle pyramidal rather open.

Type: Described from Europe.

A-3 Gurgi, 5 km west of Tripoli, 24.3.1967, *Boulos* 1636; Tripoli, April 1913, *Cavara*

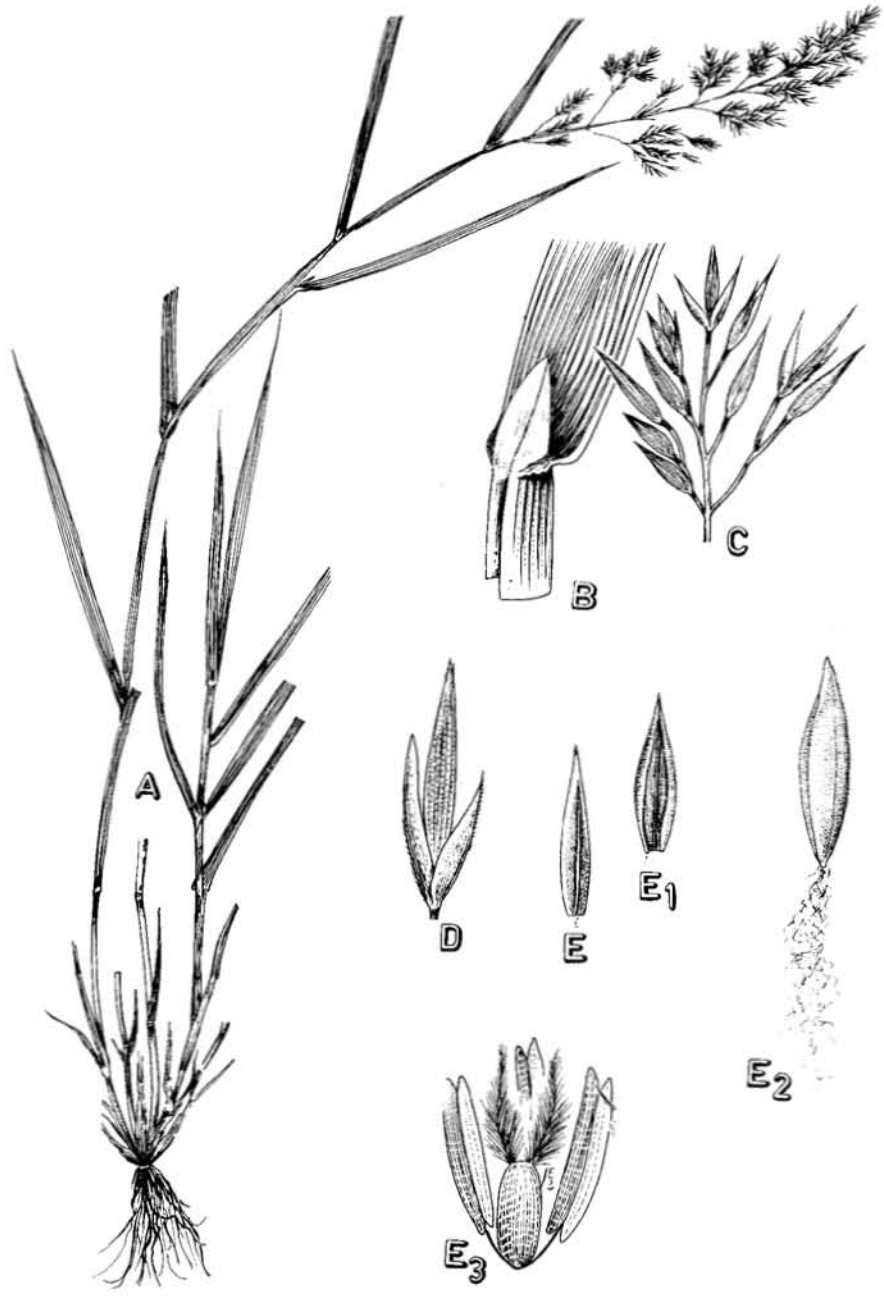


Fig. 16 **Poa trivialis**: A, habit × 0.5; B, portion of lamina, sheath and ligule × 5; C, portion of panicle × 5; D, spikelet × 10; E, upper glume × 10; E_1, lower glume x 10; E_2, lemma × 10; E_3, stamens and pistil × 20.

(FI); **A-7** Ain Mara, 28.4.1934, *Pampanini* and *Pichi-Sermolli* 1051 (FI); Baida, U. Urdama, 2.5.1934, *Pampanini and Pichi-Sermolli* 1052 (FI); Cirene U. Belgadir, 26.4.1934, *Pampanini and Pichi-Sermolli* 1053 (FI).

Distribution: N. Africa, Canaries, Europe, Siberia, China, Japan, W. and Central Asia. Introduced into N. & S. America and Australia.

Fl.: Mar.-May

b. ssp. **sylvicola** (Guss.) H. Lindb. f., Ofvers. Finska Vet.-Soc. Forhandl 48(13):9. 1906.
P. sylvicola Guss., Enum. Pl. Inar. 371. tab. 18. 1854; Scholz l.c. 421 & 433.

Stolons fleshy, moniliform, ligules 5-10 mm. Panicle narrowly ovoid, somewhat contracted.

Syntype: Described from near Naples in Italy.

A-3 Tripoli, lawn in University campus, 13.6.1978, *Faruqi* 1850; **A-7** Shahat, 4.5.1978, *Faruqi* 1741.

Edmondson in Davis, Flora of Turkey 9: 474. 1985. treated ssp. *sylvicola* as a synonim of *P. trivialis*.
Distribution: Mediterranean region, S.W. Asia.

Fl.: April-May

3 . **Poa vaginata** Pamp. in Arch. Bot. 12: 20. 1936; Maire, l.c. 88; Keith, l.c. 784; Scholz, l.c. 433.

Small perennial, 6-7 cm tall, erect to geniculately ascending, branching from the base, base bulbous and swollen, rhizome small. Culm of 2 internodes, the lower shorter than the upper. Leaves filiform, 3-4 cm long, 0.5 mm broad, leaf sheath several times broader than the leaves, ligule large, up to 6 mm long, lanceolate acuminate. Panicle 2-2.5 cm long; glumes glabrous-scabrous on the upper part of mid-nerve, ovate-oblong, acuminate, tip curved; lemma with long hair at the keel and lower margins.

Type: Described from Oum-er-Rezem, Libya.

A-7 Oum er-Rezem, E. Derna, 13.3.1968, *Boulos* 2358; Martuba, 8.4.1933, *Pampanini* 1024 (FI); Derna, 10.4.1933, *Pampanini* 1028 (FI).

Also reported from Tripolitania by Pampanini (l.c.) etc.

Distribution: Endemic to Libya.

Fl.: Mar.-Apr.

4. **Poa bulbosa** L., Sp. Pl. 70. 1753; Durand & Barratte, l.c. 268; Pamp., Pl. Trip. 32. 1914; Prod. Fl. Cir. 119. 1931; Maire, l.c. 84; Keith, l.c. 783; Scholz, l.c. 433. (Fig. 17)

Perennial, tufted, glabrous; base bulbous, 30-(50) cm tall; culm erect or geniculately ascending, smooth. Leaf very narrow, linear and soft up to 10 cm long, 1-2 mm wide; leaf sheath ribbed, basal sheath swollen. Panicle ovate-oblong, dense, 3-8 cm long, 1-2 cm broad. Spikelets 3-5 mm long, with 3-6 florets, elliptic, generally viviparous; glumes 2-3 mm long, ovate, acuminate, finely puberulent; callus wool present; lemma wooly on keel, keel and nerves hairy; palea keels scabrous. 2n = 14, 28, 39-59, 42 + 1B.

Type: Described from Gallia, Herb. Linn. 87/57, 58, 59 (LINN).

A-6 10 km from Benina towards Alabiar, 12.3.1978, *Faruqi* 1659; **A-7** 12 km E. Labrag, Gebel Akhdar, 11.3.1968, *Boulos* s.n.; Shahat, 6.5.1978, *Faruqi* 1779; 47 km W. of Baida, 10.4.1975, *Amina Gammudi* 3050; Shahat ruins, 20.3.1970, *Davis* 50091; 5 km W. of Baida, 25.3.1970, *Davis* 49975.

Distribution: Southern, Western and Central Europe, Mediterranean region, Southern, Western and Central Asia.

Fl.: Mar.-May

5. **Poa sinaica** Steud., Syn. Pl. Glum. 1: 256. 1854; Keith, l.c. 784. (Fig. 18)

Perennial, tufted grass with bulbous base; culms 10 cm or more long, erect, rarely geniculate, dense. Leaf blades very narrow, up to 6 cm long, 1.5-2 mm wide, convolute, densely scabrous on the margins and along the prominent nerves on the lower surface,

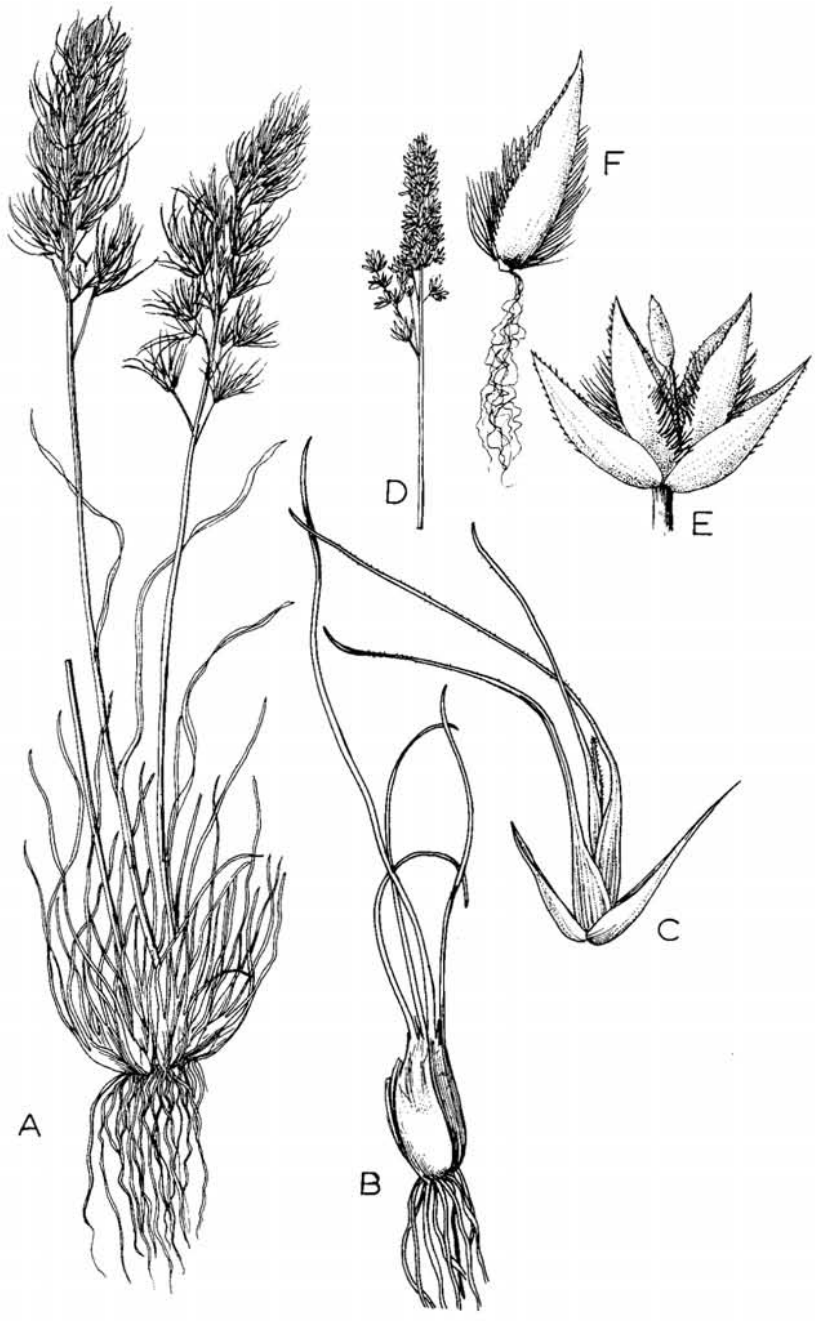


Fig. 17 **Poa bulbosa**: A, habit showing proliferating spikelets × 0.5; B, bulbils from the culm base × 2; C, spikelet showing bulbils × 4; D, portion of panicle before proliferating × 0.5; E, spikelet × 8; F, floret showing wooly callus × 10.



Fig. 18 **Poa sinaica**: A, habit × 0.5; B, bulbils from the culm base × 1; C, spikelet × 8; D, a floret × 8.

leaf bases oblong, often scarcely inflated below, densely covered by leaf sheaths of the previous years. Panicle dense, oblong-elliptic, up to 8 cm long and 4 cm wide. Spikelet 7-8 mm long, 7-flowered; lower glume 3-4 mm long, upper 4.5 mm long; lemma 4.5-5 mm long, oblong-obtuse with hyaline tip, lateral nerves and keel hairy, wool absent; palea keels scabrous.

Type: Described from Sinai, Schimper 326 (K).

B-2 25 km North Mizda, 7.4.1979, *Gintzburger* 790407 20.

It is quite difficult to differentiate it from *P. bulbosa* from which it differs in having lemma callus without cobwebby wool but Feinbrun (Kew Bull. 1940. 277-285. 1941) provided further diagnostic character for *P. sinaica.*

Distribution: Palestine, Arabia, Iraq, Iran, Afghanistan and Pakistan.

This species is regarded as a pasture grass of importance in sub-desert areas. It is also quite useful soil binder.

Fl.: Mar.-Apr.

6 . **Poa pentapolitana** H. Scholz in Willdenowia, 6: 292. 1971.

A small annual, 8-12 cm tall, erect, tufted. Culm ribbed, glabrous-scabrous. Leaf finely scabrous, linear, up to 5 cm long, 2 mm broad, acute, mucronate. Inflorescence a loose, branchd panicle, up to 4 cm long. Spikelets with an aspect of *Melica*, 3 mm or less long, 1-2 flowered; glumes 1.5 mm long, keeled, ovate, acute, glabrous; lemma keeled, ovate, glabrous, subacute, 1.5 mm long; palea elliptic, 2-keeled, 1/3 keel smooth and 2/3 denticulate; stamens 3, anthers 1 mm long; style 2, stigma plumose.

Type: Described from Shahat in Libya.

A-7 East of Shahat, *P.H. Davis* 50250 (K).

Distribution: Endemic to Libya (Gebel Akhdar area).

Fl.: March

7 . **Poa annua** L., Sp. Pl. ed. 1: 68. 1753; Durand & Barratte, l.c. 267; Pamp., Pl. Trip. 32. 1914; Prodr. Fl. Cir. 119. 1931; Maire, l.c. 79; Keith, l.c. 783; Scholz, l.c. 433. (Fig. 19)

Annual, up to 45 cm tall, glabrous, erect, geniculately ascending or prostrate. Culms numerous. Leaves linear, tips hooded, up to 15 cm long. Panicle of few loose branches, up to 8 cm long, branches with 1-3 or occasionally up to 6 spikelets. Spikelets 5-8 mm long, with 2-6 florets disarticulating above the glumes; glumes unequal, obtuse; lemma broadly hyaline, silky hair on the lateral and keel nerves; anthers 1 mm or more long. 2n = 14, 28.

Two subspecies are reported from Libya.

+ Hairs on glume nerves c. 0.37 mm long, hairs absent between the nerves	(a) ssp. **annua**
– Hairs on glume nerves 0.5-0.6 mm long, hairs present between the nerves at the base	(b) ssp. **pilantha**

(a) ssp. **annua**

Type: Described from Europe.

A-3 Tripoli, Hadba Sharqia, University Lane, 25.3.1976, *Jafri* 6457; Tripoli, Behind University, 19.4.1976, *Jafri* 6631; Tripoli, Hadba El Khadra, 8.4.1967, *Boulos* 1641; University Campus, 20.1.1977, *Faruqi* 1053; Tajura, 24.3.1936, *Faruqi* 426; **A-7** Baida, 23.5.1977, *Faruqi* 1367-a; Shahat, 8.5.1978, *Faruqi* 1802; Roman aquaduct near Labrag, E. of Shahat, 29.3.1970, *Davis* 50237 & 50250.

Distribution: All over the temperate world.

(b) ssp. **pilantha** (Ronniger) H. Scholz. Sonderab. Ber. Deutsch. Bot. Ges. 81: 17. 1968; in Willdenowia, 7: 433. 1974.

Poa annua var. *pilantha* Ronniger, Verh. Zool.-Bot. Ges. Wien 88/89: 97. 1941.

Type: Described from Zante Islands, Greece.

A-7 Wadi Derna, near town, 20.1.1967, *Boulos* 1295.

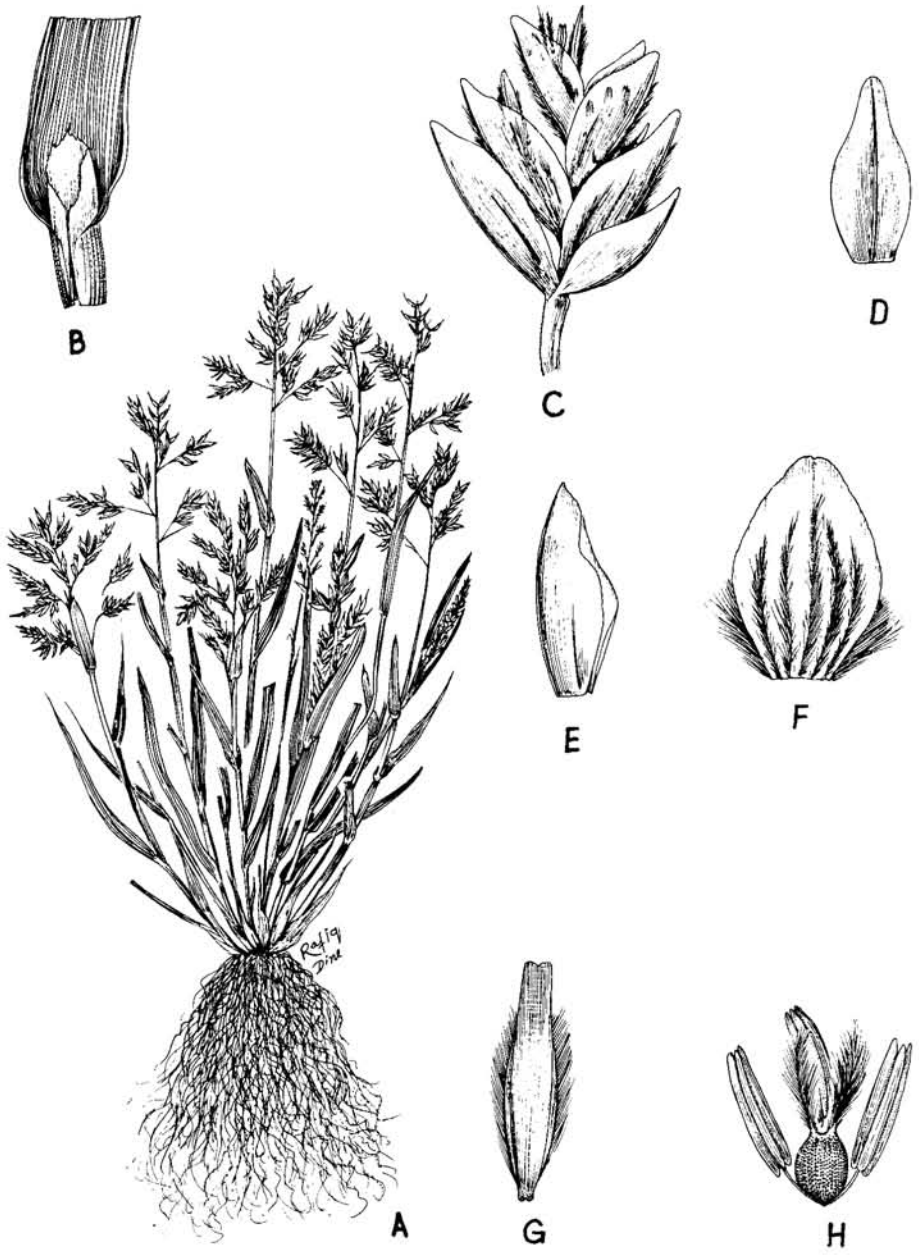


Fig. 19 **Poa annua**: A, habit × 0.5; B, portion of lamina, sheath and ligule × 3; C, spikelet × 8; D, lower glume × 10; E, upper glume × 10; F, lemma × 10; G, palea × 10; H, stamens and pistil × 20.

Distribution: Tunisia, Italy, Greece.

Fl.: Mar.-May

8 . **Poa infirma** Kunth in H., B. & K., Nov. Gen. ed. Sp. 1: 158. 1817; Keith, l.c. 784; Scholz, l.c. 433.

P. exilis Murb. ap. Aschers. et Graebn., Syn. Mitteleurop. Fl. 2: 389.1900, Durand & Barratte, l.c. 267., Pamp., Pl. Trip. 33. 1914; Prod. Fl. Cir. 119. 1931; *P. annua* L. ssp. *exilis* (Tomm.) Aschers. & Graebn., Syn. Mitteleurop. Fl. 2: 389. 1900; Maire, l.c. 3: 83. 1955.

Tufted annual. Culms erect-spreading, glabrous, ribbed, up to 20-(30) cm tall. Leaf up to 15 cm long, 5 mm wide, flat, abruptly contracted at the apex; leaf sheath loose. Panicle loose, branches spreading, (up to 9 cm tall), angular. Spikelets on peduncles of variable lengths, few-flowered; florets disarticulating individually above the glume; glumes 2, unequal, 1-1.75 mm long, glabrous, obtuse; lemma broadly hyaline, keel and lateral nerves with silky hair in younger florets; anthers 0.2-0.3 mm long. 2n = 14.

Type: Crescit in frigidis regni Novogranetensis inter Fontibor, Suba et Santa Fe de Bogata, *Humboldt & Bonpland* (holo.P).

A-7 Wadi El Kouf, Gebel Akhdar, 12.3.1968, *Boulos* 2226; *Pampanini & Pichi-Sermolli* 1050 (FI); Wadi Kuf, 15.4.1979. Isameldin Ahmad 140.

Also reported to be present in Tripolitania by Durand & Barratte (l.c.) etc.

Distribution: Mediterranean region, S.W. Asia and S. America.

Fl.: Mar.-May

It is quite difficult to differentiate it from *P. annua* from which it differs in having anthers about half as long as those of *P. annua*. The character used to separate the two taxa has been found to vary very much within the same individual specimen. Since the study of this taxon was based on only two specimens (*Boulos* 2226 & *Isameldin* 140), no critical comments on the relationship between the two taxa can be made. Therefore, the two taxa will remain as separate until more specimens become available to draw a definite conclusion.

19. CYNOSURUS

L., Sp. Pl. 72. 1753; Gen. Pl. ed. 5: 33. 1754.

Annuals or perennials. Leaves flat. Panicle globose, oval or one sided. Spikelets bristly and long awned or stiff and unawned, dimorphic, some sterile others fertile, the latter compressed laterally and enclosed or concealed within the sterile spikelets; sterile spikelets consisting of glumes and empty lemmas; rachilla disarticulating above the glumes and between the florets; glumes more or less equal, narrow; lemmas rounded on the dorsal surface, 3-5-nerved, mucronate or awned at the tip, palea 2-nerved, as long as lemma; stamens 3; lodicules 2, oblong with 2 very unequal teeth.

5-6 species distributed in the N. temperate regions of the old world; 3 species are present in Libya.

1. + Perennial, highly tufted; leaves rolled, sharp pointed — 1. **C. junceus**
   — Annual, solitary or fascicled; leaves not as above — 2

2. + Peduncle conspicuously curved below the panicle; anthers oblong-linear — 3. **C. elegans**
   — Peduncle erect below the panicle; anthers ovate — 2. **C. coloratus**

1. **Cynosurus junceus** Murb., in Act. Univ. Lund. 36, Afd. II. 1: 13. 1900; Durand & Barratte, l.c. 262; Pamp., Prod. Fl. Cir. 118. 1931; Maire, l.c. 53; Keith, l.c. 419; Scholz, l.c. 433.

Perennial, culms very small, glabrous, 12-22 cm long, fascicled, not exceeding the longest leaves. Leaf blade rolled, sharp pointed; ligule lacerated at the tip. Inflorescence somewhat lateral with short branches. Spikelets fertile and sterile; glumes and lemma of sterile spikelet not differentiated, linear-lanceolate, terminating into an awn, fertile spikelets with 2-3 florets, glumes subequal, scabrous, terminating into an awn; lemma oblong-lanceolate, scabrous, slightly 2-toothed at the tip; palea with 2 small mucro; anthers 3.

Type: Described from Libya (Cyrenaica).

Reported from the former Cyrenaica by Durand and Barratte (l.c.) etc.

Distribution: Endemic to Libya (Cyrenaica).

Fl.: July

2. **Cynosurus coloratus** Lehm. ex Steud., Nomencl. Bot. ed. 2, 1: 465. 1840; Durand & Barratte, l.c. 261; Pamp., Pl. Trip. 20. 1914; Prod. Fl. Cir. 117. 1931; Maire, l.c. 55; Keith, l.c. 419; Scholz, l.c. 433. (Fig. 20)

Annual, 10-20 cm tall, glabrous, geniculately ascending, few branches from the base. Leaves up to 60 mm long, 2-3 mm broad. Inflorescence head on long and erect peduncles, more or less one sided, 4 cm long and 3 cm broad, short branched with alternating glumes. Sterile spikelets with glumes and lemmas not differentiated, the lower linear to linear-lanceolate, 1-1.5 mm long, 1-nerved with a very long awn up to 20 mm, the 3-4 upper 3-nerved, scabrous. Fertile spikelets usually single flowered, glumes subequal, 6-7 mm long, with a short awn at the apex; lemma 3.5-4 mm long, 5-nerved, oblong-lanceolate, bidentate, with purple or violet-purple awn 15-20 mm long; palea more or less equal or shorter than lemma, 2-toothed, 2-keeled, scabrous on keels; anthers 3, ovate; ovary glabrous.

Type: Described from Europe.

A-6 Al Bakur, near Tocra, 10.3.1968, *Boulos* 2072; **A-7** near Slanta, 1.4.1970, *Davis* 50539; Between Barce and Tecnis, 3.4.1939, *Sandwith* 2306 (K); Shahat to Faidia, 1.4.1970, *Davis* 50525 (K).

Also reported from Tripolitania (Pamp., l.c.; Maire, l.c ; Keith, l.c.; Scholz, l.c.).

Distribution: Crete, Egypt, Syria, Palestine and S. Africa.

Fl.: Feb.-Apr.

3. **Cynosurus elegans** Desf., Fl. Atl. 1: 82, tab. 17. 1798; Durand & Barratte, l.c. 261; Pamp., Prod. Fl. Cir. 117. 1931; Maire, l.c. 60; Keith, l.c. 419; Scholz, l.c. 433. (Fig. 21)

Annual, up to 35 cm tall, erect or geniculately ascending, glabrous, glaucous, single or fascicled. Leaves and sheath highly pubescent, leaves flat, up to 10 cm long, 5 mm broad; ligule very long (5 mm) and membranous. Panicle one sided, 2-4 cm long, peduncle curved below the panicle, branches short, joints of branches having white bands. Sterile spikelets 5-6-flowered with glumes alternately arising from different nodes, stiff

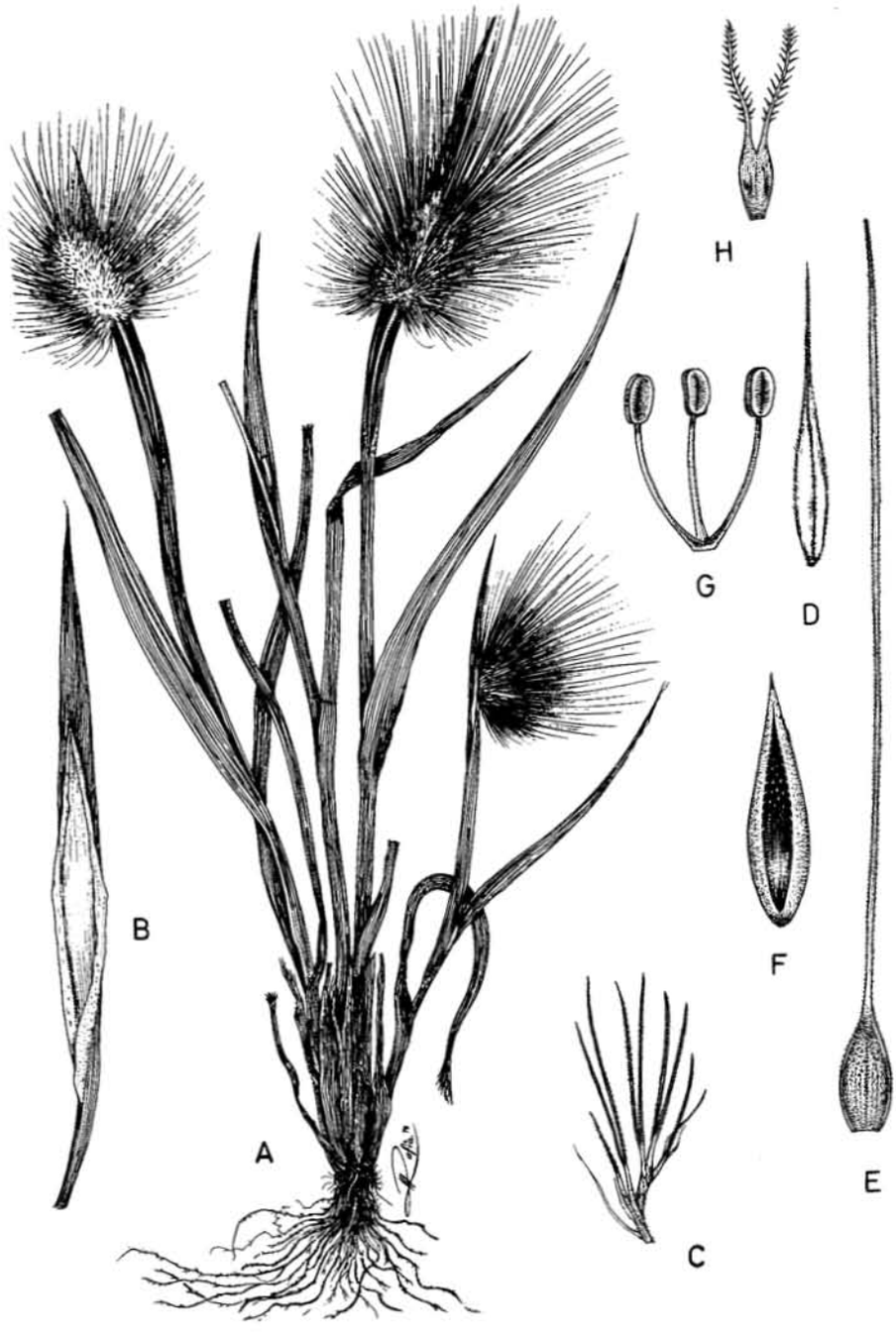


Fig. 20 **Cynosurus coloratus**: A, habit × 1; B, portion of lamina, ligule and sheath × 2; C, sterile spikelet × 2; D, glume of fertile spikelet × 5; E, fertile lemma × 5; F, palea × 10; G, stamens × 10; H, pistil × 10.

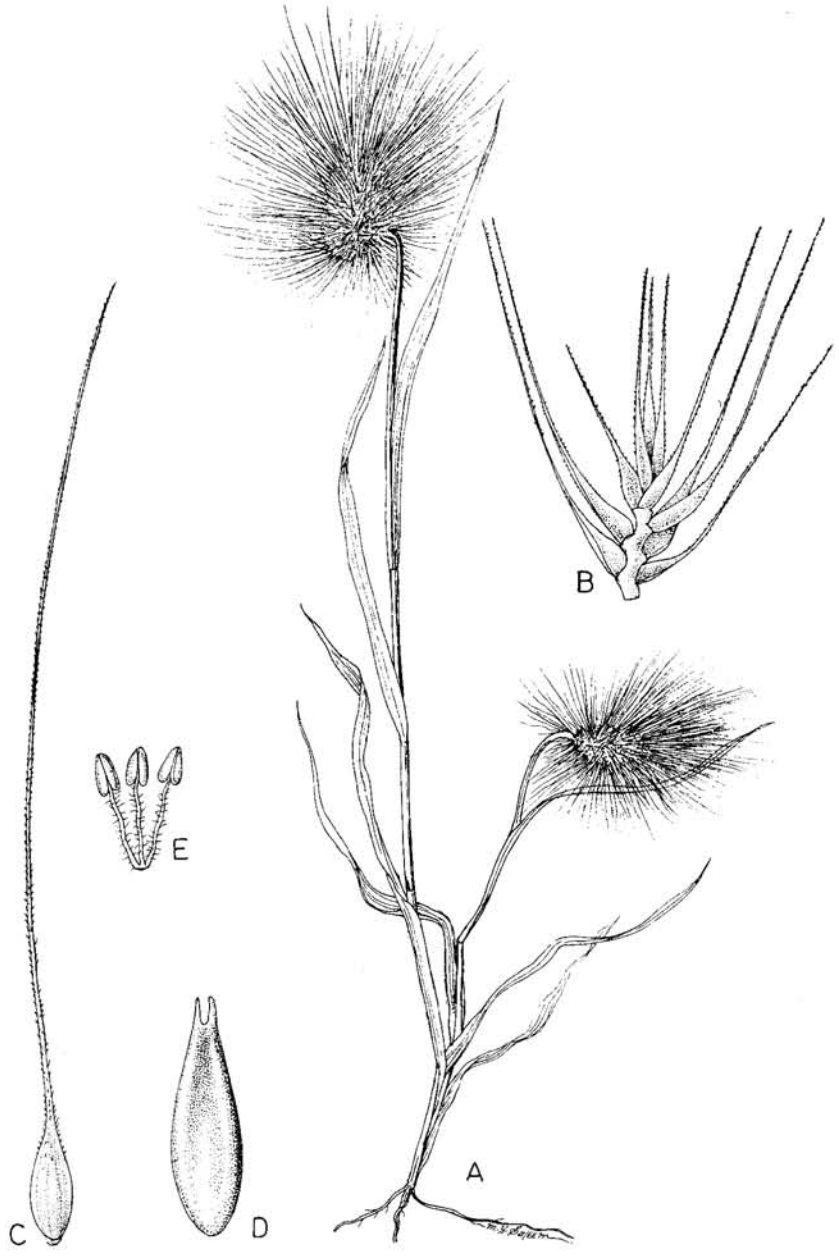


Fig. 21 **Cynosurus elegans:** A, habit × 1; B, sterile spikelets × 5; C, fertile lemma × 5; D, pistil × 12; E, stamens × 12.

and awn-like; both glumes and lemma pubescent, lemma 2 mm long, awned. Fertile spikelets 3, glumes keeled, membranous, lemma 3 mm long, elliptic, pubescent on the upper half, awn up to 12 mm; anthers oblong-linear.

Type: Described from Algeria.

A-7 Beda U. Beregd, 24.4.1934, *Pampanini & Pichi-Sermolli* 597 (FI); Cirene U. Belgadir, 26.4.1934, *Pampanini & Pichi-Sermolli* 598 (FI); Beda, U. el Kuf Bu Breica, 27.4.1934, *Pampanini & Pichi-Sermolli* 599 (FI); **A-7** Shahat, 4.5.1978, *Faruqi* 1731; Shahat, 7.5.1978, *Faruqi* 1801; *ibid, El-Gadi, Jafri and others* 1694; 2 km before Susa coming from Ras el Hilal, 14.4.1979.

Distribution: S.W. and Mediterranean Europe, N. Africa, Cyprus, Lebanon, Syria, Palestine, Turkey, Iran and C. Asia.

Fl.: Mar.-Apr.

20. **LAMARCKIA**

Moench, Meth. 201. 1794 (*nom. cons.*)

Annual herbs. Leaves flat. Panicle dense, one sided. Spikelets of 2 kinds, lower sterile and upper fertile, glossy, some spikelets in each cluster finely awned, each spikelet cluster pendulus and falling as a unit; lodicules 2; stamens 3; ovary glabrous.

A monotypic genus.

Lamarckia aurea (L.) Moench, Meth. 201. 1794; Durand & Barratte, l.c. 261; Pamp., Pl. Trip. 27. 1914; Prod. Fl. Cir. 118. 1931; Maire, l.c. 63; Keith, l.c. 592; Scholz, l.c. 433. (Fig. 22)

Cynosurus aureus L., Sp. Pl. 73. 1753.

A pale annual herb, up to 25 (-40) cm tall, erect or geniculately ascending, tufted, glabrous. Leaves flat, glabrous-scabrous, up to 13 cm long, 5 mm broad; ligule scarious, lacerated 10-20 mm long, usually glabrous. Panicle one sided with pendulus spikelet clusters, glossy, 4-7 cm long. Spikelets in each cluster of 2 kinds, the upper fertile, 1-flowered, acute, awned, the lower of 5-10 sterile lemmas, unawned, obtuse; glumes 2, equal, shortly awned, 3 mm long, glabrous to densely puberulent. A reduced spikelet of the same shape as the fertile one is borne on the pedicel with one of the sterile ones. $2n = 14$.



Fig. 22 **Lamarckia aurea**: A, habit × 1; B, portion of lamina, ligule and sheath × 4; C, a cluster of spikelets × 5; D, spikelet with unawned sterile lemmas × 5; E, reduced awned spikelet × 5; F, lower glume × 8; G, upper glume × 8; H, fertile lemma × 8; I, palea × 8; J, pistil × 8.

Type: Described from southern Europe.

A-2 Yefran hills, 27.3.1976, *Faruqi* 547; **A-3** Gharian, 12.4.1974, *S.I. Ali* 2084; *ibid, M. Godeh* 280; *ibid,* 10.4.1975, *Z. Abou Raya* 379; Leptis Magna, 29.3.1975, *S.I. Ali* 2571; *ibid,* 8.3.1968, *Boulos* 1874; **A-6** Gaminas, Benghazi Road, 9.3.1968, *Boulos* 1970; 10 km from Benina towards Al-Abiar, on hill slope, 12.3.1978, *Faruqi* 1663; **A-7** Al-Tamimi, S.E. Derna, 13.3.1968, *Boulos* 2258; Ain Mara, 5.5.1978, *Faruqi* 1772, 1777; Shahat, 26.3.1970, *Davis* 50007 & 50072; *ibid,* 4.5.1978, *A. El-Gadi, Jafri & others* 1388-G; 22 km E. of Labrag, 6.5.1978, *A. El-Gadi, Jafri & others* 1678-G; Derna, near water-fall, 25.3.1980, *A. El-Gadi & M.A. Siddiqi* 3492.

Distribution: Mediterranean region, Ethiopia, Iran, Afghanistan and Pakistan.

Fl.: Mar.-Apr.

21. **BRIZA**

L., Sp. Pl. 70. 1753; Gen. Pl. ed. 5: 32. 1754.

Annual or perennial herbs. Leaf flat. Inflorescence a loose nodding panicle with delicate branches or dense panicle. Spikelets laterally compressed, broad, more or less triangular, with several hermaphrodite flowers, awnless; glumes boat-shaped; rachilla disarticulating above the glumes; lemma cordate-rounded at the base, many-nerved; palea smaller than lemma, obovate, 2-keeled; stamens 3; lodicules 2; caryopsis rounded on the back.

c. 20 species of the N. temperate area and S. America; only 2 species are reported from Libya.

+ Spikelets 3 mm long	1. **B. minor**
– Spikelets 10-15 mm long	2. **B. maxima**

Briza minor L., Sp. Pl. 70. 1753; Pamp., Prod. Fl. Cir. 115. 1931; Maire, l.c. 104; Keith, l.c. 301; Scholz, l.c. 433.

Annual up to 60 cm tall, glabrous, erect, few branches from the base. Culm glaucous. Leaf and sheath glabrous. Inflorescence a nodding well branched panicle, 10-13 cm long, panicle branches very thin with broad (3-4 mm) spikelets at their tips. Spikelets pyramid-like, 3 mm long and 5 mm wide; florets alternating, 3-5; glumes cup-like, 2 mm

long and 2 mm wide, glabrous, hyaline, ovate; lemma also similar to the glumes in shape.
2n = 10, 14.

Syntypes: Described from Helvetia (Switzerland) and Italy.

A-6 Benghazi, 30.4.1917, *Zanon* 29 (FI); Baida, Dahret Scissu Gattara Abid, 7.5.1934, *Pampanini & Pichi-Sermolli* 458 (FI).

Distribution: Europe, Mediterranean region, Iraq, Iran, Caucasus, S. Russia; introduced into S. Africa, Australia, Japan, U.S.A. and S. America.

Fl.: Mar.-June

2. **Briza maxima** L., Sp. Pl. 70. 1753; Durand & Barratte, l.c. 266; Pamp., Pl. Trip. 14. 1914; Prod. Fl. Cir. 115. 1931; Maire, Fl. Afr. Nord. 3: 101. 1955; Keith, Prelim. Check List Lib. Fl. 301. 1965; Scholz, Willdenowia, 7: 433. 1974. (Fig. 23)

Annual, (smaller than *B. minor*), up to 30 cm tall, erect. Culm slender. Inflorescence a panicle with spikelets on wiry branches. Spikelets pyramidal, up to 15 mm long and 8 mm broad; glumes cup-like 5 mm broad, lemma glabrous to pubescent, 4 mm long. 2n = 14.

Type: Described from Italy and Portugal, Herb. Linn. 88/6 (LINN).

A-3 13-6 km S. of Gusbat, 26.3.1979, *A. El-Gadi* 2604; **A-6** Al-Bakur, near Tokra, Jabal Akhdar, 10.3.1968, *Boulos* 2100; 10 km from Benina towards Al-Abiar, on hill slope, 12.3.1978, *Faruqi* 1657; **A-7** El-Karsa, Derna-Ras el Hilal, Jabal Akhdar, 11.3.1968, *Boulos* 2132; Shahat, 6.5.1978, *Faruqi* 1784, *ibid.*, 26.3.1970, *Davis* 50100; *ibid.*, 14.4.1979, *Nadia S.* 72; *ibid., Fauzi, A. Ouheda* 72; *ibid.*, 4.5.1978, *A. El-Gadi, Jafri & others* 1387; *ibid.*, 14.4.1979, *M.A. Siddiqi and Ramadan* 2487-Z; 25 km from Ras el Helal, 25.3.1980, *Mofida M. Mustafa* 224; 14 km from Ras el Hilal to Derna, 25.3.1980; *Saleh Hassan M.* 168; Wadi El Kuf, 24.3.1980, *Saleh Hassan M.* 117; 21 km from Al Gubba to Ras el Helal, 14.4.1979, *M.A. Siddiqi & Ramadan* 2501-Z; Tolmetta, 22.4.1978, *M.A. Siddiqi, Fathi and Ramadan* 1121-Z; 10-25 km from Derna on way to Tamimi, 27.3.1980, *A. El Gadi and M.A. Siddiqi* 3798; 47 km W. of Baida, 22.3.1980, *A. El-Gadi & M.A. Siddiqi* 3048; Wadi Mahbool, 23.3.1980, *A. EL-Gadi & M.A. Siddiqi* 3171.

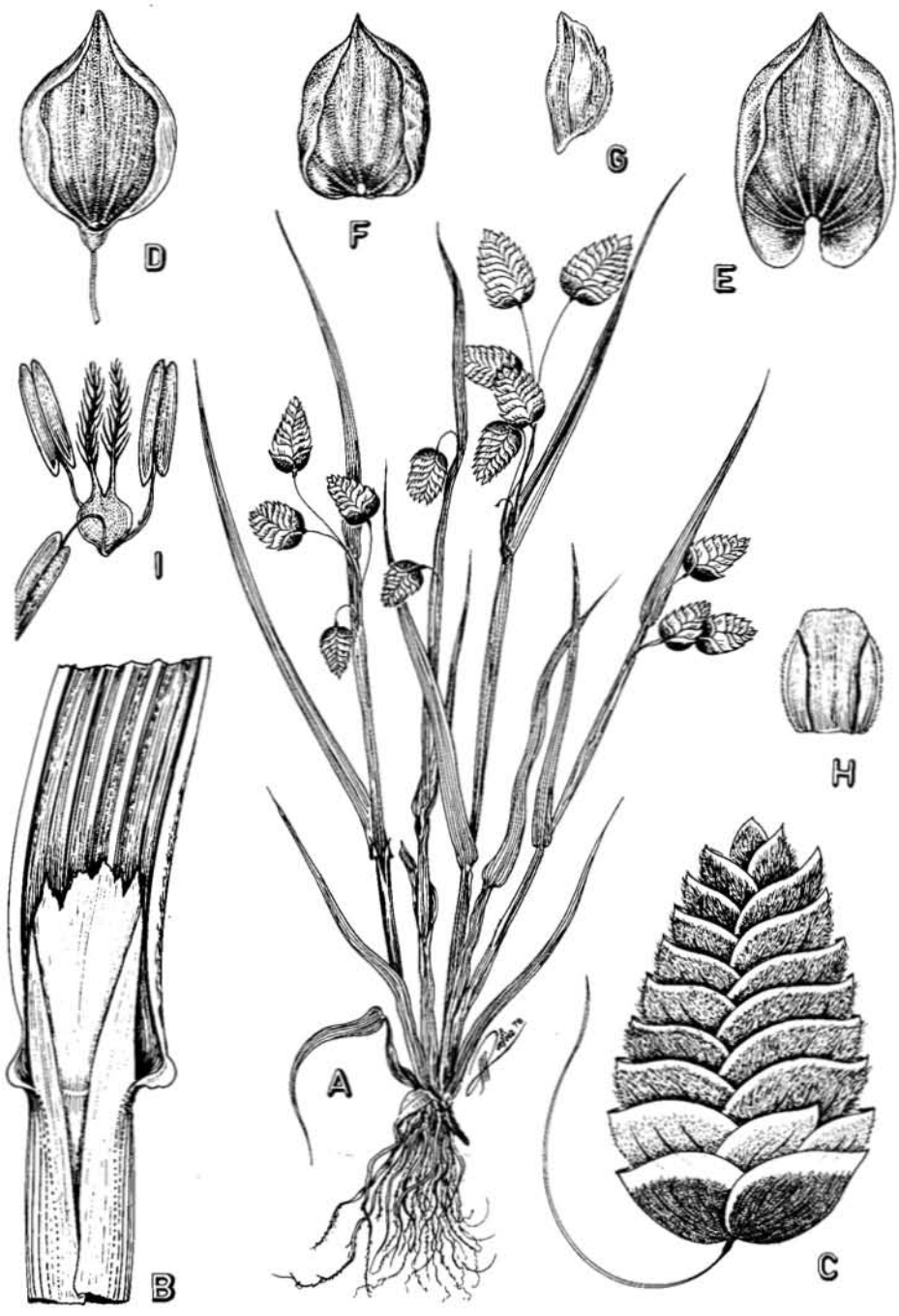


Fig. 23 **Briza maxima**: A, habit × 0.5; B, portion of lamina, ligule and sheath × 10; C, spikelet × 3; D, lower glume × 5; E, upper glume × 5; F, lemma × 5; G, H, palea lateral and ventral views × 5; I, stamens and pistil × 10.

Also reported from former Tripolitania by Pamp. (l.c.) and others.

Distribution: Mediterranean region, S. Africa, Macronesia; introduced into Australia.

Fl.: Mar.-Apr.

22. **CATABROSA**

P. Beauv., Ess. Agrost. tab. 19,97. fig. 8.1812.

Perennial, grows in damp places. Leaf blades flat, much branched; panicle with subsessile spikelets. Spikelets 1-3, usually 2-3-flowered; rachilla disarticulating above the glume; glumes persistant, unequal, broad, the lower nerveless, upper 1-3-nerved; lemma 3-nerved, palea 2-keeled; stamens 3; lodicules 2; caryopsis loose, hilum short, supra-basal.

c. 4 species of temperate region, only one is found in Libya.

Catabrosa aquatica (L.) P. Beauv., Ess. Agrost. tab. 19, 97. fig. 8. 1812; Durand & Barratte, l.c. 265; Pamp., Fl. Cir. 114. 1931; Maire, l.c. 29; Keith, l.c. 337; Scholz, l.c. 433.

Aira aquatica L., Sp. Pl. ed. 1: 64. 1753.

Perennial grass, 25 cm tall, geniculately ascending, rhizomaceous, glabrous-finely ciliate. Leaves up to 15 cm long, 2-7 mm broad, tip broad. Inflorescence a much branched loose panicle, 10 cm long. Spikelets sessile, usually 1-flowered, sometimes up to 3; florets disarticulate above the glume; glumes 2, large glume lobed and broad at the tip, the small usually acute and narrow, longer glume up to 1.5 mm long and 1 mm broad, the smaller 1 mm long and 0.5 mm broad; lemma hyaline, 3-nerved, glabrous, 2.5 mm long, tip broad, truncate.

Type: Described from Europe, Herb. Linn. 85/6, photo (LINN).

A-7 Matan Borgu, 6.9.1919, *Maugini* s.n. (FI).

Distribution: Throughout Europe and temperate northern hemisphere including Syria, Lebanon, Palestine, Jordan, Turkey, Iran, Afghanistan, Pakistan, India, China and Tibet.

Fl.: May-June

23. AMPELODESMOS

Link., Hort. Berol. 1: 136. 1827.

Robust perennials. Leaves flat, ligule membranous. Inflorescence a much branched panicle. Spikelets 2-5 florets; rachilla pilose; florets usually hermaphrodite; glumes unequal, smaller than the spikelet; lemma 5-nerved, villous on the lower half, bidentate, one small awn between the teeth; palea smaller than lemma, 2-keeled; lodicules 2; stamens 3; ovary hairy at the top.

A monotypic genus.

Ampelodesmos mauritanica (Poiret) Th. Dur. & Schinz, Consp. Fl. Afr. 5: 874. 1894; Durand & Barratte, l.c. 262; Pamp., Prod. Fl. Cir. 111. 1931; Maire, l.c. 2: 222, Keith, l.c. 223; Scholz, l.c. 433; KitTan in Davis, Fl. Turk. 9. 560. 1985.

Arundo mauritanica Poir., Voyage 2: 104. 1789.

A rhizomaceous robust grass up to 2 m tall. Culm glabrous, scabrous below the panicle. Leaf 1 m or more long, very acuminate, whip-like, glabrous. Inflorescence a branched panicle; branches variable within and between the plants, in certain plants longest branches could be up to 6 cm long, while in others up to 3 cm long. Spikelets with 2-5 florets, the terminal rudimentary, 15 mm long; glumes unequal, 8.5 and 10 mm long, acuminate, awn tipped, glabrous-granulated; lemma villous on the lower half and granulated; lodicules 2, lanceolate, 1-nerved, 3 mm long; anthers 3; caryopsis hairy at the top.

Type: 'a Mauritania, collines prope Cagliari (Sardinia), *Gouan* 142 (K).

Reported from Cyrenaica and Tripolitania by Durand & Barratte, (l.c.) etc.

Distribution: Mediterranean region.

Maire (l.c.) doubts the presence of this plant in our area and believes that these records need confirmation. Keith (l.c.) however, mentions that this plant is similar to *Stipa tenacissima* in appearance which might indicate that he has seen the plant under

living conditions. We have, however, not seen any authentic specimen of this species from Libya.

24. **BRACHYPODIUM**

P. Beauv., Ess. Agrost. 100. 1812.

Annuals or perennial. Culm slender. Inflorescence a raceme. Spikelets subsessile (an aspect of *Lolium*), terete, many-flowered; florets bisexual or uppermost reduced; rachilla disarticulating above the glume; glumes unequal, persistent; lemma lanceolate, acuminate, awned; palea as long as lemma, 2-keeled; stamens 3; lodicules 2, lanceolate, ciliate on the margins; caryopsis with hairy appendage, hilum linear.

About 9 species, distributed in the temperate zone and tropical mountains; only 1 species is recorded from Libya.

Brachypodium retusum (Pers.) P. Beauv., Ess. Agros. 101. 1812; Scholz, Willdenowia, 7: 434. 1974.

Bromus retusus Pers., Syn. 1: 96. 1805; *Brachypodium ramosum* Roemer et Schultes, Syst. 2: 737. 1817; Maire, FI. Afr. Nord. 3: 274. 1955.

A short stiff perennial with creeping rhizome, 15-20 cm tall. Culm slender, glabrous. Leaves stiff, needle-like, up to 3 cm long, 1 mm broad, rolled longitudinally, spine tipped; leaves and sheath puberulent; sheath with a tendency of being flat; ligule a membrane, 1/2 mm long, minutely ciliated, lacerated. Inflorescence a spike of either one or up to 3 spikelets. Spikelets up to 2 cm long, dorsoventrally compressed, 6-8 florets; glumes 4 & 6 mm long, unequal, glabrous, deeply ribbed, lanceolate, mucronate; lemma 8 mm long, 2 mm wide, an awn like mucro 0.5-0.75 mm long; palea broad tipped.

Type: Described from France.

A-7 Al Abrak, 4.5.1934, *Pampanini and Pichi-Sermolli* 429 (FI).

Distribution: Mediterranean region.

Fl.: Apr.-June

A polymorphic species, consequently divided into several infraspecific categories.

25. **TRACHYNIA**

Link, Hort. Bot. Berol. 1: 42. 1827.

Annual, glaucous. Leaf flat. Inflorescence a spike of spikelets. Spikelets few, many-flowered, crowded at the top of peduncle, laterally compressed; glumes unequal; lemma awned; stamens 3; lodicules 2, ciliate towards the apex; caryopsis adnate to the palea, hilum linear.

A monotypic genus.

Trachynia distachya (L.) Link, Hort. Bot. Berol. 1: 43. 1827; Scholz, l.c. 434. (Fig. 24)

Bromus distachyos L., Cent. 2: 8. 1756, Amoen Acad. 4: 304. 1759; *Brachypodium distachyom* (L.) P. Beauv., Ess. Agrost. 101, 155. 1812; Durand & Barratte, Prodr. Fl. Lib. 274. 1910; Pamp., Pl. Trip. 13. 1914, Prod. Fl. Cir. 132. 1931; Maire, Fl. Afr. Nord. 3; 277. 1955; Keith, Prelim. Check List Lib. Fl. 295. 1965.

Annual, few cm to 50 cm tall. Culm slender, glabrous, few branches from the base. Leaf flat, pubescent with long hairs, 5 cm long and 3 mm wide. Inflorescence a stiff spike of spikelets, 3-4 cm long, 5 mm wide, 2-4 spikelets per spike. Spikelets 1.5-2 cm long, 8-20-flowered, laterally compressed, elliptic-lanceolate; florets 2-ranked arranged in 2 rows; glumes 2, highly ribbed, glabrous, 4.5-5.5 mm long, acute; lemma glabrous to adpressedly hairy, 7 × 1.5 mm extending into an awn up to 2 cm long.

Type: Described from S. Europe & Orient, Herb. Linn. 93/46, photo (LINN).

A-2 Yafran hills, 3 km from Yafran on way to Tripoli, 27.3.1976, *Faruqi* 541; **A-3** Misrata, sea shore, 26.4.1967, *Boulos* 1824; Tripoli, barley fields, Faculty of Science, 18.4.1967, *Boulos* 1685; 22 km West Khoms, 25.4.1967, *Boulos* 1771; Zanzur, roadside, 25.3.1976, *Faruqi* 496; Zanzur beach, *ibid.*, 509; c. 20 km on old airport road, Tripoli, 7.5.1976, *Faruqi* 607 & 693; Hadba Khadra, Tripoli, 7.5.1976, *Faruqi* 653; Zanzur gate, main highway, 9.3.1977, *Faruqi* 1224; 2 km from Gharian hills, 86 km from Tripoli, 27.3.1977, *Faruqi* 1315, 1316 & 1317. **A-4** 10 km of Buwairat, 14.3.1978, *Faruqi* 1700; **A-6** 10 km from Tokra, towards Baida, 10.3.1978, *Faruqi* 1627; 20 km from Tokra, towards Baida, 10.3.1978, *Faruqi* 1634; Gar Yunus, Benghazi, 13.3.1978, *Faruqi* 1665; **A-7** Um Rezum, S.E. Derna, 13.3.1968, *Boulos* 2359; Wadi Derna, 14.3.1968, *Boulos* 2408; Baida, 23.5.1977, *Faruqi* 1367-b; 10 km from Baida on way to Derna, 23.5.1977,

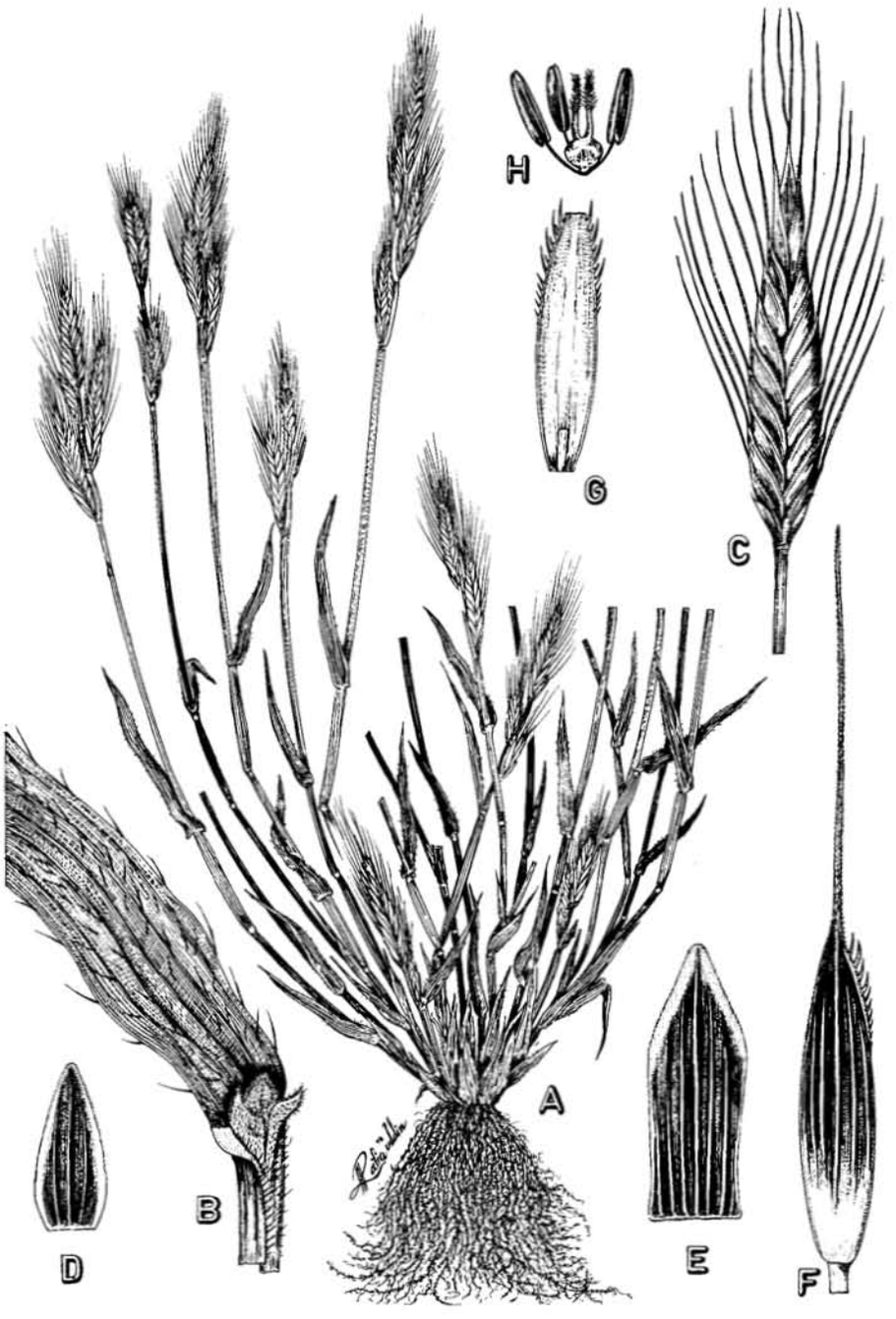


Fig. 24 **Trachynia distachya**: A, habit x 0.5; B, portion of lamina, ligule and sheath × 5; C, spikelet × 2; D, lower glume × 5; E, upper glume × 5; F, lemma × 5; G, palea × 5; H, stamens and pistil × 10.

Faruqi 1368-d; 3 km from Shahat on way to Derna, 4.5.1978, *Faruqi* 1753; 22 km E. of Gubba, on way to Derna, 5.5.1978, *Faruqi* 1768; c. 5 km from Shahat on way to Baida, 18.6.1972, *S.I.Ali* 615; c. 16 km from Labrag, 19.6.1972, *S.I. Ali* 740; Wadi Mahbool, 23.3. 1980, *A. El Gadi & M.A. Siddiqi* 3177.

Distribution: Mediterranean region and S.W. Central Asia.

26. **BROMUS**

L., Sp. Pl. 76. 1753; Gen. Pl. ed. 5: 33. 1754.

Annuals or perennial. Leaf sheath tubular, blade flat. Inflorescence a contracted or loose panicle. Spikelets usually many-flowered, wedge-shaped or lanceolate; rachilla disarticulating above the glume and between the florets; glumes unequal, awnless, shorter than the lemma; lemma bifid at the apex, awned from below the tip or muticous, 5-9-nerved; palea 2-keeled, ciliate on the keel; stamens 3; lodicules 2, net veined, glabrous; caryopsis flattened, oblong, tapering at the base, hilum linear.

c. 50 species, distributed in the temperate regions and the tropical mountains; 12 species are found in Libya.

1.	+ Spikelets ovate, elliptic or lanceolate; tapering towards the tip; lower glume 3-nerved	2
	— Spikelets oblong or wedge-shaped, not tapering towards the tip; lower glume 1-nerved	8
2.	+ Largest spikelets (excluding awns) 3 cm long or more	3
	— Largest spikelets (excluding awns) up to 2.5 cm long	4
3.	+ Panicle axis often with single spikelet on each node; spikelets usually 6 or less per panicle	9. **B. caroli-henrici**
	— Panicle axis often with 2 or more spikelets on each node; spikelets 7 or more per panicle	10. **B. lanceolatus**
4.	+ Panicle extremely dense, ovate-obovate or flabellate	5
	— Panicle lax, if dense, then lanceolate or oblong	6

5.	+ Spikelets 20-25 cm long; lemma 9-11.5 × 3-4 mm; awn 8-15 mm long; panicle usually flabellate	6. **B. chrysopogon**
	— Spikelets 8-20 mm long; lemma 7-8(-10) × 1-2.5 mm; awn 7-9(-12) mm long; panicle ovate-obovate	7. **B. scoparius**
6.	+ Awns 10 mm long or more	8. **B. alopecuros**
	— Awns less than 10 mm long	7
7.	+ Awns reflexed	11. **B. intermedius**
	— Awns straight	12. **B. molliformis**
8.	+ Lemmas of mature spikelets 20 mm long or more (excluding awn); awn 30 mm long or more; lower glume 15-25 mm long, upper glume 20-35 mm long	9
	— Lemmas of mature spikelets less than 20 mm long (excluding awn); awn up to 25 mm long; lower glumes 5-9(10) mm long; upper glume 7-15 mm long	10
9.	+ Panicle dense, erect, with branches mostly shorter than spikelets (excluding awns); spikelets conspicuously crowded	1. **B. rigidus**
	— Panicle lax, spreading or nodding, with branches equalling or longer than spikelets (excluding awns); spikelets spaced and drooping	2. **B. diandrus**
10.	+ Panicle lax, at least some branches more than 10 mm long; spikelets not densely crowded	3. **B. madritensis**
	— Panicle dense, branches up to 10 mm long; spikelets densely crowded	11
11.	+ Panicle with numerous spikelets (more than 10), brush-like, usually more than 5 cm long (including awns); spikelets 4 or more on each branch; awns straight at maturity	4. **B. rubens**

— Panicle with several spikelets (10 or less), not brusk-like, 2-5 cm long (including awns); spikelets 1-2 on each branch; awns widely spreading at maturity 5. **B. fasciculatus**

1. **Bromus rigidus** Roth in Bot. Mag. (Roem. & Usteri) 4, 10: 21. 1790; Durand & Barratte, l.c. 273; Maire, l.c. 232; Keith, l.c. 303; Scholz, l.c. 434. (Fig. 25)

B. villosus Forsk., Fl. Aeg. Arab. 23. 1775; *B. villosus* var. *rigidus* (Roth) Aschers. et Graebn. in Syn. Mitt. Fl. 11: 596. 1901; Pamp., Pl. Trip. 17. 1914; Prod. Fl. Cir. 127. 1931; *B. maximus* Desf., Fl. Atl. 1: 95. 1798.

Annual up to 50-(80) cm tall. Culm pubescent above, glabrous below, erect-geniculately ascending, tufted. Leaf up to 20 cm long, 4-6 cm wide, covered with villous hairs; ligule membranous, toothed; sheath villous. Panicle contracted, erect, branches 0.5-2.5 cm. Spikelets crowded, 7-9 cm with straight awns, florets 6-8, not completely overlapping; glumes glabrous, unequal 15 or more and 20-(26) mm long, acuminate, lower glume narrow, 1-nerved; lemma 30 mm long, tip divided; palea toothed at the margins.
2n = 28, 42, 56, 70.

Type: Not indicated.

A-3 Tripoli, Faculty of Agriculture, 11.4.1978, *Ramadan Labany* 88-R; Hashshan, 28.1.1961, *Kheiri Saghir* s.n.; 20-23 km east of Tripoli, coastal road to Khoms, 8.3.1967, *Boulos* 1571; Tajura, Tripoli, 24.3.1976, *Faruqi* 421; Sharshara, Tarhuna, 24.3.1976, *Faruqi* 489; Zanzur Beach, 24.3.1976, *Faruqi* 503; c. 20 km on the Old Airport Road, Tripoli, 7.5.1976, *Faruqi* 608, 615, 618 & 619; Ain Zara, Tripoli, 6.3.1977, *Faruqi* 1208 & 1209; **B-2** 17 km from Yafran on way to Nalut, 27.3.1976, *Faruqi* 563.

Distribution: Mediterranean region, Lebanon, Syria, C. & S. Europe and S.W. Asia.

Fl.: Mar.-June *Vern.* Bu-shrenta

2. **Bromus diandrus** Roth in Bot. Abhl. 44. 1787; Scholz, l.c. 434. (Fig. 26)

B. rigidus Roth ssp. *gussonii* (Parl.) Maire in Jehand. et Maire, Cat. Maroc.



Fig. 25 **Bromus rigidus:** A, habit × 0.5; B, spikelets × 1; C, lower glume × 2; D, upper glume × 2.



Fig. 26 **Bromus diandrus:** A, habit × 0.5; B, spikelet × 1; C, glumes × 2.

865. 1934; Maire, Fl. Afr. Nord. 3: 233. 1955; *Anisantha gussonii* (Parl.) Nevski in Acta Univ. As. Med. Ser. VIII b, Bot. Fasc. 17: 20. 1934; *A. diandra* (Roth) Tutin, Fl. Brit. Isles. ed. 2: 1149. 1962.

Annual, up to 80 cm tall. Culm glabrous, erect, 1 to few branches from the base. Leaf with long hairs, linear, up to 20 cm long, 3-5 cm wide; sheath villous; ligule membranous, lacerated with long hair. Panicle quite lax, up to 30 cm long and 20 cm wide, branches up to 5 cm long excluding spikelets. Spikelets wedge-shaped, 7-9 cm long (including awns), spaced and drooping, 8-10-flowered; glumes highly acuminate, unequal, lower 15-23 mm long, 1-nerved, upper 20-32 mm long, 3-5-nerved; lemma 22-36 mm long, acuminate, 2-toothed, margins broadly hyaline, awned, awn straight and broom-like, 3-6 cm long. 2n = 56.

Type: Seeds obtained from Passulas which were cultivated in the Nurnberg Botanical Garden (*Roth*).

A-3 Tripoli, University Campus, 15.2.1976, *Jafri* 6291 & 6292; Jadida, 5.12.1975, *Fathi R.* 39; Gurgi, 5 Km west Tripoli, 24.3.1967, *Boulos* 1638; Tajura, 24.3.1976, *Faruqi* 422; Sharshara, Tarhuna, 24.3.1976, *Faruqi* 488; 22 Km west Khoms, calcareous slopes, 25.4.1967, *Boulos* 1770.

Distribution: Mediterranean region, Asia Minor, Central Asia, Syria, Lebanon, Palestine. Introduced into England, coastal W. Europe.

Fl.: Mar.-Apr.

3. **Bromus madritensis** L., Cent. Pl. 1.5.1755; Amoen. Acad. 4:265.1759; Durand & Barratte, l.c. 273; Pamp., Pl. Trip. 16. 1914; Prod. Fl. Cir. 126. 1931; Maire, l.c. 235; Keith, l.c. 302; Scholz, l.c. 434. (Fig. 27)

Zerna madritensis (L.) S.F. Gray, Nat. Arr. Brit. Pl. 2: 117. 1821; *Anisantha madritensis* (L.) Nevski in Acta Univ. As. Med. Ser. VIII b, Bot. Fasc. 17: 21. 1934.

Annual, up to 80 cm tall. Culms smooth and glabrous, very sparsely hairy below the panicle. Leaf pilose, linear-acuminate, up to 20 cm long, 5 cm broad; ligule membranous. Panicle loose, nodding, up to 14 cm long, branches 10 mm or more (excluding spikelets) long, pubescent. Spikelets wedge-shaped, not pointed at the top, 2.5-4 cm



Fig. 27 **Bromus madritensis**: A, habit × 0.5; B, spikelet × 1.5; C, lower glume with single nerve × 5.

long, 5-14 florets, partly free; glumes unequal, the inner 13-14 mm long, the outer narrow, 1-nerved, 7-9 mm; margin of palea lined with white hairs, awns straight, up to 25 mm long, lemma tip divided, pubescent or glabrous. 2n = 14, 28, 42.

Type: Described from Spain *Loefling,* Herb. Linn. 93/35 (LINN).

A-2 Ain Rumia, 10.4.1975, *Fauzia* 344; **A-3** Shara Ben Ashur, Tripoli, 1.5.1978, *Faruqi* 1720; **A-7** Shahat, 4.5.1978, *Faruqi* 1735 & 1736; 16 Km from Labrag, c. 30 Km from Lamluda, 19.6.1972, *S.I. Ali* 720 & 737; Wadi el-Mahbool, 23.3.1980, *A. El Gadi & M.A. Siddiqi* 3172; Wadi Kuf, 8.5.1978, *Faruqi* 1845; near Derna water-falls, 25.3.1980, *A. El Gadi & M.A. Siddiqi* 3433.

Distribution: Europe, N. Africa, Anatolia, Syria, Iraq, Iran and introduced into N. & S. America and Australia.

Fl.: Mar.-June

4. **Bromus rubens** L., Cent. Pl. 1:5.1755; Amoen Acad. 4: 265. 1759; Durand & Barratte, l.c. 273; Pamp., Pl. Trip. 16. 1914; Prod. Fl. Cir. 127, 1931; Maire, l.c. 239; Keith, l.c. 303; Scholz, l.c. 434.

   Anisantha rubens (L.) Nevski, in Acta Univ. As. Med. Ser. VIII b, Bot. Fasc. 17: 19. 1934.

Small annual, 15-20 cm tall, occasionally 30 cm. Culm glabrous-finely puberulent below the panicle, covered by leaf sheath, tufted, geniculately ascending. Leaf 4-6 cm long, linear, acuminate; ligule membranous. Panicle very dense, obovate to obovate-oblong, erect, usually more than 4 cm long, sometimes longer, branches 1-10 mm long, lower fasciculate with 4-5 spikelets on each branch. Spikelets 4-10 florets, 2.5-4 cm long (including awns), peduncles pubescent; glumes acuminate, keeled on the central nerve, pubescent, hyaline, unequal, 5-7 and 8-10 mm long, lower glume narrow, 1-nerved; lemma pubescent, sometimes glabrous, 13-15 mm long, awned, awn 10-18 mm long, straight, hyaline teeth on the apex of lemma, long hairs at the margins; anthers 0.6-1 mm long. 2n = 28

Type: Described from Spain, *Loefling* 84, Herb. Linn. 93/28 (LINN).

A-2 Al Awenia, c. 7 Km from Rumia, barley field, 11.4.1974, *S.I. Ali* 2005; ibid, 10.4.1975, *Faruqi* 300; Yafran hills, 3 Km from Yafran on way to Tripoli, 27.3.1976, *Faruqi* 552; Gwalish, 21.5.1976, *Faruqi* 771; Shakshuk, 6.2.1976, *Fathi Ratib* 97; **A-3** Zanzur, 9.3.1977, *Faruqi* 1229, 1230 & 1233; Tajura, Tripoli, 24.3.1976, *Faruqi* 419; Airport road, Tripoli, 5.3.1977, *Faruqi* 1189; **A-4** Tawargha, 14.3.1978, *Faruqi* 1704; **A-6** Garyounis, Benghazi, 13.3.1978, *Faruqi* 1670; 5 Km from Al-Abiar towards Merj, 12.3.1978, *Faruqi* 1652 & 1654; 15 Km from Tokra on way to Baida, 10.3.1978, *Faruqi* 1629; **A-7** near Derna water falls, 25.3.1980, *El-Gadi & M.A. Siddiqi* 3449; Shahat, 4.5.1978, *Faruqi* 1737 & 1740; **B-2** c. 7 Km before Zintan, 12.4.1974, *Milad K.* 410; **B-6** 79 Km from Ajdabiyah on way to Benghazi, 3.5.1978, *A. El-Gadi, Jafri & others* 1343; **E-1** 70 Km from Ghat, beyond new airport, 19.2.1977, *M. Ahmed* 1126-S.

Distribution: Europe, Mediterranean region, Anatolia, Iraq, Iran, Afghanistan & Turcomania.

A highly variable species with glabrous or highly pubescent lemmas.

Fl.: Mar.-June *Vern.* Bo-shrenta

5. **Bromus fasciculatus** C. Presl, Cyp. et Gram. Sic. 39. 1820; Durand & Barratte, l.c. 273; Pamp., Pl. Trip. 15. 1914; Prod. Fl. Cir. 129. 1931; Keith, l.c. 302; Scholz, l.c. 434.

B. fasciculatus C. Presl var. *alexandrinus* Thell. in Feddes Rep. 5: 161. 1908; *B. rubens* L. ssp. *fasciculatus* (Presl) Trabut in Batt. & Trab., Fl. Alg. Monocot. 226. 1884; *Anisantha fasciculata* (Presl) Nevski in Acta Univ. As. Med. Ser. VIII b, Bot. Fasc. 17: 21. 1934.

Annual, 5-20 cm tall, sometimes taller. Culm erect, geniculate at the base, puberulent below the panicle, slender. Leaves glabrous-(softly hairy), up to 10 cm long, 2-4 mm broad, acuminate; sheath densely pubescent with long hairs. Panicle dense, pilose, obovate, 4-5 cm long, 3-4 cm broad at the top, branches short, 1-10 mm long, with 1-2 spikelets on each branch. Spikelets subsessile, somewhat wedge-shaped, 2-5 cm long, densely crowded, up to 16 florets; glumes unequal 6 and 8 mm long, highly acuminate, lower glume narrow, 1-nerved; upper 1-2 florets sterile, lemma linear-lanceolate, 12 mm long, glabrous or hairy, margins involute, awns more or less equal and bent out in the same direction as the lemma, not exactly broom like; palea narrow, with teeth 2 mm

long on the margins, anthers 0.3-0.4 mm.

Type: Described from Sicily in arvis arenosis Panormi in planitie *C. Presl* (holo.PR).

A-3 c. 20 km on old Airport Road, Tripoli, 7.5.1976, *Faruqi* 606; **A-7** 5 km east of Wadi Kuf, on main highway, 8.5.1978, *Faruqi* 1844.

Distribution: Mediterranean region, Anatolia, Palestine, Iraq, Iran & Afghanistan.

Two subspecies, i.e. ssp. *fasciculatus* and ssp. *delilei* (Boiss.) H. Scholz are recognized from Libya by Scholz (l.c.).

Fl.: Mar.-June

6 . **Bromus chrysopogon** Viviani, Fl. Lib. Spec. plate 2, 4. 1824; Scholz in Willdenowia, 7: 435. 1974; Davis, Fl. Turk. 9: 285. 1985.

B. szaboi Penzes in Bot. Kozl, 33: 135. 1936; *B. scoparius* L. var. *stenantha* Stapf in Kew Bull. 1907: 369. 1907.

A stout annual, erect-geniculately ascending. Culm glabrous. Leaf linear-lanceolate, acuminate, villous, up to 15 cm long and 2-4 mm wide. Panicle erect, dense and compact, ovoid-flabellate, branches and pedicels much shorter than spikelets. Spikelets densely crowded, subsessile, 20-25 mm long, 2-2.5 mm wide, linear-lanceolate, 7-12-flowered; glumes pubescent, unequal, 6 and 9-11 mm long, keeled, acuminate, lower glume narrow, 3-nerved; lemma up to 11.5 mm long, 3-4 mm wide, awned; awn slightly divaricate and up to 15 mm long; stamens 3.

Type: Described from Libya (Cyrenaica).

A-6 Benghazi, Um Genah, Primavera 1822, *Maugini* s.n. (FI); Benghazi, Karmu, 28.2.1922, *Maugini* s.n. (FI); fra Gamfuda e Suani Tica, 26.3.1922, *Maugini* s.n. (FI); Merg, Sidi Gibrin, 17.3.1922, *Maugini* s.n. (FI); **A-7** Derna, Oasis di Derna, Primavera 1922, *Maugini* s.n. (FI).

Also reported from Tripolitania by Scholz, (l.c.).

Distribution: Mediterranean region.

Fl.: Feb.-March

7. **Bromus scoparius** L., Cent. Pl. 1: 6. 1755; Amoen. Acad. 4: 266. 1759; Durand & Barratte, l.c. 274; Pamp., Pl. Trip. 17. 1914; Prod. Fl. Cir. 130. 1931; Maire, l.c. 258; Keith, l.c. 303; Scholz, l.c. 435.

Annual, solitary or tufted, erect or geniculate at the base, up to 30 cm. Culm glabrous. Leaf linear, acuminate, up to 15 cm long and 2-3 mm wide, sparsely villous; leaf sheath villous. Panicle dense, 3-5-(7) cm long, 1-1.5-(2.5) cm broad, ovate-obovate. Spikelets subsessile, elliptic, lanceolate, 8-12-flowered; glumes acute, mucronate, unequal, lower 3-4 mm long, 3-nerved, upper 5-7 mm long, 3-nerved; lemma 7-nerved, shortly bifid, awned, 6-(10) mm long; palea with long white hairs either on tip or margin or glabrous; stamens 3, anthers 0.5 mm long.
2n = 28.

Type: Described from Spain, *Loefling* 81, Herb. Linn. 93/32 (LINN).

Reported from Tripolitania by Durand & Barratte, (l.c.) etc.

Distribution: Mediterranean region, Syria, Iran, Afghanistan, Pakistan and Central Asia, N.W. India. Introduced into America.

Fl.: Apr.-June *Vern.* Bo-shrenta.

A variable species with glabrous to villous spikelets; the type is under the glabrous category.

8. **Bromus alopecuros** Poir., Voyage Barb. 2: 100. 1789; Maire, l.c. 259; Keith, l.c. 302; Scholz, l.c. 435. (Fig. 28)

B. alopecuroides Poir. in Lam., Encycl. Suppl. 1: 703. 1810; Pamp., Prod. Fl. Cir. 131. 1931; Keith, l.c.

Annual, 30-50 cm tall. Culm nodes either hairy or glabrous, when hairy, hairs pointing downwards and outwards. Leaf and sheath covered with long hairs, leaf flat, 10-15 cm or more long, 3-4 cm broad, linear-lanceolate, acuminate. Panicle erect, oblong, compact, 5-6.5-(12) cm long, 1 cm broad. Spikelets subsessile, elliptic-lanceolate, pointing, with florets compressed, 2.5 cm long; glumes glabrous-highly pu-

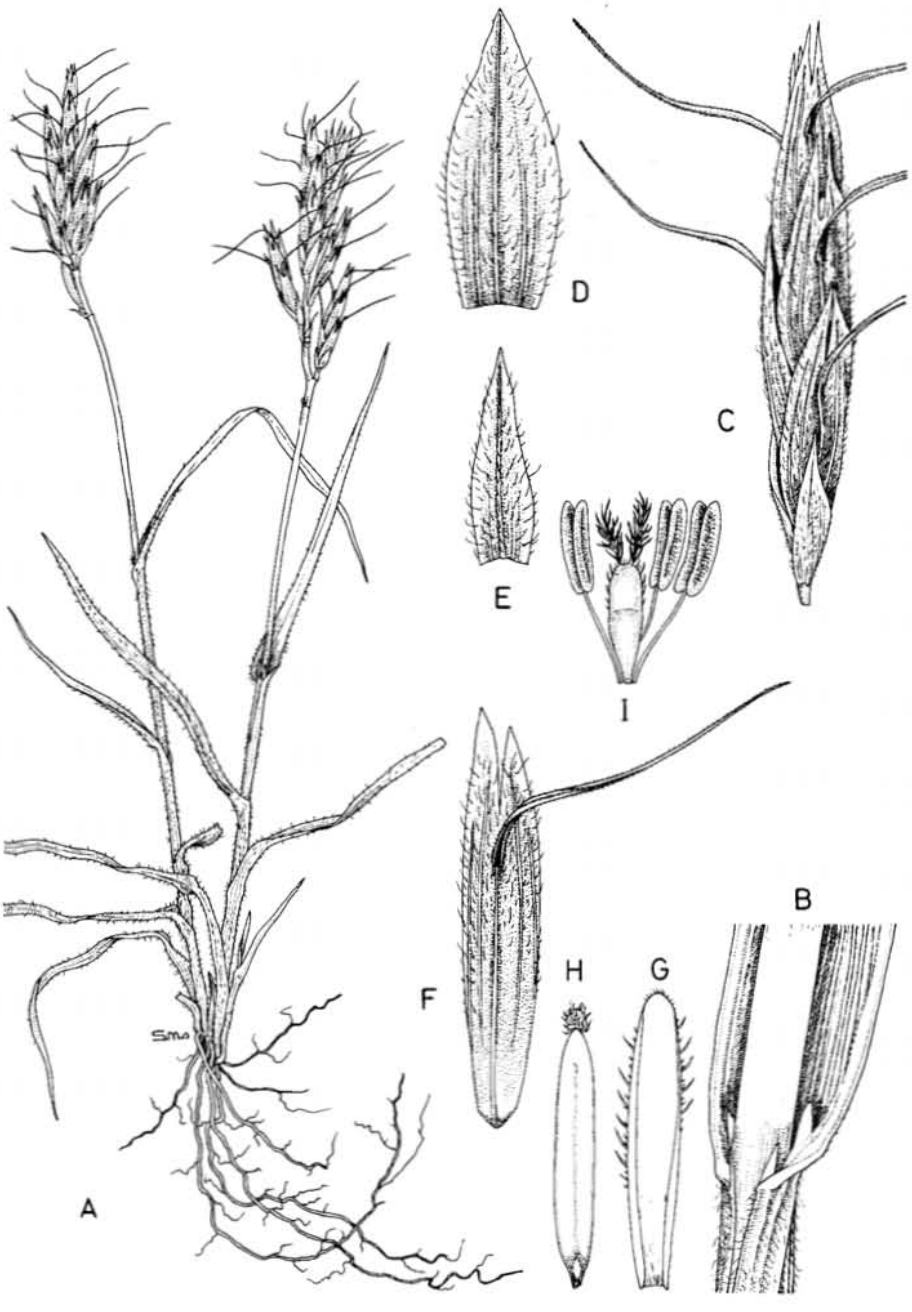


Fig. 28 **Bromus alopecuros**: A, habit × 1; B, portion of lamina, sheath and ligule × 10; C, spikelet × 4; D, lower glume × 5; E, upper glume x 5; F, lemma × 5; G, palea × 5; H, mature ovary × 5; I, stamens and pistil × 20.

bescent, unequal, 5 mm and 7 mm long, lower 3-nerved, upper 5-nerved, acuminate; lemma awned, pubescent towards the tip, tip divided, 10 mm long, awn 10-14 mm long. 2n = 14, 28.

Type: Described from Barbaria (Algeria "El Kala").

A-6 Benghazi, Bu Mariam, Primavera 1922, *Maugini* s.n. (FI); Benghazi, Megzaha, Primavera 1922, *Maugini* s.n. (FI); Benghazi, Wadi Gattara, Primavera 1922, *Maugini* s.n. (FI); Fra Regima e Benina, April 1922, *Maugini* s.n. (FI); **A-7** Cirene, 15.5.1922, *Maugini* s.n. (FI); Gubba, 7.4.1933, *Pampanini* 574 (FI); Shahat, 28.3.1970, *P.H. Davis* 50225 (K); Above Cyrene, 5.4.1939, *Sandwith* 2399 (K); Shahat, 4.5.1978, *Faruqi* 1724, 1738.

Distribution: North Africa, Italy, Greece and Western Asia.

On the basis of hairy or glabrous spikelet, this species is split sometimes into 2 varieties, i.e. var. *alopecuros* and var. *calvus* Hal. (Consp. Fl. Graec. 3: 400. 1904) respectively.

Fl.: Mar.-May

9. **Bromus caroli-henrici** Greuter in Ann. Naturhist. Mus. Wien 75: 83. 1971; Scholz, l.c. 435.

B. caroli-henrici ssp. *biaristulatus* (Maire) Scholz, in Willdenowia, 7: 435. 1974; *B. lanceolatus* Roth, ssp. *biaristulatus* Maire in M., Cat. 3429. 1942; Fl. Afr. Nord. 3.263. 1955; *B. alopecuros* Poir. ssp. *caroli-henrici* (Greuter) P.M. Smith, in Bot. J. Linn. Soc. Lond. 76: 360. 1978.

Annual, 40 cm tall, geniculately ascending. Culm solitary or fascicled, pubescent on node with small hairs facing downwards, glabrous below the panicle. Leaves up to 15 cm long and 2 mm wide, linear, acuminate, covered with long hairs; leaf sheath densely pubescent with hairs facing downwards. Inflorescence up to 8 cm long with 1-3-(6) large spikelets. Spikelets pedicellate, 3-5 cm long, oblong-lanceolate, acute; florets compactly overlapping; glumes minutely scabrous, ribbed, up to 17 mm long, lower 3-5-nerved, upper 9-nerved, mucronate, lemma 22 mm long, scabrous, 11-nerved, tip divided into 2 minute awns, acuminate; dorsal awn up to 25 mm long, flat from the base, twisted to form a right angle with the glume.

Type: Described from Kato Lastos, in faucibus Kunepa, 23.5.1963, *Greuter* 5518 (Gr).

A-7 Shahat, 7.5.1978, *Faruqi* 1791, 1792; 5 km East of Wadi Kuf, on main highway, 8.5.1978, *Faruqi* 1823; c. 16 km from Labrag, c. 30 km from Lamluda, 19.6.1972, *S.I. Ali* 719 and 727.

Distribution: N. Africa.

10. **Bromus lanceolatus** Roth, Cat. Bot. 1: 18. 1797; Keith, l.c. 302; Scholz, l.c. 435.

B. macrostachys Desf., Fl. Atl. 1: 96. 1798.

Annual, up to 50 cm or more tall, erect or geniculately ascending. Culm solitary or fascicled, shortly hairy below the panicle, nodes with 0.5-1 mm long hairs pointing downwards. Leaves up to 20 cm long, usually less, 3-5 mm wide, villous; leaf sheath densely villous, covered with short hairs. Panicle 6-12 cm long, dense with short branches or loose with solitary spikelets on each branch, axis and branches hairy. Spikelet oblong-lanceolate, 3-4 cm long, up to 6 mm broad, compactly 10-12-flowered, florets overlapping; glumes unequal, lower 6-9 mm long, 3-nerved, upper 9-13 mm long, 7-9-nerved, acute, elliptic-lanceolate, lemma 8-12-(20) mm long, awn 8-12 mm long, equal to lemma, stout, flattened and twisted, both glume and lemma either glabrous or highly pubescent with silvery hairs. $2n = 28$.

Type: Described from Samina benignitati debeo amici aestimatiss. cel. Roemeri.

A-2 Abu Zaiyan, 21.5.1976, *Faruqi* 763; **A-7** Shahat, 4.5.1978, *Faruqi* 1738-a; *ibid.*, 4.5.1978, *O. Shetwiy* 59.

Distribution: Mediterranean region, Caucasus, Anatolia, Iraq, Iran, Afghanistan, and Pakistan.

The plants with glabrous spikelets are included as var. *lanceolatus* and those with hairy spikelets, as var. *lanuginosus* (Poir.) Dinsm. (Fl. Pal. ed. 2, 2: 774. 1933).

Fl.: Apr.-June

11. **Bromus intermedius** Guss., Prodr. Fl. Sic. 1: 114. 1827; Maire, l.c. 256;

Scholz, l.c. 435.

Delicate annual, erect-geniculately ascending, up to 80 cm tall, usually shorter. Leaf flat, pilose; sheath pilose. Panicle lax, ovate-oblong, up to 15 cm long, branches up to 4 cm long, axis glabrous, nodes hairy, scabrous above. Spikelets ovate-lanceolate, 10-15-(20 mm) long, (excluding awns), villous, green, sometimes purple, 6-12-flowered, glumes unequal, lower lanceolate to elliptic-acute, 4-6 mm long, 3-nerved, villous, upper lanceolate, 6-8 mm long, 5-7-nerved, villous, lemma 6-9 mm long, pilose, apex 2-toothed, awns bent away from the lemma and tapering, usually as long as lemma, flat at the base, originating below the tip; palea somewhat equal to lemma, truncate at the tip, 2-nerved, ciliate; anthers 3, linear; ovary villous at the tip; styles 2, plumose to the base. $2n = 14, 28$.

Type: Described from Palermo, Baida, Ficuzza and Piana "Gussone".

A-7 5 km East of Wadi Kuf, on main highway, 8.5.1978, *Faruqi* 1824.

Distribution: Mediterranean Europe, N. Africa, Turkey, Iran and Afghanistan.

Fl.: Apr.-June

12. **Bromus molliformis** Lloyd, Fl. Loire-Inf. 315. 1844; Scholz, l.c. 435.

B. mollis L. Sp. Pl. ed. 2, 1: 112. 1762; Durand & Barratte, l.c. 274; Pamp., Prod. Fl. Cir. 132. 1931; *B. hordeaceus* L. ssp. *molliformis* (Lloyd) Maire et Weiller in Maire, Fl. Afr. Nord. 3: 255. 1955; Keith, l.c. 302; *B. hordeaceus* var. *molliformis* f. *villosus* Pamp., Pl. Trip. 16. 1914.

Annual, up to 40 cm high, very variable. Culm glabrous, erect or geniculate at the base. Leaf flat, pilose, up to 20 cm long, 3-6 mm broad; ligule membranous; sheath densely pilose. Panicle 8-10 cm long, lax, branches excluding spikelets as long as 15 mm. Spikelets spaced on axis, elliptic-lanceolate, acute, up to 20 mm long, 5-6 mm broad, 8-14-flowered; glumes acute, ovate, unequal, 6-7 mm long, pubescent, ribbed; lemma 7 mm long, pubescent; awns 5-6 mm long, more or less straight and in the direction of lemma, not flat at the base. $n = 14$.

Type: Described from France.

A-3 University Campus, Tripoli, 17.3.1977, *M. Ahmed* 1272; Valley 44 km from Tripoli on way to Khoms, 5.4.1977, *Faruqi* 1332.
Also reported from Cyrenaica by Durand & Barratte (l.c.).

Distribution: North Africa, Mediterranean and Atlantic Europe.

Fl.: Mar.-April

27. **AEGILOPS**

L., Sp. Pl. 1050. 1753; Gen. Pl. ed. 5: 470. 1754.

Annuals. Culm usually kneed at the base. Leaves flat, narrow. Inflorescence a spike of spikelets. Spikelets solitary at each node of the axis, cylindrical, hermaphrodite, 2-8 florets, the upper male or neuter, the others hermaphrodite; glumes thick, with rounded back, truncate, awned or awnless; lemma toothed or awned; palea 2-keeled; stamens 3; lodicules 2, fimbriate on the upper margin; caryopsis compressed, with a hairy apical appendage, hilum linear.

About 25 species of W. Asia; 6 species are recorded from Libya. A difficult genus because of interspecific and intergeneric hybridization with *Triticum*. This genus is considered as an ancestor of *Triticum*.

1.	+ Spikes (excluding awns) more than 10 times as long as wide, moniliform; glumes awnless	6. **A. ventricosa**
	— Spikes (excluding awns) c.5 times or less longer than wide (if longer, then not moniliform); glumes awned	2
2.	+ Nerves on the glumes narrow, equally broad, approximately parallel	3
	— Nerves on the glumes unequally broad, flattened, not parallel	4
3.	+ Lemmas awnless	5. **A. peregrina**
	— Lemmas awned	4. **A. kotschyi**
4.	+ Glumes of some spikelets with 4 or more awns	2. **A. geniculata**
	— Glumes with 3 or less awns	5

5. + Spikes (excluding awns) 4 cm or more long; spikelets 3 or more, all fertile and not ovoid in shape — 3. **A. triuncialis**

— Spikes (excluding awns) 2-3 cm long; spikelets up to 3 with the upper most one sterile, ovoid in shape — 1. **A. neglecta**

1. **Aegilops neglecta** Req. ex Bertol., Fl. Ital. 1: 787. 1834; Scholz in Willdenowia 7: 435. 1974.

Ae. ovata Roth in Bot. Abh. Beob. 47. 1787 nom. ambig. non L., 1753; *Ae. triaristata* Willd., Sp. Pl. ed. 3,4: 743. 1805 nom illegit., (fide Hammer, 1980); Pamp. , Prod. Fl. Cir. 135. 1931; *Triticum neglectum* (Req. ex Bertol.) Greuter in Boissiera 13: 171. 1967.

Annual, branching from the base, branches many, up to 45 cm tall, usually smaller. Leaves flat, up to 10 cm long, 2-3 mm wide, hairy. Inflorescence a spike of spikelets, spikes 2-3 cm long. Spikelets 3 or less, lower two fertile, well developed, upper one sterile, 2 (-3) rudimentary spikelets at the base; glumes hairy, with nerves unequally broad, flattened and not parallel, awned, awns 2-3; lemma awns shorter than those of glumes. 2n = 28.

Syntypes: Described from Italy.

A-7 Shahat, 4.5.1978, *Faruqi* 1734; *ibid,* 6.5.1978, *Faruqi* 1778; *ibid,* 7.5.1978 *Faruqi* 1793; 10 km from Baida on way to Derna, 22.5.1977, *Faruqi* 1368-m and 1368-s; **B-1** 51 km from Nalut on way to Ghadames, 25.4.1975, *Faruqi* 184.

Distribution: Mediterranean region, S.W. Asia.

2. **Aegilops geniculata** Roth, Bot. Abhl. 45. 1787; Scholz, l.c. 435.

A. geniculata var. *africana* (Eig) H. Scholz l.c. 420. 1974; *A. ovata* L. Sp. Pl. 1050. 1753 (proparte); Durand & Barratte, l.c. 275; Pamp., Prodr. Fl. Cir. 135. 1931; Keith, l.c. 198; *A. ovata* var. *africana* Eig, Monogr. 144. 1929; *Triticum ovatum* (L.) Gren & Godron, Fl. Gr. 3. 601: 1856.

Annual, up to 25 cm tall, geniculately ascending. Culm ribbed, sheath pubescent, specially at the margins. Leaves up to 4 cm long, linear-lanceolate, sparsely hairy on margins. Inflorescence a spike of spikelets up to 6 cm long. Spikelets 2-5-awned; glume ovate, 7-nerved, nerves unequally broad, flattened, not parallel, scabrous on nerves, awned; lemma awned, awn as long as that of glume.

Type: Described from Spain (iso.BM,K).

A-2 Abu Zaiyan, 21.5.1976, *Faruqi* 758, 759, 760; **B-2** 5 km after Gwalish on way to Jadu, 21.5.1976, *Faruqi* 788; 40 km after Gwalish on way to Jadu, 21.5.1976, *Faruqi* 798, 799.
Also reported to be present in the former Cyrenaica, by Durand & Barratte (l.c.).

Distribution: Mediterranean region, S.W. Asia.

Fl.: Apr.-May

3 . **Aegilops triuncialis** L., Sp. Pl. 1051. 1753; Durand & Barratte, l.c. 276; Pamp., Pl. Trip. 7. 1914; Prodr. Fl. Cir. 135. 1931; Maire, l.c. 362; Keith, l.c. 199; Scholz, l.c. 435.

Plant geniculately ascending, annual, up to 45 cm tall. Culm glabrous; slender, few to many branches from the base. Leaves and sheath with scattered hairs, auricles well developed and overlapping. Inflorescence a spike of spikelets, 4 or more cm long, first two nodes of the spike without spikelets; 3-5 or more spikelets on an axis. Pedicel hirsute; glume hirsute with spicule-like hairs, up to 10 mm long 3 mm broad, 3-awned, the central awn not as long as the side ones, 2.5 and 4.5 mm long respectively, nerves of glume unequally broad, not parallel; lower lemma glabrous, gland dotted, upper 1/4 develop into 2-3 mm awns and one acute lobe; upper half of ovary covered with long hairs. $2n = 28$.

Syntypes: Described from Monspelii, Massiliae, Smyrnae aridis.

B-6 Gaminas, 17.4.1978, *Ramadan, Fathi* and *Siddiqi* 412-Z.

Also reported from the former Tripolitania by Durand & Barratte (l.c.) and others.

Distribution: Mediterranean region, S.W. Asia.

Ae. triuncialis L. var. **brachyathera** Boiss. Fl. Or. 5: 674. 1884; Durand & Barratte, Fl. Lib. Prod. 276. 1910; Pamp., Fl. Trip. 7. 1914.

This taxon has been reported by Pamp., in Prod. Fl. Cir. 135. 1931, as being a new or very rare from Libya. However, due to the lack of material its presence can not be ascertained.

4 . **Aegilops kotschyi** Boiss., Diagn. Pl. Or. Nov. Ser. 1, 7: 129. 1846; Pamp., Prod. Fl. Cir. 136. 1931; Maire, l.c. 361; Keith, l.c. 197; Scholz, l.c. 435. (Fig. 29)

A. ovata var. *triaristata* auct. non Willd. (1805); Durand & Barratte, l.c. 276.

Annual, 15-20 cm tall, geniculately ascending. Culms ribbed and sometimes white-dotted. Leaf and sheath with scattered tubercle based long hairs, leaves up to 5 cm long and 3 mm broad. Inflorescence a spike of 2-4(-6) spikelets, up to 6 cm long. Glumes scabrous, 6 mm long, 3 mm broad or more, truncate, narrow, 2-3-awned, awns up to 4 cm long, strongly nerved, nerves equally broad, parallel or nearly so; lemma rounded, usually 3-awned, 2 long and 1 short, fine cilia at the throat of lemma; caryopsis adherent at least to the palea, embryo 6 mm long, fuzzy at one end.
2n = 28.

Type: *Kotschy* 366-a, 1033 (W) from Iran.

A-3 12 km west Tripoli, near the sea-shore, 24.3.1967, *Boulos, Tawil and Bouni* 1596; **A-7** Wadi Derna, 14.3.1968, *Boulos* 2443.

Distribution: Egypt, Syria, Palestine, Jordan, Kuwait, Turkey, Cyprus, Transcaucasica and Iran.

A highly variable species, often divided into a number of varieties.

Fl.: Mar.-April

5 . **Aegilops peregrina** (Hack.) Maire et Weiller in Maire, Fl. Afr. Nord. 3: 358. 1955; Keith, l.c. 199; Scholz, l.c. 435.

Triticum peregrinum Hack., in Ann. Scot. Nat. Hist. Mag. 101. 1907; *Ae.*

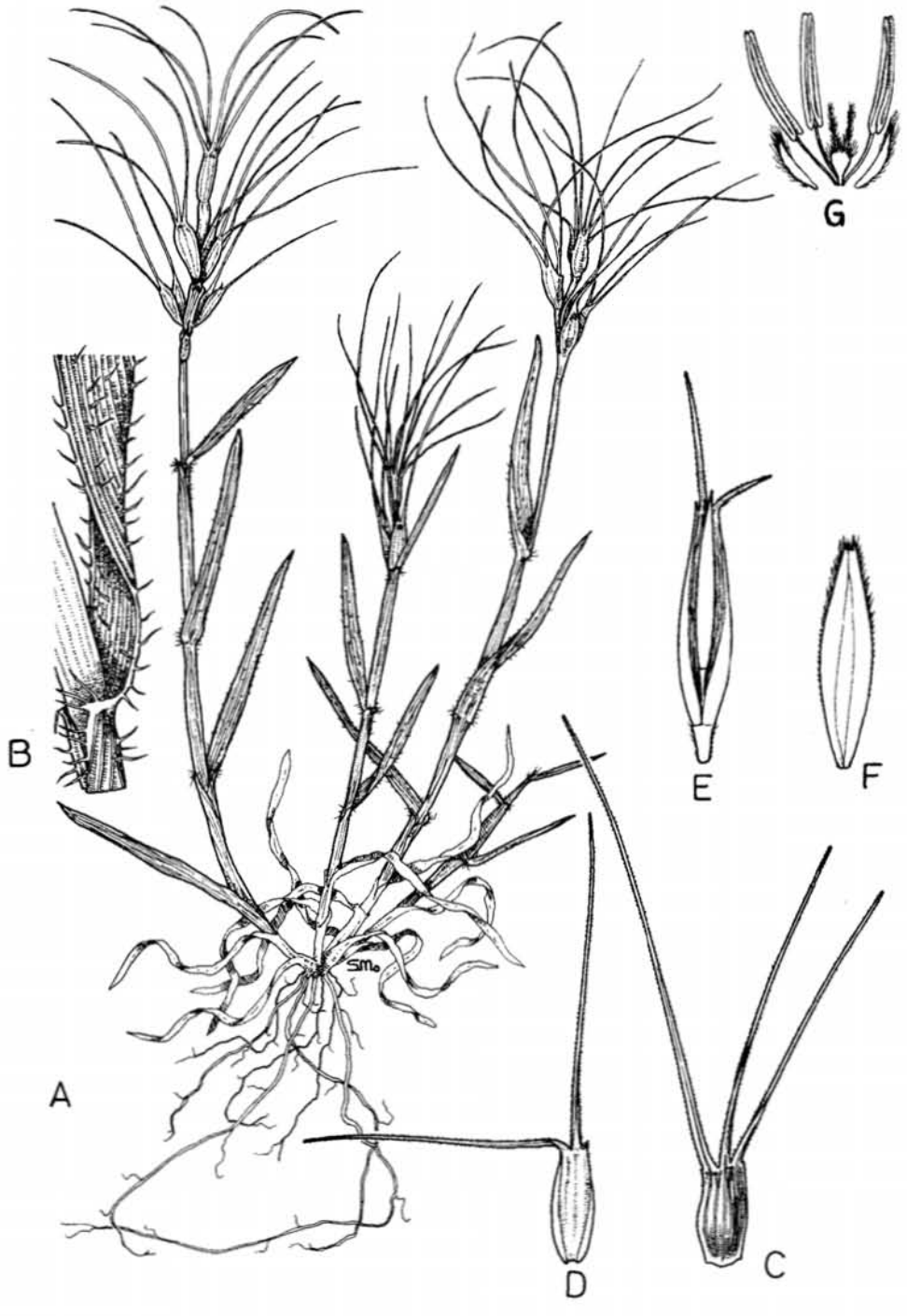


Fig. 29 **Aegilops kotschyi**: A, habit × 1; B, portion of lamina and sheath × 4; C, lower glume × 2; D, upper glume × 2; E, upper lemma with reduced floret on a prolonged rachilla × 4; F, palea × 4; G, stamens and pistil × 10.

variabilis Eig., var. *peregrina* Eig et Feinbrun in Monogr. 125. 1929; Pamp., l.c. 137; *Ae. triuncialis* var. *brachyathera* auct. non Boiss., 1884; Durand & Barratte, l.c. 276. 1910; Pamp., l.c. 135, 136.

Annual, erect to geniculately ascending, loosely branched from the base. Culm glabrous, 10-15 cm long. Leaves with white hairs up to 5 mm long, basal leaves linear, cauline lanceolate, acuminate, up to 5 cm long; sheaths also with 0.5 mm long white hairs. Spike up to 3 cm long, with 2—7 spikelets; 0-3 rudimentary spikelets at the base. Spikelets 8-10 mm long; glumes 3-awned, flat at the base, awn very broad at the base, glumes of the rudimentary spikelets usually awnless and awns replaced by teeth, nerves on glume narrow, more or less parallel and equally broad, trichomes on nerves; lemma awnless. 2n = 28.

Type: (Scotland) Patria ignota, introductam in Scotia prope Edinburgh (Slateford et Leith Docks), Fraser (holo.E).

A-7 Derna, 10.4.1939, *Sandwith* 2515 (K); Derna, 15.4.1887, *Taubert* 345 (K).
Also reported from Tripolitania by Durand & Barratte (l.c.) etc.

Distribution: N. Africa, Egypt, Palestine, Greek Islands, Anatolia, Iraq.

Fl.: Mar.-April

6 . **Aegilops ventricosa** Tausch., in Flora 20: 108. 1837; Durand & Barratte, l.c. 276; Pamp., Pl. Trip. 7. 1914; Prodr. Fl. Cir. 137. 1931; Maire, l.c. 353; Keith, l.c. 199; Scholz, l.c. 436. (Fig. 30)

Annual, up to 40 cm tall, geniculately ascending, tufted. Culm ribbed, glabrous. Leaves sheath with scattered hairs; leaves lanceolate, up to 10 cm long and 6 mm broad. Inflorescence moniliform with spikelets embedded in the grooves of the axis, each spikelet with its base swollen and top constricted to give a beaded appearance to the spike. Awns of the lower spikelets reduced, sometimes not visible, upper spikelets with longer awns, up to 3.5 cm long; glume 2-lobed, awnless, 7-nerved, scabrous on nerves; lemma glabrous, 2-lobed, awned. 2n = 28.

Type: Described from Orient.

A-3 20-23 km east Tripoli, along the coastal road to Khoms, 8.3.1967, *Boulos* 1566;

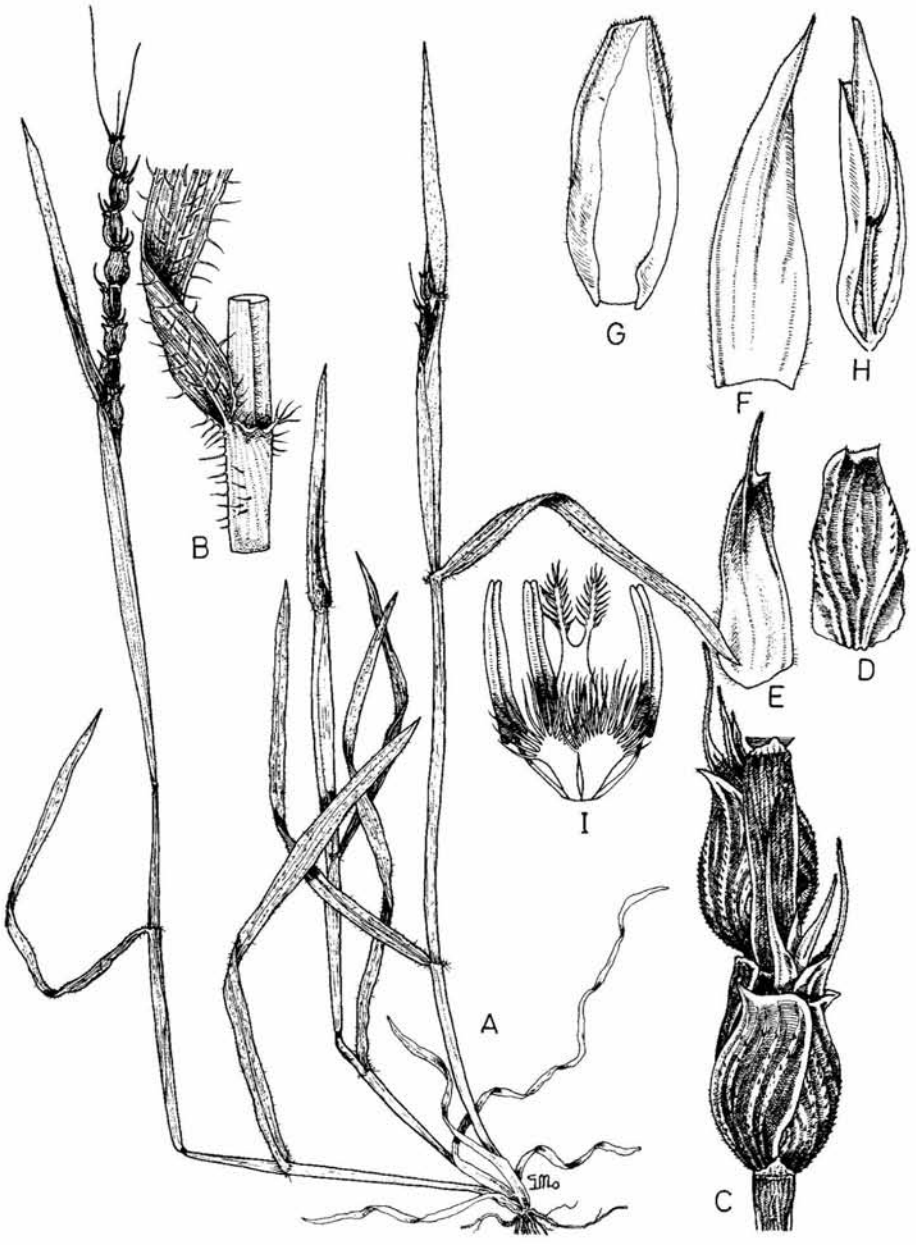


Fig. 30 **Aegilops ventricosa**: A, habit × 0.5; B, portions of lamina and sheath × 3; C, portion of spike with 2 spikelets × 3; D, lower glume × 3; E, lowest lemma × 3; F, second lemma × 5; G, its palea × 5; H, upper lemma with sterile floret on a prolonged rachilla × 5; I, stamens and pistil × 10.

A-6 Benina, 22.5.1977, *Faruqi* 1358 & 1360-a; 15 km from Tokra on way to Baida, 10.3.1978, *Faruqi* 1630; Merj on main highway, 8.5.1978, *Faruqi* 1811; Around Al Abiar, 50-60 km E. of Benghazi, 24.3.1979, *Davis* 49908; **A-7** Faidia, 3 km from gas station on way to Slanta, 23.5.1977, *Faruqi* 1371; Shahat ruins, 24.5.1977, *Faruqi* 1375-d; c. 35 km from Shahat on way to Derna, 5.5.1978, *Faruqi* 1766; Ain Mara, 5.5.1978, *Faruqi* 1773; 135 km East Benghazi on Baida Rd., 8.5.1978, *Faruqi,* 1804. Labrag, 19.6.1972, *S.I. Ali* 743; Shahat, *N.H. Faris* 37; 9 km from Baida on way to Shahat, 14.4.1979, *M.A. Siddiqi & Ramadan* 2428-Z; Wadi Kuf, 8.5.1978, *A. El-Gadi, Jafri & others* 1835; **B-4** Sirt, 16.4.1978, *Ramadan, Fathi and Siddiqi* 309-Z.

Distribution: Mediterranean region.

Fl.: March-June

A considerably variable species, 4 varieties are sometimes recognised. Pamp., in Prod. Fl. Cir. 137. 1931 recognised var. *vulgaris* Eig; later on Maire (l.c. 3.355) recognised three other varieties for the same taxon: i) var. *subulata* (Pomel) Maire et Weiller; ii) var. *comosa* Coss. et Dur. and iii) var. *truncata* Coss. et Dur. As we have not seen any authentic specimens of these varieties they are not considered in this study.

28. **TRITICUM**

L., Sp. Pl. 85. 1753; Gen. Pl. ed. 5: 37. 1754.

Annual. Leaves flat. Inflorescence a spike of spikelets, solitary, alternate and distichous. Spikelets laterally compressed, 3-9 bisexual florets, or one to several uppermost florets sterile; glumes unequal, more or less keeled, toothed or awned; lemma keeled at least in the upper half, many-nerved, awned or toothed; palea 2-nerved, 2-keeled, ciliate on the keels; stamen 3; lodicules 2, ovate, ciliate on the upper margin; caryopsis deeply grooved adaxially, hilum linear.

About 15 species (mostly cultivated) in the Mediterranean region and Asia; one wild and five cultivated species are found in Libya.

1. + Spike axis breaking at maturity; grain not separating easily from lemma and palea on threshing — 2
   — Spike axis tough, not breaking at maturity; grain separating easily from lemma and palea on threshing — 3

2.	+ Glume bidentate; lemma lanceolate and awned	1. **T. bicornis**
	— Glume unidentate; lemma ovate, obtuse with 2-short teeth, rarely awned	4. **T. spelta***
3.	+ Spikes three to four times as long as broad	5. **T. compactum***
	— Spikes much longer	4
4.	+ Glumes 2.5-3 cm long, lanceolate, concealing the lemmas	3. **T. polonicum***
	— Glumes not more than 1.5 cm long, stiff, often toothed at the apex, not concealing the lemmas	5
5.	+ Glumes with a sharp, ridged, almost compressed keel from base to apex, ending in a sharp tooth at the apex; axis ciliate	2. **T. durum***
	— Glumes nearly always sharply keeled in the upper portion, weakly keeled on the lower half or rounded, but not uniformly keeled and ridged from tip to base; axis not ciliate	6. **T. aestivum***

1. **Triticum bicorne** Forsk., Fl. Aeg.-Arab 26. 1775; Scholz in Willdenowia, 7: 436. 1974. (Fig. 31)

Aegilops bicornis (Forsk.) Jaub. et Spach, Illustr. Fl. Or. 4: Tab. 309, 10. 1850-1853; Durand & Barratte, l.c. 276; Pamp., Pl. Trip. 6. 1914; Prod. Fl. Cir. 138. 1931; Post, Fl. Pal. ed., 2.2: 788. 1933; Tackh., Stud. Fl. Egypt. 531. 1956; Keith, l.c. 197.

Annual, up to 40 cm high, erect or geniculately ascending, single-few branches from the base. Culm glabrous. Leaf and sheath pubescent, soft, leaves linear to lanceolate, acuminate, auricled, 10 cm long and up to 4 cm wide. Inflorescence a narrow spike with alternating spikelets in 2 rows, 70-85 mm long and 3-4 mm wide, spike axis breaking at maturity; glumes about 6 mm, nerves distinct sometimes scabrous, 2-lobed, one lobe acuminate and the other blunt to acute; lemma lanceolate, nerves distinct, awned, awns up to 5 cm long. $2n = 14$.

Type: Described from Egypt.

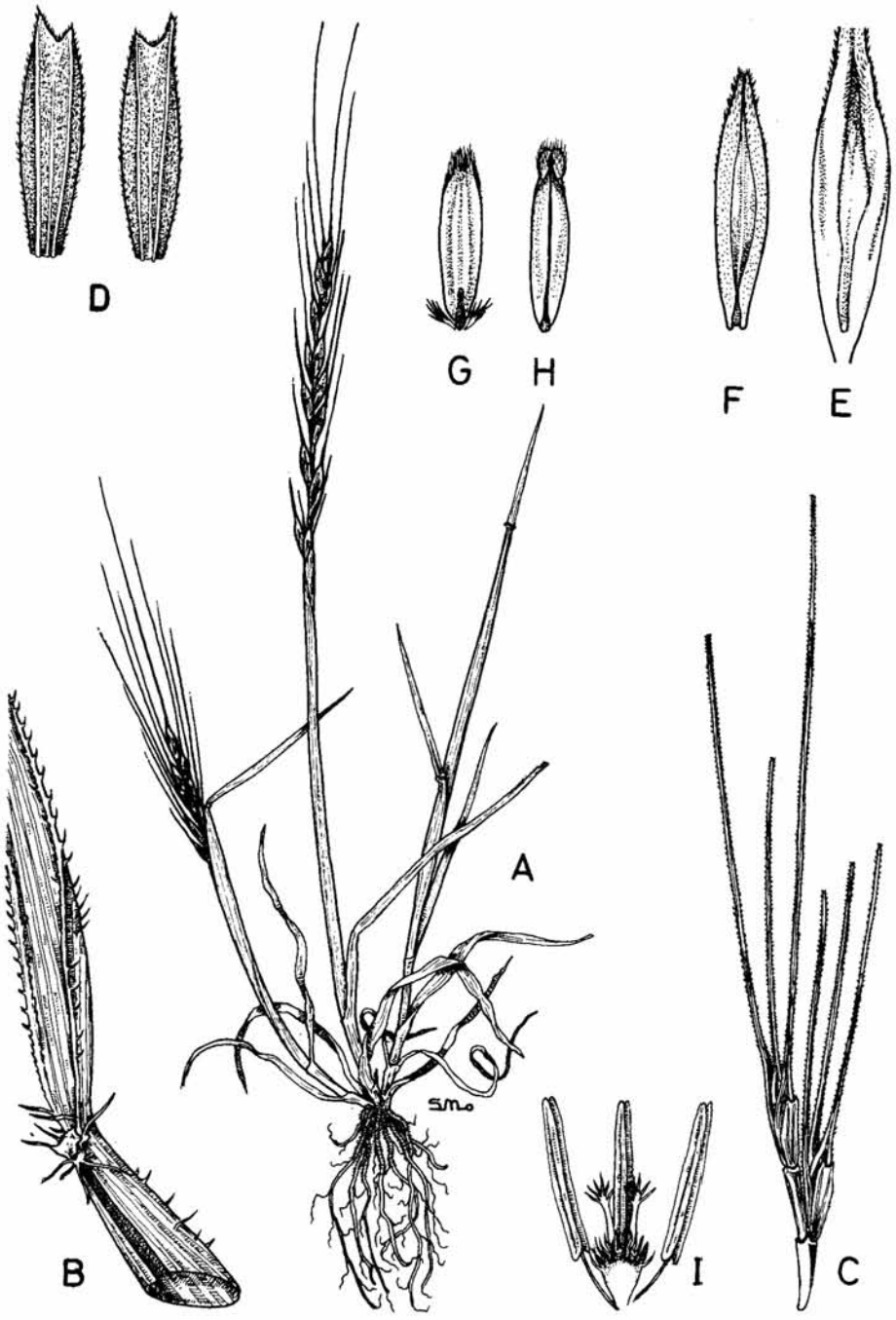


Fig. 31 **Triticum bicorne**: A, habit × 1; B, portion of lamina, sheath and ligule × 4; C, portion of spike with few spikelets × 2; D, glumes × 6; E, lower lemma × 6; F, palea × 6; G, caryopsis, dorsal view and lodicules × 6; H, caryopsis, ventral view × 6; I, stamens and pistil × 10.

B-6 35 km West of Marsa Brega, 9.5.1978, *Faruqi* 1847.

Also reported from Tripolitania by Durand and Barratte (l.c.) etc.

Distribution: Egypt, Sinai, Palestine and Syria.

Although this taxon is being treated under *Aegilops* by Durand & Barratte (l.c.) and others (l.c.), it has keeled glumes which is the characteristic feature of the genus *Triticum*. Whereas in *Aegilops* the glumes are not keeled.

Fl.: Feb.-May

2 . ***Triticum durum** Desf., Fl. Atlant. 1: 114. 1798; Durand & Barratte, l.c. 275; Keith, l.c. 986; Scholz, l.c. 436.

Annual. Culms usually solid. Leaf blades glaborus or lower slightly pubescent. Spike axis tough, quadrate in cross section; axis ciliate on the margins and with a tuft of hair at the insertion of each spikelet. Spikelet 4-7-flowered, longer than broad; glumes keeled, winged in the upper third, ending in a tooth, 1.5 cm or less long; awn 8-15 cm long. 2n = 28

Type: Described from plants grown in N. Africa (Barbaria).

Reported from the former Tripolitania, Cyrenaica and Fezzan by Durand & Barratte (l.c.) etc.

Distribution: Cultivated in the Mediterranean region, S. Europe and most of Asia, North, C. & S. America.

Fl.: Mar.-Apr. *Vern.* durom gamah, gamah, taam.

3 . ***Triticum polonicum** L., Sp. Pl. ed. 2: 127. 1762; Maire, l.c. 346; Keith, l.c. 987.

Annual. Culms up to 160 cm tall, smooth, glabrous, rarely bearded at the nodes, upper portion filled with pith. Leaf blade glabrous, often 2 cm or more broad. Spikes 14-16 cm long, axis tough, ciliate at margins and with a tuft of hairs at each node. Spikelets very large, 2.5-3 cm long; glumes as long as the spikelets, unequal, lanceolate,

glabrous or hairy, the lower glume longer, bidentate at the apex; lemma 2.5 cm long, awned or awnless. 2n = 28.

Type: Not indicated.

Reported from the former Cyrenaica by Keith (l.c.).

Distribution: S. Europe, Algeria, Anatolia, Iraq, Iran, Afghanistan and India.

Fl.: May-June

4 . ***Triticum spelta** L., SP. Pl. 86. 1753; Maire, l.c. 347; Keith, l.c. 987.

T. vulgare Host ssp. *saharae* (Ducell.) Cif. and Garav.; Corti, Fl. Veg. Fezz. 469. 1942.

Annual. Culm 60-150 cm tall, smooth and glossy, hollow. Leaf blade linear-acuminate, up to 60 cm long and 10-15 mm broad, glabrous or sparsely pilose. Spikes up to 10 cm long or more, lax, tetragonal, internode of the axis exposed, axis fragile and ciliate on the margins without tufts of hairs at the nodes. Spikelets up to 15 mm long, 2-5-flowered, only the lower two flowers fertile; glume unidentate, more or less 8 mm long, keeled, ovate, apex truncate, the keel ending in a small tooth; lemma ovate, obtuse, with 2-short teeth or rarely awned; palea subequal, 2-keeled, winged, ciliate. 2n = 28.

Type: Not indicated.

Reported from the former Fezzan by Corti (l.c.) and Keith (l.c.).

Distribution: Iran and Europe.

Fl.: Mar.-Apr.

5. ***Triticum compactum** Host, Gram. Austr. 4: 4, tab. 7. 1809; Keith, l.c. 986; Scholz, l.c. 43.

T. vulgare L. var. *compactum* (Host) Alef., Landw. Fl. 327. 1866.

Annual. Culm up to 140 cm tall, stiff, hollow, smooth and glabrous. Leaves linear,

acuminate, up to 60 cm long, 10-15 mm wide, with long scattered hairs. Spike short and thick, about 3-4 times as long as broad, up to 6 cm long, 1-1.5 cm broad, dense, axis tough, margin shortly ciliate. Spikelets 10-13 cm long, 13-15 mm wide, 6-7-flowered; glumes 8-9 mm long, equal, glabrous or hairy, keeled in the upper half, rounded below, keel prolonged into a tooth or short awn; lemma inflated, about 10 mm long, long or short awned. $2n = 42$.

Type: "Seritur in Styria sub nomine Binkelwaigen", Host, W.

A-7 Faidiya, 3 km from gas station on way to Slanta, 23.5.1977, *Faruqi* 1371-a.

Distribution: Cultivated in most of the temperate and sub-tropical parts of the world.

This species is considered by Schiemann (in Rech. f., l.c.) to belong to the *aestivo-compactum* grex, and is known as Binkel-Weizen. Bor (in Rech., l.c. 211) has treated it as a separate species and the same is followed here.

According to Percival 1921 (vide Bor., Fl. Iraq, 703, 1968), this is the earliest wheat grown by Neolithic man in many parts of Europe which was replaced by Bread Wheat, during the later pre-historic period. The species is still widely distributed throughout the world, but pure fields are seldom found except in Transcaucasica and Central Asia. In general club wheat is resistant to drought and frost and also to fungal diseases. It grows well on poor soil and is good for making bread.

6. ***Triticum aestivum** L., Sp. Pl. ed. 1: 85. 1753. nom. cons. prop.; Fiori et Paol., Fl. Anal. Italy. 1: 107. 1896; Maire, l.c. 348; Keith, l.c. 985; Scholz, l.c. 436; Kit Tan in Davis, Fl. Turk. 9: 253. 1985.

T. hybernum L., Sp. Pl. 86. 1753; *T. sativum* Lam., Fl. Fr. 3: 625. 1778; *T. vulgare* Vill., Hist. Pl. Dauph. 2: 153. 1787; *T. segetale* Salisb., Prodr. Stirp. 27. 1789; *T. vavilovi* (Tuman) Jakubz. ex Zhuk., La Turquie Agricole 705, 805, f. 379-381. 1933; Ic: Fl. Iraq 9: t. 67. 1968; Hubbard Grasses ed. 2: 415. 1968.

Annual. Culm 70-100 cm tall, hollow, glabrous, occasionally hairy on nodes. Leaves glabrous, pubescent when young, up to 60 cm long and 10-15 mm wide. Spikes dense, 6-18 cm long, square in cross section, axis tough, without a tuft of hairs on nodes, margins not ciliate. Spikelets of 3-6-florets; as long as broad or broader; glumes with a keel in the upper half only, glabrous, pilose or villous, 6-11 mm long, apex den-

tate; lemma muticous or long awned. 2n = 42.

Lectotype: Designated by Bowden (1959: 674, 1962: 1708): specimen *'Triticum 3'* (BM-Hb. Cliff, Photo).

Reported from all over Libya by Durand & Barratte (l.c.) etc.

Distribution: Cosmopolitan (cultivated).
Originating in Turkey and Iraq.

Fl.: Mar.-Apr. *Vern.:* Gamah, Taam, Nima.

29. SECALE

L., Sp. Pl. ed. 1: 84. 1753; Gen. Pl. ed. 5: 36. 1754.

Annual or perennial. Leaf blades flat. Inflorescence a spike of spikelets. Spikelets solitary at each node of axis, distichous, alternate, laterally compressed with 2 hermaphrodite florets and one pedicelled rudimentary floret; glumes subequal, narrow, terminated by a single awn; lemma keeled, spinously ciliate, 5-nerved, and one fine awn; palea 2-keeled, scabrid on keels; stamens 3; lodicules 2, fimbriate on the rounded margin; caryopsis hairy at the top, hilum linear.

4 Mediterranean, E. Europe to C. Asia and one S. African species; represented by 2 species in Libya.

+ Perennial with fragile axis (wild)	1. **S. montanum**
– Annual with tough axis (cultivated)	2. **S. cereale***

1. **Secale montanum** Guss., Ind. Sem. Hort. Boccad. 1825 et. Prodr. Fl. Sic. 1: 145. 1827; Pamp., Fl. Cir. 138. 1931; Maire, Fl. Afr. Nord. 3: 338. 1955; Keith, Prelim. Check List Lib. Fl. 884. 1965; Scholz in Willdenowia, 7: 436. 1974.

Perennial; a metre or more tall, glabrous or dotted with very minute adpressed hairs, erect, tufted. Leaves up to 18 cm long, linear or lanceolate, acuminate, shortly hairy or glabrous. Inflorescence a spike of spikelets, linear, 6-14 cm long, 1 cm wide, axis fragile, densely ciliate on margins. Spikelets of paired florets, solitary; glume acuminate, 10-12 mm long, dorsally ciliate; lemma pectinately ciliate on the keel, 10-11 mm

long; awn 0.7-1.5 mm long; palea keeled. 2n = 14.

Type: Described from Pizzuta, Busambra, Etna, Madonia, Mistretta, Sicilia, *Gussone* (NAP).

Reported from the former Cyrenaica by Pamp. (l.c.).

Distribution: N. Africa, S. Europe, Anatolia, Caucasus, Iraq, Iran and Pakistan.

Fl.: May-June

2 . ***Secale cereale** L., Sp. Pl. 84. 1753; Scholz, l.c. 356 et ll.cc. 436.

Triticum cereale (L.) Salisb., Prodr. Stirp. 27. 1796.

Annual. Culms 1-several, up to 150 cm tall, scabrous or villous below the spike. Leaf blade flat, linear-acuminate, 20 cm long, 2-5 mm wide, glabrous or pubescent. Spike up to 16 cm long, 10-15 mm wide, axis tough; joints ciliate on the margins. Spikelets up to 1.5 cm long, 3-flowered, lower two fertile, upper reduced; glumes linear to linear-lanceolate, 10-12 mm long, shortly attenuate, scabrous on keel, glabrous, occasionally minutely pilose; lemma compressed, keeled, 5-nerved, 15-18 mm long, keel pectinately ciliate, awned, awns 3.5 cm long. 2n = 14, 14 + 1-8B, 16, 18, 27, 28, 29.

Type: Locality not designated, Herb. Linn. 102/1 (LINN).

Reported to be cultivated in Fezzan by Scholz (l.c.).

Distribution: Cultivated widely in the temperate zones of old and new worlds.

Vern. Shofal, Shofan.

30. **ELYTRIGIA**

Desv. in Nouv. Bull. Soc. Philom. 2: 191. 1810;
Braconotia Godr., Fl. Lorraine. 3: 191. 1844.

Perennials. Culms erect. Leaf blades flat. Spike long with usually a terminal non pectinate spikelet. Glumes equal-subequal, with or without keel, 3-11 equal nerves, rigid.

POACEAE

About 50 temperate and Eurasian species; 3 species are found in Libya.

1.	+ Both glume and lemma with sharp points	1. **E. repens**
	— Both glume and lemma or at least lemma obviously obtuse	2
2.	+ Spikelets overlapping (crowded), lower spikelets much longer than the internodes of the non-disarticulating main axis	2. **E. littoralis**
	— Spikelets non-overlapping (spaced), lower spikelets shorter or equal to the internodes of the readily disarticulating main axis	3. **E. juncea**

1. **Elytrigia repens** (L.) Desv. ex Nevski, in Acta Inst. Bot. Acad. Sci. URSS, 1, 1: 14. 1933; Scholz in Willdenowia, 7: 425 and 436. 1974.

Triticum repens L., Sp. Pl. 86. 1753; *Agropyron repens* (L.) P. Beauv., Ess. Agros. 102. Pl. 20. f. 2. 1812; Maire, l.c. 324.

Rhizome long and slender; plant up to 60 (-90) cm tall. Culm glabrous. Leaves minutely scabrulous or pubescent, lanceolate, acuminate, up to 15 cm long and up to 6 mm broad. Inflorescence a spike of spikelets 5-10-(15) cm long, axis glabrous. Spikelets 15 mm long, pointed, distichous, longer than the internode, rachilla scabrous; glumes subequal, 1/2 to 2/3 the length of spikelet, 8-10 mm long, pointed; lowest lemma 9 mm long, tip with a mucro, usually glabrous, scabrous on nerves; palea subequal, obtuse, 2-keeled; lodicules 2; stamens 3, anthers linear; ovary hispid above. $2n = 42$.

Type: Described from Europe, Herb. Linn. 104/7 (LINN).

Reported from the former Tripolitania by Maire (l.c.), but its presence in Libya has been doubted, Scholz (l.c.).

Distribution: N. Africa, Europe, temperate Asia, Iraq, Iran, Afghanistan and N. America.

Fl.: Apr.-July

2. **Elytrigia littoralis** (Host) Hyl., Nomencl. u. Syst. Stud. Nord. Gefasspfl.

(Uppsala Univ. Arsskr.) 7: 36. 1945.

Triticum littorale Host, Gram. Austr. 4: 5. 1809 non Pallas (1776); *Agropyron littorale* (Host) Dumort, Agrost. Belg. 97. 1824; Maire l.c. 327; Scholz, l.c. 436. *A. pungens* auct. non (Pers.) Roem. & Schultz; Keith, l.c. 203; *T. pycnanthum* Godron in Mem. Soc. Emul. Doubs., ser. 2, 5: 10. 1854.

About a metre tall rhizomaceous plant. Culm glabrous, smooth. Leaves lanceolate, acuminate, 35 cm long, 8 mm broad; sheath and leaf glabrous. Inflorescence a spike of spikelets, about 18-(25) cm long. Spikelets up to 1.5-3 cm long, 4-10-flowered, the lower longer than the internode; rachilla finely pubescent; glumes subequal, deeply ribbed, 11-20 mm long, 1/2-2/3 the length of the spikelet, tip somewhat pointed; lemma obtuse, bluntly mucronate; palea subequal, lanceolate, 2-keeled; lodicules 2; stamens 3, anthers linear; ovary hispid above.

Type: Described from Europe (Austria).

Reported from Tripolitania by Maire (l.c.), Scholz, (l.c.) and Keith (l.c.).

Distribution: Mediterranean region and Atlantic coast of Europe.

Fl.: April-June

3. **Elytrigia juncea** (L.) Nevski in Acta Inst. Bot. Acad. Sci. URSS, 1, 2: 83. 1936; Scholz, l.c. 437. (Fig. 32)

Triticum junceum L., Amoen. Acad. 4: 266. 1759; Mant. 2: 327. 1771; *Agropyron junceum* (L.) P. Beauv., Ess. Agros. 102, 146, 1812; Durand & Barratte, l.c. 275; Pamp., Pl. Trip., 7. 1914; Prod. Fl. Cir. 135. 1931; Maire, l.c. 328; Keith, l.c. 203.

Perennial, 40 cm to 1 metre tall, rhizomaceous. Culm glaucous, very minutely puberulent or dotted, erect, branches from basal nodes. Leaf blades up to 30 cm long and 8 mm wide, glabrous on dorsal surface and pubescent on the ventral surface, tip long and narrow. Inflorescence a spike of spikelets alternating on a stout axis, 12-(25) cm long, lax, distichous. Spikelets up to 3 cm long, 6-10-flowered, spaced with lower spikelets shorter or equal to the internodes; glumes subequal 7-8 and 10-12 mm long, ribbed with 6-7 prominant veins, broadly obtuse; lemma 15-20 mm long, lanceolate, broadly ob-

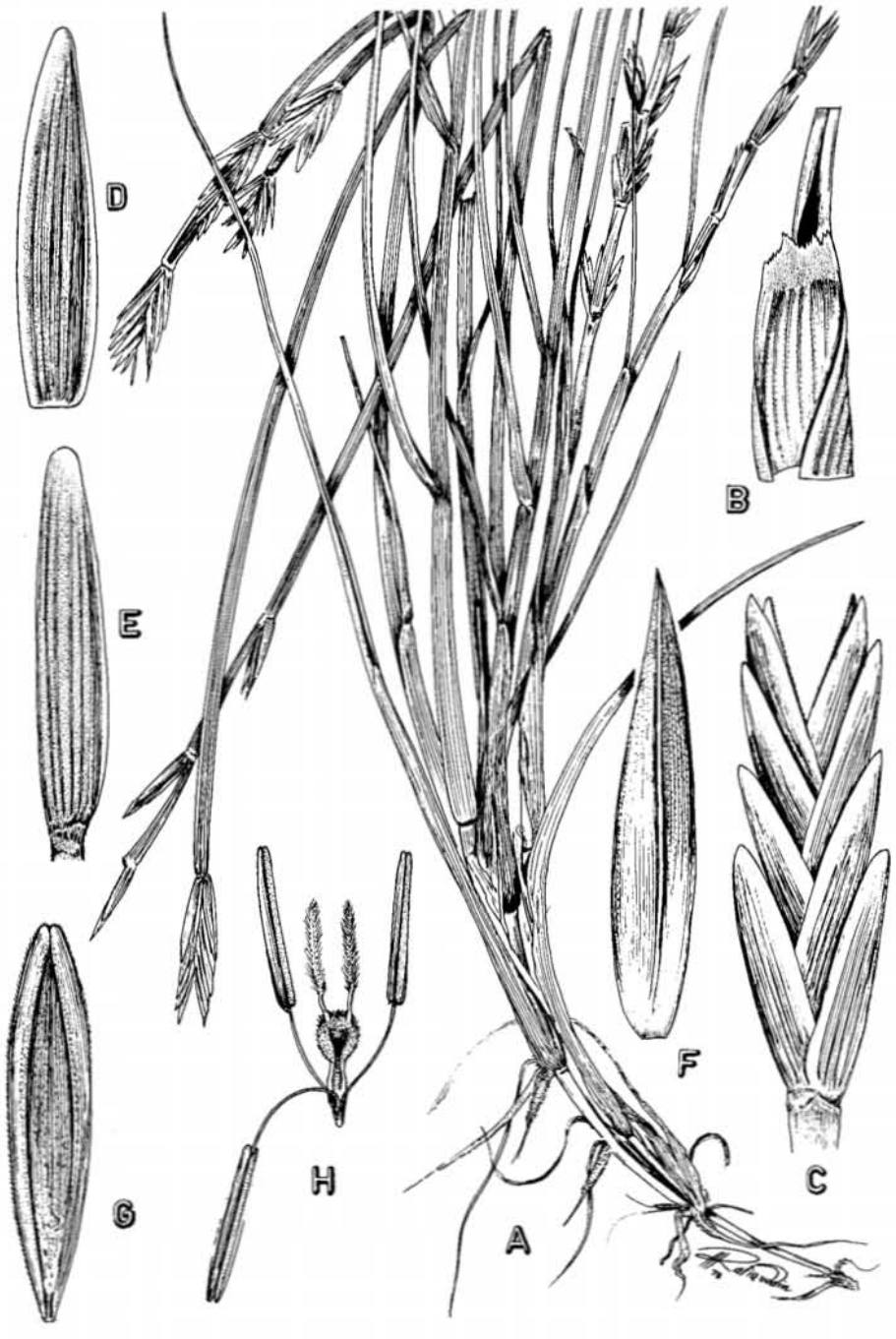


Fig. 32 **Elytrigia juncea**: A, habit × 0.5; B, portion of lamina, ligule and sheath × 0.3; C, spikelet × 3; D,E, lower and upper glumes × 4; F, lemma × 4; G, palea × 4; H, stamens and pistil x 3.

tuse, sometimes with a mucro, 5-nerved; palea subequal, 2-keeled; lodicules 2; stamens 3, anthers linear; ovary hairy above. 2n = 28, 42.

Type: Described from Switzerland.

A-2 Assa, by the sea shore, 4.6.1976, *K. Maghboob* 982, 988-999, 1006-1007 and 1010-1912; **A-3** Tajura, Tourist City beach, 12.3.1977, *Faruqi* 1263; Leptis Magna, 1.5.1974, *B. Faris* 325; *ibid., M. Godeh* 340; El Naggasa, 1.5.1974, *G. Faris* 593.
Also reported from Cyrenaica by Durand and Barratte (l.c.) etc.

Distribution: Mediterranean coast and the Atlantic coast of Europe and Africa.

31. **CRITHOPSIS**

Jaub. et Spach, Ill. Pl. Or. 4: 30, t. 321. 1851.

Annual with auriculate leaf base. Inflorescence of dense spikes. Spikelets paired, distichous, rachis densely hairy, fragile; spikelets with a lower bisexual and an upper rudimentary florets; glumes similar, strap-like, scabrid, awned, lemma 5-nerved flat or depressed on the abaxial surface, extending into a flat awn; palea 2-keeled, ciliate on keels.

A monotypic genus.

Crithopsis delileana (Schultes) Rozhev., Graser, 319. 1937; Keith, l.c. 395; Scholz, l.c. 436. 1974. (Fig. 33)

Elymus geniculatus Delile, Fl. Egypt 30, t. 13f. 1. 1812 non Curtis (1790); *E. delileanus* Schultes, Syst. Veg. ed. 15, 2. Mant. 424. 1824; Durand & Barratte, l.c. 278; Pamp., Pl. Trip., 21. 1914; Prod. Fl. Cir. 141. 1931; Maire, l.c. 394.

A small annual grass, 15-30 cm. Culms fascicled, erect or geniculate, glabrous. Leaf linear-lanceolate, acuminate, up to 6 cm long, flat, glabrous, leaf base auriculate. Spike up to 4 cm long including the awns, terminal, axis fragile, densely ciliate on the margins, spikelets disarticulating in pairs, 2-flowered, lemma hairy on the back; stamens 3; lodicules 2, fimbriate at the apex and margins; caryopsis oblong elliptic, hilum linear, appendaged at the apex. 2n = 14.

Type: Described from Egypt.

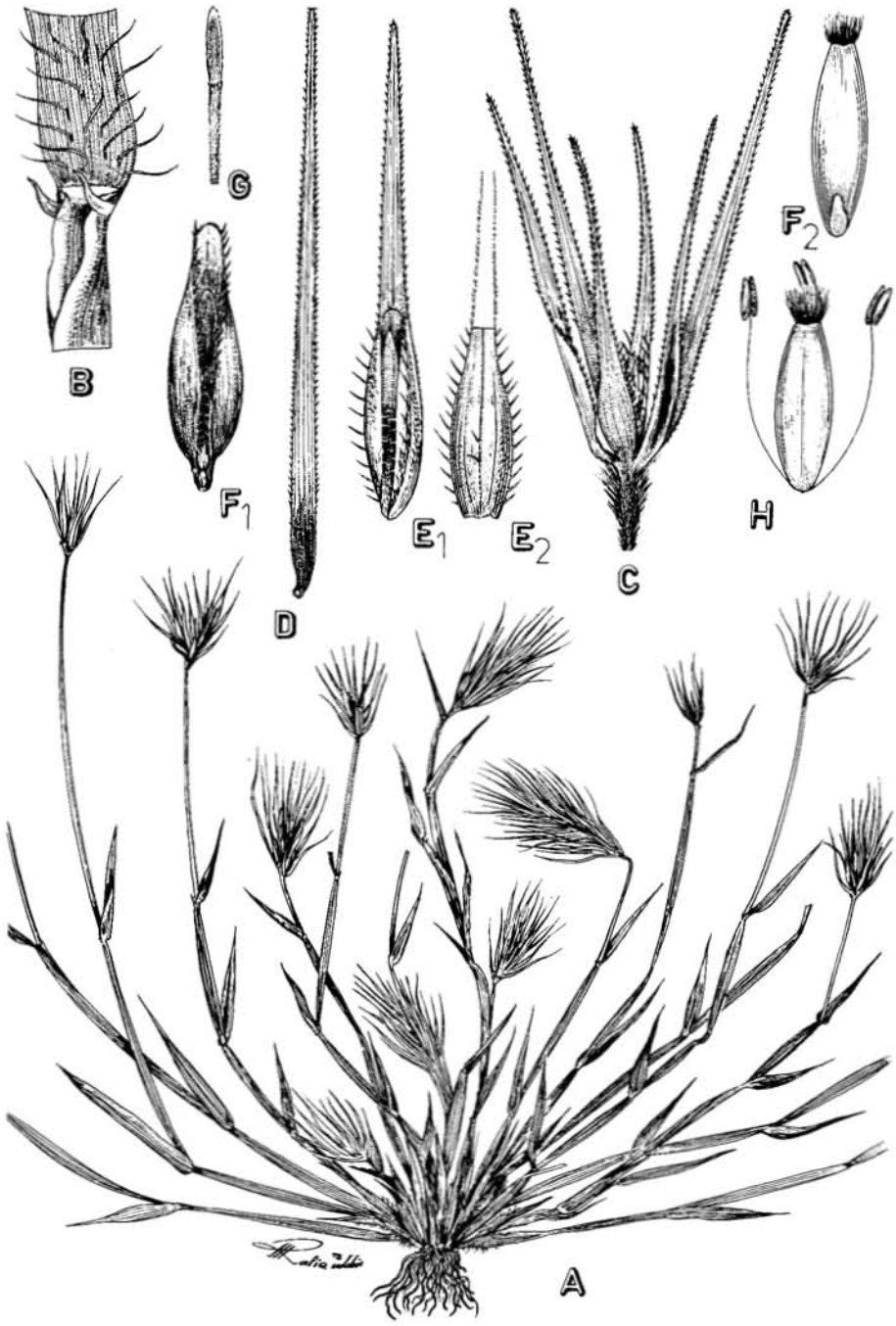


Fig. 33 **Crithopsis delileana**: A, habit × 0.5; B, portion of lamina, ligule and sheath × 5; C, disarticulated spikelet pair × 3; D, glume × 4; E^1, ventral view of a fertile floret with a sterile floret on a prolonged rachilla x 4; E^2, dorsal view of a portion of lemma × 4; F^1, palea of a fertile floret with rachilla and sterile floret × 5; F^2, caryopsis × 5; G, rachilla with the sterile floret × 4; H, stamens and pistil × 5.

A-6 Benghazi, Garyunus, 13.3.1978, *Faruqi* 1664; **A-7** 10 km from Baida on way to Derna, 23.5.1977, *Faruqi* 1367-f, 1368-p; Faidiya, 23.5.1977, *Faruqi* 1371-C; Shahat, 4.5. 1978, *Faruqi* 1728; 3 km from Shahat on way to Derna, main highway 4.5.1978, *Faruqi* 1751; 37 km from Ras el Helal on way to Susa, 14.4.1979, *M.A. Siddiqi & Ramadan* 2395-Z; 16 km from Labrag, c. 30 km from Lamluda, 19.6.1972, *S.I. Ali* 738; Above Derna on way to Martuba, 30.3.1970, *Davis* 50328. **A-8** Tamimi to Om Razm, 30.3.1970, *Davis* 50295.

Also reported from Tripolitania by Durand and Barratte l.c..

Distribution: Crete, Cyprus, Syria, Palestine, Jordan, Iraq, Iran, Egypt and Morocco.

Fl.: Apr.-June

32. **HORDEUM**

L., Sp. Pl. 84. 1753; Gen. Pl. ed. 5: 37. 1754.

Annual or perennial. Leaf flat, auricled at the base. Inflorescence a spike of spikelets, compressed. Spikelets in threes, distichous, the central sessile and hermophrodite and the lateral sessile or pedicelled, male or neuter, 1-flowered, rachilla prolonged in the central spikelet; glumes linear, awn-like, sometimes expanded at the base; lemma 5-nerved, awned, awnless or appendaged; lemma and palea adherent to the grain or palea free; stamens 3; lodicules 2; caryopsis elliptic, deeply furrowed, hilum linear.

About 20 species in the temperate regions; represented by 7 species in Libya.

1.	+ Perennial plants; culms bulbous at the base	1, **H. bulbosum**
	— Annual plants; culms not bulbous at the base	2
2.	+ Panicle with tough rachis; cultivated species	3
	— Panicle with fragile rachis; wild species	4
3.	+ Lateral spikelets fertile; spikes with 6 rows of fertile spikelets	7. **H. vulgare***
	— Lateral spikelets sterile; spikes with 2 rows of fertile spikelets	6. **H. distichon***
4.	+ Awn of central (fertile) lemma stout, 5(-4)-15 cm long	5. **H. spontaneum**

– Awn of central (fertile) lemma slender, up to 3.5 cm long 5

5. + Glumes of central spikelets long-ciliate at margins 2. **H. murinum**
– Glumes of central spikelets not ciliate at margin 6

6. + Both glumes of lateral spikelets linear-subulate or the inner glume slightly swollen at the base 4. **H. geniculatum**
– Only the outer glume of lateral spikelets linear and the inner glume broadly winged at the base 3. **H. marinum**

1. **Hordeum bulbosum** L., Amoen. Acad. 4: 304. 1759; Durand & Barratte, Prodr. Fl. Lib. 278. 1910; Pamp., Prod. Fl. Cir. 140. 1931; Maire, Fl. Afr. Nord. 3: 374. 1955; Keith, Prelim. Check List Lib. Fl. 557. 1965; Scholz in Willdenowia 7: 436. (Fig. 34)

H. strictum Desf., Fl. Atl. 1: 113, t. 37. 1798.

Perennial, up to 80 cm tall. Culm with scattered hairs, base bulbous. Leaves flat, 10-20 cm long, 2-5 mm broad, sparsely hairy. Inflorescence a spike of spikelets, linear, up to 14 cm long, 1 cm broad, dense. Spikelets in groups of 3, the lateral 2-pedicelled and the central sessile; glumes reduced to 2 awn-like structures at the base of each spikelet; rachilla in the central spikelet tapering to the tip, 4-4.5 mm long, barbed; lemma 8-10 mm long, 5-nerved, lemma of the central spikelet awned, those of lateral spikelets not awned, awn 2-3.5 cm long. 2n = 14,28.

Type: Described from Italy, Herb. Linn. 103/3 (LINN).

A-6 Around Alabiar, 24.3. 1970, *Davis* 49905; **A-7** 12 km E. Labrag, Gebel Akhdar, 11.3.1968, *Boulos* 2203; 20 km E. of Baida, 4.5.1978, *A. El Gadi, Jafri et al.* 1463-G.

Distribution: Mediterranean region, Anatolia, Iraq, Iran, Afghanistan, Turcomania, S. Russia, N. China.

Fl.: Feb.-May

2. **Hordeum murinum** L., Sp. Pl. 85. 1753; Durand & Barratte, l.c. 278; Pamp.,

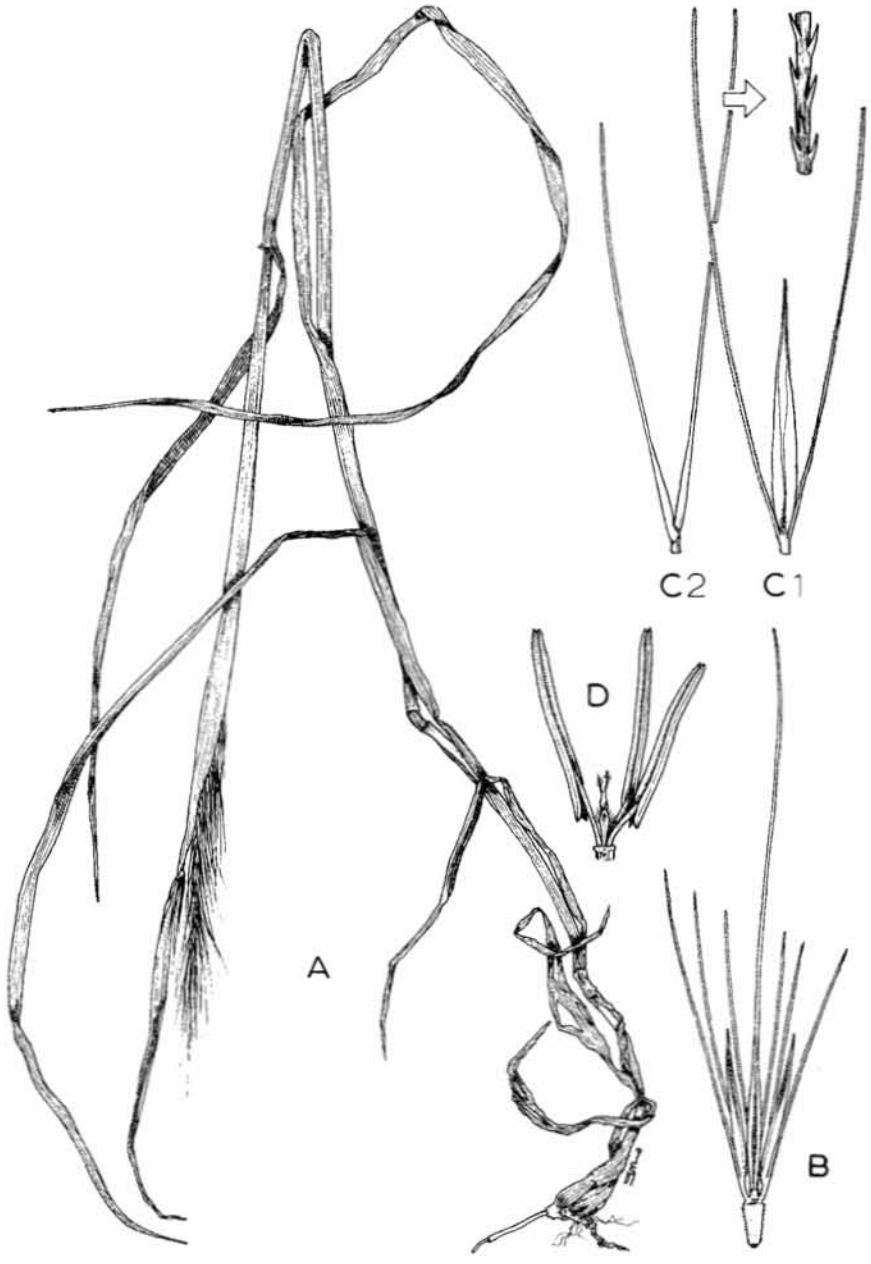


Fig. 34 **Hordeum bulbosum:** A, habit × 0.5; B, group of 3 spikelets × 1.5; C_1, lateral spikelet and C_2, its glumes × 2.5; D, stamens and pistil × 5.

Pl. Trip. 22. 1914; Maire, l.c. 376; Keith, l.c. 558; Scholz, l.c. 436.

Annual, 45 cm tall. Culm glabrous, glaucous, erect, tufted from the base. Leaf with scattered long hairs, linear to linear-lanceolate, acute, 16 cm long and up to 6 mm broad. Spikes up to 9 cm long. Spikelets a cluster of three; glumes modified into awn-like structures, ciliate on the margin, 25 mm long with awn; central floret subsessile, peduncle less than 1/2 the length of the lateral spikelets; lemmas of both central and lateral florets awned, glabrous, elliptic, 9 mm long, awn 28 mm long. 2n = 28.

A very polymorphic species, three infraspecific taxa can be recognised in our area.

1.	+ Central spikelets sub-sessile, pedicel less than 1/2 as long as those of lateral spikelets	a. ssp **murinum**
	– Central spikelets pedicelled; pedicel ± equal to those of lateral spikelets	2
2.	+ Anthers 0.7-1.5 mm long	b. ssp. **leporinum**
	– Anthers 0.2-0.5 mm long	c. ssp. **glaucum**

a. ssp. **murinum**

Type: Described from Europe, Herb. Linn. 103/8 (LINN).

Distribution: Europe, Asia, introduced into America and Tasmania.

Fl.: Mar.-Apr.

b. ssp. **leporinum** (Link) Arcang., Comp. Fl. Ital. 805. 1882; Maire, l.c. 376; Tzvelev, Poaceae URSS 198. 1976; Humphries in Tutin et al., Fl. Eur. 5: 205. 1980; Cope in Nasir & Ali, Fl. Pak., 143: 638. 1982. (Fig. 35)

H. leporinum Link in Linnaea 9: 133. 1835; Keith, l.c. 558; Scholz, l.c. 437; *H. murinum* L. var. *leporinum* (Link) Richt; Pl. Eur. 1: 130. 1890. Pamp., Pl. Trip., 22. 1914; Prod. Fl. Cir. 139. 1931.

A tufted, geniculately ascending annual, up to 40 cm tall, usually smaller. Culms glabrous. Leaf pubescent, up to 25 cm long, 2-5 mm broad, lanceolate-acuminate. Spike

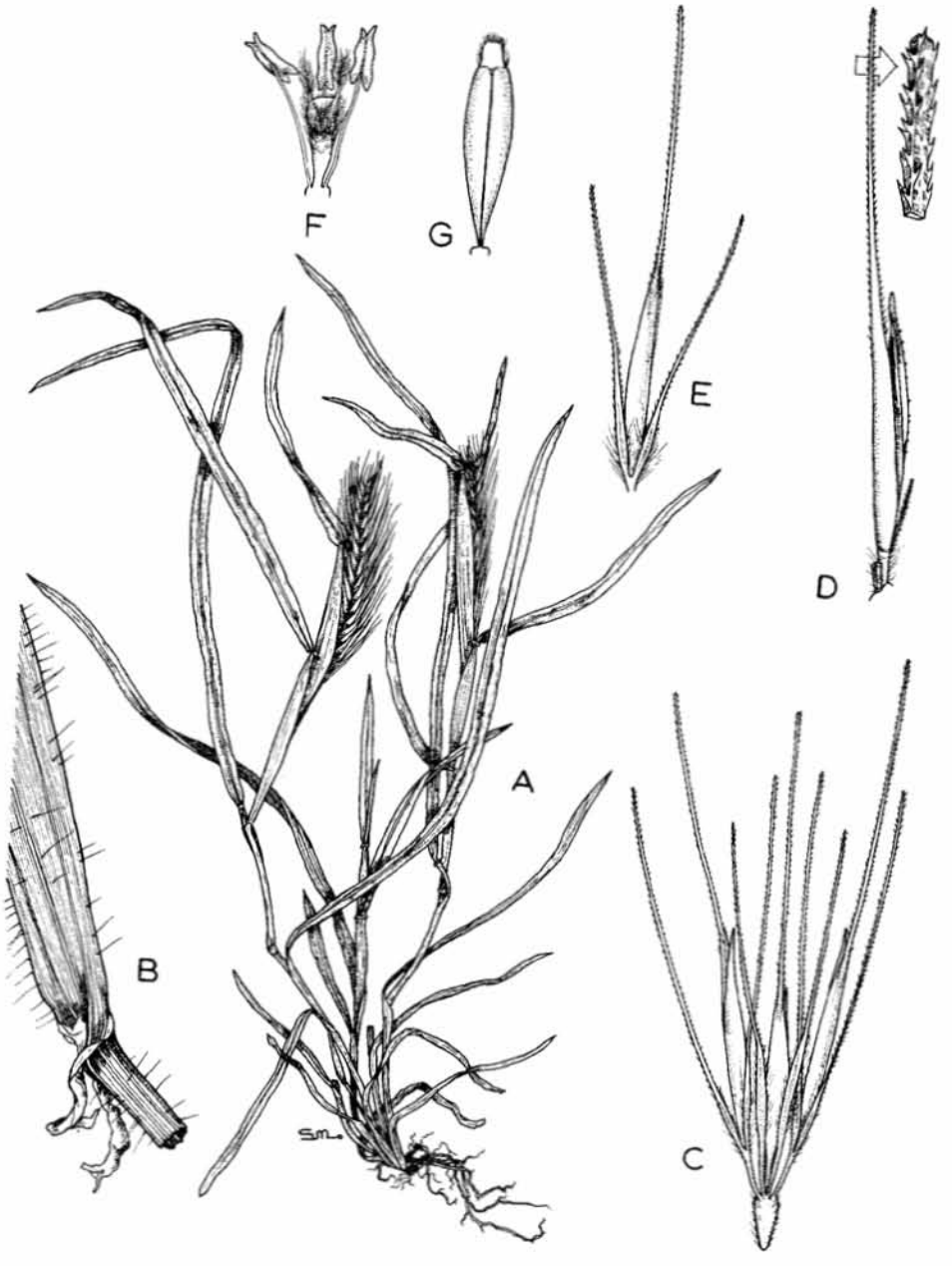


Fig. 35 **Hordeum murinum** ssp. **leporinum:** A, habit × 0.5; B, portion of lamina, auricle and sheath × 5; C, a group of 3 spikelets × 3; E, lateral spikelet × 2; F, stamens and pistil × 10; G, mature ovary × 5.

up to 7 (10) cm long, obovate when old. Spikelets in group of three, all pedicelled, axis fragile, pedicel of the central spikelet more or less equal to those of lateral spikelets, the two glumes of the central floret flat at the base and barbed at margins, those of lateral spikelets only one flat and barbed and the other somewhat terete and not barbed; extention of rachilla 4.5-5.5 mm, very slender, minutely scabrous-smooth; stamens of central floret exerted, anthers 0.7-1.5 mm long. 2n = 28,42.

Type: Described from Greece.

A-3 Tripoli, Sciara-Sciat, 23.4.1913, *Pampanini* 3525 (FI); **A-6** Benghazi, Deryana, 7.3.1922, *Maugini* s.n. (FI); **A-7** Derna-el-Mechili, Bir Bu Azzagh, 19.4.1934, *Pampanini & Pichi-Sermolli* 752 (FI); Derna, Wadi Derna, 12.5.1934, *Pampanini & P. Sermolli* 756 (FI); Cirene, Ain Midisch, 15.5.1934, *Pampanini & P. Sermolli* 757 (FI); Cirene, 15.5.1922, *Maugini* s.n. (FI); Wadi Derna, 14.3.1968, *Boulos* 2410; **B-2** Fra Mizda-Garian, 12.5.1932, C.sso *O. Bargagli-Petrucci* s.n. (FI).

Distribution: Mediterranean region, S. Russia, Syria, Iraq, Iran, Afghanistan, Pakistan, N.W. India, Caucasus, Turkestan, Pamir-Alaj, Tien Shan; introduced into N. America and Australia.

Fl.: Feb.-June

c. ssp. **glaucum** (Steud.) Tzvelev in Nov. Sist. Vyssh. Rast. 1971: 67. 1971; Poaceae URSS 198. 1976; Humphries, l.c. 205; Cope, l.c. 637. (Fig. 36)

H. glaucum Steud., Syn. Pl. Glum. 1: 352. 1854; Scholz in Willdenowia 7: 422. 437. 1974.

A tufted, erect, geniculately ascending, up to 40 cm tall, annual. Culms glabrous. Leaf pubescent, 10-15 cm long, 5-7 cm broad. Spike up to 9 cm long, usually shorter, with fragile axis, all of the 3 spikelets pedicelled, pedicel of the central spikelet more or less equal to those of lateral spikelets, the two glumes of the central spikelet flat at the base and barbed with 1.5 mm long hairs at the margins, those of lateral spikelets only one flat and barbed, the other somewhat terete and not barbed; extention of rachilla slender, 3.5 mm long, minutely scabrous; stamens hidden within the central florets, anthers 0.2-0.5 mm long; lemma awned, awns 3-3.5 cm long. 2n = 14.

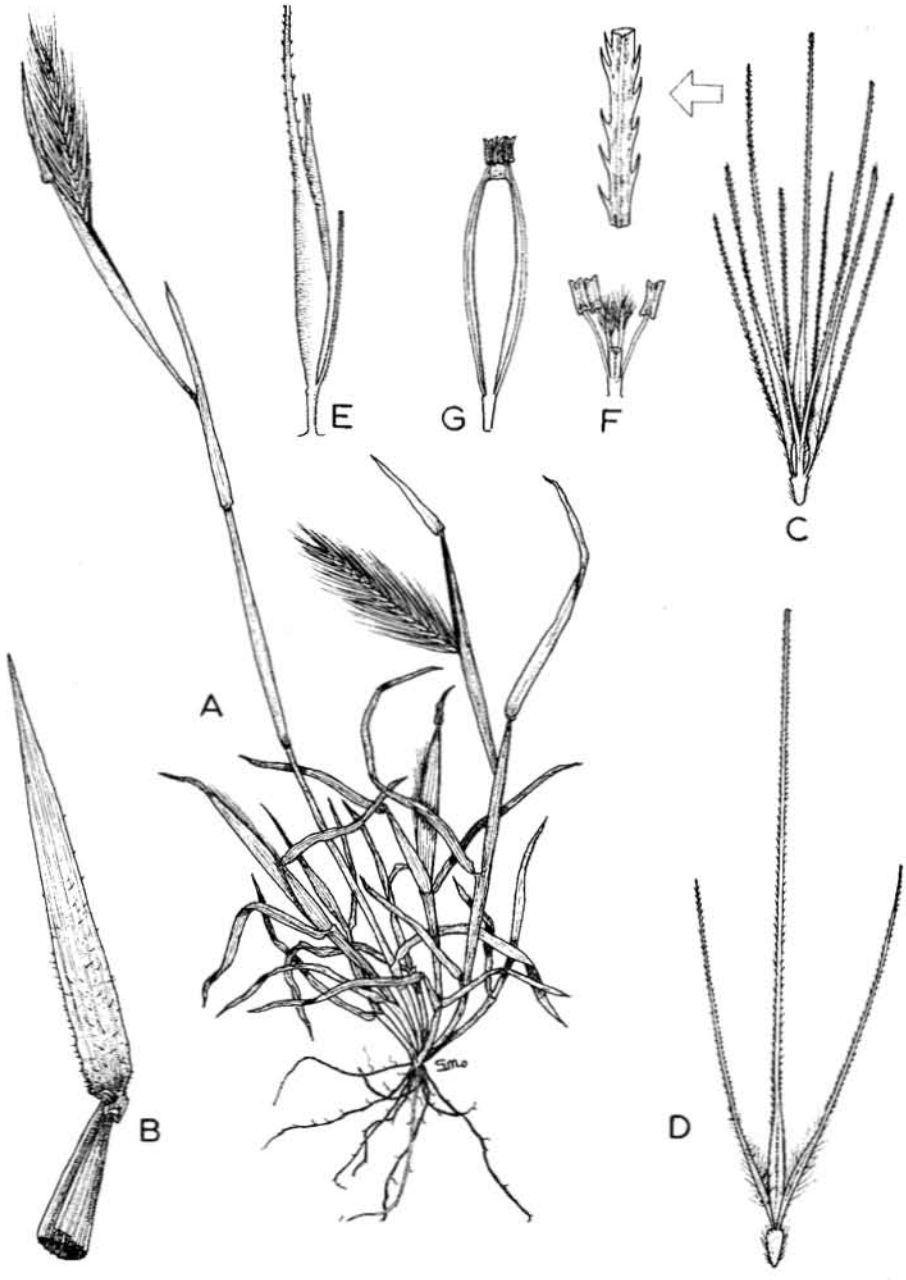


Fig. 36 **Hordeum murinum** ssp. **glaucum:** A, habit × 0.5; B, lamina, auricles and portion of sheath × 1.5; C, group of three spikelets × 1.5; D, central spikelet × 2; E, central spikelet with prolonged rachilla × 5; F, stamens and young pistil × 10; G, mature ovary × 5.

Type: Described from Mons. Sinai, Arabia, Schimper 383 (K).

A-2 10 km from Azizia on way to Nalut, 27.3.1976, *Faruqi* 534; Road bifurcation to Yafren and Nalut, 27.3.1976, *Faruqi* 536 and 537; Yafren hills, 3 km on way to Tripoli, 27.3.1976, *Faruqi* 549 and 550; 17 km from Yafren on way to Nalut, 27.3.1976, *Faruqi* 558, 559 and 560; 1 km before Gwalish, 21.5.1976, *Faruqi* 768, 769 and 770; **A-3** 20-23 km east Tripoli, along the coastal road to Khoms, 8.3.1967, *Boulos* 1583; Hadba El-Khadra, Tripoli, 8.4.1967, *Boulos* 1642; 22 km west Khoms on calcareous slopes, 25.4.1967, *Boulos* 1772; Hashshan forest, 19.3.1976, *Faruqi* 344, 345 and 346; Gargaresh, 2 km from Post Office, on way to Zanzur, 23.3.1976, *Faruqi* 404-a; Tajura, 24.3.1976, *Faruqi* 420; Sharshara, Tarhuna, 24.3.1976, *Faruqi* 490; Zanzur, 25.3.1976, *Faruqi* 500, 510, 511, 513, 514 and 515; Hadba Sharqia Military Camp, 7.5.1976, *Faruqi* 646; 56 km from Tripoli, towards Bughelan, 20.5.1976, *Faruqi* 698,699 and 700; Bughelan hills, 21.5.1976, *Faruqi* 737; 20 km from Zalitan on way to Misrata, 7.1. 1977, *Faruqi* 1044; Tripoli, 5 km towards airport, 5.3.1977, *Faruqi* 1194; Tajura, Bil Ashhar, 6.3.1977, *Faruqi* 1220; Shati Zanzur, 9.3.1977, *Faruqi* 1236-a and 1240; 84 km from Tripoli, towards Gharian, 23.7.1977, *M. Ahmad* 1312 and 1314; 5 km from Gharian, 27.3.1977, *M. Ahmad* 1325; Wadi Kam Bridge on main highway, 7.4.1977, *Faruqi* 1349. **A-6** 2 km from Benina, towards El-Rajma project, 22.5.1977, *Faruqi* 1359; road between Al-Kuwayfiah and Daryana, N.E. Benghazi, 10.3.1968, *Boulos* 2008, 2015; **A-7** 10 km from Baida, on way to Derna, 23.5.1977, *Faruqi* 1367-e; 65 km from Mertuba on way to Faidiya, 25.5.1977, *Faruqi* 1392-ao and 1392-ap; **B-1** Nalut, 22.5.1976, *Faruqi* 825; 2 km from Nalut on way to Ghadames, 16.6.1977, *Faruqi* 1418; 10 km from Nalut on way to Ghadames, 16.6.1977, *Faruqi* 1424; **B-2** 5 km after Gwalish on way to Jadu, 21.5.1976, *Faruqi* 781, 782 and 783; Jnawan, 21.5.1976, *Faruqi*, 810; **B-5** 55 km to Ras Lanuf, towards Benghazi, 27.5.1977, *Faruqi* 1401-b; **B-6** 20 km from Gaminas towards Benghazi, 13.3.1978, *Faruqi* 1685; **C-4** 33 km from Hun, towards Bughrain, 8.3.1978, *Faruqi* 1619.

Distribution: Mediterranean region, S.W. Asia, India,Pakistan, introduced into S. & N. America and Australia.

Fl.: Jan.-June *Vern.* Zewan.

3. **Hordeum marinum** Huds., Fl. Angl. ed. 2, 1: 57. 1778; Scholz in Willdenowia, 7: 437. 1974. (Fig. 37)

H. maritimum With., Nat. Arr. Br. Pl. ed. 2, 1: 127. 1787; Durand & Bar-



Fig. 37 **Hordeum marinum:** A, habit × 0.5; B, group of spikelets × 3; C, glumes of lateral spikelet × 5.

ratte, l.c. 277; Pamp., Pl. Trip., 22. 1914; Prodr. Fl. Cir. 140. 1931; Maire, l.c. 378; Keith, l.c. 558.

Annual, erect or geniculately ascending, 15-40 cm tall, branching from the base. Leaves small 2-3 cm long, minute hair on leaves and sheaths or glabrous, sheath dilated and loose, panicle 3-4 cm long with fragile axis, 2-lateral spikelets pedicelled and the central spikelet sessile, central spikelet 5 mm long, rachilla 4 mm long, lateral spikelets smaller, awned; the upper glume of each lateral spikelet broadly winged at the base and not ciliate on margins, others bristle-like, glume awn 13 mm long; lemma awn of the central floret 10 mm long; palea subequal to lemma; anthers 3, linear-oblong, 1-1.2 mm long; ovary hairy at the top. 2n = 14.

Type: Described from England (Gramen secalinum maritimum minus, Morison, Hist. Oxon. 3: 179, t. 6f. 5, 1699).

A-7 N.E. Benghazi, Road between Al-Kuwayfiyah and Daryanah, 10.3.1968, *L. Boulos* 2013.

Also reported from the former Tripolitania and Cyrenaica by Durand & Barratte (l.c.) etc.

Distribution: N. Africa, W. & S. Europe, Aegean Isles, Syria, Palestine, Jordan, Turkey, Caucasus, Iran, Afghanistan, tropical and S. Africa, introduced into America.

Fl.: April-June

4. **Hordeum geniculatum** All., Fl. Pedem 2: 259, tab. 91, fig. 3. 1785; Scholz in Willdenowia, 7: 437. 1974.

H. hystrix Roth, Cat. Bot. 1: 23. 1797; *H. gussoneanum* Parl., Fl. Palerm. 1: 246. 1845; *H. marinum* ssp. *gussoneanum* (Parl.) Ascherson et Graebner, Syn. 2: 737. 1902; Pamp., Prodr. Fl. Cir. 140. 1931; Maire, l.c. 380; Keith, l.c. 558.

Annual with delicate culms, tufted, erect-geniculately ascending, up to 30 cm tall. Culm glabrous. Leaf sheath pubescent; leaf 3-5 cm long, 1-1.5 mm broad. Spike 4 cm long (including the awn) with fragile axis, delicate lateral spikelets neuter, much smaller than the central spikelet, lateral spikelets pedicelled; all the glumes of lateral spikelets

modified into awns or one of them swollen at the base but not winged, glumes not ciliate; lemma of both central and lateral spikelets awned, 15 mm long. 2n = 14.

Type: Prope Portum di Limpia ad litora maris Nicaeensis, *Bellardi.*

A-3 Tripoli, Nell'Oasi al Henni, 23.4.1913, *Pampanini* 4406 (FI).

Distribution: N. Africa and Tropical S. Africa, W.C. & S. Europe; Turkey, Aegean Isles, Balkan, Crimea, Syria, Sinai, Iran, C. Asia. Introduced into Australia, New Zealand and N. America.

FL.: Mar.-June *Vern.* Zewan.

5. **Hordeum spontaneum** C. Koch in Linnaea 21: 430. 1848; Bacht. in Bot. Zhurn. 47:846.1962; Maire, l.c. 383; Keith, l.c. 559; Scholz, l.c. 437. (Fig. 38)

H. distichon L. var. *spontaneum* (C. Koch) Ascherson et Schweinf. in B. Herb. Boiss. 1:677. 1893; Durand & Barratte, l.c. 277; Pamp., Prod. Fl. Cir. 138. 1931.

Annual up to 70 cm tall. Culm sparsely hairy, erect, tufted or solitary, not bulbous at the base. Leaf base flat, blade up to 10-15 cm long, 4-7 mm broad. Spikes up to 8 cm long excluding awn and with fragile axis; 2 awn-like glumes at the base of each spikelet, the base of glume covered with small silvery hairs; rachilla up to 4 mm long, with hairs 1 mm long, 2 lateral florets without an awn or with a very short one, central florets with a scabrid awn 5(-4)-15 cm long, central spikelet sessile, the lateral pedicellate. 2n = 14.

Type: Described from Caucasus 500-1000 ft., *C. Koch.*

Distribution: N. Africa, S.E. Europe, Cyprus, Syria, Palestine, Jordan, Egypt, Turkey, Caucasus, Iran, Afghanistan, Pakistan, N.W. India and C. Asia.

Fl.: Mar.-May

6. ***Hordeum distichon** L., Sp. Pl. 85. 1753; Maire, l.c. 385; Keith, l.c. 558; Scholz, l.c. 437.

Annual, 90 cm tall. Culm solitary or tufted, smooth, glabrous, glaucous, not bul-

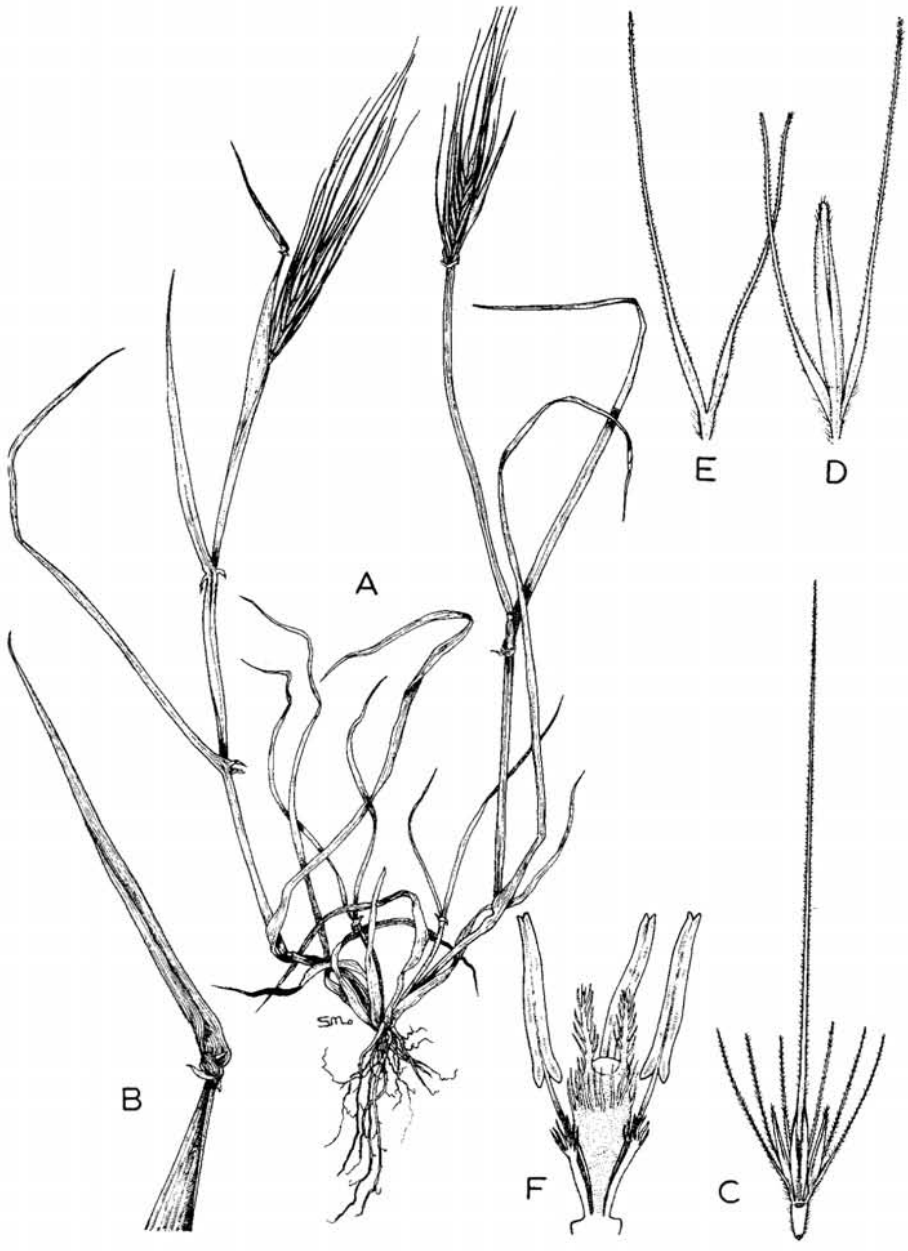


Fig. 38 **Hordeum spontaneum:** A, habit × 0.5; B, leaf, auricle and portion of sheath × 2; C, group of three spikelets × 1; D, lateral spikelet × 2.5; E, its glumes × 2.5; F, stamens and pistil × 10.

bous at the base. Leaf glabrous, linear-lanceolate, acuminate. Spike up to 10 cm long, and 1.5 cm broad with a tough axis. Spikelets in cluster of three, the two lateral ones either neuter or male and awnless, only central spikelet hermaphrodite and awned, the fruiting spike 2-rowed, glumes of fertile spikelet linear-lanceolate to oblong-elliptic, 4-5 mm long; lemma 10 mm long, 5-nerved, awn 12 cm long. 2n = 14 (28).

Type: Not designated.

Reported to be cultivated in Cyrenaica by Maire (l.c.), Keith (l.c.) and Scholz (l.c.).

Distribution: Cultivated all over the temperate regions of the world.

Fl.: Mar.-Apr.

7. ***Hordeum vulgare** L., Sp. Pl. 84. 1753; Lam., Fl. France 3: 623. 1778; Durand & Barratte, l.c. 27; Pamp. Pl. Trip. 6. 1914; Prod. Fl. Cir. 628. 1931; Corti, Fl. Veg. Fezz. 468. 1942; Maire, l.c. 386; Keith, l.c. 559; Scholz, l.c. 437. (Fig. 39)

H. hexastichon L., Sp. Pl. 85. 1753; *H. sativum* Pers., Syn. Pl. 1: 108. 1805.

Annual. Culm up to 1 m tall, erect, smooth and glabrous, not bulbous at the base. Leaf linear, lanceolate, acuminate, glabrous, up to 45 cm long. Spike 6-10 cm long, up to 2 cm broad with a tough axis. Spikelets in cluster of three, all fertile, the fruiting spike with 6 rows of fertile spikelets; glumes linear-lanceolate, awned, lemmas broadly ovate-lanceolate, strongly 5-nerved, awned, awn up to 15 cm long and 1 mm broad at the base. 2n = 14.

Type: Described without indication of locality, Herb. Linn. 103/11 (LINN).

A-3 Bu Ghelan, erect, 2.4.1976, *M.M. Shuehdi* 62; Sharshara, erect, 25.3.1976, *Amina Abdel Aziz* 16; 13-16 km S. of Gussbat, soil clayey, 26.3.1979, *A. El-Gadi* 2797-G; **A-7** Derna, Sidi Aziz, Primavera 1922, *Maugini* s.n. (FI); Derna, Fateiah, Primavera 1922, *Maugini* s.n. (FI); Derna, Casa Aronne, Primavera 1922, *Maugini* s.n. (FI).

Distribution: Cultivated throughout the world.

Fl.: Mar.-Apr. *Vern.* Sha-eer



Fig. 39 **Hordeum vulgare:** A, habit × 0.5; B, group of three fertile spikelets × 1; C, an enlargement of the three fertile spikelets × 3.

33. **HAINARDIA**

Greuter in Boissiera 13: 178. 1967.

Monerma P. Beauv., Ess. Agrost. 116, tab. 20. fig. 10. 1812.

Erect annual. Leaves involute or complicate. Inflorescence a straight, vertical, terminal spike with a tough rachis. Spikelets distichous, alternate and sessile, sunken in internodal cavities, 1-flowered, hermaphrodite; glumes 2, equal, in the terminal spikelets and only one in the lateral spikelets covering the cavity, leathery, strongly nerved, the lower glume of the lateral spikelets absent; lemma with its back to the rachis, membranous, 3-nerved; palea membranous, 2-nerved; stamens 3; lodicules 2, broad, thick and fleshy at the base, oblique, glabrous, tip acute or acuminate; caryopsis oblong, somewhat dorsally compressed with an appendage at the apex; embryo small, about 1/5 the length of the grain; hilum short, linear, suprabasal.

A monotypic genus.

Hainardia cylindrica (Willd.) Greuter in Boissiera 13: 177. 1967; Scholz in Willdenowia, 7: 437. 1974. (Fig. 40)

Rottboellia cylindrica Willd., Sp. Pl. 1: 464. 1797; *Lepturus cylindricus* (Willd.) Trin., Fund. Agrost., 123. 1820; *Monerma cylindrica* (Willd.) Coss. et Dur., Expl. Sci. Alg., Glu. 214. 1855.

A slender grass, with or without cauline branches. Culm cylindrical, glabrous and smooth, finely puberulent on either side of node. Leaves filiform, up to 6 cm long, sometimes curved, glabrous, sheaths dilated. Inflorescence a slender spike of spikelets up to 10 cm long, lower portion enclosed within the uppermost leaf sheath, spikelets embedded in the grooves of the cylindrical axis, deviating at the time of opening of florets, 1-flowered; lower glume supressed, upper glume glabrous, linear, acute, mucronate 5-7 mm long with a prominent median nerve.

Type: Described from S. Europe.

Reported by Scholz (l.c.) from N. Cyrenaica.

Distribution: Mediterranean region, Anatolia, Iraq, Iran.

Fl.: Mar.-May

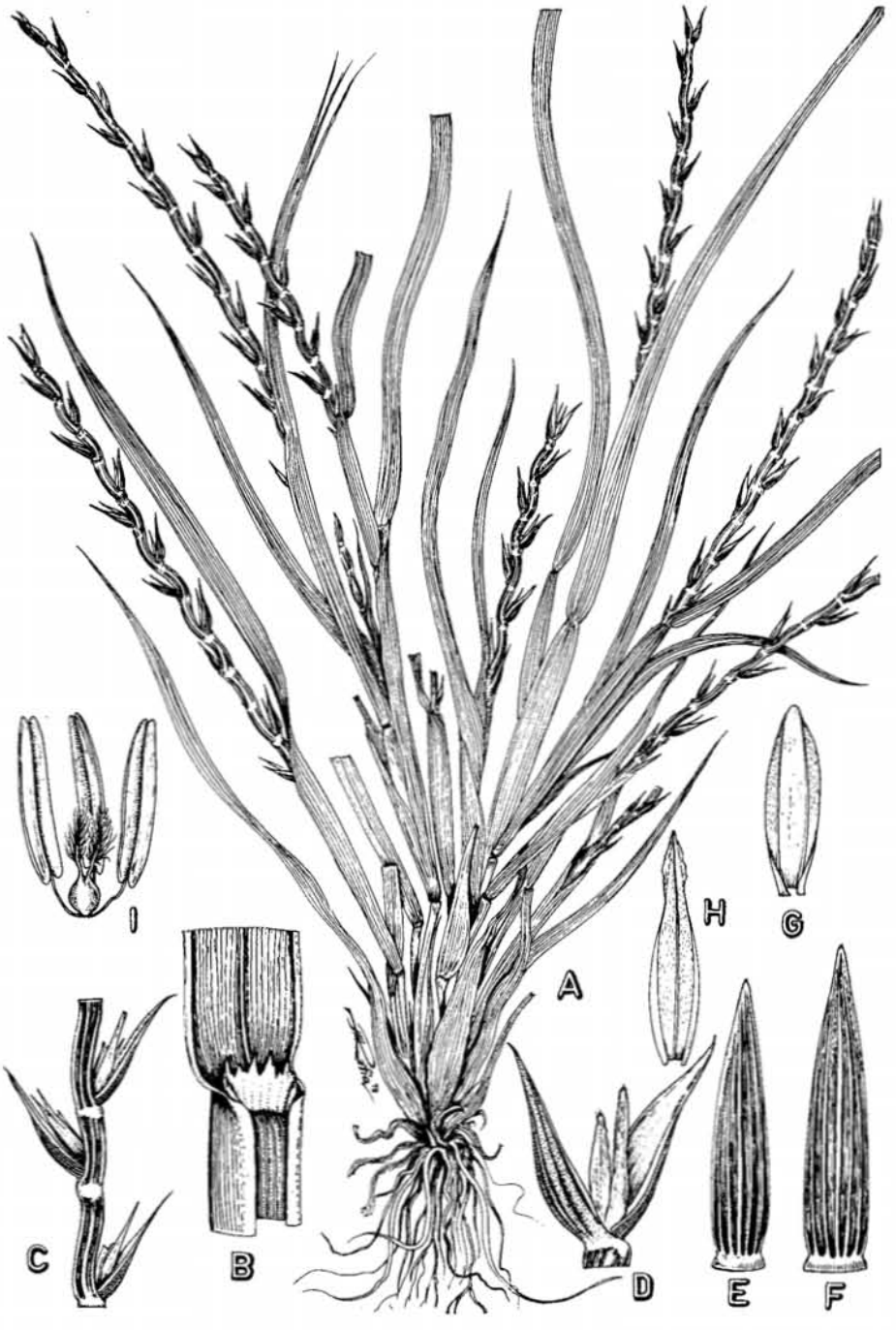


Fig. 40 **Hainardia cylindrica:** A, habir × 1; B, portion of lamina, ligule and sheath × 8; C, portion of spike with lateral spikelets × 3; D, terminal spikelet × 6; E, F, lower and upper glumes of terminal spikelet × 6; G, palea × 6; H, lemma × 6; I, stamens and pistil × 10.

34. PARAPHOLIS

C.E. Hubbard in Blumea, Suppl. 3: 14. 1946.

Annual. Leaf flat, leaf sheaths without auricle. Inflorescence a cylindrical, narrow, curved or straight, culm-like spike. Spikelets awnless, one-flowered, sunken in the cavities of rachis and disarticulating above the glume; glumes 2, equal, placed side by side, 5-nerved; lemma with 3 short lateral nerves, palea as long as lemma, 2-nerved; stamens 3; lodicules 2, ovate-acute, glabrous; hilum small.

About 6 species of temperate region, 3 are present in Libya.

1.	+ Keel of glumes distinctly winged	2. **P. marginata**
	– Keel of glumes not winged	2
2.	+ Spikes strongly curved; plants dwarf or prostrate; anthers 1 mm or less long	1. **P. incurva**
	– Spikes straight to slightly curved; plants erect and tall; anthers 1.5 mm or more long	3. **P. strigosa**

1. **Parapholis incurva** (L.) C.E. Hubbard in Blumea, Suppl. 3: 14. 1946; Scholz in Willdenowia, 7: 437. 1974. (Fig. 41)

Aegilops incurva L., Sp. Pl. ed. 1. 1051. 1753; *A. incurvata* L. Sp. Pl. ed. 2: 1490. 1763; *Lepturus incurvatus* (L.) Trin., Fund. Agrost. 123. 1820; Durand & Barratte, Fl. Lib. Prodr. 276. 1910; Pamp., Pl. Trip. 28. 1914; Prod. Fl. Cir. 134. 1931; Keith, l.c. 608; *Pholiurus incurvatus* (L.) Hitchcock, in U.S. Dept. Agr. Bull. 772. 106. 1920.

A small annual, dwarf or prostrate grass. Culm glabrous, glaucous, branches and inflorescence curved inwards, 5-15 cm tall, sometimes up to 40 cm, highly branched. Leaf flat, 5-10 cm long, 2-3 mm broad, lanceolate, acuminate; sheath swollen, somewhat loose due to branches arising through it; ligule 1 mm long, truncate, denticulate. Inflorescence a curved spike with alternating spikelets sunken in the cavities of a fragile rachis. Spikelets distributed evenly; glumes ribbed, keel not winged, 8 mm long, 1 mm broad, linear-lanceolate, acute, placed side by side; lemma hyaline, subequal, 1-nerved; palea hyaline, bifid at the tip; anthers 3, 0.5-1 mm long. $2n = 14, 36, 42$.

Type: Described from the Orient, *Tournefort*.

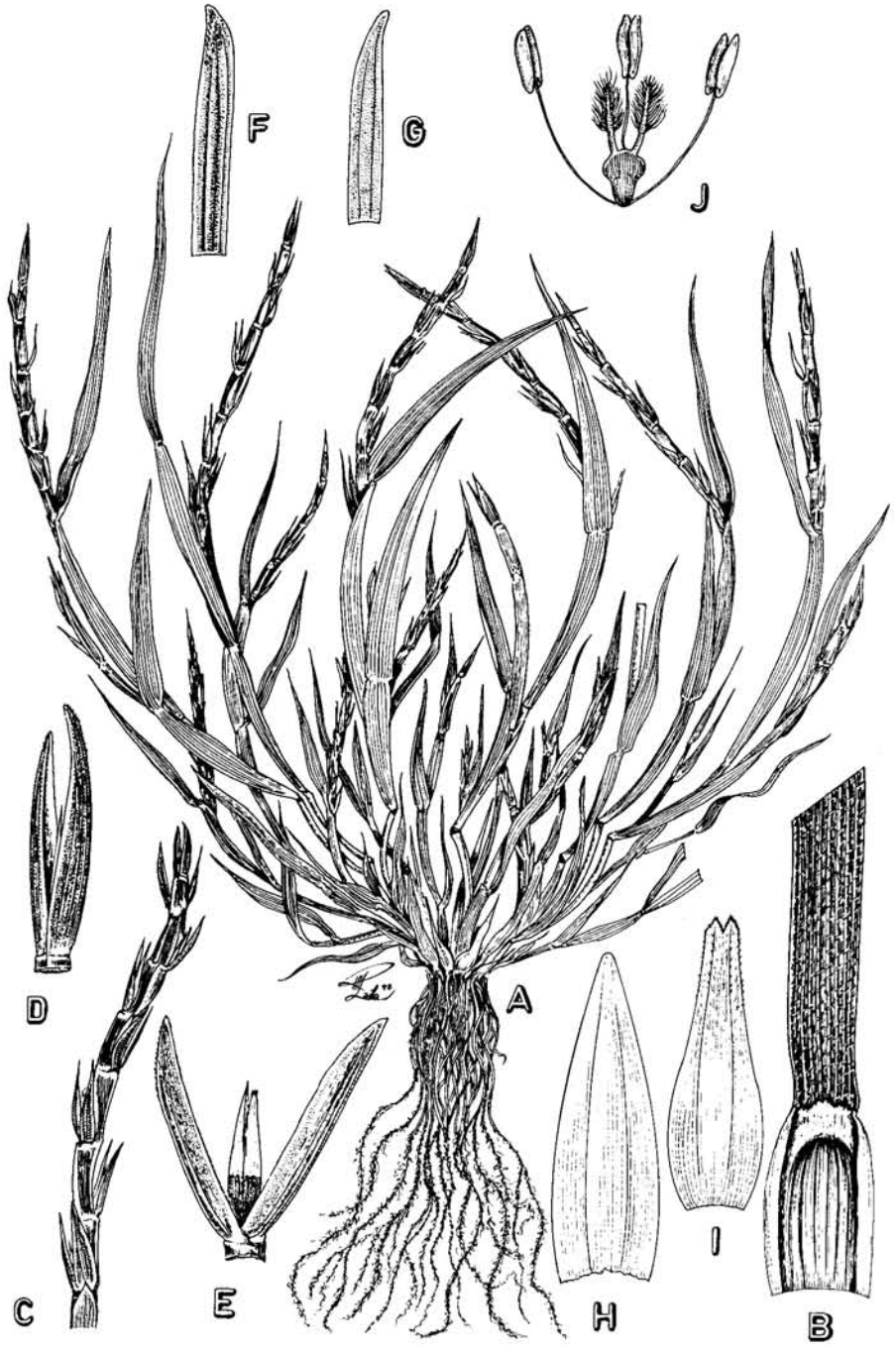


Fig. 41 **Parapholis incurva:** A, habit × 1; B, portion of lamina, ligule and sheath × 5; C, portion of spike × 2; D, terminal spikelet × 5; E, lateral spikelet × 5; F, lower glume × 5; G, upper glume × 5; H, lemma × 10; I, palea × 10; J, stamens and pistil × 10.

A-3 Misrata, on a farm, 14.3.1978, *Faruqi* 1706; **A-6** Benghazi, Gar Younis University, 13.3.1978, *Faruqi* 1661, 1662; **A-7** Shahat, 7.5.1978, *A. El-Gadi, Jafri et al.* 1699-G; Roman acquaduct near Labrag, 29.3.1979, *Davis* 50238; Tamimi to Um Razm, 30.3.1970, *Davis* 50309; 3 km from Shahat on way to Derna, 4.5.1978, *Faruqi* 1758; Shahat, 6.5.1978, *Faruqi* 1781; *ibid,* 7.5.1978, *Faruqi* 1796; 5 km E. of Wadi Kuf on main highway, 8.5.1978, *Faruqi* 1829, 1831 and 1832; **B-6** Brega, 9.5.1978, *A. El-Gadi, Jafri et al.* 2048-G; **C-4** Sokna petrol station garden, 5.3.1978, *Faruqi* 1563; **D-3** 5 km from Sebha, on way to Brak, roadside near a farm, 6.3.1978, *Faruqi* 1584.

Distribution: N. Africa, Europe, temperate Asia. Introduced into N. & S. America and Australia.

2. **Parapholis marginata** Runemark in Bot. Notiser 115, 8. 1962; Scholz, l.c. 422 and 437.

Annual, branches both cauline and ramal, 10-20 cm tall, sometimes taller. Culm glabrous. Leaves flat, lanceolate-acuminate; leaf sheath swollen because of outcoming branches and loose. Spike 30-50 mm long, curved, internodes of inflorescence axis much shorter on the upper half (2 mm) consequently spikelets crowded; glumes 2, broadly lanceolate, 7 mm long, 1.5 mm broad, acute, winged at the keel. 2n = 14.

Type: described from Greece.

Distribution: Tunis, Italy, Greece.

Reported from Tripolitania (Scholz, l.c.).

3. **Parapholis strigosa** (Dumort.) C.E. Hubbard in Blumea, Suppl. 3:14.1946; Scholz, l.c. 437.

Lepturus strigosus Dumort., Obs. Gram. Belg. 146. 1824.

Annual, up to 35- (40) cm tall, solitary or loosely branched from the base, cauline

branches frequent, erect to geniculately ascending. Culm smooth, glabrous. Leaf up to 6 cm long, 2 mm broad, glabrous, filiform-linear, acuminate. Spike long and slender, straight to slightly curved, up to 10- (20) cm long, 1—1.5 mm wide, joints deeply hollowed on one side, breaking horizontally at maturity. Spikelets embedded in the grooves of the axis, 4-6 mm long, closely pressed to the axis, deviating at the time of opening of flower, 1-flowered; glumes 2, equal or subequal, as long as spikelet, placed side by side in front of excavation and covering it, glabrous, 3-5-nerved, not winged at the keel; lemma as long as the glumes, membranous, not bifid, 3-nerved; palea equal to lemma, anthers 3,1.5-4 mm long. 2n = 14.

Type: Described from Belgium.

Reported from Tripolitania (Scholz, l.c.).

Distribution: S. Europe.

35. **MELICA**

L., Sp. Pl. 66. 1753; Gen. Pl. ed. 5: 31. 1754.

Perennial. Leaf sheath closed. Inflorescence a spike-like panicle. Spikelets 2- several bisexual florets; rachilla disarticulating above the glumes and between the florets, prolonged above the uppermost floret and crowned with sterile lemmas to form a knob-like process; glumes more or less unequal; lemma prominently nerved, hairy or sometimes glabrous; palea 2-keeled; stamens 3; lodicules 2, laterally fused; hilum linear.

About 70 species, throughout the warm temperate zone, excluding Australia; one species is found in Libya.

Melica minuta L., Mant. 32. 1767; Aschers. in G. Rohlfs., Kufra 544. 1881; Durand & Barratte, l.c. 265; Pamp., Prod. Fl. Cir. 114. 1931; Keith, l.c. 661. (Fig. 42)

Melica ramosa Vill., Hist. Pl. Dauph. 2: 91. 1787; Scholz in Willdenowia, 7: 438. 1974; *M. cyrenaica* Viv., Fl. Lib. Spec. 4. 1824; *M. minuta* L. var. *cyrenaica* Maire et Weiller, in Maroc Cat. 2865. 1939; Fl. Afr. Nord. 3: 20. 1955; Keith, l.c. 661.



Fig. 42 **Melica minuta:** A, habit × 0.5; B, spikelet × 5; C, knob-shaped sterile terminal floret × 5.

Perennial, up to 80 cm tall, glabrous, shortly decumbent at the base. Leaf linear, acuminate, blade up to 20 (-30) cm long, 2-3 mm wide, scabrid on the lower surface. Panicle 5-25 cm long. Spikelets 7-10 mm long, composed of 2-fertile florets, the rest sterile; glumes unequal, usually purplish, glabrous-scabrid; the paleas with fimbriate margins; stamens 3, anthers linear, 2.5 mm long.

Type: Habitat in Italia, D. Scopoli, Herb. Linn. 86/3 (LINN).

A-7 Wadi El-Kuf, Jabal Akhdar, 12.3.1968, *Boulos* 2234; El-Karsa, coastal road Derna-Ras El-Hilal, *Boulos* 2127; Upper stream of Wadi El-Kuf, Jabal Akhdar, 12.3.1968, *Boulos* 2224; Al-Bakur, near Tocra, Jabal Akhdar, 10.3.1968, *Boulos* 2078; 50 km from Baida on way to Benghazi, 12.3.1978, *Faruqi* 1640; Shahat ruins, 24.5.1977, *Faruqi* 1376; 3 km from Shahat on way to Derna, main highway, 4.5.1978, *Faruqi* 1747; Half way between Shahat and Susa, in Wadi Raseyt, 27.3.1970, *Davis* 50122.

Distribution: Mediterranean region, Syria and Armenia.

FL.: Feb.-May

36. AVENULA

(Dumort.) Dumort., in Bull. Soc. Bot. Belg. 7: 68. 1868 (in adnot.)
Avenochloa Holub, in Acta Hort. Bot. Prag. 1962: 82. 1962; *Helictotrichon* Bess. ex Roem. and Schult., Syst. Veg. 2. (1): 526, 1827. (in obs.)

Perennials. Inflorescence on long panicles with prominent pedicels. Spikelets erect, 2-many florets, florets disarticulating above the glume; glumes persistent, unequal, 1-3-nerved; lemma awned, awns geniculate and originating from the middle of the dorsal surface; stamens 3; ovary hairy above.

c. 30 species in Europe; represented by 1 species in Libya.

Avenula bromoides (Gouan) H. Scholz in Willdenowia, 7: 420. 1974.

Avena bromoides Gouan, Hort. Monsp. 52. 1762; Durand & Barratte, l.c. 259; Pamp., Pl. Trip. 12. 1914; Prod. Fl. Cir. 110. 1931; Maire, l.c. 302; Keith, l.c. 278.

A tufted perennial, 30-70 cm tall. Culm glabrous or scabrous. Leaves glabrous to puberulent, up to 15 cm long, 1 mm wide, erect and twisted in a characteristic way; ligule lanceolate (triangular). Panicle 8-10 (20) cm long; pedicels short. Spikelets 10-25 mm long, 2-8 florets. Callus hairs 0.4-0.8 mm long; glumes unequal, 3-nerved; lemma glabrous-puberulent, irregularly denticulate at the apex, awns geniculate; palea smaller than lemma, bidentate, 2-nerved; lodicules 2, linear-lanceolate; anthers 3, linear; ovary hispid at the top. 2n = 14.

Type: Described from Montpellier, France.

Reported from Tripolitania and Cyrenaica by Durand & Barratte (l.c.) etc.

Distribution: N. Africa and Mediterranean Europe.

One subspecies has been reported from Libya.

ssp. **australis** (Breistr.) H. Scholz in Willdenowia 7: 420. 1974; J. Holub. in Tutin et al Fl. Eur. 5: 215. 1980.

Avenochloa bromoides (Gouan) Holub, ssp. *australis* Breistr., in Bull. Soc. Bot. Fr. 110: 89. sess. extraord. 68. 1966; *Avenula cincinnata* (Ten.) J. Holub, Folia Geobot. Phytotax. (Praha) 11: 294. 1976.

A tufted perennial, 40-80 cm tall. Leaves up to 15 cm long with a distinct cartilaginous margin, sulcate beneath, twisted in a characteristic way. Panicle 6-12 (-15) cm long. Spikelets 10-25 mm long, 2-7 florets; callus hairs c. 1.5 mm long, exceeding the base of lemma; glumes unequal; lemma 2-fid, glabrous, awns geniculate; lodicules 2; anthers 3, linear. 2n = 14.

Type: Described from Italy.

Reported from Tripolitania and Cyrenaica by Maire, (l.c.) and Scholz (l.c.).

Distribution: N. Africa, Italy and Greece.

Differs from the type species in having basal leaves longitudinally grooved beneath and callus hairs c. 1.5 mm long.

Fl.: Mar.-May

37. AVENA

L., Sp. Pl. ed. 1:79.1753; Gen. Pl. ed. 5:34.1754.

Annuals. Leaf flat. Inflorescence an open pendulous panicle with large pedicellate spikelets. Spikelets 1-several flowered; florets bisexual; glumes 5-9-nerved, equal or markedly unequal, chaffy, several-nerved, exceeding the lemmas; lemma 7-nerved, with a stout awn arising from the middle of the dorsal surface; palea densely hairy on keels; stamens 3, lodicules 2; caryopsis oblong, hairy, deeply grooved on the adaxial surface, tightly enclosed by lemma and palea.

About 70 species, in the temperate zones and in the mountains of tropics; represented by 7 species in Libya.

1.	+ Glumes very unequal	1. **A. eriantha**
	— Glumes equal or subequal	2
2.	+ Callus 5-7 mm long, with a sharp articulation	3
	— Callus shorter, inarticulate, if articulated, articulation cushion-like	4
3.	+ All florets articulated on the rachilla, lemmas hairy on the lower half	2. **A. longiglumis**
	— Only lower floret articulated, lemmas glabrous below and hairy above	3. **A. ventricosa**
4.	+ Lemma with 2 fine apical awns in addition to the dorsal awn	4. **A. barbata**
	— Lemma without 2 apical awns (with dorsal awn only)	5
5.	+ Lemma with long spreading hair at least on the base	6
	— Lemma glabrous or only sparsely hairy at the base	7. **A. sativa***
6.	+ All florets with a kneed awn at the back, the small uppermost floret on a hairy pedicel	6. **A. fatua**
	— Only 2-3 lowermost florets awned, the small uppermost floret on a glabrous pedicel	5. **A. sterilis**

1. **Avena eriantha** Durieu, in Duchartre, Rev. Bot. 1: 360, 1845; Keith l.c. 278; Scholz in Willdenowia, 7: 438, 1974.

Trisetum pilosum Roemer et Schultes, Syst. Veg. ed. 15, 2: 662. 1817; *A. pilosa* M. Bieb., Fl. Taur. Cauc. 3:84. 1819; Maire, Fl. Afr. Nord. 2: 269. 1953.

Annual, erect. Culm solitary or fascicled, up to 50-(60) cm tall, glabrous. Leaf linear-lanceolate, acuminate, flat, up to 18 cm long and 2-5 mm broad. Inflorescence a lax raceme of pedicellate spikelets; lower pedicels as long as the spikelets, the upper decreasing in length gradually. Spikelets 2-4-flowered, the lower floret alone articulate on the rachilla, the upper florets not articulated and fall with the lower floret; glumes very unequal, the outer up to 25 mm long and the inner 15 mm long; callus hair less than 1/2 in the length of lemma, in the lowest floret up to 10 mm long with 2 fine awns at the tip, awn up to 40 mm long, geniculate and twisted below the knee, pubescent below; lodicules 2, acuminate; anthers 3, linear. 2n = 14, 28.

Type: Described from Algeria.

Reported from the former Tripolitania by Maire (l.c.) and others.

Distribution: Libya, Tunisia, E. Europe, Cyprus, Syria, Turkey, Caucasus, C. Asia, Iran and Afghanistan.

Fl: Mar.-May

2. **Avena longiglumis** Durieu, in Duchartre, Rev. Bot. 1: 359. 1845; Maire, l.c. 271; Keith, l.c. 279; Scholz, l.c. 438. (Fig. 43)

Plant 1 m tall, robust, fascicled, or solitary. Culm glabrous, adpressedly hairy on the node. Leaf linear-lanceolate, pubescent on the blade and sheath, acuminate, up to 35 cm long and 5-7 mm broad. Panicle somewhat one sided, 15-40 cm long. Spikelets with 2-3 florets, all articulated on the rachilla, lower pedicels up to 50 mm long; glumes subequal, up to 35 mm long, lanceolate, sharp pointed, the lower 11-nerved, the upper 9-nerved; lemma up to 25 mm long, 7-nerved, finely awned at the tip, highly pubescent with long hairs, upper 1/4 of lemma glabrous, lemma gradually tappering into 2 fine bristles; dorsal awn up to 40 mm long, geniculate and twisted below the knee; callus hairs up to 3-4 mm long, not going beyond 1/4th of lemma, callus 5-7 mm long; palea 2-keeled, ciliate on keels; anthers 3, linear; ovary villous. 2n = 14.

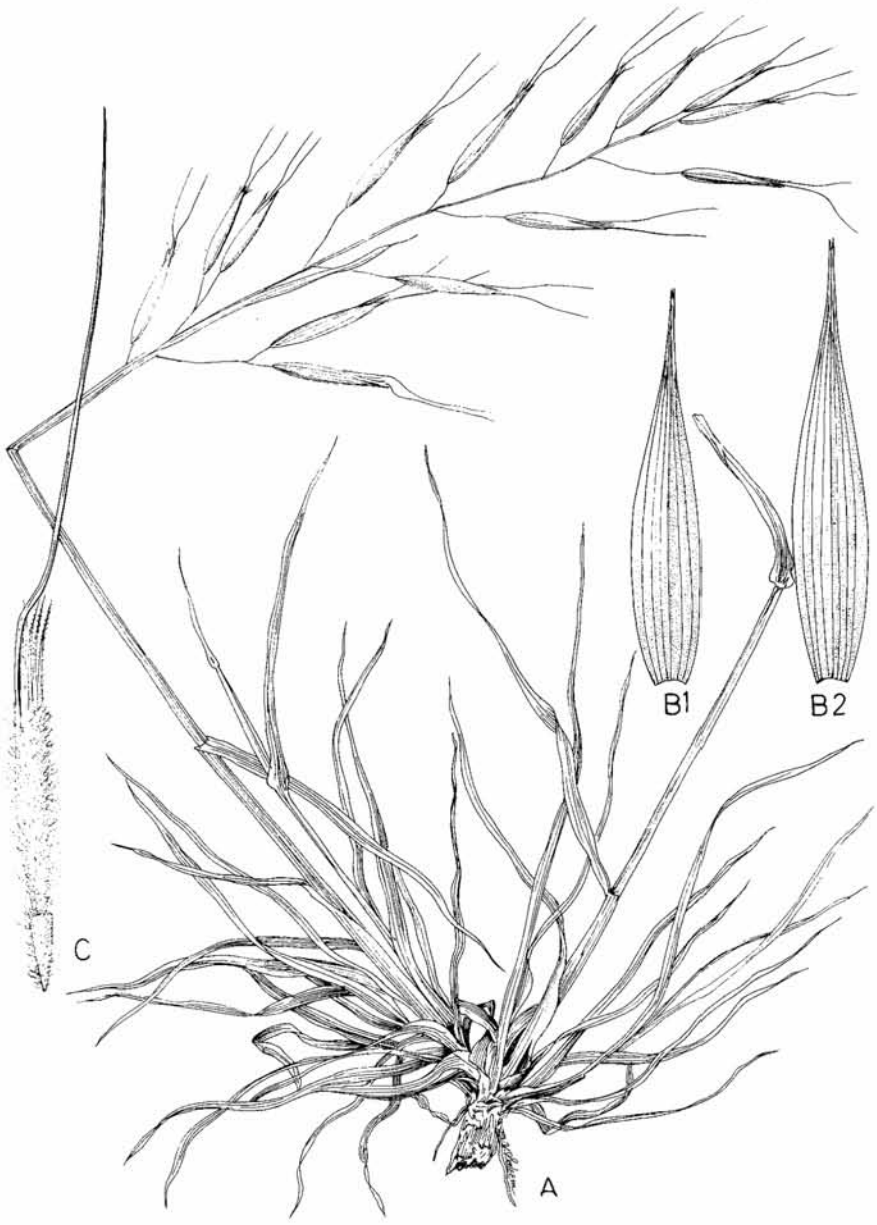


Fig. 43 **Avena longiglumis:** A, habit × 0.5; B-1, lower glume × 2, B-2, upper glume × 2; floret showing pronounced callus × 2.

Type: Described from Algeria.

A-3 Tripoli, Swani Road, 3.3.1977, *Faruqi* 1164, 1166; Airport Road, 5.3.1977, *Faruqi* 1201, 1202 and 1204; **A-2** 17 km from Yafren on way to Nalut, 27.3.1976, *Faruqi* 561.

Distribution: Mediterranean region.

Fl.: Mar.-May

A. longiglumes var. **tripolitana** Maire et Weiller has been reported from Tripoli, Kasr Karabouli by Maire l.c. 272.

3. **Avena ventricosa** Balansa ex Cosson in Bull. Soc. Bot. Fr. 1: 14. 1854; Maire, l.c. 273; Scholz, l.c. 438.

A. beguinotiana Pamp. in Archiv. Bot. Forli, 12: 18. 1936.

Annual 35 cm high, erect, branched from the base. Culm glabrous. Leaf with long scattered white hairs, 5 cm long, 2-3 cm broad, linear, acuminate; ligule membranous. Glumes subequal, glabrous; lemma 12 mm long, elliptic, lanceolate, tip membranous, fine pointed , glabrous below the awn, pubescent above the awn; awn up to 45 mm long, twisted below the knee with 1/4 mm long hair or less; callus 5 mm long, callus hair up to 5 mm long. 2n = 14.

Type: Described from Algeria.

B-6 Marsa Brega, 8.4.1934, *Pampanini & Pichi Sermolli* 362 (FI); **B-8** Amseat a sud di Bardia, 24.3.1933, *Pampanini* 361 (FI).

Distribution: N. Africa, Azerbaijan, Caucasus, Iraq, Iran.

Fl.: Mar.-May

4. **Avena barbata** Pott ex Link in Schrad., Journ. fur Botanik, 2: 314. 1799; Durand & Barratte, l.c. 259; Pamp., Pl. Trip. 11. 1914; Prod. Fl. Cir. 108. 1931; Keith, l.c. 278; Scholz, l.c. 438. (Fig. 44)

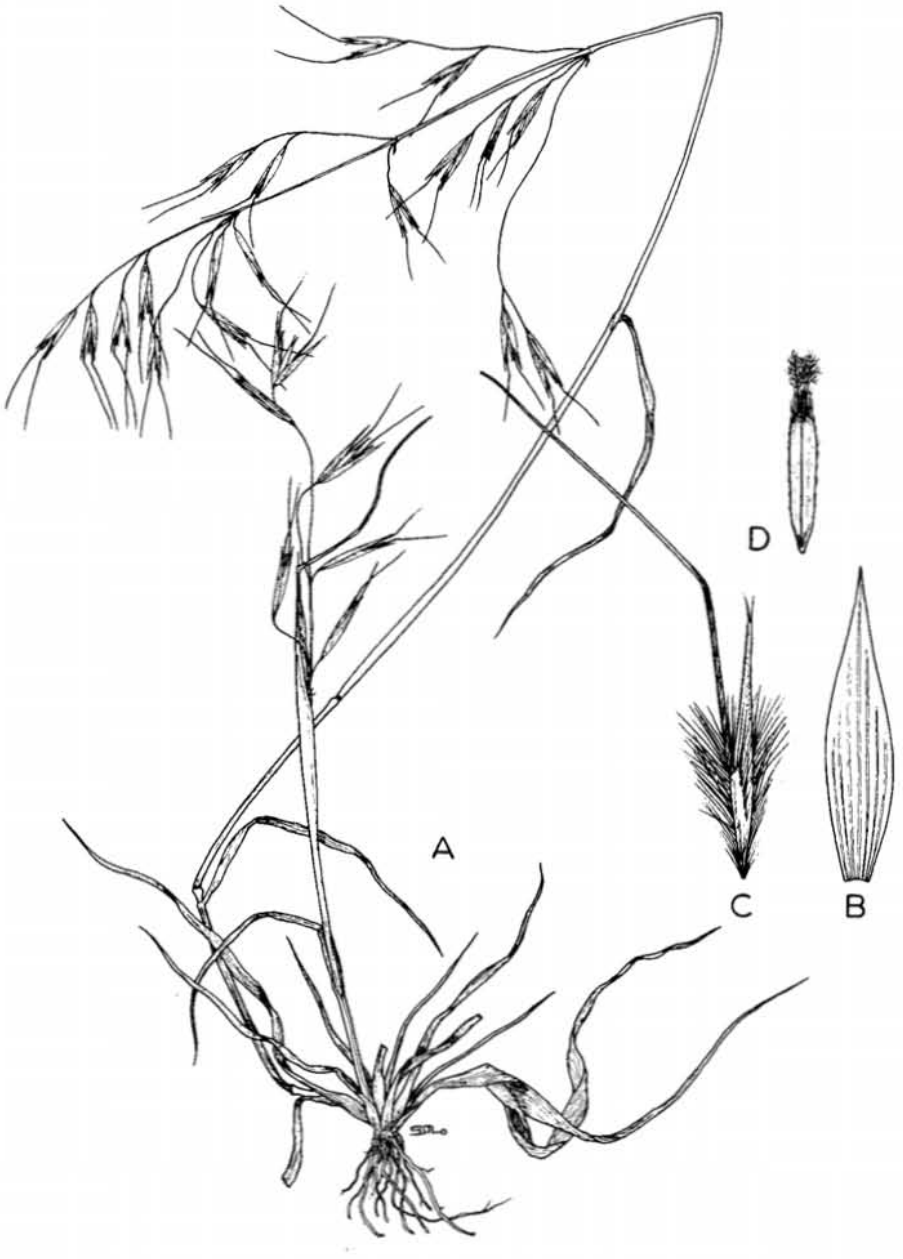


Fig. 44 **Avena barbata:** A, habit × 0.5; B, glume × 2; C, lower lemma × 2; D, mature pistil × 4.

Annual 50 cm (-1 m) tall, branching from the base. Culm with dot-like hairs, in rows. Leaves puberulent, 10 cm long, 5 cm wide, linear, acuminate, sheath glabrous-puberulent. Inflorescence branches fine; glumes 20 to 25 mm long, subequal, acuminate, not awned; lemma up to 25 mm long, bifid, each lobe terminating into a 2 mm long awn, back of lemma with up to 5 mm long hair, up to the lower half of lemma, hairs not exceeding the tip, awn inserted at the back of lemma, awn twisted below the knee, glabrous, 30 mm long, elliptic acuminate. 2n = 28.

Type: Described from Germany.

A-2 Sabratha, 12.6.1976, *Jafri & Alavi* 6732; Shakshuk, 6.2.1976, *Fathi, B.R.* 107; **A-3** 22 km West Khoms, on calcareous slopes, 25.4.1967, *Boulos*1773; 12 km West Tripoli, near sea shore, 24.3.1967, *Boulos, Tawil & Buni* 1602; University, Tripoli, 10.3.1977, *Faruqi* 1244; Tajura, Tripoli, 12.3.1977, *Faruqi* 1269; Leptis Magna, 29.3.1975, *S.I. Ali* 2551; Gharian, 10.4.1975, *Zenab Abou Raya* 397; Misallata, 17.3.1978, *Ramadan Labany* 68-R; **A-7** Slanta to Marawa, 1.4.1970, *Davis* 50549; Shahat, 28.2.1973, *S.I. Ali & Faruqi* 985; Susa, 28.2.1973, *S.I. Ali & Faruqi* 1051; Tokra, 3.3.1973, *S.I. Ali & Faruqi* 985; Tokra, 3.3.1973, *S.I. Ali & Faruqi* 1259; **B-2** 5 km after Gwalish on way to Jadu, 21.5.1976, *Faruqi* 777; **B-6** 35 km from Gaminas towards Benghazi, 13.3.1978, *Faruqi* 1686; 5 km from Al Abiar, towards Merj, 12.3.1978, *Faruqi* 1655.

Distribution: Mediterranean region, Anatolia, Transcaucasia, Iraq, Iran, Afghanistan, Pamir-Alaj.

Fl.: Feb.-May

Maire l.c. 277 and Keith l.c. 277 recognized *Wiestii* as a variety of *Avena alba* Vahl (*A. alba* var. *wiestii* (Steud.) Maire et Weiller). Later, Scholz l.c. 438 treated the same taxon as a subspecies of *Avena barbata* Potte ex Link (*A. barbata* subsp. *weistii* (Steud.) Mansfeld). The presence of this taxon in Libya is doubtful and cannot be confirmed due to the lack of material.

5. **Avena sterilis** L., Sp. Pl. ed. 2: 118. 1762; Durand & Barratte, l.c. 258; Pamp., Pl. Trip. 12. 1914; Prod. Fl. Cir. 107. 1931; Maire, l.c. 283; Keith, l.c. 279; Scholz, l.c. 438. (Fig. 45)

Annual, up to 1 metre tall. Culm glabrous, erect. Leaves up to 30 cm long and up to 10 mm wide, sheath and leaf with scattered white hairs. Spikelet with only 2-3 lower

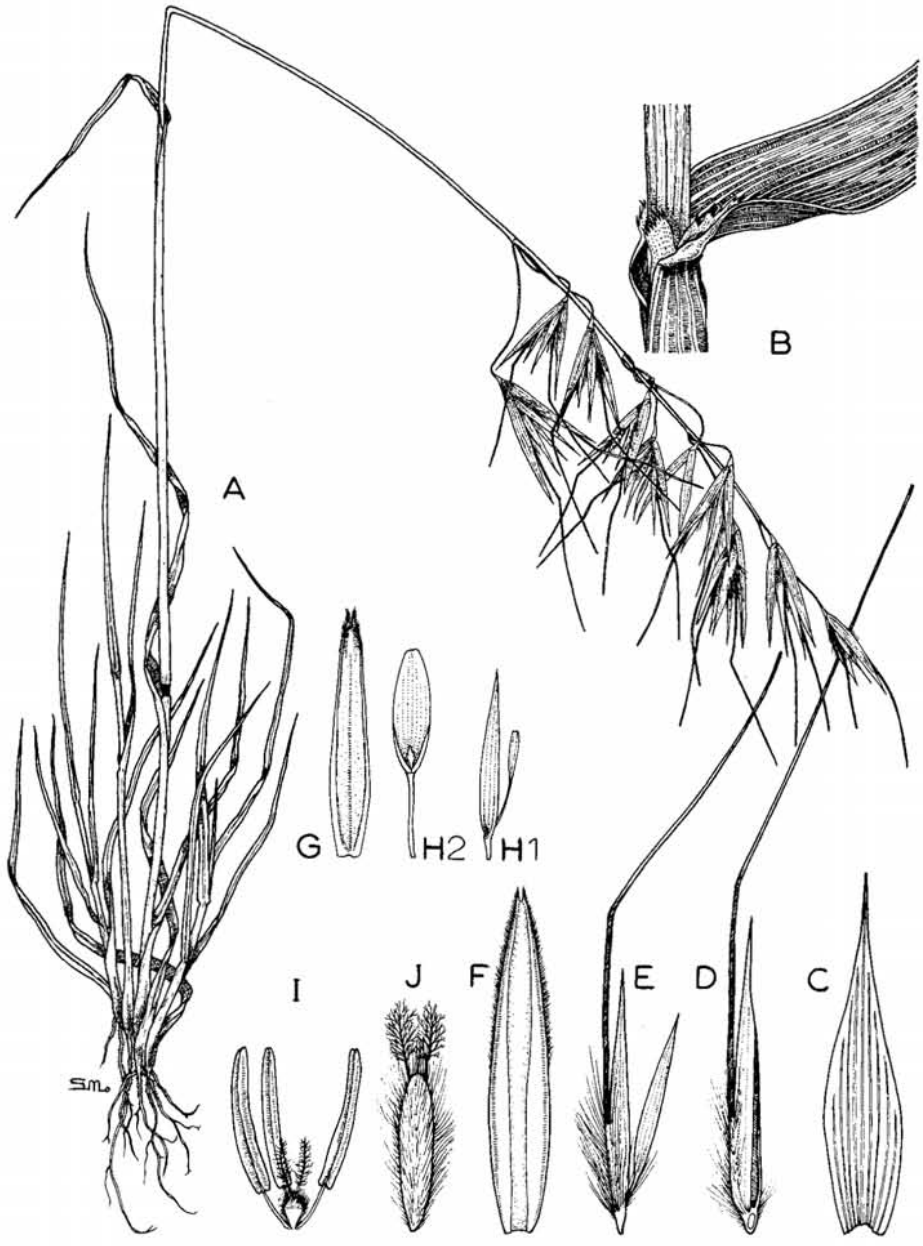


Fig. 45 **Avena sterilis:** A, habit × 0.5; B, portion of lamina, ligule and sheath × 2; C, glume × 1.5; D, lower lemma × 1.5; E, awned and unawned lemmas × 1.5; F,G, lower and upper paleas × 3; H_1, upper florets × 1.5; H_2, terminal floret with glabrous rachilla × 3; I, stamens and pistil × 5; J, mature pistil × 3.

florets awned, the small uppermost floret awnless on a glabrous pedicel; glumes subequal up to 35 mm long, glabrous, acuminate; lemma up to 18 mm long, with few scattered hairs on the lower half and without 2 apical awns, callus 1.5-2 mm long; callus hair up to 8 mm long 2n = 42, 44.

Type: Described from Mediterranean region.

A-2 Tagrua, 5 km from Yefren, 9.4.1974, *Salim El Jaly* 220; **A-3** Leptis magna, 1.5.1974, *B. Faris* 327; c. 8 km S. of Gusbat, 25.3.1979, *A. El-Gadi* et al. 2512-G; **A-3** Hills near Gharian, 21.5.1976, *Faruqi* 728, 729 and 730; 84 km from Tripoli towards Gharian, 27.3.1977, *Mohamed Ahmed* 1313; **A-4** Tawargha, 14.5.1975, *Zenab Abou Raya* 428; **A-7** c. 5 km from Shahat on way to Baida, 18.6.1972, *S.I. Ali* 606, Susa, Jabal Akhdar, 24.1.1967, *Boulos* 1442; Shahat, jabal Akhdar, 24.5.1977, *Faruqi* 1378 and 1379; 2 km from Baida, on way to Slanta, 23.5.1977, *Faruqi* 1373-Z; Faidia, 3 km from gas station, on way to Slanta, 23.5.1977, *Faruqi* 1370; 20 km from Tokra, towards Baida, 10.3.1978, *Faruqi* 1636; Labrag, 5.5.1978, *Faruqi* 1762; Wadi Kuf, 8.5.1978, *Faruqi* 1838. **B-2** Al Awenia, 11.4.1974, *S.I. Ali* 2007.

Distribution: Mediterranean region, Iraq, Iran, Arabia, Anatolia.

Fl.: Jan.-May *Vern.* Spulet el agreb

6. **Avena fatua** L., Sp. Pl. ed. 1:80. 1753; Durand & Barratte, l.c. 258; Pamp., Prod. Fl. Cir. 108. 1931; Maire, l.c. 279; Keith, l.c. 278; Scholz, l.c. 438.

A robust annual, up to 1 metre tall, glabrous, erect. Leaves up to 35 cm long, 12 mm broad, linear, acute or acuminate. Inflorescence a large spreading panicle. Spikelets 2-3-flowered, all flowers with a kneed awn; glumes subequal, glabrous, 2-3 cm long, lanceolate, acuminate; callus inarticulated, hairy; lemma with long spreading hairs at least at the base, 17-25 mm long, 7-nerved, tip 2-toothed, awned, awn 2.5-3 cm long, kneed, terminal floret awned. 2n = 42.

Type: Described from Europe.

A-3 56 km from Tripoli towards Abu Ghelan, 20.5.1976, *Faruqi* 713.

Also reported from Cyrenaica by Durand & Barratte (l.c.) and others.

Distribution: Europe, Egypt, Iraq, Pakistan, India, Caucasus, C. Asia; introduced in China, Japan, Australia, N. and S. America.

Fl.: Mar.-May

7. ***Avena sativa** L., Sp. Pl. ed. 1:79. 1753; Corti, Fl. Veg. Fezz. 269. 1942; Maire l.c. 281; Keith, l.c. 279; Sholz, 438.

Annual, solitary or fascicled, erect, glabrous. Leaf glabrous. Inflorescence widely spreading or nodding panicle. Spikelets large, mostly 2-flowered; glumes equal or subequal; lemma bifid, tip not awned, not articulated, glabrous or few hairs towards the base; awn usually single or absent. 2n = 42, 48, 63.

Type: Not indicated.

A-3 c. 20 km on the old Airport Road, Tripoli, 7.5.1976, *Faruqi* 625 and 631; Hadba Khadra Tripoli, 7.5.1976, *Faruqi* 651 and 652; 56 km from Tripoli towards Abu Ghelan, 20.5.1976, *Faruqi* 707, 708, 709 and 710; **A-6** Benina, Benghazi, 22.5.1977, *Faruqi* 1353, 1354.

Also reported to be present in Fezzan (Corti, l.c.; Keith, l.c.; Scholz, l.c.).

Distribution: Cultivated all over the world.

This is the most important cultivated 'oat' which is used both as a cereal for human consumption and also as a very important fodder. Although its origin is not well known yet it is considered to have originated either in S.E. Europe or W. Asia. In Libya it is cultivated as fodder.

Fl.: Apr.-May *Vern.* Shofan, shofal, boshrenta, gussaba

38. GAUDINIA

P. Beauv., Ess. Agrost. 95. 1812.

Annual herbs. Leaf flat. Spikelets sessile, solitary at each node of the axis and alternate, axis long, 4-11 florets, laterally compressed; all florets bisexual or uppermost rudimentary; glumes unequal, smaller than florets; lemma membranous, laterally

compressed, keeled, bifid, awned above the middle, awn kneed; lodicules 2; stamens 3; ovary hairy on the top; styles 2, plumose up to the base; caryopsis, oblong.

3 species of Mediterranean region and Azores; only 1 is recorded from Libya.

Gaudinia fragilis (L.) P. Beauv. Ess. Agrost. 95. 164. 1812; Durand & Barratte, l.c. 259; Pamp., Pl. Trip. 22. 1914; Prod. Fl. Cir. 110. 1931; Maire, l.c. 314; Keith, l.c. 515; Scholz, l.c. 438.

Avena fragilis L., Sp. Pl. ed. 1:80. 1753.

A metre tall grass of moist places, erect, hoary, few culms arising from the base. Leaf and leaf sheath covering the plant hoary; leaves 20 cm long, and up to 5 mm broad, linear, acute. Inflorescence an aspect of *Lolium,* spike of spikelets up to 28 cm long. Spikelets 13 mm long, 4-7-(11) florets; glumes unequal, 8 mm and 5 mm long, deeply ribbed with veins, winged at the tip, oblique, scabrous; lemma lanceolate, keeled, acute, 8 mm long, awned, awns below $^1/_3$-$^1/_4$ of the tip (glume) about 12 mm long, kneed. 2n = 14.

Type: Described from Portugal and Spain, *Loefl.,* Herb. Linn. 95/16 (LINN).

A-3 Tripoli, Nell'Oasis ad Henni, 23.4.1913, *Pampanini* 3530 (FI); **A-6** Merg. Bosco Zorda, 5.4.1922, *Maugini* s.n. (FI); Merg. Bivio della strada Tocra-Merg-Cirene, 9.4.1922, *Maugini* s.n. (FI); Merj, on main highway, Thick growth along the highway near cultivated field, 8.5.1978, *S.A. Faruqi* 1805; Benghazi, April 1919 *Zanon* 106 (FI); Tocra, 6.4.1933, *Pampanini* 697 (FI); Tra Barce e Tocra, Bu Goeir, 15.5.1934, *Pampanini & Pichi-Sermolli* 698 (FI).

Distribution: Mediterranean region and Southern France.

Fl.: Apr.-June

This species has an aspect of *Lolium* with large awns.

39. **TRISETARIA**

Forsk., Fl. Aegypt-Arab. 27. 1775.

Annual. Culm solitary or fascicled, erect or geniculate. Leaf flat or rolled. Inflorescence open or spike-like panicle. Spikelets laterally compressed; 2 or more florets, the upper seated on an elongated hairy rachilla joint; branches and central axis scabrid; glumes acute, unequal; lemma with 2 short awns at the apex and a perfect awn from the back; stamens 3, anthers minute; lodicules 2, minute; caryopsis elongate, grooved on the adaxial side.

About 5 E. Mediterranean species, represented by 4 species in Libya.

1.	+ Glumes unequal (the upper twice as broad and longer than the lower)	1. **T. macrochaeta**
	— Glumes equal-subequal	2
2.	+ Lemma tip divided into 2 fine awns, 1-3 times as long as lemma; panicle 5-15 cm long, dense and spike-like	2. **T. linearis**
	— Awns of lemma tip shorter; panicle 2-3 (-5) cm long	3
3.	+ Rachilla with long villous hairs; the two apical awns of lemma 1 mm long or longer, the dorsal awn of lemma geniculate and originating from the middle of lemma	3. **T. glumacea**
	— Rachilla hairs short; the 2 apical awns of lemma very short, up to 0.5 mm, the dorsal awn somewhat straight and originating from the upper 1/3 of lemma	4. **T. vaccariana**

1. **Trisetaria macrochaeta** (Boiss.) Maire, in Bull. Soc. Hist. Nat. Afr. Nord. 33: 92. 1942; Maire, Fl. Afr. Nord. 2: 249. 1953; Keith, l.c. 983; Scholz in Willdenowia, 7: 439. 1974. (Fig. 46)

Trisetum macrochaetum Boiss., Diagn. Ser. 1, 13: 58. 1853; Durand & Barratte, l.c. 258; Pamp., Prodr. Fl. Cir. 106. 1931.



Fig. 46 **Trisetaria macrochaeta:** A, habit × 1; B, portion of lamina, sheath, ligule and culm × 10; C, portion of panicle with spikelets × 5; D, lower glume × 10; E, upper glume × 10; F, lower floret with rachilla × 10; G, stamens and pistil × 10.

Delicate annual, up to 15 cm long. Culm solitary or fascicled, slender, erect, glabrous, branches and axis of panicle scabrous. Leaves filiform up to 5 cm long and 0.5 mm broad. Panicle up to 4 cm long, highly branched, contracted, subconical. Spikelets 2-flowered, rachilla villous or glabrous; glumes unequal, the upper twice as broad and longer than the lower, keeled, scabrous on the nerve, acuminate with a delicate awn; lemma pilose, divided at the tip, tips acuminate, awn originating from the back of the lemma, up to 7 mm long, twisted below the knee.

Type: Described from Palestine.

A-6 Road, between Al-Kuwayfiya and Daryana, N.E. Benghazi, 10.3.1968, *Boulos* 2012; **A-7** Cirene, Labrak, 24.4.1922, *Maugini s.n.* (FI); Derna, Vivaio di Derna, Primavera 1922, *Maugini s.n.* (FI); Cirene, 27.4.1926, *Giannattasio s.n.* (FI); 3 km from Shahat on way to Derna, 4.5.1978, *Faruqi* 1752 and 1759 (ULT); 22 km E. of Gubba, 5.5.1978, *Faruqi* 1767-a; Shahat, 4.5.1978, *Faruqi* 1733; Wadi Kuf, 8.5.1978, *A. El-Gadi, Jafri & others* 1868-G; **A-8** Tobruk, Marmarica, 12.3.1914, *Vaccari* 12 (FI); **B-6** Gaminas, Benghazi Road, 9.3.1968, *Boulos* 1977; Benghazi, 9.3.1883, *Ruhmer* 366 (FI); Benghazi, Karmu, 28.2.1922, *Maugini s.n.* (FI); Merj, Wadi el Mnechrat, 22.3.1922, *Maugini s.n.* (FI); 35 km from Gaminas, towards Benghazi, 13.3.1978, *Faruqi* 1673.

Also reported from Tripolitania (Durand & Barratte, l.c.; Pamp., l.c.; Maire, l.c.; Keith, l.c.; Scholz, l.c.).

Distribution: Egypt, Palestine.

A very common plant from Benghazi to Tobruk.

Fl.: Feb.-May

2. **Trisetaria linearis** Forsk., Fl. Aegypt-Arab. 60. 1775; Maire, l.c. 256; Keith, l.c. 983; Scholz, l.c. 439.

Trisetum lineare (Forsk.) Boiss. Diagn. 1, 13: 49. 1853; Durand & Barratte, l.c. 258; Pamp., Pl. Trip. 39. 1914; Prod. Fl. Cir. 107. 1931.

Erect annual with solitary culms, sometimes branching from the lower nodes, up to 30 cm tall, glabrous. Leaf and sheath highly puberulent, linear-lanceolate, acuminate,

up to 7 cm long. Panicle linear, up to 15 cm long, 10 mm wide, usually less, slender, compact, glumes more or less equal, keeled, scabrous on nerve, finely puberulent, inflorescence branches and pedicel puberulent, acuminate; lemma finely puberulent, bifurcated acuminate tip forming 2 delicate awns.

Syntypes: Described from Egypt, Arabia and Syria.

A-3 Khoms, Lubda, 13.4.1913, *Pampanini* 3047 (FI).

Also reported from former Cyrenaica by Durand & Barratte (l.c.) etc.

Distribution: Egypt, Libya, Palestine, Arabia and Syria.

Fl.: Mar.-Apr.

3. **Trisetaria glumacea** (Boiss) Maire, in Bull. Soc. Hist. Nat. Afr. Nord. 33: 93. 1942; Maire, Fl. Afr. Nord. 2: 259. 1953; Keith, l.c. 983; Scholz, l.c. 439.

Trisetum glumaceum Boiss., Diagn. 1. 13: 49. 1853.

Small annual, tufted, geniculately ascending. Culm glabrous-scabrous, pubescent below the node, violet in colour. Leaves and sheath hairy; ligule small, truncate and fimbriate-ciliate. Panicle dense, glossy, oblong, 2-2.5 (-5) cm long. Spikelets of 2 florets, lower sessile, upper pedunculate; rachilla villous; glumes subequal, oblong-lanceolate, 3-nerved, scabrid on nerves; lemma oblong-lanceolate, 5-nerved, glabrous, bifid at apex extending into 2 fine awns, 1 mm long or more and one small awn from the back; palea bidentate at the apex; lodicules 2; stamens 3, anthers linear, violet; ovary glabrous with 2 styles plumose to the base.

Type: Described from Palestine.

A-6 El-Agheila, 22.5.1937, *Pampanini* 216 (FI); Tra Agedabia e Agheila, Melch en Nogra, 15.3.1933, *Pampanini* 801 bis. (FI); Agedabia e Autelat a Baglia, 10.4.1934, *Pampanini & Pichi-Sermolli* 804 (FI); Marsa Brega, 8.4.1934, *Pampanini & Pichi-Sermolli* 802 (FI).

Distribution: Libya, Egypt and Palestine.

Fl.: Mar.-May

4. **Trisetaria vaccariana** (Maire et Weiller) Maire, in Bull. Soc. Hist. Nat. Afr. Nord. 33: 93. 1942; Maire, Fl. Afr. Nord. 2: 260. 1953; Keith, l.c. 984; Scholz, l.c. 439.

Trisetum vaccarianum Maire et Weiller in Maroc., Cat. 2855. 1939.

Annual. Culms solitary or shortly branched at the base, glabrous or somewhat pubescent. Leaf sheath and blade pubescent; ligule membranous, fimbriate-ciliate. Panicle with long peduncle, oblong-cylindrical, up to 3 cm long, dense. Spikelets 4 mm long, 2 florets, 1st floret sessile, the 2nd pedicelled; glumes equal-subequal, lanceolate, acuminate, glabrous or villous; lemmas glabrous, lanceolate, bifid at the tip and prolonged into two small awns up to 0.5 mm long; inferior lemma glabrous, superior villous; palea linear, bifid, 2-nerved, scabrous; lodicules 2, obtuse; anthers 3, violet, linear; ovary glabrous.

Type: Described from Libya (Cyrenaica).

A-6 Agedabia, ad el-Agheila, Melch en Nogra, 15.3.1933, *Pampanini* 807 (FI); Ridotta Tilger a 10 km da Agedabia, 7.4.1934, *Pampanini & Pichi-Sermolli* 808 bis (FI); Agedabia ed el-Agheila, 15.3.1933, *Pampanini* 801 (FI).

Distribution: Endemic to Libya.

The plants with long bulbous based hairs on the glume are kept under var. *villiglumis* by Maire and Weiller. The other variety *glabriglumis* Maire & Weiller is separated on the basis of glabrous glumes. The type species itself is based upon the latter. The characteristic hairs indicate that most probably var. *villiglumis* shall find a place as a new species.

Fl.: Mar.-Apr.

40. LOPHOCHLOA

Reichb., Fl. Germ. Excurs. 42. 1830.

Annual. Leaf flat. Inflorescence a dense or loose panicle. Spikelets firmly com-

pressed, 3-5 bisexual florets or the uppermost reduced; rachilla disarticulating above the glume and between the florets; glumes equal or unequal, the upper broader and longer than the lower, 3-nerved; lemma keeled and bifid at the tip, with tips obtuse or extended into short awns, awned just below the tip with a straight awn; palea 2-keeled, keel nerves extending into short awns; stamens 3, anthers minute; lodicules 2, fleshy below; caryopsis narrowly oblong.

About 8 Eurasian species; 5 species are found in Libya.

1.	+ Glumes unequal (the upper twice as long as the lower)	2
	– Glumes subequal (the upper not as above)	3
2.	+ Lower glume 1-veined; spikelets with 2-4 florets	5. **L. cristata**
	– Lower glume 3-veined; spikelets with 3-13 florets	4. **L. rohlfsii**
3.	+ Rachilla with c. 1 mm long hairs; culm glabrous	1. **L. pumila**
	– Rachilla with less than 0.5 mm long hairs; culm usually with retrorse hairs below the node	4
4.	+ Awn less than 1.3 mm long; inflorescence-axis pubescent; keels of each pair of glumes parallel or slightly convergent	3. **L. pubescens**
	– Awn more than 3 mm long; inflorescence-axis not so; keels of each pair of glumes divergent	2. **L. salzamannii**

1. **Lophochloa pumila** (Desf.) Bor. Grass. Burm. Ceyl. Ind. Pak. 445. 1960; Scholz in Willdenowia, 7: 439. 1974. (Fig. 47, I-O)

Avena pumila Desf., Fl. Atlant. 1: 103. 1798; *Trisetum pumilum* (Desf.) Kunth, Rev. Gram. 1: 102. 1829; *Koeleria pumila* (Desf.) Domin, Monogr. *Koeleria*, 288. 1906; *Trisetaria pumila* (Desf.) Maire in Bull. Soc. Nat. Afr. Nord. 33: 93. 1942; Maire, Fl. Afr. Nord. 2: 261. 1953.

Annual. Culm erect, small, fascicled, glabrous. Leaf flat, up to 6 cm long, 4 mm broad. Inflorescence a dense panicle, somewhat lobed; glumes subequal, the lower 1-nerved and densely pubescent; rachilla with long hairs; lemma awned just below the tip.

Type: Described from Mascar, *'Desfontaine.*

C-4 c. 27 km from Washka, 25.3.1975, *S.I. Ali* 2314; **E-1** 70 km fom Ghat, behind airport, 19.2.1977, *M. Ahmad, A. El-Taife & Siddiqi* 1125.

Also reported from Tripolitania by Scholz (l.c.).

Distribution: Mediterranean region, Iraq, Iran, Pakistan and India.

Fl.: Feb.-May *Vern.* Zewan.

It is an uncommon grass in Libya and apparently looks like *Trisetaria.*

2. **Lophochloa salzmannii** (Boiss.) H. Scholz in Willdenowia, 6: 292. 1971; *ibid.* 7: 439. 1974. (Fig. 47, A-H)

Koeleria salzamannii Boiss. et Reuter, Pugillus, 123. 1852; Durand & Barratte, l.c. 263; Pamp., Pl. Trip. 26. 1914; *K. pubescens* (Lam.) P. Beauv. ssp. *salzmannii* (Boiss et Reuter) Traubut in B. Soc. Bot. France 34: 394. 1887; Maire, l.c. 338; Keith, l.c. 587.

Annual, geniculately ascending, culm usually hairy below the nodes, up to 23 cm tall, fascicled from the base. Leaf up to 5 cm long, linear acuminate. Leaf and leaf sheath hirsute, covered with appressed hair facing downwards. Inflorescence a condensed panicle with very short branches, spike-like, branches scabrous. Spikelets 2-3 florets; glumes subequal, not exceeding the spikelet, with long white hair with broad base, the lower 3-veined; rachilla hairy, hairs less than 0.5 mm long; lemma hirsute, awns on lemma more than 3 mm long.

Type: Described from Morocco, *(Tingidem).*

A-2 Abu Zaiyan, 21.5.1976, *Faruqi* 753 and 762; **A-3** barley fields, Faculty of Science, Sidi El-Masri, Tripoli, sandy soils, 18.4.1967, *Boulos* 1666; 20-23 km east Tripoli, along the coastal road to Khoms, 8.3.1967, *Boulos* 1581; Gurgi, 5 km west Tripoli, 24.3.1967, *Boulos* 1639; Hashshan, Tripoli, 19.3.1976, *Faruqi & K. Maghbub* 356; c. 20 km on old Airport Road, Tripoli, 7.5.1976, *Faruqi* 605 and 616; Hadba Khadra Military Camp, Tripoli, 7.5.1976, *Faruqi* 650; 56 km from Tripoli towards Bughelan, 20.5.1976, *Faruqi* 714; 3 km on Swani Road from Tripoli, 3.3.1977, *Faruqi* 1161; Airport Road, 5 km

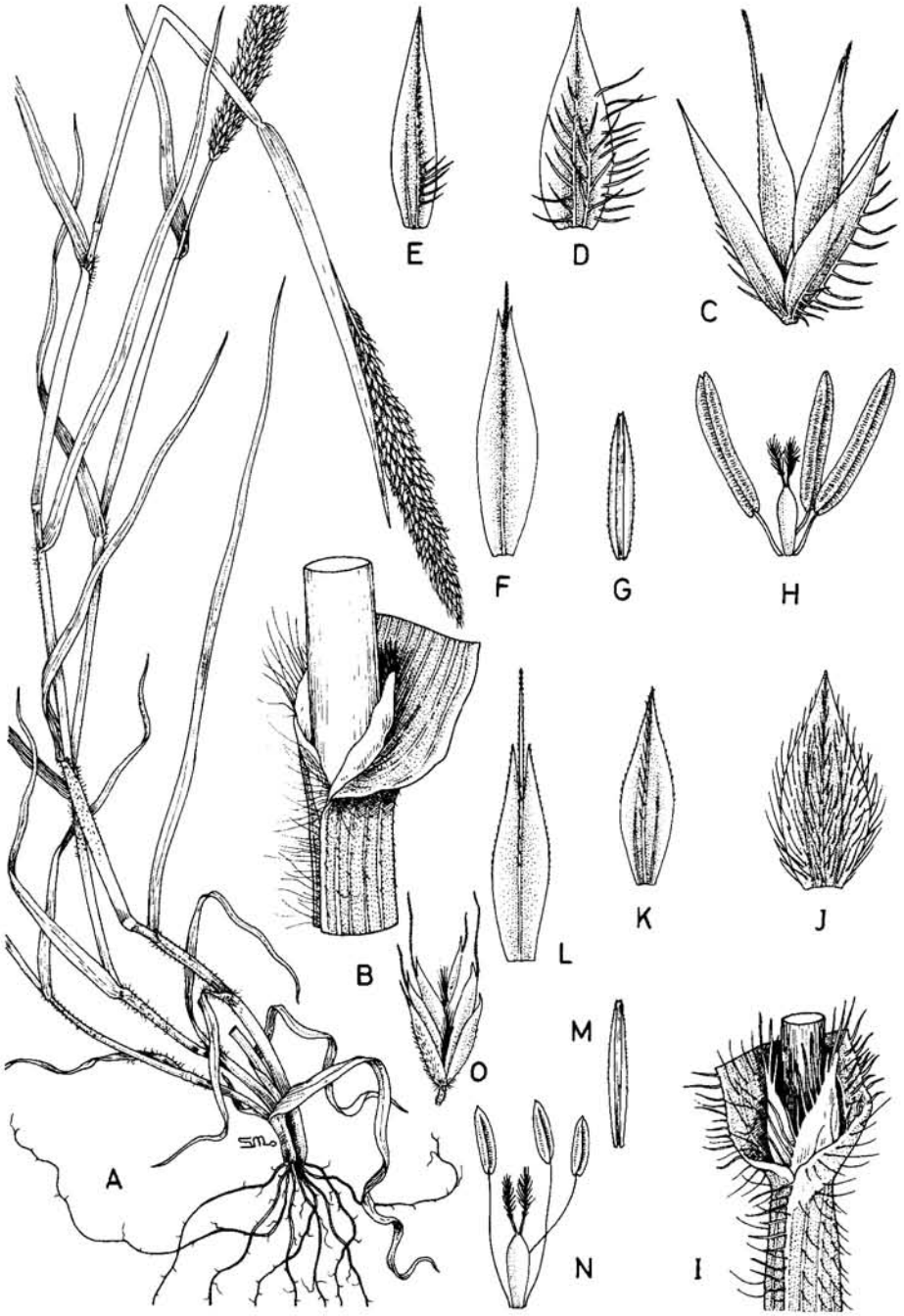


Fig. 47 **Lophochloa salzmannii:** A-H: A, habit × 1; B, portion of lamina, sheath and ligule × 10; C, spikelet × 10; D, lower glume × 10; E, upper glume × 10; F, lemma × 10; G, palea × 10; H, stamens and pistil × 20. **L. pumila:** I-O: I, portion of lamina, sheath and ligule × 10; J, lower glume × 10; K, upper glume × 10; L, lemma × 10; M, palea × 10; N, stamens and pistil × 10; 0, spikelet × 5.

from Tripoli, 5.3.1977, *Faruqi* 1184 and 1193; Shati Zanzur gate, Tripoli, 9.3.1977, *Faruqi* 1225; 1 km before Ben Gashir, towards Tripoli, 23.3.1977, *Faruqi* 1277; **B-2** 5 km after Gwalish on way to Jadu, 21.5.1976, *Faruqi* 785; **B-4** 24 km from Sirt, towards Bughrein, 14.3.1978, *Faruqi* 1698; **C-4** 84 km from Hun, towards Bughrain, 8.3.1978, *Faruqi* 1618.

Distribution: North Africa, Iberian Peninsula.

Although many plants referred here show the crucial characters of the species, yet they have a very thick and compact inflorescence and look like *L. pubescens*. These plants also have pubescent spikelets and shorter awns than found in typical *L. salzamannii*. It seems that these plants have originated as an outcome of hybridization between the two species.

Fl.: Feb.-May *Vern.* Zewan

3. **Lophochloa pubescens** (Lam.) H. Scholz in Willdenowia 6: 291. 1971; *ibid.* 7: 439. 1974.

Phalaris pubescens Lam., Encycl. Method. Bot. 1: 92. 1783; *Koeleria pubescens* (Lam.) P. Beauv., Ess. Agrost. 85. 1812; Maire, Fl. Afr. Nord. 2: 337. 1953; Keith, Prelim. Check List Lib. Fl. 587. 1965; *Trisetaria pubescens* (Lam.) Kerguelen, in Lejeunia N.S. 75: 274. 1975.

Annual. Culm solitary or fascicled, geniculately ascending, usually with retrorse hairs below the node and antrorse below the panicle. Leaf flat, densely pubescent. Panicle oblong cylindrical, usually dense, axis pubescent. Spikelets usually 2 florets, sometimes one floret, rachilla slightly pubescent, with less than 0.5 mm long hairs; glumes subequal, the lower 3-veined, ciliate on the nerves and villous, exceeding the flowers or equal; lemma oblong, 5-nerved, shortly ciliate on nerves or scabrous, somewhat obtuse, bidentate, one-awned, awn inserted at the apical sinus, less than 1.3 mm long; palea smaller than lemma, bidentate, with 2 scabrous nerves; lodicules 2; anthers 3, linear; caryopsis oblong, laterally compressed. 2n = 12, 12 + 1B, 14.

Type: Described from France.

Reported to be present in Tripolitania by Maire (l.c.) and Scholz (l.c.).

Distribution: Mediterranean region.

A polymorphic species.

Fl.: Apr.-June

4. **Lophochloa rohlfsii** (Ascherson) H. Scholz in Willdenowia, 6: 292. 1971; *ibid.* 7:439. 1974.

Trisetum rohlfsii Ascherson in Verh. Bot. Ver. Brandenb. 21: 71. 1880; *Koeleria rohlfsii* (Ascherson) Murbeck., Contr. Fl. Tun. 4: 16. 1900; Pamp., Pl. Trip. 25. 1914; Maire, Fl. Afr. Nord. 2: 332. 1953; Keith, l.c.587.

Annual. Culm delicate, fascicled, rarely solitary, hairs facing downwards. Leaves flat, leaf sheath finely pubescent. Panicle lanceolate or linear-lanceolate, branches distinct; minutely hairy on pedicel, hairs facing upwards; axis scabrous. Spikelets 3-13-flowered, 4-5.5 mm long; glumes unequal, smaller than flowers, lower 3-nerved, upper 1-nerved, hairy; lemma conduplicate, lanceolate, 5-nerved, glabrous, very finely scabrous, bidentate, one awned below the tip; palea bidentate; lodicules 2, ovate-truncate, glabrous; anthers 3; caryopsis linear-fusiform, laterally compressed, glabrous.

Type: Described from Tunis.

A-3 Faculty of Science, Sidi El-Masri, Tripoli, 22.4.1967, *Boulos* 1747; Tajura, Tripoli, 24.3.1976, *Faruqi* 425; **A-4** Misratha, 14.3.1978, *Faruqi* 1706; S.I. Ali 1986; **D-3** Al-Abiad, 20.3.1973, *S.I. Ali* 1328; **C-4** Sokna, petrol pump garden, 5.3.1978, *Faruqi* 565; **D-3** Sebha, 17.2.1977, *M. Ahmad* 1121: *ibid,* 6.3.1978, *Faruqi* 1568; 5 km from Sebha on way to Brak, 6.3.1978, *Faruqi* 1585; **E-1** Ghat, 28.2.1934, *Corti* 918 (FI); Serdeles, 24.2.1976, *Jafri* 6358.

Distribution: Sahara.

Fl.: Feb.-Apr.

5. **Lophochloa cristata** (L.) Hyl., Nord. Karlvaxtfl. 1: 283. 1953 and Bot. Notiser. 1953: 355. 1953; Scholz in Willdenowia, 7: 439. 1974.

Festuca cristata L., Sp. Pl. 76. 1753; *F. phleoides* Vill., Flor. Delph. (ed.

Gibbert) 7: 1786; Hist. Pl. Dauph. 2: 95, tab. 2, fig. 7. 1787; *Koeleria phleoides* (Vill.) Pers. Syn. 1: 97. 1805; Durand & Barratte, l.c. 263; Pamp., Pl. Trip. 23. 1914; Prod. Fl. Cir. 113. 1931; Maire, Fl. Afr. Nor. 2: 328. 1953; Keith, l.c. 586; *Rostraria cristata* (L.) Taveler, in Nev. Syst. Pl. Vase. 7:47. 1971; *Trisetaria cristata* (L.) Kerguelen, in Lejeunia N.S. 75: 273. 1975.

Annual, up to 25 cm tall, glabrous-finely scabrous, scabrous below the panicle, geniculately ascending, fascicled, few cauline branches sometimes present. Leaf and leaf sheath puberulent with long white hairs scattered all over, up to 15 cm long, 5 mm broad, flat, linear-lanceolate, acuminate, basal leaf sheath flat. Inflorescence dense, linear-lanceolate, up to 8 cm long; spikelets 2-4-flowered; glumes unequal, shorter than the spikelets, sparsely hairy, the lower 1-nerved, 4 mm long; lemma glabrous-hirsute with 2 mm long bulbous based hair, awn inserted right on the tip, awn 2 mm long.

Type: Described from Portugal, Herb. Linn. 92/24, photo (LINN).

A-3 Faculty of Science, Sidi El Mesri, Tripoli, 22.4.1967, *Boulos* 1754; El-Hadba El-Khadra, Tripoli, 8.4.1967, *Boulos* 1645; Tajura, Tripoli, 24.3.1976, *Faruqi* 428 and 429; *ibid,* 6.3.1977, *Faruqi* 1216 and 1217; *ibid,* 10.3.1977, *Faruqi* 1255; Hadba Sharqia military camp, Tripoli, 7.5.1976, *Faruqi* 636; University of Fateh, Tripoli, 27.1.1977, *Faruqi* 1090-S; *ibid,* 15.2.1976, Jafri 6283; **A-6** 5 km from Al-Abiar, towards Merj, 12.3.1978, *Faruqi* 1651; Gar Yunus, Benghazi, 13.3.1978, *Faruqi* 1671: **A-7** 10 km from Baida, on way to Derna, 23.5.1977, *Faruqi* 1367-d and 1368-e; 3 km from Shahat on way to Derna, main highway, 4.5.1978, *Faruqi* 1748; **D-3** Sebha sheep farm, 17.2.1977, *M. Ahmad, A. El-Taife & Siddiqi* 1124; Sebha, 6.3.1978, *Faruqi* 1569.

Distribution: Mediterranean region, S. Europe, Irano-turanian region, Tropical E.S. and N. Africa, India, Australia, America.

Fl.: Jan.-May

41. **AVELLINIA**

Parl., Pl. Neuv. 59. 1842. *Celebanthium* Reichb., Deutsche Botaniker, Herbarienb., Abt. 2: 149. 1841 (in adnot).

Annual herbs with open panicle. Spikelets 2-4 florets, spaced, the upper reduced; rachilla glabrous; glumes very unequal, the inner very short, linear-lanceolate, the outer

large, lanceolate, slightly larger than the lemma; lemma convolute, linear, bifid at the tip, with a straight awn, more or less equal to lemma; palea very small; lodicules 2, glabrous; stamens 3, ovary glabrous, style hairy up to the base; caryopsis linear, glabrous.

A monotypic Mediterranean genus.

Avellinia michelii (Savi) Parl., Pl. Nouv., 59. 1842; Maire, Fl. Afr. Nord. 2: 342. 1953; Keith, l.c. 276; Scholz in Willdenowia, 7. 439. 1974. (Fig. 48)

Bromus michelii Savi, Bot. Etr. 1: 78. 1808; *Koeleria michelii* (Savi) Coss. et Durand, Expl. Sc. Alg. 2: 120. 1855.

Herb, erect. Culms fascicled, rarely solitary, retrorsely hairy. Leaf blade pubescent; ligule less than 1 mm long. Panicle lanceolate or linear-lanceolate up to 7 cm long, branches small, axis glabrous, pedicel scabrous. Spikelets laterally compressed, ±4 mm long, 2-4 florets; glumes very unequal, the larger slightly smaller than the flower, glabrous or slightly scabrous on nerves; the smaller 1.7-1.8 mm long, linear-lanceolate, scabrous; rachilla slightly pubescent on one side, prolonged in the upper florets; lemma bifid at the tip with one awn arising form the sinus; palea bifid; lodicules 2, glabrous; anthers 3; caryopsis laterally compressed. 2n = 14.

Type: Described from Italy.

A-3 Ain Sharshara Tarhuna, 23.3.1977, *Faruqi* 1300.

Distribution: Mediterranean region.

Fl.: Mar.-June

42. AIRA

L., Sp. Pl. ed. 1: 63. 1753; Gen. Pl. ed. 5: 31. 1754.

Small herbs. Panicle lax and diffused or somewhat contracted; branches capillary. Spikelets of 2 florets, the entire floret disarticulating with the rachilla; glumes more or less equal, 1-nerved; lemma bifid at the tip, one awn from the back; palea slightly smaller than lemma, 2-nerved; lodicules 2, lanceolate, glabrous; stamens 3; ovary glabrous, style plumose nearly up to the base; caryopsis oblong.

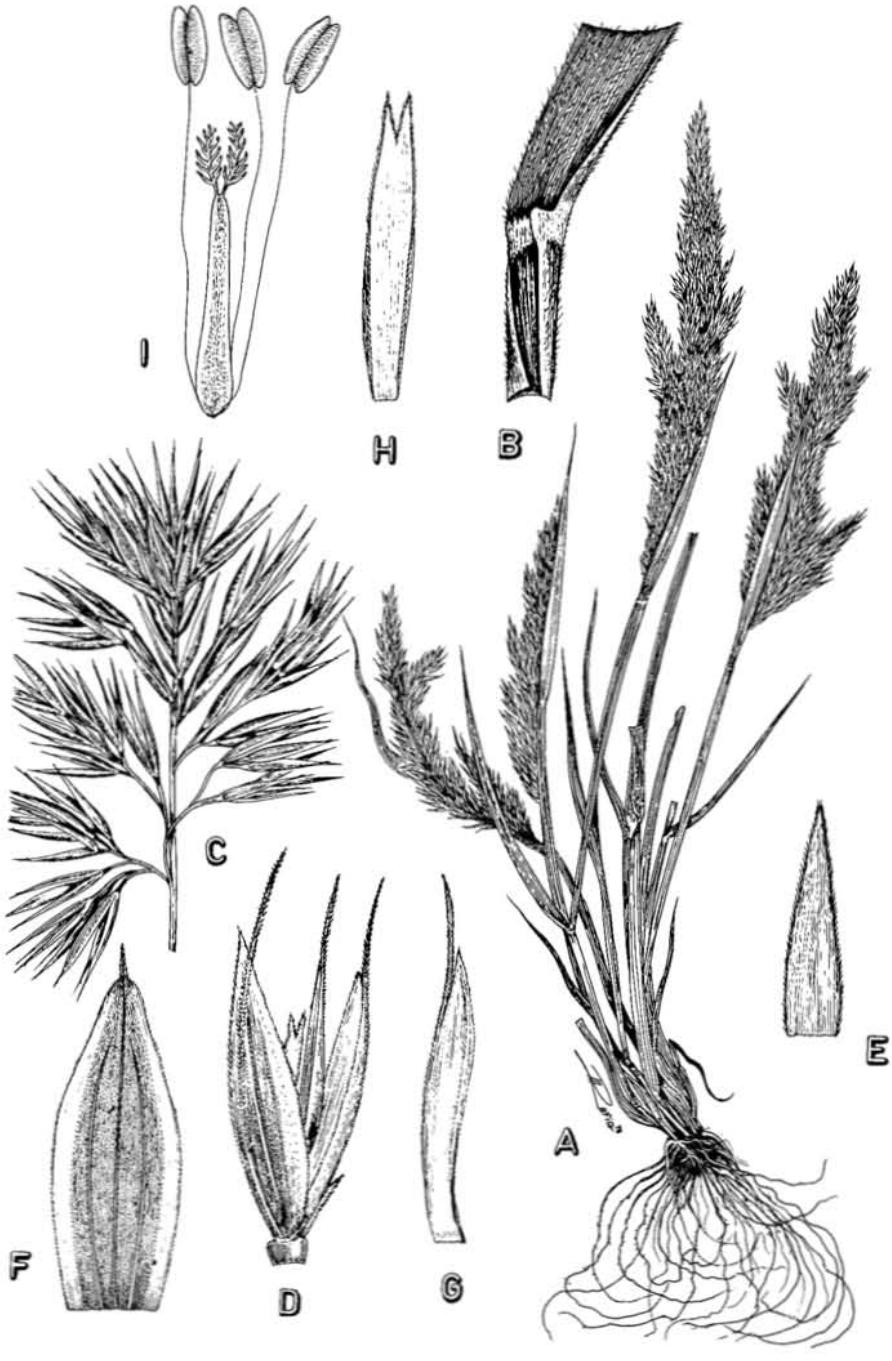


Fig. 48 **Avellinia michelii:** A, habit × 0.5; B, portion of lamina, ligule and sheath × 5; C, portion of panicle × 2; D, spikelet × 10; E, lower glume × 20; F, upper glume × 10; G, lemma × 10; H, palea × 20; I, stamens and pistil × 20.

POACEAE

About 12 species, distributed in N. and S. temperate regions and mountains of Tropics; 2 species are present in Libya.

+ Inflorescence very lax with terminal branches equal and dichotomous; spikelets open	1. **A. tenorii**
— Inflorescence somewhat contracted, with terminal branches neither equal nor strictly dichotomous; spikelets congested	2. **A. cupaniana**

1. **Aira tenorii** Guss., Fl. Sic. Prodr. 1: 62. 1827; Maire, Fl. Afr. Nord. 2: 345. 1953; Scholz, Willdenowia, 7: 439, 1974.

A. pulchella Link, Hort. Berol. 1: 130. 1827; Keith, l.c. 204.

Slender annual, up to 40 cm tall, glabrous. Leaf up to 9 cm long, 1 mm wide, glabrous, filiform. Inflorescence lax up to 15 cm long, dichotomously or trichotomously branched, branches slender and equal. Spikelets ovate, open, 2-flowered at the tip of 10-15 mm branches; glumes subequal, mucronate truncate, tip hayaline; lemma 5-nerved (obscurely) scabrous on the back, 2-toothed at the tip, awned; lodicules 2; anthers 3, linear; caryopsis fused with the palea and the lemma. 2n = 14.

Type: Described from Spain.

A-6 Barce (El Merj) Sidi Ahmad-el Gheila 6.4.1933, *Pampanini* 240 (FI).

Distribution: Mediterranean region.

Fl.: Apr.-May

2. **Aira cupaniana** Guss., Fl. Syn. n. 1: 148. 1842; Maire, Fl. Afr. Nord 2: 351. 1953; Scholz, Willdenowia, 7: 439. 1974. (Fig. 49)

Annual, up to 20 cm tall. Culm usually solitary and slender, glabrous. Leaf 3 cm long and 0.5 mm wide, filiform. Inflorescence 7 cm long, contracted, branches capillary, terminal branches not strictly dichotomously branched. Spikelet crowded at the tip, florets 2; glumes obtuse, scabrous on veins; lemma much smaller than the glumes, scabrous, obscurely 5-nerved, upper with an awn, lower bidentate, muticous or awned; palea bidentate; lodicules 2. 2n = 14.

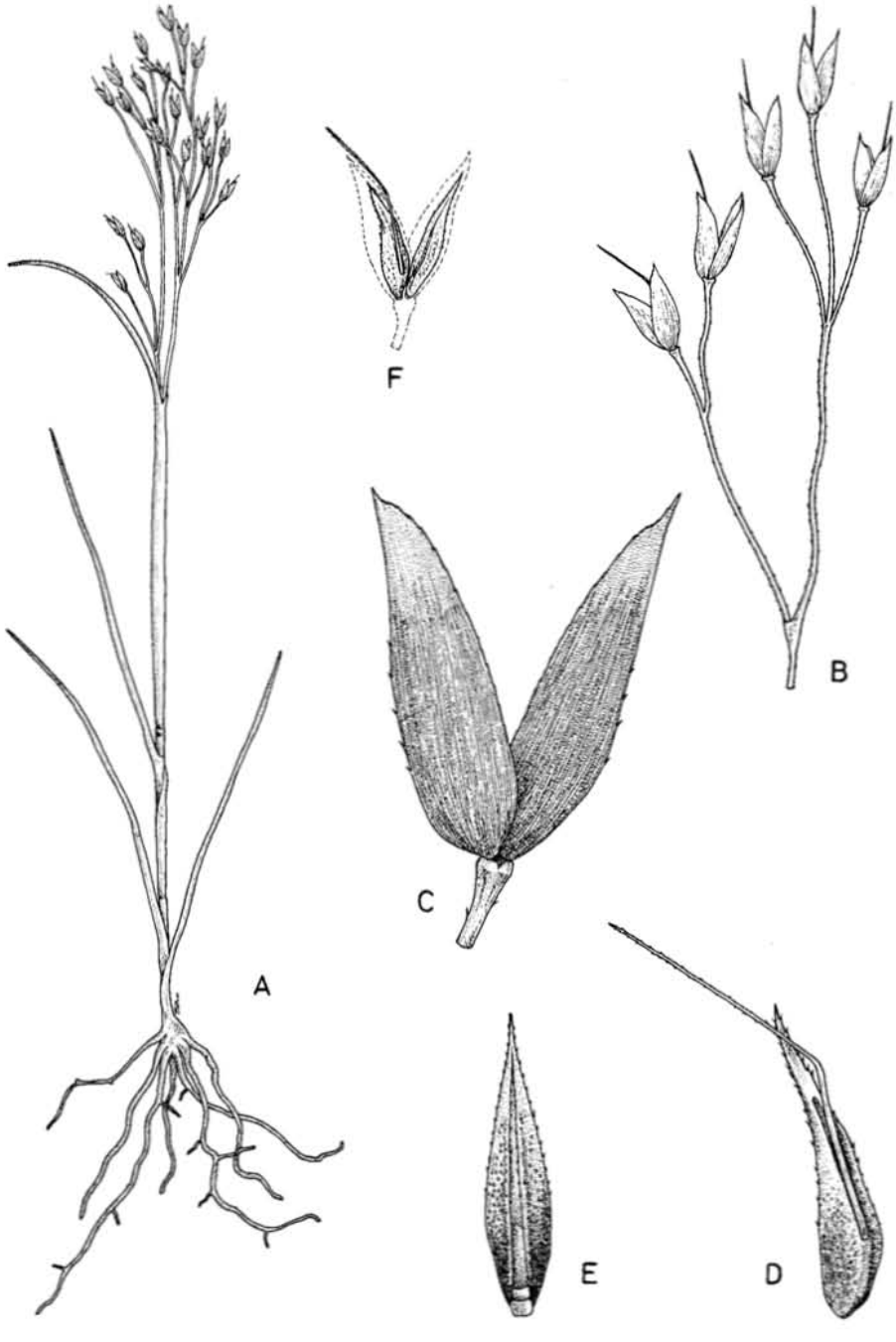


Fig. 49 **Aira cupaniana:** A, habit × 2; B, portion of panicle × 5; C, glumes × 25; D-E, upper and lower lemma × 25; F, spikelet × 10.

Type: Described from Sicily.

A-7 c. 5 km W. of Baida, 25.3.1970, *Davis* 49977.

Distribution: W. Mediterranean region.

Fl.: Apr.-June

43. ANTINORIA

Parl., Fl. Parlerm. 1: 92. 1845.

Annual or perennial. Spikelets of 2 florets, hermaphrodite; glumes subequal; lemma muticous, half the length of glume, 3-nerved, truncate and somewhat three lobed; palea 2-toothed; lodicules 2, lanceolate; style plumose up to the base; stamens 3; caryopsis.

2 species, distributed in S. and W. Europe and N. Africa, represented by only one species in Libya.

This genus is a segregate from *Aira* on the basis of the absence of awn.

Antinoria insularis Parl., Fl. Palerm. 1: 94. 1845; Scholz, l.c. 440; M. Dogan in Davis, Fl. Turk. 9: 336. 1985.

Airopsis insularis (Parl.) Nyman, Syll. 411. 1854-1855; *Aira insularis* (Parl.) Boiss., Fl. Or. 5: 528. 1884; *Antinoria agrostidea* (DC.) Parl. var. *insularis* (Parl.) Maire in Jehand. & Maire, Cat. Pl. Maroc. 569. 1929; Maire, l.c. 2: 360; Keith, l.c. 241.

Annual up to 15 cm, erect-geniculately ascending, glabrous, glaucous, slender. Culms solitary, (many plants grow together). Leaf filiform, glabrous up to 8 cm long, 0.5 mm broad, acuminate; ligule 20 mm long, membranous, attached to the culm. Inflorescence an open panicle, branches divaricating, bearing spikelets at the tip of branches. Spikelets 2-flowered; glumes subequal, 1 mm long, minutely mucronate, floret 5 mm long, not awned. 2n = 14.

Type: Described from Greece.

A-7 Lamluda, 28.4.1934, *Pampanini & Pichi-Sermolli* 238 (FI); *ibid,* 13.5.1934, *Pampanini & Pichi-Sermolli* 239 (FI).

Distribution: S. Italy, Crete and Libya.

Fl.: Mar.-June

44. CORYNEPHORUS

P. Beauv., Ess. Agrost. 90 tab. 18, fig. 2. 1812. *nom. cons.*
Weingaertneria Bernh., Syst. Verz. Erfurt. 1: 23. 51. 1800.

Annual or perennial. Leaves conduplicate. Panicle open or somewhat contracted. Spikelets of 2 florets, laterally compressed, the upper pedunculate; glumes subequal, 1-3-nerved; lemma with a club-shaped awn; palea bifid; lodicules 2; stamens 3; caryopsis oblong, fused with the lemma and palea.

About 6 European and Mediterranean species; 1 species is recorded from Libya. Club-shaped awn is the characteristic feature of this genus.

Corynephorus divaricatus (Pourr.) Breistr. in Proc. Verb. Soc. Dauph. Etud. Biol., Grenoble, Ser. 3, 17: 3. 1950; Bull. Soc. Bot. France, 119: 237. 1952; Scholtz, l.c. 440. (Fig. 50)

Aira divaricata Pourr. in Mem. Acad. Toul. 3: 307. 1788; *A. articulata* Desf., Fl. Atlant. 1: 70. 1798; *C. articulatus* (Desf.) P. Beauv., Ess. Agrost. 159. 1812; Durand & Barratte, l.c. 258; Pamp., Pl. Trip. 18. 1914; Prod. Fl. Cir. 105. 1931; Maire, l.c. 238; Keith, l.c. 389.

Annual, few cauline branches, erect, solitary or fascicled. Culm glabrous. Leaf filiform, scabrous, up to 60 mm long and 0.5 mm broad, subacute. Inflorescence a loose panicle, divaricating or condensed up to 10 cm long, pedicel scabrous; glumes subequal, glabrous, 4 mm; florets small 1 mm long, rachilla pubescent, awn reddish-brown towards the base, whitish and club-shaped at the top with a ring of small hairs in the middle of the awn.

Type: Described from France.

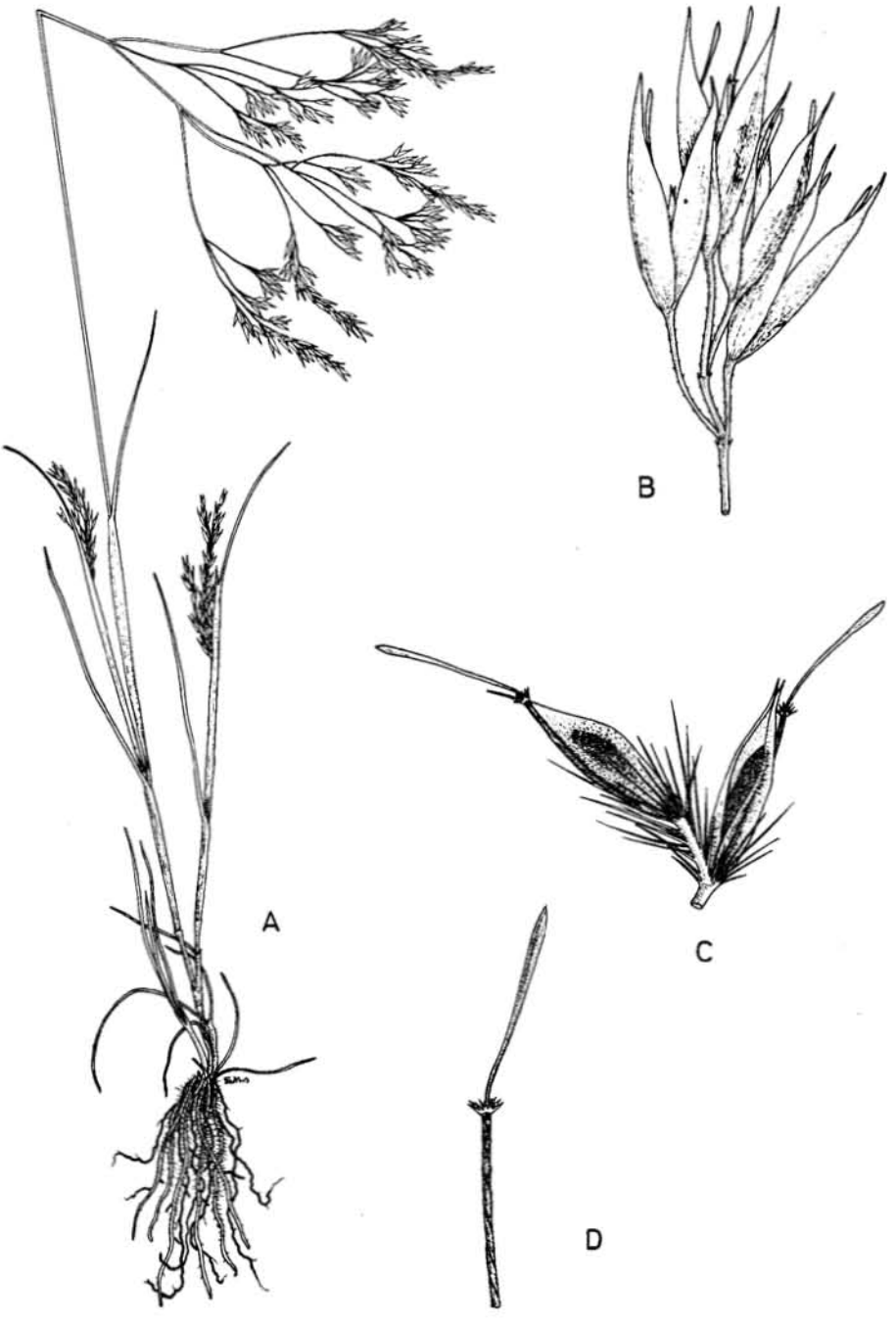


Fig. 50 **Corynephorus divaricatus:** A, habit × 1; B, portion of panicle × 10; C, florets × 20; D, awn × 25.

A-3 Tripoli, Ain Zara, 22.4.1913, *Pampanini* 3462 (FI); **A-6** Benghazi, alla Punta Giuliana, 6.4.1914, *Viccari* 1259 (FI); Benghazi, Palmeo, Primavera (Spring) 1921, *Maugini s.n.* (FI).

Distribution: Mediterranean region.

Fl.: Apr.-June

45. **MILIUM**

L., Sp. Pl. ed. 1: 61. 1753; Gen. Pl. ed. 5: 30. 1754

Annual. Culm erect, solitary or fascicled. Leaves flat. Panicle long and open. Spikelets small with long peduncles, dorsally compressed, awnless; glumes subequal, exceeding the flowers, ovate, muticous; palea more or less equal to lemma; lodicules bifid; anthers 3; styles 2, caryopsis convex.

4-6 species in the N. temperate region; represented by only 1 species in Libya.

Milium vernale M. Bieb., Fl. Taur.-Cauc. 1: 53. 1808; Maire, l.c. 88; Scholz, l.c. 440. (Fig. 51)

M. montianum Parl., Fl. Ital. 1: 156. 1848.

Annual, erect. Culm glabrous-scabrous, ribbed, solitary or few branches from the base. Leaf flat, linear-lanceolate, subacute, 9 cm long, 4 mm broad. Inflorescence a loose panicle with an aspect of *Poa*, up to 9 cm long. Spikelets 1-flowered at the tip of the branch dorsally compressed, awnless; glumes more or less equal, glabrous, 3 mm long; caryopsis shining. 2n = 18.

Type: (USSR) in Tauriae et Caucasi subalpini collibus, *Marschall von Bieberstein* (holo.LE,iso.K).

A-7 Shahat, 1.4.1970, *Davis* 50514.

Distribution: W.S. and S.E. Europe, Libya (Gebel Akhdar), Cyprus, Syria, Lebanon, Palestine, Turkey, Caucasus, Iran and C. Asia.

Fl.: Apr.-June



Fig. 51 **Milium vernale:** A, habit × 1; B, portion of panicle × 5; C, lemma × 20.

46. AMMOPHILA

Host., Gram. Austr. 4: 24, t. 41. 1809.

Psamma P. Beauv., Ess. Agrost. 114. t. 6. fig. 1. 1812.

Perennial, robust sea shore grass, with strong rhizomes. Leaves c. 60 cm or more long, convolute. Panicle dense and spike-like. Spikelets large, laterally compressed, one-flowered; glumes subequal; lemma 9-12 mm long, glumes 10-13 mm long, 5-nerved; callus hairy; caryopsis somewhat cylindrical.

4-6 species in Europe, N. Africa, N. America and Australia. 1 species in Libya.

Ammophila australis (Mabille) Porta et Rigo, Exs. Itin. Ital. 2: nr. 36. 1875. (Fig. 52)

Psamma australis Mabille, Rech. Pl. Corse. 1: 33. 1867; *Ammophila arenaria* (L.) Link, var. *australis* (Mabille) Durand & Barratte, Prodr. Fl. Lib. 255. 1910; Pamp., Pl. Trip. 10. 1914; Prod. Fl. Cir. 104. 1931; Maire, l.c. 159; Keith, l.c. 223.

A robust plant, 1 m or more tall with rhizome and woody base. Culm glabrous, glaucous when outside leaf sheath. Lamina rolled to form a dagger-like structure, innerside of the rolled leaf highly pubescent, acuminate, up to 40 cm long. Inflorescence a condensed panicle, up to 30 cm long, elliptic-lanceolate. Spikelet one-flowered; glumes 10-13 mm long, glabrous, glaucous, outer one keeled; lemma 9-12 mm long, glabrous, callus hair 3-5 mm long. 2n = 14, 28, 56.

Type: Described from Europe.

A-3 Khoms, Labda, 13.4.1913, *Pampanini* 3050 (FI); Tripoli, Tajura, Tourist city beach sand dunes, 12.3.1977, *Faruqi* 1266; Leptis Magna, 1.5.1974, *B. Faris* 327; **A-6** Benghazi, Sidi Khalifa, 28.4.1922, *Maugini s.n.* (FI); Benghazi, 6.6.1916, *Zanon* 629 (FI); Tocra-Tolmeta, 29.4.1933, *Pampanini* 245 (FI); **B-4** Tripolitania, Magnae Syrteos, Marsa Luegia, 30.3.1914, *Vaccari s.n.* (FI); **B-6** Es-Zuetina, N.E. of Agdabia, 11.4.1934, *Pampanini & Pichi-Sermolli* 246 (FI).

Distribution: Mediterranean region.

This species differs from *A. arenaria* (L.) Link in having sharp pointed and rigid

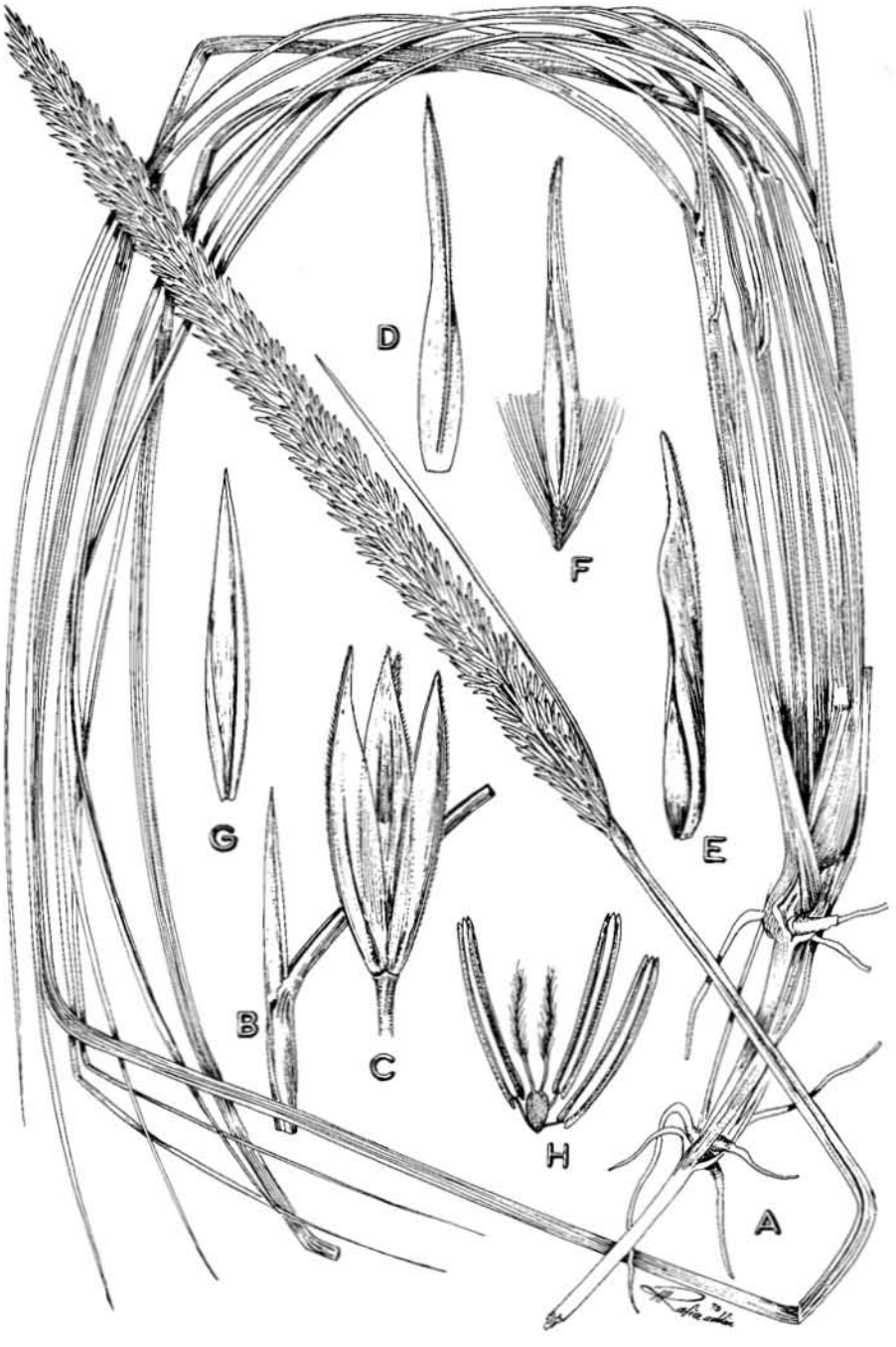


Fig. 52 **Ammophila australis:** A, habit × 0.5; B, portion of lamina, sheath and ligule × 2; C, spikelet × 4; D, lower glume × 5; E, upper glume × 5; F, lemma × 5; G, palea × 5; H, stamens and pistil × 5.

leaves, the inflorescence much longer and narrower (18-30 × 1.5 cm), less dense. A good sand binder.

Fl.: Mar.-June *Vern.* Sbut, Summa.

47. POLYPOGON

Desf., Fl. Atlant. 1: 66. 1798.

Annual or perennial, erect. Leaf flat. Inflorescence very dense, bristly, panicle of many small, awned spikelets. Spikelets with one bisexual floret, falling entire at maturity; callus below the glume slightly swollen; glumes subequal, rounded on the back, median nerve extending as an awn or sometimes awnless; lemma about half as long as the glumes, truncate at the top, 5-nerved, awnless or the midnerve extending as a short awn; palea 2-nerved; stamens 3; lodicules 2, 2-toothed at the apex, teeth unequal; caryopsis ellipsoid.

About 10 species in the Mediterranean region and S.W. Asia; 3 species are found in Libya.

1.	+ Glume awnless	3. **P. semiverticillatus**
	– Glume awned	2
2.	+ Margins of lemma densely ciliate in the upper half; lemma awnless	2. **P. maritimus**
	– Margins of lemma not densely ciliate; lemma usually awned	1. **P. monspeliensis**

1. **Polypogon monspeliensis** (L.) Desf., Fl. Atlant. 1: 67. 1798; Durand & Barratte, l.c. 255; Pamp., Pl. Trip. 33. 1914; Prod. Fl. Cir. 103. 1931; Corti, l.c. 49; Maire, l.c. 2: 147; Keith, l.c. 789; Scholz, l.c. 440. (Fig. 53)

Alopecurus monspeliensis L., Sp. Pl. 61. 1753.

Annual up to 70 cm tall. Culm solitary or tufted, geniculately ascending, glabrous, glaucous. Leaves up to 25 cm long, 8 mm wide, densely puberulent in rows, linear-acuminate. Panicle dense with an aspect of spike (like *Setaria*), lobed, oblong. Spikelets 2-3 mm long, narrowly oblong; florets disarticulating below the glumes, narrowly

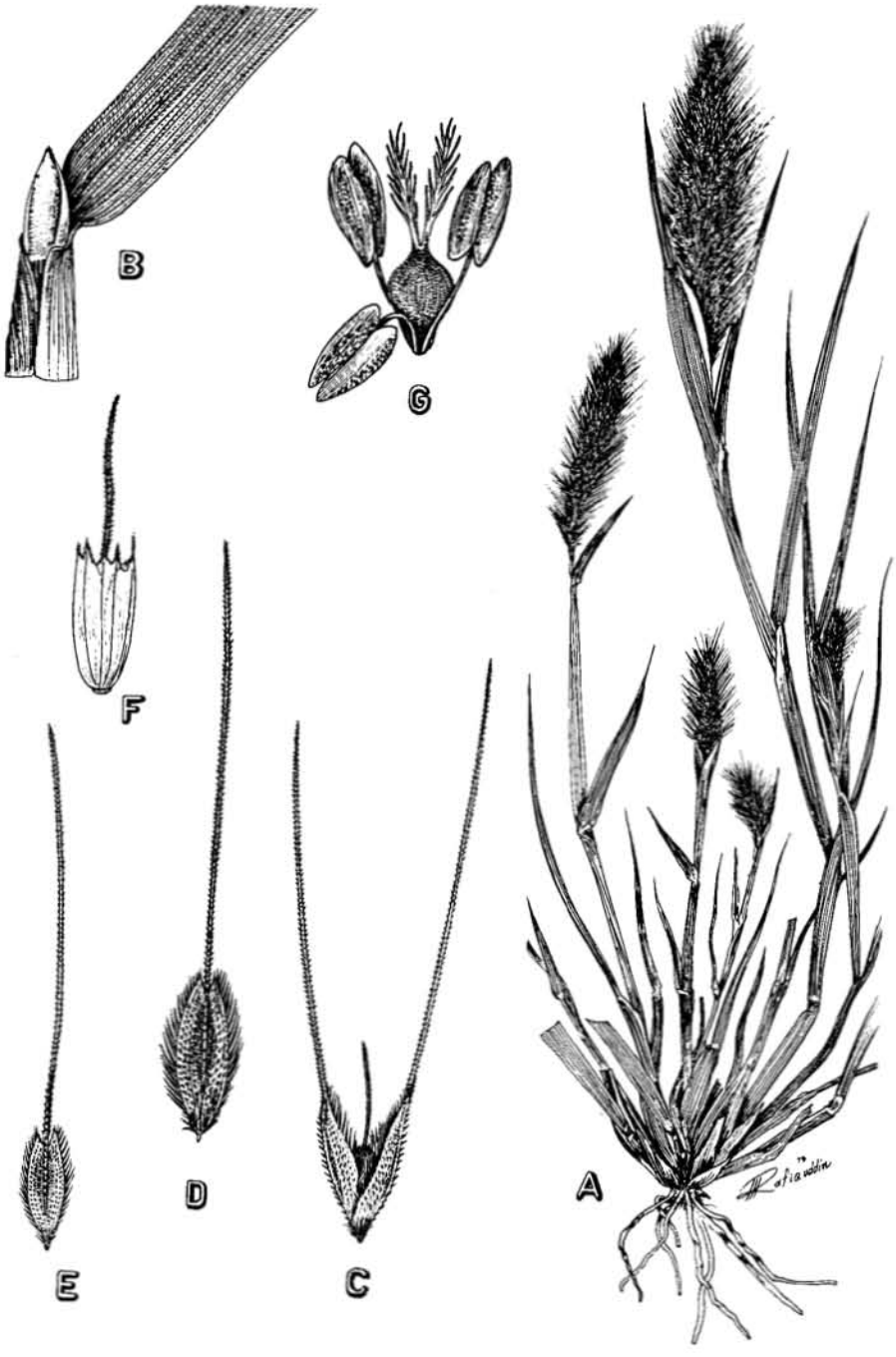


Fig. 53 **Polypogon monospeliensis**: A, habit × 0.5; B, portion of lamina, sheath and ligule × 2.5; C, spikelet × 10; D, lower glume × 10; E, upper glume × 10; F, lemma × 20; G, stamens and pistil × 30.

oblong, laterally compressed, emarginate, margins minutely pilose, awn originating from the emarginate tip, 5-9 mm long; glumes awned; lemma 1-1.5 mm long, glabrous, truncate, awned or (sometimes unawned); awn 2 mm long. 2n = 28.

Type: Described from Montpellier.

A-3 Tripoli, Faculty of Science, Sidi El-Masri, 22.4.1967, *Boulos*, 1737; Sharshara, 23.3.1977, *Faruqi* 1305 and 1308; **A-6** 10 km from Merj on way to Baida, 26.5.1977, *Faruqi* 1393. 1394, 1395 and 1396; **A-7** Baida, 23.5.1977, *Faruqi* 1374-F; **B-1** Nalut, 17.6.1977, *Faruqi* 1425; *ibid.*, 22.5.1976, *Faruqi* 824; **C-4** Hun, 21.2.1977, *M. Ahmad, A. El-Taif & Siddiqi* 1135; **D-3** Brak, 7.3.1978, *Faruqi* 1602; 41 km from Brak on way to Hun, 7.3.1978, *Faruqi* 1605; Idri, 16.2.1977, *M. Ahmad, A. El-Taif & Siddiqi* 1117 and 1118; **E-1** 70 km from Ghat behind new airport, 19.2.1977, *M. Ahmad, A. El-Taif & Siddiqi* 1126; **G-8** Jabal Uwainat, 7.11.1968, *Boulos* 3308.

Distribution: S. and E. Europe, Mediterranean region, Anatolia, Iraq, Iran, Afghanistan, Pakistan, India, S. Russia, China, Japan, Ethiopia, S. Africa, N. & S. America and Tasmania.

Fl.: Feb.-June *Vern.* Sbul el far

2. **Polypogon maritimus** Willd. in Neue Schriften Ges. Naturf. Fr. Berlin. 3: 442. 1801; Durand & Barratte, l.c. 255; Pamp., Pl. Trip. 33. 1914; Prod. Fl. Cir. 103. 1931; Maire, l.c. 149; Keith, l.c. 789; Scholz, l.c. 440.

Annual, up to 25 cm high, geniculately acsending, solitary or fascicled. Culms glabrous. Leaf flat, 5 cm long, 3 mm broad. Inflorescence a dense panicle of short branches, not lobed, cylindrical, (an aspect of *Setaria*), up to 5 cm long. Spikelets 2-2.25 mm long; glume awned, awn originating about 1/3 from the glume tip, minutely curved spines below; lemma truncate, densely ciliate in the upper half of the margin, not awned. 2n = 14, 28.

Type: Received from Herrn Boupland who collected it from the coast of Rochella.

A-3 Tripoli, Ain Zara, 22.4.1913, *Pampanini* 3465 and 3467 (FI); Lamluda, 9.4.1933, *Pampanini* 1066 (FI); *ibid.*, 28.4.1934, *Pampanini & Pichi-Sermolli* 1064 (FI); **A-7** Cirene, Safsaf, 18.4.1933, *Pampanini* 1067 (FI).

Distribution: S. Europe, Mediterranean region, S. Russia, S. Siberia, Anatolia, Turkey, Iraq, Iran, Afghanistan.

Fl.: Mar.-May

3. **Polypogon semiverticillatus** (Forsk.) Hyl., in Uppsala Univ. Arsskr. No. 7.74.1945. (Fig. 54)

Phalaris semiverticillata Forsk., Fl. Aeg.-Arab. 17.1775; *Agrostis verticillata* Vill., Pl. Dauph. 2: 74. 1779; Prosp. 16. 1779; Durand & Barratte, l.c. 254; Pamp., Pl. Trip. 7. 1914; Prod. Fl. Cir. 103. 1931; *Polypogon littoralis* Sm. var. *muticus* Hook. f., Fl. Brit. Ind. 7: 246. 1896; *A. semiverticillata* (Forsk.) Christ., Dansk. Bot. Archiv. 4, 3: 12. 1922; Maire, l.c. 128.

Perennial, 40 cm tall, erect, fascicled, finely puberulent, ribbed. Leaf lanceolate, acute, scabrous on veins, up to 10 cm long and 6 mm broad; leaf sheath and ligule finely puberulent, ligule membranous, toothed. Inflorescence a panicle, pyramidal, somewhat open, nodes on the primary axis spaced. Glumes more or less equal, minutely puberulent, awnless; lemma without an awn. 2n = 28.

Type: "Rosettae & Kahirae frequens", *Forsskal*, C.

A-3 Tripoli, Faculty of Science, Sidi El-Masri, 22.4.1967, *L. Boulos* 1749; Sharshara, 23.3.1977, *Faruqi* 1304 and 1307; *ibid,* 25.3.1976, *Fathi, B.R.* 19; **A-7** Wadi Derna, 14.3.1968, *L. Boulos* 2404; Shahat, 4.5.1978, *Faruqi* 1742.

Distribution: Mediterranean Europe, Libya, S.E. Asia.

Fl.: Mar.-May

48. GASTRIDIUM

P. Beauv., Ess. Agrost. 21, t. 6, f. 6. 1812.

Annual. Leaf flat, ligule lanceolate. Inflorescence dense, narrow, panicle tapering towards the tip, with many shortly pedicelled spikelets, branches scabrid. Spikelets with one bisexual floret, disarticulating above the glume; glumes somewhat unequal with shining swollen bases, keeled, the lower 1-nerved, the upper 3-nerved; lemma very

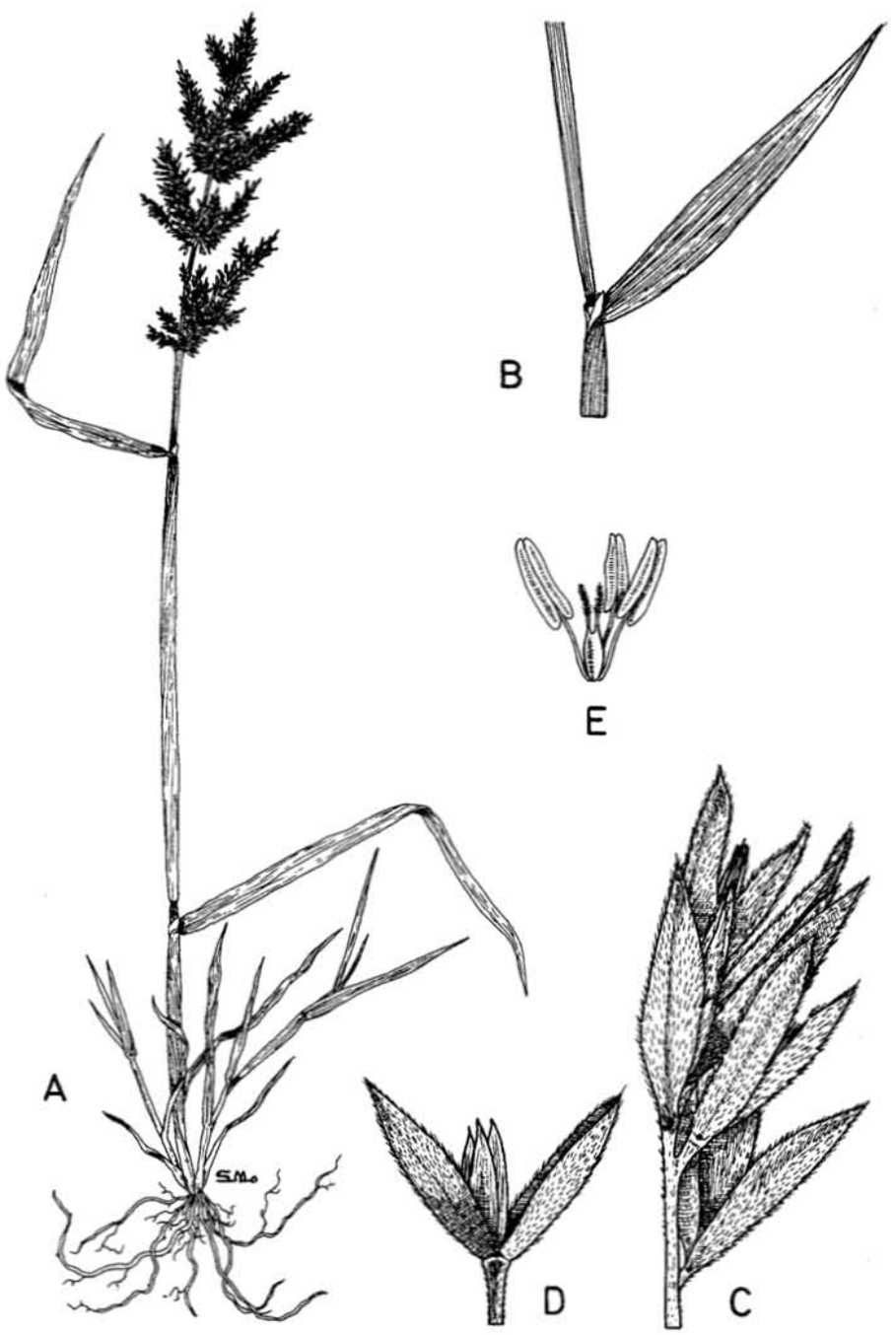


Fig. 54 **Polypogon semiverticillatus**: A, habit × 2/3; B, portion of sheath, ligule and lamina × 2; C, portion of panicle × 20; D, spikelet × 20; E, stamens and pistil × 40.

short, truncate and toothed at the top, 5-nerved, the median extending into an awn twisted at the base from the dorsal surface or awnless, pilose; palea 2-keeled; stamens 3; lodicules 2; caryopsis elliptic.

3 species of the Mediterranean region of which 2 are reported from Libya.

+ Lemmas with visible awns; glumes acuminate	1. **G. ventricosum**
– Lemmas with awns hidden within the spikelet; glumes acute	2. **G. scabrum**

1. **Gastridium ventricosum** (Gouan) Schinz et Thell. in Vierteljahrschr. Nat. Ges. Zürich 58:39.1913; Pamp., Prod. Fl. Cir. 104. 1931; Maire, l.c. 142; Keith, l.c. 515; Scholz, l.c. 441. (Fig. 55)

Agrostis ventricosa Gouan, Hort. Monsp. 39; tab. 1, fig. 2. 1762; *Milium lendigerum* L., Sp. Pl. ed. 2, 91. 1762; *G. lendigerum* (L.) Desv., Obs. Pl. Angers, 48. 1818; Durand & Barratte, l.c. 254; Pamp., Pl. Trip. 22. 1914.

Annual, up to 30 cm tall, tufted, geniculately ascending, (glabrous)-finely puberulent, glaucous. Leaf up to 12 cm long, 3 mm wide, glabrous, flat, linear-lanceolate, acuminate; ligule glabrous, flat, linear-lanceolate, acuminate; ligule glabrous, membranous lacerated. Inflorescence up to 90 mm long, linear, acute (when young), a condensed panicle. Spikelet short peduncled, 1-floret; glumes unequal, acuminate, rounded at the back below and keeled towards the tip, keel scabrous, 5.5 and 4.5 mm; lemma pubescent, toothed, awned. 2n = 14, 28.

Type: Described from Montpellier.

A-7 Faidia, 3 km from gas station on way to Slanta, 23.5.1977, *Faruqi* 1373-f; Shahat, 24.5.1977, *Faruqi* 1375-C; Shahat, 4.5.1978, *Faruqi* 1729; 3 km from Shahat on way to Derna, 4.5.1978, *Faruqi* 1760; 22 km E. of Gubba, 5.5.1978, *Faruqi* 1767; 5 km E. of Wadi Kuf, on main highway, 8.5.1978, *Faruqi* 1834; Wadi Kuf, 8.5.1978, *Faruqi* 1842 & 1842-a; c. 16 km from Labrag, c. 30 km from Lamluda, 19.6.1972, *S.I. Ali* 723.

Distribution: N. Africa, S. Europe, Anatolia, Palestine, Lebanon, Syria, Iraq, Iran.

Fl.: Apr.-June

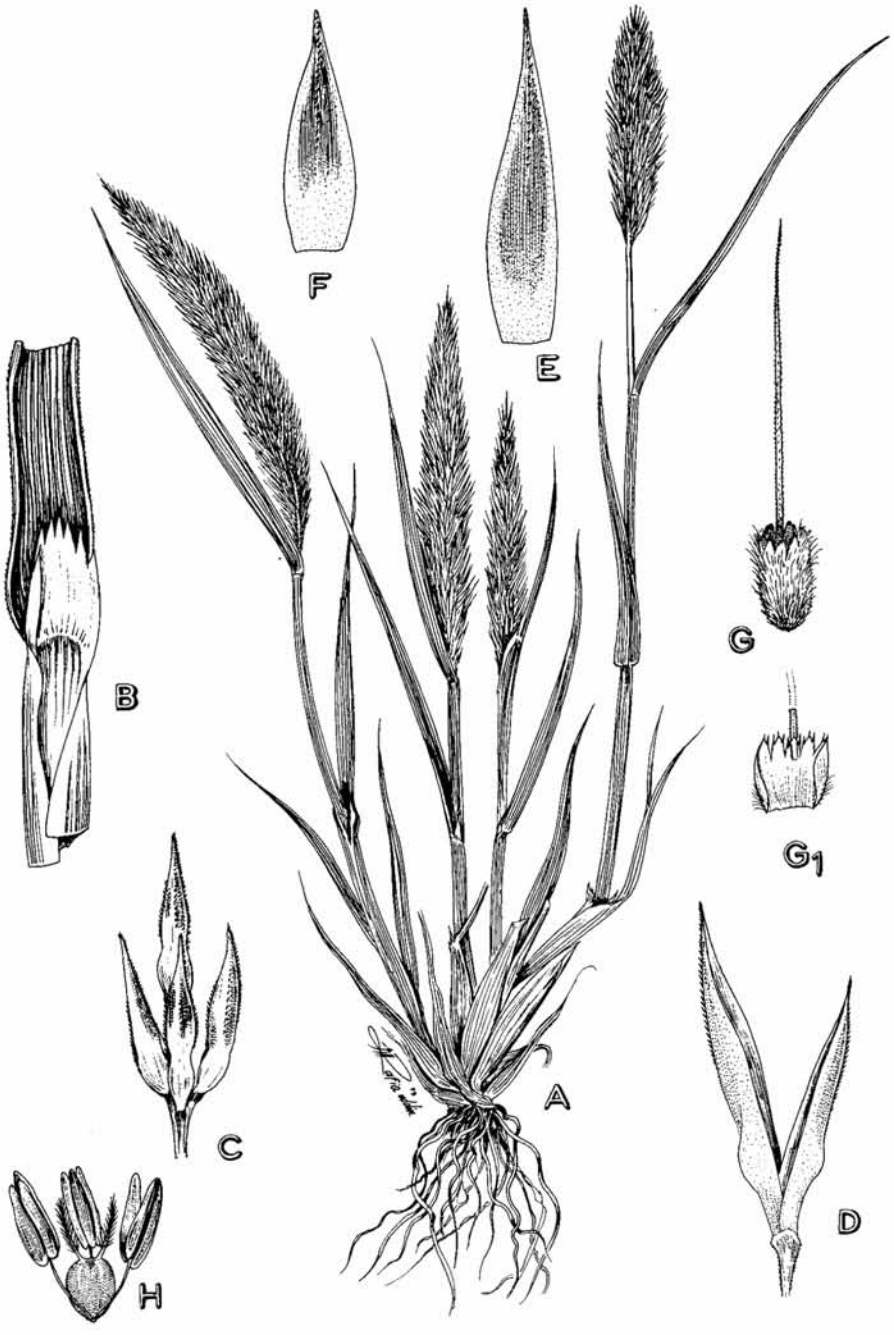


Fig. 55 **Gastridium ventricosum:** A, habit × 1; B, portion of lamina, sheath and ligule × 5; C, group of spikelets × 5; D, spikelets showing glumes × 10; E, upper glume × 10; F, lower glume × 10; G, G1, lemma × 10; H, stamens and pistil × 20.

2. **Gastridium scabrum** C. Presl., Gram. Sicul. 21.1818; Maire, Fl. Afr. Nord. 2: 144. 1953; Scholz in Willdenowia, 7: 441. 1974.

About 20 cm tall, erect or geniculately ascending. Culm puberulent, glaucous, few branches from the base. Leaf up to 7 cm long, 3 mm wide, linear-lanceolate, acute scabrous on the veins; ligule glabrous, veined, 3 mm long. Inflorescence a compound spike, up to 5.5 cm long, spikelets linear-lanceolate; glumes unequal, acute, outer scabrous; lemma ovate, apex toothed, shortly awned; seed brownish, elliptic.

Type: In arvia incultis Panormi Sicily.

A-7 Matn Borgu, sitisahair, June 1919, *Maugini s.n.* (FI).

Distribution: Mediterranean region.

Fl.: May-June

49. TRIPLACHNE

Link, Hort. Berol. 2: 241. 1833.

Small, glabrous annual. Inflorescence a dense spike-like panicle. Spikelets of 1 floret; glumes larger than lemma; lemma with a short kneed awn from its base, hardly exerted from the spikelet; palea 2-nerved and 2-toothed; caryopsis fusiform.

A monotypic genus.

Triplachne nitens (Guss.) Link, Hort. Berol. 2. 241. 1833; Durand & Barratte, l.c. 254; Pamp., Fl. Cir. 104. 1931; Maire, l.c. 146; Keith, l.c. 982; Scholz, l.c. 441.

Agrostis nitens Guss., Ind. Sem. Hort. Boccad. 1825, and Prodr. Fl. Sic. 1: 50. 1827.

A single stemmed, unbrached, erect or geniculately ascending plant. Culm glabrous, up to 20 cm tall. Leaves puberulent, sheath somewhat dilated. Leaves 5 cm long and 3 mm broad. Inflorescence a compound spike, about 5 cm long, and 12 mm broad, narrowed towards the top, top rounded. Spikelets on small pedicels; glumes 2, unequal, keeled, lanceolate, mucronate, 4 and 3 mm long, glabrous.

Type: Described from Sicily, *Gussone* (holo NAP).

A-6 Benghasi, Palemo Primavera 1921, *Maugini* s.n. (FI).

An uncommon species of sandy sea shores.

Distribution: Canaries, Sicily, Libya (Benghazi), E. Mediterranean region.

*Fl.:*Apr.-May

50.LAGURUS

L., Sp. Pl. 81. 1753; Gen. Pl. ed. 5: 34. 1754.

Annual. Panicle ovoid or subglobose, plumose-wooly, with dark awns exerted from the pale wool. Spikelets with 1 floret laterally compressed; glumes narrow, covered with long hairs; lemma much smaller than glumes, 5-nerved, bifid with 2 bristles at the tip and with a kneed awn from its back; palea 2-nerved, smaller than lemma.

A monotypic genus.

Lagurus ovatus L., Sp. Pl. 81. 1753; Durand & Barratte, l.c. 255; Pamp., Pl. Trip. 26. 1914; Prod. Fl. Cir. 105. 1931; Maire, l.c. 155; Keith, l.c. 591; Scholz, l.c. 441. (Fig. 56)

Annual, erect or geniculately ascending, solitary or with few branches. Culm pubescent with soft and slightly retrorse hairs. Leaves flat with inflated shealth, pubescent; ligules hairy and truncate. Inflorescence ovate-subglobose head. Glumes filiform with long hairs on both margins up to the tip, subequal; lemma thin and glabrous, bifid tip with 2-bristles, awned from its back, awn kneed, thin; palea 2-nerved; lodicules 2; ovary with 2 styles plumose up to the base. 2n = 14.

Syntypes: Described from Italy, France, Sicily and Portugal (BM - Herb. Cliff).

A-3 Lubda, Khoms, 29.3.1975, *Fauzia* 171; 23 km W. of Khoms, on low hills ending the Jabal Nafusa range 100 m. soft limestone slopes, in scrub, 22.3.1970, *Davis* 49812; Sharshara, Tarhuna, 23.3.1976, *Faruqi 487; Gharyan, 10.4.1975, Zenab Abou Raya* 398; **A-7** Above Derna, on road to Mertuba, 300 m. limestone plateau, in gulley, 30.3.1970, *Davis* 50330; Shahat to Faidia S. of Baida cross-roads, 700 m fallow fields

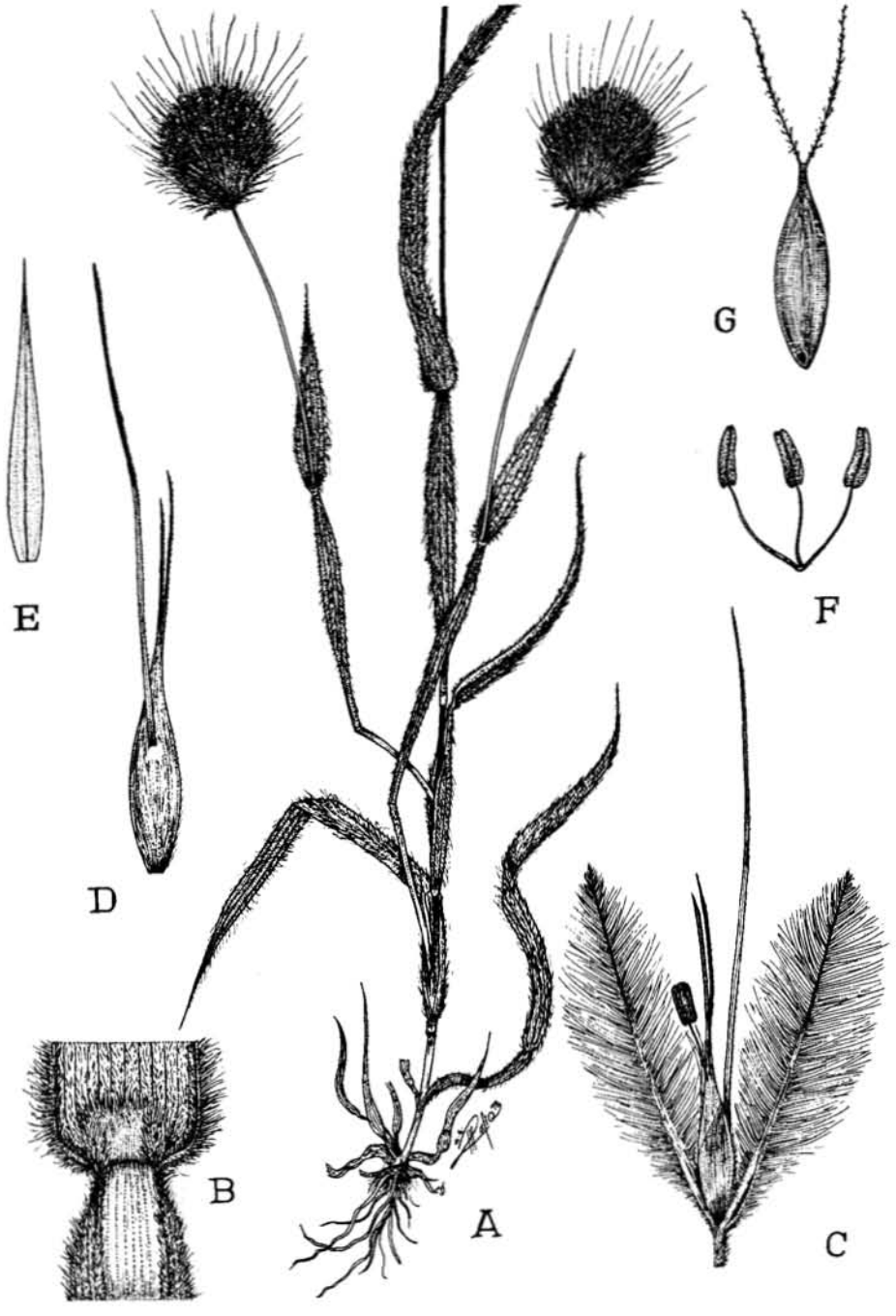


Fig. 56 **Lagurus ovatus:** A, habit × 1; B, portion of lamina, ligule and sheath × 10; C, spikelet × 5; D, lemma × 5; E, palea × 10; F, stamens × 5; G, mature pistil × 10.

and calcareous slopes, 1.4.1970, *Davis* 505013; Shahat, 7.5.1978, *Faruqi* 1799; Ain Mara, 5.5.1978, *Faruqi* 1771; 2 km before Susa, coming from Ras el Helal, 14.4.1979, *Fauzi A. Ouheda* 58.

Distribution: Macronasia, E. France, Mediterranean region and Transcaucasia.

Fl.: Mar.-June

51. PHLEUM

L., Sp. Pl. 59. 1753; Gen. Pl. ed. 5: 29. 1754.

Annual or perennial. Leaf blades flat, linear. Inflorescence cylindrical, spike-like panicle. Spikelets many, pedicels short, laterally compressed, 1-flowered, hermaphrodite, rachilla disarticulating above the glume, rarely prolonged; glumes equal, median nerve extending into a short awn or a mucro, often coarsely ciliate on the keels; lemma shorter than the glumes, truncate or muticous, awnless; palea slightly shorter than the lemma, 2-nerved; stamens 3; lodicules 2 or absent; styles 2, stigma plumose caryopsis ellipsoid, hilum basal punctiform, embryo 1/5-1/6 the length of grain.

About 12 species of temperate regions; 1 species is reported from Libya.

Phleum subulatum (Savi) Aschers. et Graebn., Syn. Mittleur, Fl. 2: 154. 1899; Pamp., Prod. Fl. Cir. 102. 1931; Maire, l.c. 110; Keith, l.c. 752; Scholz l.c. 441.

Phlaris subulata Savi, Fl. Pis. 1: 57. 1798.

Annual, fasciculated, erect or geniculately ascending, 10-30 cm tall. Culm smooth and glabrous. Leaf glabrous, linear-lanceolate, acuminate, up to 6 cm long and 2-3 mm broad. Panicle long peduncled, cylindrical, 3-6-(10) cm long, 4-5 mm broad. Spikelets laterally compressed; glume 3-nerved, hemispherical or hemielliptic, margins membranous, keels scabrous; lemma 1.5 mm long, 5-nerved, toothed at the apex, scabrous; lodicules absent; stamens 3. 2n = 14.

Type: Described from Monte Pisano, Savi (holo.PI).

Distribution: Mediterranean region, Syria, Iraq, Palestine, Arabia and Iran.

Fl.: Mar.-May

Although Pamp. l.c., and Maire l.c., reported var. *ciliatum* (Boiss) Asch., from Libya, the present study, however, cannot confirm the presence of this taxon due to the lack of material.

52. ALOPECURUS

L., Sp. Pl. 60. 1753; Gen. Pl. ed. 5: 30. 1754.

Annual or perennial. Leaf flat. Panicle cylindrical, or ovate. Spikelets laterally and finely compressed, seated on a cupuliform tip of short pedicel, one-flowered, hermaphrodite; glumes subequal, connate by the margins or free, ciliate on keels; lemma truncate with a median or basal awn; palea absent; stamens 3; caryopsis laterally compressed.

About 20 species, distributed in temperate regions of the world; 2 species are reported from Libya.

+ Panicle elliptic-ovate, 2-4 × 1-1.5 cm; uppermost leaf sheath conspicuously inflated — 2. **A. urticulatus**
− Panicle linear, 5-12 cm × 5-6 mm; uppermost leaf sheath not inflated — 1. **A. mysuroides**

1. **Alopecurus mysuroides** Huds., Fl. Angl. ed. 1: 23. 1762; Pamp., Pl. Trip. 8. 1914; Prod. Fl. Cir. 102. 1931; Maire, l.c. 97; Keith, l.c. 215; Scholz, Willdenowia, 7: 441. 1974. (Fig. 57)

Annual, 1/2 m tall, ribbed, glabrous, tufted, erect. Leaf lanceolate, acuminate, rough, up to 15 cm long, the uppermost sheath not inflated. Panicle 5-12 cm long, 5-6 mm broad, linear, tapering, spike-like, primary branches fused to the axis; pedicel 1 mm long or slightly more, tip of the pedicel discoid with a rim; 1-flowered; glumes minutely hairy, ciliated on the keel, fused at the base for about 1/3-1/2 of their length, 4 mm long; lemma 4 mm long, awned. 2n = 14.

Type: Described from England.

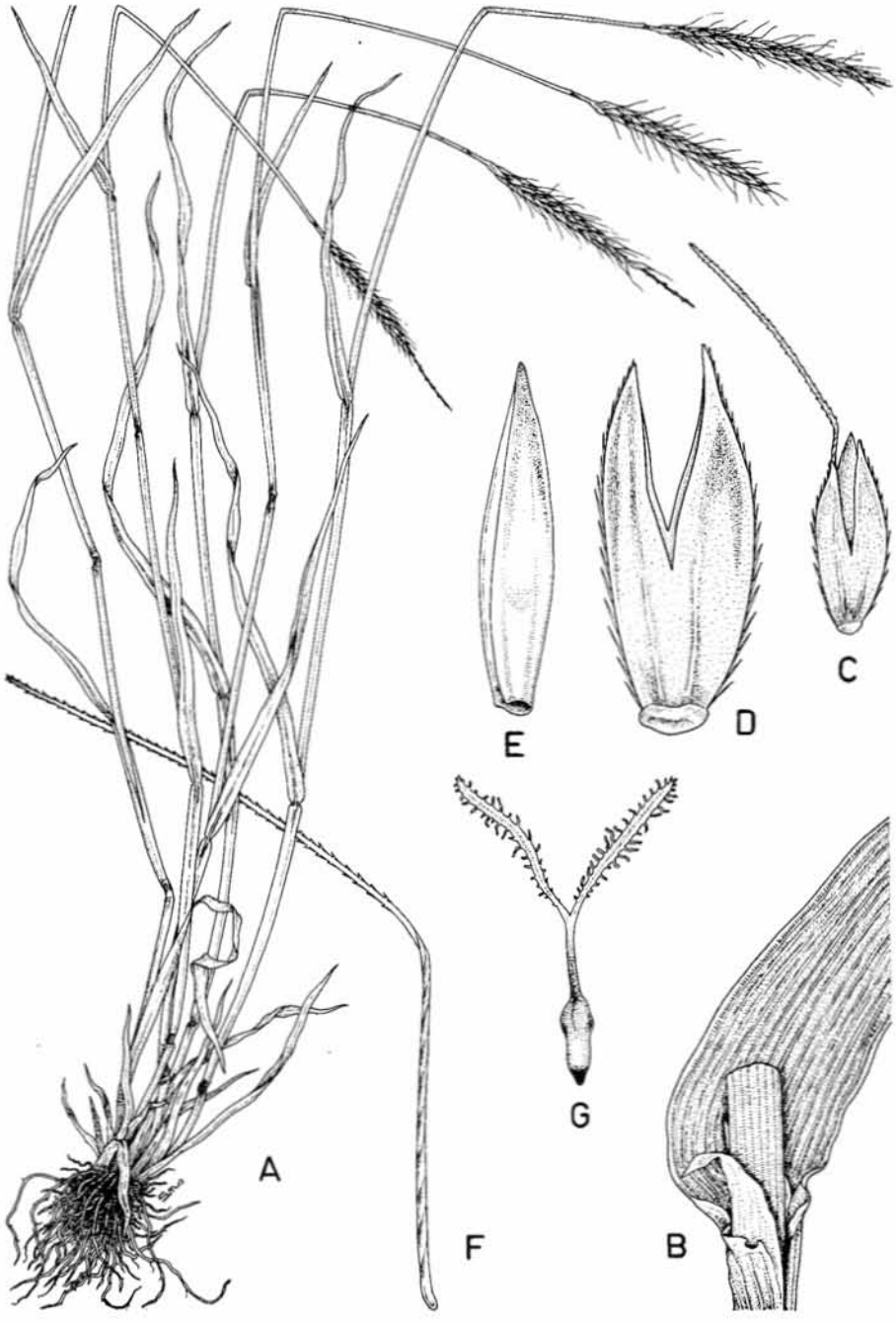


Fig. 57 **Alopecurus mysuroides**: A, habit × 0.5; B, portion of lamina, sheath and ligule × 5; C, spikelets × 5; D, glumes × 10; E, lemma × 10; F, awn × 10; G, pistil × 10.

A-3 Tripoli, Sciara-Sciat, 23.4.1913, *Pampanini* 3522 (FI); **A-7** Ain Mara, in cultivated field, 5.5.1978, *Faruqi* 1769; Derna, 21.4.1934, *Pampanini & Pichi-Sermolli* 241 (FI).

Distribution: Europe, East Asia, introduced into North America and other temperate regions.

A very good forage grass.

Fl.: Apr.-June

2. **Alopecurus urticulatus** Banks et Sol. in Russ., Nat. Hist. Aleppo ed. 2, 2: 243. 1794; Pamp., Pl. Trip. 8. 1914; Prod. Fl. Cir. 102. 1931; Maire, l.c. 96; Keith, l.c. 215; Scholz, l.c. 441.

Annual, up to 35 cm tall, erect-geniculately ascending, tufted, nodes black. Leaves up to 10 cm long and up to 2 mm broad; the uppermost sheath inflated in a characteristic way, spindle-shaped (elliptic) with a 3 cm long leaf blade. Inflorescence a compound spike up to 2-4 cm long, and up to 1-1.5 cm broad. Spikelets single-flowered, 6 mm long and 3 mm broad; 2 glumes laterally compressed and more or less joined with a flower inside; one of the glumes with an awn 6 mm long, glumes expanded in the lower half, the upper half narrowed, hairy towards the base; lemma equal to the glume, membranous, hyaline, obtuse, long-awned (10-15 mm) from the base. 2n = 14.

Type: Described from Aleppo (Syria), *Russell* (holo BM).

A-3 Tripoli, Nell'Oasi ad Henni, 23.4.1913, *Pampanini* 3551 (FI); **A-6** Benghazi, May 1917, *V. Zanon* (FI); **A-7** Ciren, 15.5.1922, *Maugini* s.n. (FI).

Distribution: Europe, N. Africa, Cyprus, Syria, Lebanon, Palestine, Jordan, Turkey, Iran.

Fl.: Apr.-May

53. LIBYELLA

Pamp., in Bull. Soc. Bot. Ital. 149. 151. 1925.

Inflorescence a simple spike. Spikelets dimorphic, one-flowered, basal one female,

the other hermaphrodite or rarely male; glumes smaller than the lemma; caryopsis dimorphic.

A North African genus with 2 species; represented here by only one species.

Libyella cyrenaica (Durand & Barratte) Pamp. in Bull. Soc. Bot. Ital. 151. 1925; Fl. Cir. 120. 1931; Maire, l.c. 115; Keith, l.c. 609; Scholz, l.c. 441.

Poa cyrenaica Durand & Barratte, Fl. Lib. Prod. 268. 1910.

Very small and delicate grass, 3-4 cm tall, erect, base bulbous. Leaves linear, 2-2.5 cm long, up to 0.5 mm broad, leaves longer than the spike. Spike 2-2.5 cm long; sessile one-flowered spikelets alternating on the main axis, spaced; dimorphic, basal female, the others hermaphrodite or rarely male; lemma hyaline, pubescent on the lower half.

Type: Benghazi, 10.2.1883, *Ruhmer* 379 (B).

A-6 Benghazi, 29.1.1924, *Cavara & Grande* s.n. (FI); Bengasi, Giocchi el Chebir 9.3.1933, *Pampanini* 884 (FI).

Distribution: Endemic.

Fl.: Jan.-March

54. PHALARIS

L., Sp. Pl. 54: 1753; Gen. Pl. ed. 5:29. 1754.

Annual or perennial. Leaf flat, linear. Inflorescence a compact oblong or ellipsoid panicle, sometimes lobed. Spikelets numerous, the basal sometimes reduced, laterally compressed, of 3 florets; the uppermost floret hermaphrodite, the lower 2 represented by lemmas; glumes winged on the keels or wingless, subequal; lower lemmas reduced to scales, the upper rounded on the back glabrous or hairy; palea similar to lemma; lodicules 2 or absent; stamen 3; caryopsis with a groove, as long as or shorter than the grain.

About 40 species in the temperate zones; 7 species are reported from Libya.

1. + Plants bulbous at the culm base or with a woody

	rhizome	2
	— Plants not bulbous at the culm base and not provided with a woody rhizome	3
2.	+ Wing of glumes prominently toothed; fertile floret glabrous; sterile floret obsolete or wanting	1. **P. coerulescens**
	— Wing of glumes entire; fertile floret densely pubescent; sterile floret(s) prominent	2. **P. aquatica**
3.	+ Spikelets in cluster of 5-7, only one hermaphrodite, the rest male or sterile; wing with 1 prominent tooth near apex	4. **P. paradoxa**
	— Spikelets solitary, all hermaphrodite; wing entire or finely toothed near apex	4
4.	+ Sterile floret 1	5. **P. minor**
	— Sterile florets 2	5
5.	+ Sterile florets c. 1/2 or more as long as the fertile floret	6. **P. canariensis**
	— Sterile florets much less than 1/2 as long as the fertile floret	6
6.	+ Glumes obliquely truncate; plants perennial (arising from a dense crown of leaves)	3. **P. truncata**
	— Glumes abruptly pointed and acute; plants annual.	7. **P. brachystachys**

1. **Phalaris coerulescens** Desf., Fl. Atlant. 1: 56. 1798; Pamp., Pl. Trip. 31, 1914; Maire, l.c. 16; Keith, l.c. 746; Scholz, l.c. 7: 441.

Perennial. Culm up to 150 cm tall, bulbous at the base, glabrous, tufted. Panicle up to 12 cm long, 2.4 cm broad, groups of 7, 1 or 2 fertile and the rest staminate (sterile spikelets not deformed); glumes 5.3-9.0 mm long 1-2 mm wide, acuminate, minutely puberulent or glabrous, winged, wing up to 1.0 mm wide, toothed; fertile floret 2.7-4.4 mm long; 0.7-1.4 mm wide; glabrous or with few hairs on the margins of lemma, shiny; sterile florets obsolete, often with a few short hairs at the base; grain 2.8-3.3 mm long, 1.2-1.4 mm wide. 2n = 14, 28.

Syntypes: Described from Algeria and Mediterranean region.

Reported from the former Tripolitania and Cyrenaica by Pamp. (l.c.); Maire (l.c.) etc.

Distribution: Mediterranean region.

Fl.: Apr.-July

2. **Phalaris aquatica** L., Cent. Plant. ed. 1: 4. 1755; Amoen. Acad. ed. 4: 264. 1759; Tutin in Tutin et al., Fl. Eur. 5: 244. 1980; Cope in Nasir & Ali, Fl. Pak. 143. 495. 1982; Baytop in Davis, Fl. Turk. 9: 368. 1985.

P. bulbosa auct. non L. (1755); Pamp., Fl. Cir. 98: 1931; Maire, l.c. 17; Keith, l.c. 746; *Phalaris tuberosa* L., Mant. 2: 557. 1771; Bor, Grasses Burma Ceyl. Ind. Pak. 616. 1960; in Towns., Guest & Al-Rawi, Fl. Iraq 9: 368. 1968; in Rech. f., Fl. Iran. 70: 348. 1970; Tzelev, Poaceae URSS, 358. 1976; *P. nodosa* Murr., Syst. Veg. ed. 13, 88: 1774 nom. superfl., based on *P. tuberosa* L.; Durand & Barratte, Fl. Lib. Prod. 253. 1910.

Perennial, up to 1.5 m tall, tufted, rhizomaceous or often bulbous, glabrous. Panicle 1.5-11 cm long, 1.0-2.5 cm wide, cylindrical-ovate, occasionally lobed at the base. Glumes 4.5-7.5 mm long, 1-2 mm wide, glabrous - (hirsute), broadly winged, wing margin entire; fertile floret 3.1-4.6 mm long, 1.2-1.5 mm wide, lanceolate; lemma densely pubescent; sterile florets 1 or sometimes 2, 0.2-2.2 mm long, when 2 the lowermost is often less than 0.5 mm long; caryopsis 2.2-2.5 mm long, 1.2-1.3 mm broad. 2n = 14, 28.

Type: Described from Egypt and the river Tiber, Italy, Herb. Linn. 78/4 (LINN).

Reported by Keith, l.c. 748; and Scholz, l.c. 441.

Distribution: Mediterranean region, S.E. Asia; introduced elsewhere.

Fl.: Mar.-July

3. **Phalaris truncata** Guss. ex Bertol. Fl. Ital. 2: 777. 1836; Maire, l.c. 19; Keith, l.c. 747; Scholz l.c. 441.

Perennial, up to 200 cm tall. Solitary-few culms from the base, glabrous. Leaf linear, acuminate, 15 cm long and 3 mm wide. Panicle cylindrical-ovoid. Glumes 5.5-6.3 mm long, 1.5-1.8 mm wide, glabrous-hirsute, obliquely truncate, winged, wing up to 1.0 mm wide, entire; fertile florets 3.7-5.0 mm long, 1.2-1.4 mm wide, densely hairy, dark brown and shiny at maturity, sterile florets 2, less than 1 mm long, swollen and appear fleshy, glabrous except with a tuft of hair at the base, grain 2.8-3.0 mm long, 1.2-1.3 mm wide. 2n = 12.

Type: Described from Italy ex Calabria, Gussone (holo. NAP).

A-7 Faidia, 23.5.1977, *Faruqi* 1371-C.

Distribution: Mediterranean region.

Fl.: May-June

4. **Phalaris paradoxa** L., Sp. Pl. ed. 2: 1665. 1753; Durand & Barratte, l.c. 253; Pamp., Pl. Trip. 31. 1914; Fl. Cir. 98. 1931; Maire, l.c. 21; Keith, l.c. 747; Scholz, l.c. 441.

Annual, 1 m tall, glabrous, erect, fascicled. Panicle up to 9 cm long, and 2 cm wide, compact, oblong, tapering to a narrow base. Spikelets falling in groups of 5-7, one fertile spikelet surrounded by six sterile ones, the group falling as a unit, some sterile spikelets deformed or clavate; glumes up to 9 mm long, narrowly winged, glumes of fertile spikelets 5.5-8.2 mm long and 1 mm wide, acuminate, conspicuously nerved, upper portion winged, the wing with a tooth-like projection near the apex; fertile florets 2.5-3.5 mm long and 0.8-1.5 mm wide, glabrous or with a few short hairs near the apex; sterile florets of the fertile spikelets represented only by knob-like projection at the base of the fertile floret. 2n = 14.

a. Var. **paradoxa**
All sterile spikelets uniform.

b. var. **praemorsa** (Lam.) Coss. et Dur., Expl. Sci. Alg., Glum: 25. 1855; Post., Fl. Pal. ed. 2, 714. 1933; Bor in Townsend & Guest, Fl. Iraq, 9: 368, t. 140. 1968; Tackh., Stud. Fl. Egypt, ed. 2, 741. 1974; Baytop in Davis, Fl. Turk., 9: 370. 1985. (Fig. 58)

Some of the sterile spikelets reduced to club-like structures.

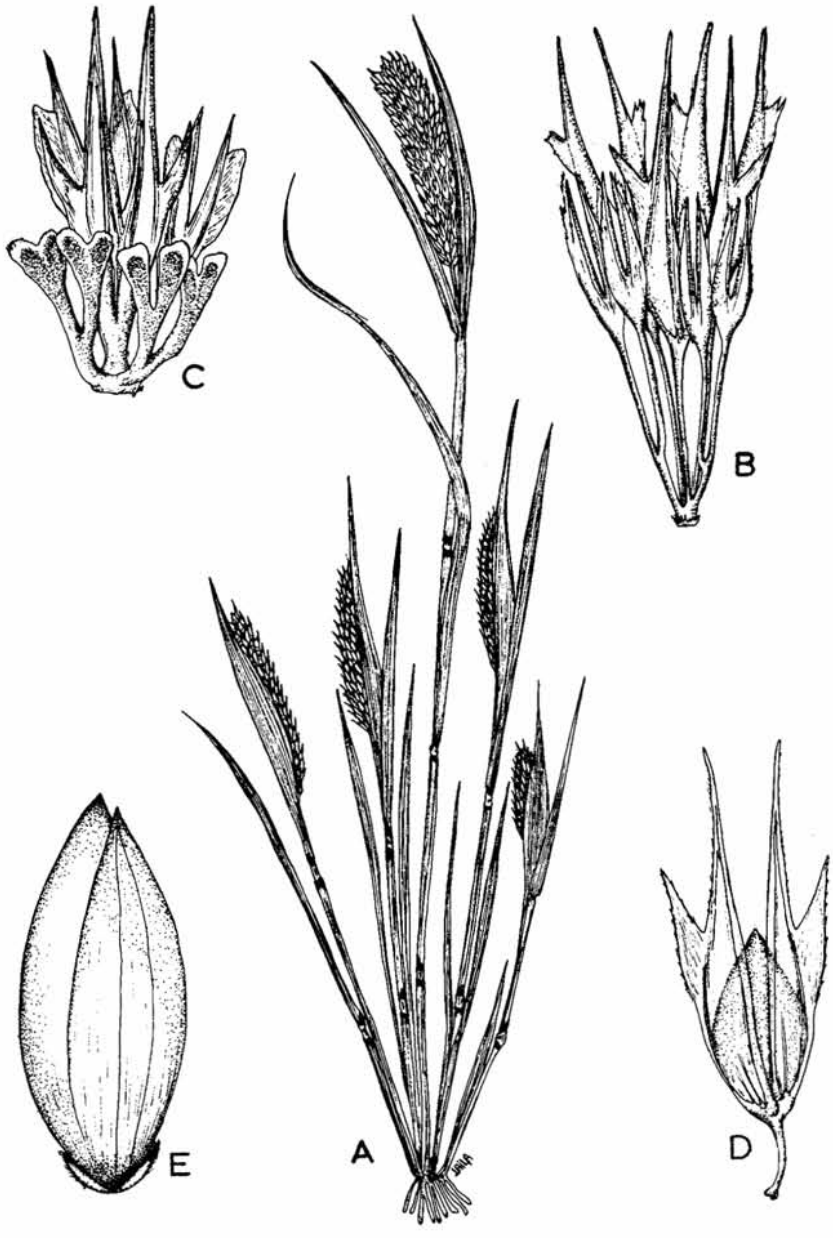


Fig. 58 **Phalaris paradoxa** var. **praemorsa:** A, habit × 0.5; B, group of spikelets from tip of inflorescence × 6.5; C, group of basal spikelet × 5: D, fertile spiekelet × 4.5; E, floret × 25.

Specimens cited below fall under var. *praemorsa* (Lam. et DC.) Coss. et Dur., which is characterized by having some of the sterile spikelets reduced to club-shaped structures. However, the type variety i.e. *paradoxa* (with spikelets all-alike) may occur in Libya but we have no voucher specimens in our herbarium.

Type: Described from the Orient, *Forsskal.*

A-6 Road between Al-Kuwayfiya and Daryana, N.E. Benghazi, 10.3.1968, *L. Boulos* 2010; Benghazi, 3.4.1883, *Ruhmer* 354; **A-7** Um Razm, S.E. Derna, 13.3.1968, *Boulos* 2353; c. 5 Km from Baida, towards Shahat, 26.6.1972, *S.I. Ali* 760.

Distribution: Europe, Mediterranean region, S.E. Asia; introduced elsewhere.

Fl.: March-June

5. **Phalaris minor** Retz., Obs. Bot. 3: 8. 1783; Durand & Barratte, l.c. 253; Pamp., Pl. Trip. 31, 1914; Prod. Fl. Cir. 96. 1931; Maire, l.c. 22; Keith, l.c. 746; Scholz, l.c. 441. (Fig. 59)

Annual, up to 50 - (100) cm tall. Leaf up to 10 cm long, 3 mm broad, linear-lanceolate, acuminate, glabrous. Panicle ovate-oblong, 1-6 cm long, 1-2 cm wide; spikelets solitary; glumes 4.0-6.5 mm long, more or less equal, keel broadened into a conspicuous wing near the tip and denticulate-entire; fertile lemma 2.7-4.0 mm long, 1.2-1.8 mm wide, ovate, pubescent; sterile floret 1, 1.0-1.8 mm long or very short, 2-3 mm long; grain 2.3-2.5 mm long, 1.3-1.5 mm broad. 2n = 28.

Type: Described from India.

A-2 Al Awenia, 11.6.1974, *S.I. Ali* 2052; **A-3** Leptis Magna, 26.4.1967, *Boulos* 1841; Msallata, 14.4.1978, *A. EL-Gadi* 1022; Shaabeyeen, c. 8 Km S. of Gussbat, 25.3.1979, *El-Gadi, Qaiser, Fathi, & Ramadan* 2489-G; **A-7** Shahat, 4.5.1978, *Abohelfaia Ali* 11; Al-Tamimi, S.E. Derna, 13.3.1968, *Boulos* 2276; **B-2** Kleba, 10.4.1975, *Amina Gammudi* 396; *ibid., K. Sifaw* 306; **B-6** Brega, 9.5.1978, *El-Gadi, Jafri & others* 2050-G.

Also reported from Ghat by Scholz (l.c.)

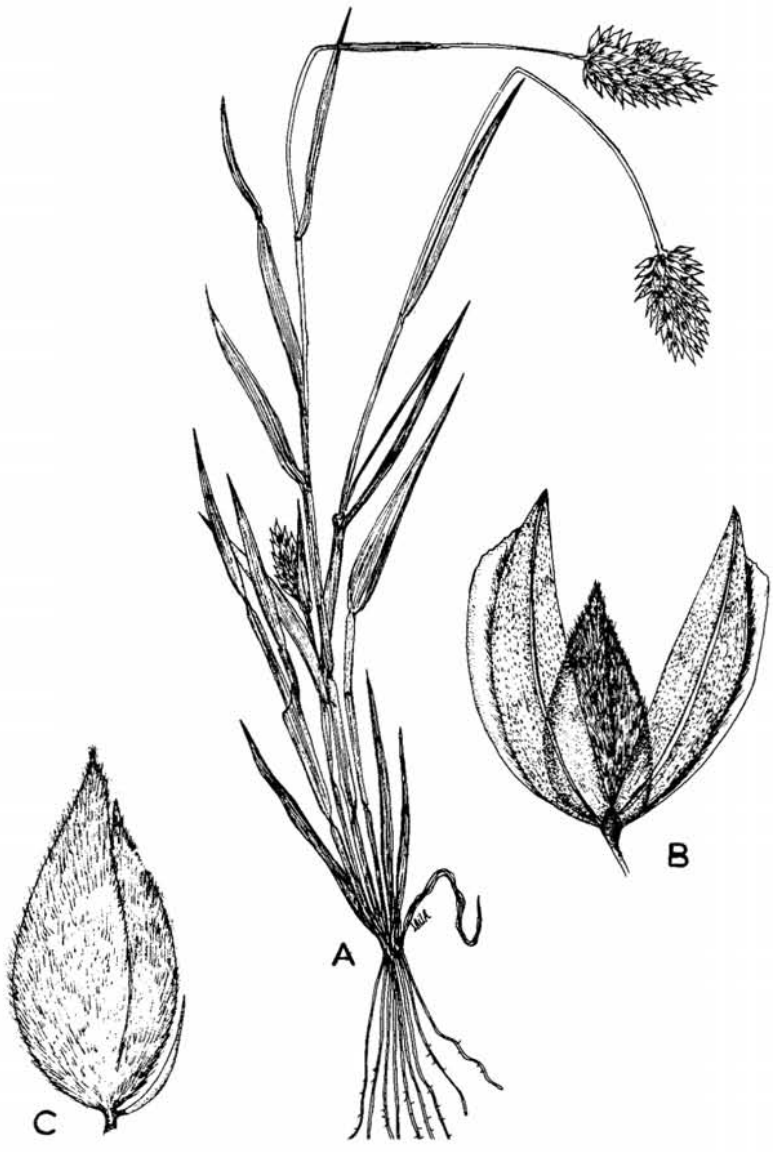


Fig. 59 **Phalaris minor**: A, habit × 0.5; B, spikelet × 9; C, fertile floret with single sterile floret × 10.

Distribution: All over the world

This is a very important forage grass and for this reason it has been introduced into many parts of the world. In Libya it is also cultivated for the same purpose.

Fl.: Mar.-June *Vern.* Zewan.

6. **Phalaris canariensis** L., Sp. Pl. ed. 1: 54. 1753; Maire, l.c. 23; Keith, l.c. 746; Scholz l.c. 441. (Fig. 60)

A tufted annual. Culms 30-100 cm, erect, glabrous. Leaf lanceolate, linear-lanceolate, acuminate, scabrous; terminal leaf sheath swollen in a characteristic way. Panicle ovate to oblong-ovate, 1.5-4.0 cm long, 1.5-2.0 cm wide. Spikelets solitary, broad; glumes 7.0-10 mm long, 2-3 mm wide, pale green with dark green stripes, keel winged, finely puberulent; fertile florets acute, 4.8-6.8 mm long, densely appressed pubescent; sterile florets 2, 2.5-4.5 mm long, sparsely pubescent; grain 3.9-4.2 mm long.

Lectotype: Designated by Anderson in Iowa State J. Sci. 36: 59. 1961, Herb. Linn. 78/1 (LINN).

A-7 Abu Dher, 19.6.1972, *S.I. Ali* 670.

Also reported to be present in the former Tripolitania and Cyrenaica by Keith (l.c.) and Scholz (l.c.).

Distribution: Eastern Mediterranean region, Macronesia.

This is the common canary grass which is cultivated either for ornamental purposes or for the production of canary seed for cage birds. It is also a good fodder.

Fl.: Apr.-July

7. **Phalaris brachystachys** Link in Schrad., Neues Jour.Bot. 1 (3): 134. 1806; Pamp., Pl. Trip. 31. 1914; Prod. Fl. Cir. 98. 1931; Keith, l.c. 746; Scholz, l.c. 441. (Fig. 61)

P. canariensis L. ssp. *brachystachys* (Link) Pospichal, Fl. Oest. Kust., 1: 59. 1897; Maire, l.c. 24.

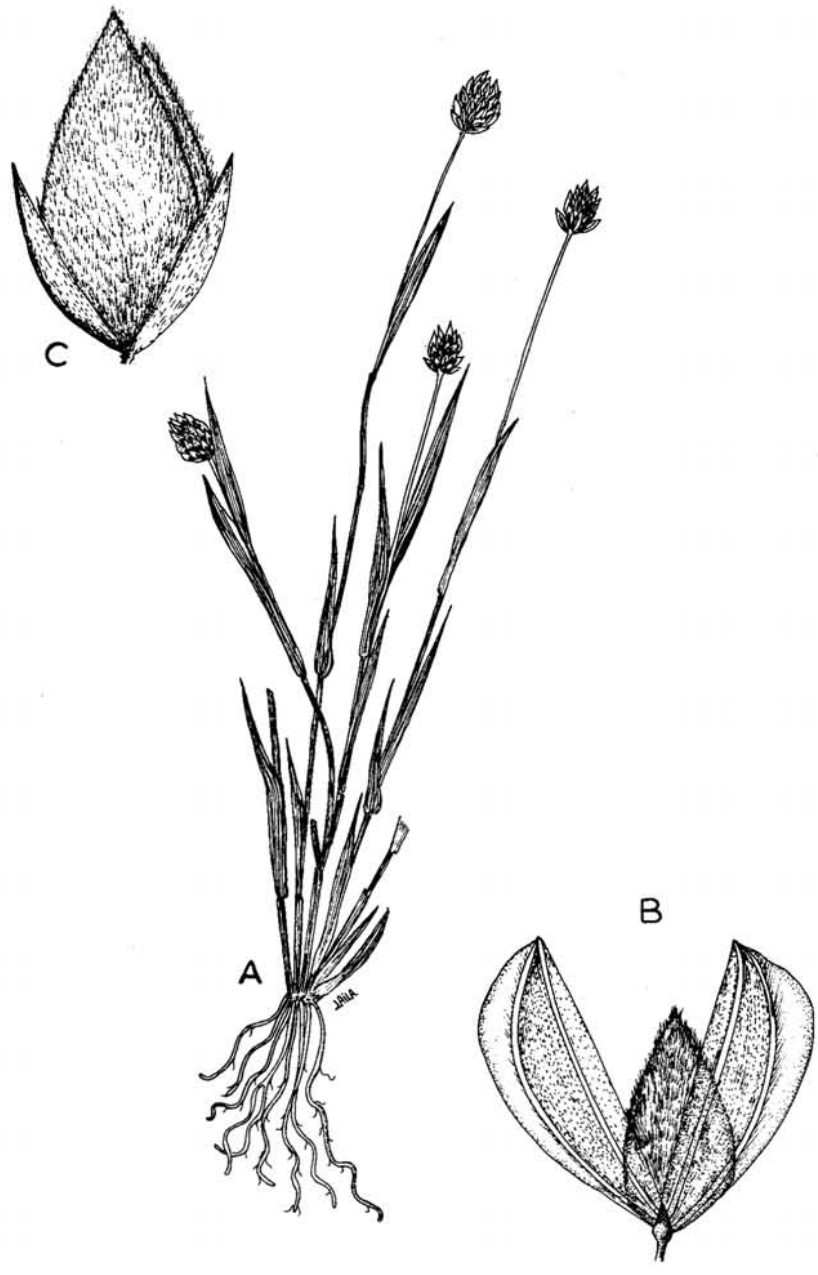


Fig. 60 **Phalaris canariensis**: A, habit × 0.5; B, spikelet × 3; C, fertile floret and two sterile florets × 4.5.

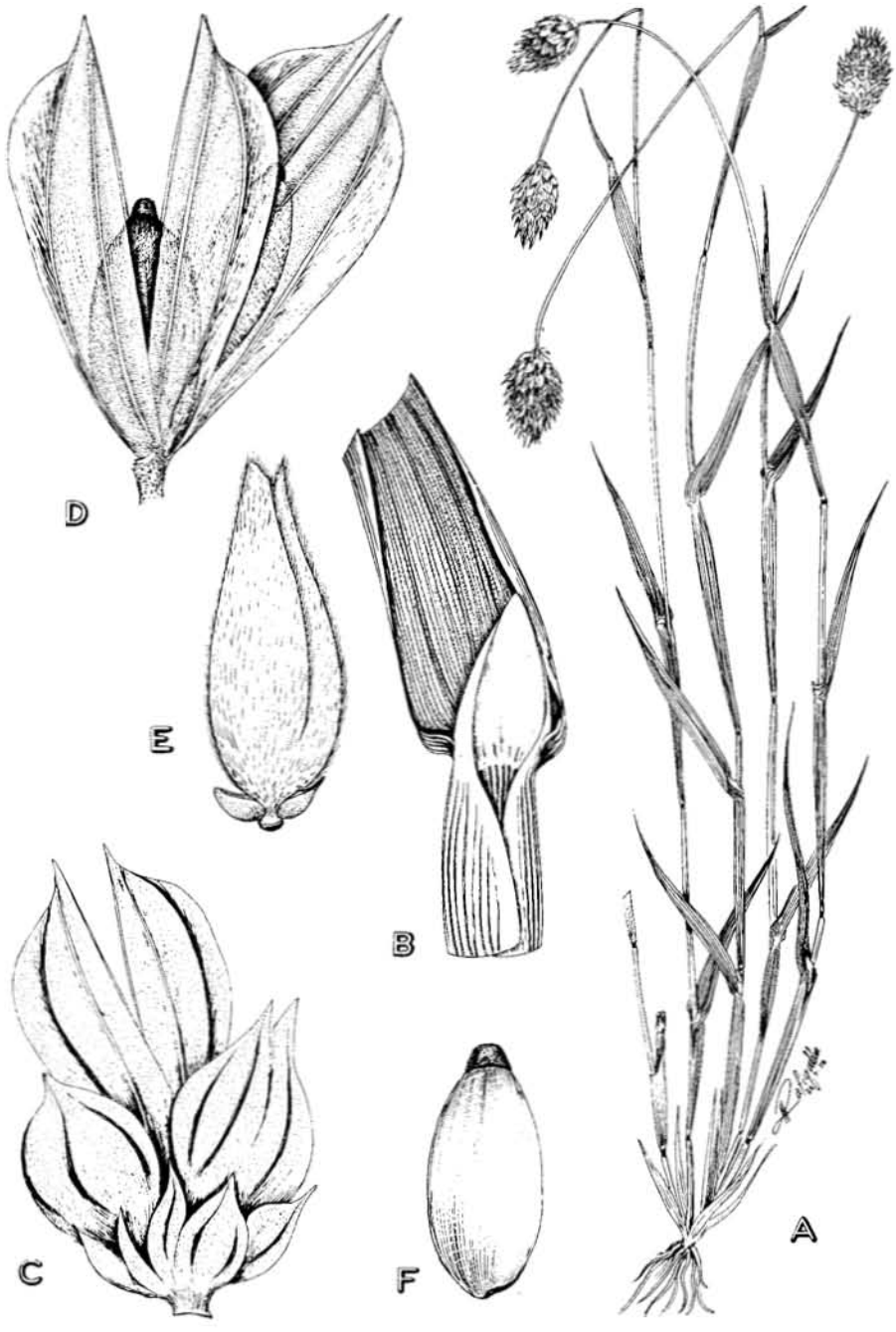


Fig. 61 **Phalaris brachystachys**: A, habit × 0.5; B, portion of lamina, sheath and ligule × 5; C, portion of panicle × 10; D, spikelets × 10; E, fertile floret and two sterile florets × 10; F, caryopsis × 10.

A tufted annual. Culms up to 50 - (90) cm tall, glabrous. Leaf and sheath minutely scabrous, up to 15 cm long, 5 mm broad, linear-lanceolate. Panicle ovoid, 1.5-4.0 cm long, 0.8-1.8 cm wide, with solitary spikelets; glumes 6.3-8.5 mm long, 1.4-2.5 mm wide, with broad wing up to 1.0 mm wide, wing more or less entire but slightly wavy, puberulent or glabrous, abruptly pointed and acute; fertile floret 4.5-5.5 mm long, 1.3-1.8 mm wide, densely hairy, shiny at maturity; sterile florets 2, 0.6-1.2 mm long, swollen and appearing fleshy, glabrous except for a tuft of hair at the base; grain 3.5-3.9 mm long, 1.5-1.7 mm wide. 2n = 12.

Type: Described from Eastern Mediterranean region, Portugal.

A-6 Merj, 17.5.1978 *M. Mashina* 157.

Also reported from the former Tripolitania and Fezzan by Pamp. (l.c.) etc.

Distribution: Mediterranean region, South-East Asia; introduced into other parts of the world.

Fl.: April-July *Vern.* Zewan.

55. **LYGEUM**

Loefl. ex Linn., Gen. Pl. ed. 5: 27. 1754; Boiss., Fl. Or. 5: 451. 1884.

Glabrous perennials with very strong rhizome. Spikelet single, terminal, of 2 florets, large with 1-2 spathe-like structures with many nerves (20-30); glumes absent; lemmas connate at the base in the form of a tube with long silky-villous hairs; paleas longer than lemma and coming out of the lemma tube; lodicules absent; stamens 3, ovary glabrous.

A monotypic genus in the Mediterranean region.

1. **Lygeum spartum** Loefl. ex Linn., Gen. Pl. ed. 5, addendum, pag. ult., post. ind. (p. "522"). 1754; Boiss., Fl. Or. 5: 452. 1884; Durand & Barratte, l.c. 252; Pamp., Pl. Trip. 29. 1914; Prod. Fl. Cir. 95. 1931; Maire, l.c. 12; Keith, l.c. 632; Scholz, l.c. 442. (Fig. 62)

Strong creeping rhizome producing numerous erect glabrous shoots, up to 90 cm tall. Leaves filiform up to 40 cm long, flexous. Inflorescence of usually single spathio-



Fig. 62 **Lygeum spartum**: A, habit × 0.5; B, culms terminating into spathiolate inflorescence × 0.5; C, portion of lamina, sheath and ligule × 5; D, spathiole × 5; E, spikelet × 2; F, base of floret × 3.

late spikelet at the tip of culm, rarely 2 spikelets may be present. Spathiole up to 5 cm long, shortly awned; glumes absent; florets 2; lemma forming a tube at the base, lemma tube highly villous; palea linear, longer than lemma; stamens 3, linear; ovary glabrous, styles long. 2n = 40.

Type: Described from W. Mediterranean (Spain), *Loefling*.

A-2 Near Sabratha, roadside, sandy ground, 4.11.1975, *S.M.H. Jafri* 6210; Jodaim forest, 6.3.1974, *A.H. Ali* 39; 15 km after Kaleba towards Mizda, dry sandy ground, 10.4.1974, *S.I. Ali* 1947; **A-2** Abu Kamash area, 2.2.1980, *A. El-Gadi* 2881-G; **A-3** 12 km West Tripoli, near the sea shore, 24.3.1967, *Boulos, Tawil & Buni* 1597; Gharian, hill slopes, 15.5.1970, *Chaudhri and Khalifa* 15463; barley field in front of Faculty of Science, Sidi El-Masri, Tripoli, 6.3.1974, *G. Faris* 39; **A-3** Sharshara, 20.3.1974, *Gassem H. Faris* 116; **A-4** 10 km W. Sirte, 22.10.1975, *S.M.H. Jafri* 6005; Tawargha, 14.5.1975, *F.A.* 396; **B-2** El-Zentan, 11.4.1974, *A.M. Abdel-Razig* 368; 70 km from Ajdabia, towards Gaminas, 13.3.1978, *Faruqi* 1696; 35 km from Ghamdinas towards Benghazi, 13.3.1978; *Faruqi* 1678; **B-2** Farsetta, 27.1.1977, *H.B. Quresh and M. Ahmed* 1092, 1093; **B-4** 50 km E. of Bughrain, 2.5.1978, *A. EL-Gadi, Jafri & others* 1260.

Distribution: Iberian Peninsula and Mediterranean region.

It is used for stuffing matresses, making rope and can be exploited on large scale for manufacture of bags, sacks as well as mats and cheap carpets. It was also used for adulterating true halfa grass for the manufacture of paper for currency notes in the past.

Fl.: Oct.-May *Vern.* Halfa Masanagh.

56. **ARUNDO**

L., Sp. Pl. 81. 1753; Gen. Pl. ed. 5: 35. 1754.

Tall perennial with hollow culm. Leaf broad and flat, brown, auricled at the base. Inflorescence large with branched panicle. Spikelets laterally compressed, few-flowered, florets mostly bisexual; rachilla articulating above the glumes, glabrous; glumes subequal; lemma bifid with a short awn in the sinus, villous on the dorsal surface; palea shorter than lemma, 2-keeled, ciliate on keels; stamens 3; lodicules 2, glabrous, 3-nerved; caryopsis oblanceolate.

About 12, tropical and warm temperate species; only 1 species is recorded from Libya.

Arundo donax L., Sp. Pl. 81. 1753; Durand & Barratte, Fl. Lib. Prodr. 262. 1910; Pamp., Prod. Fl. Cir. 112. 1931; Maire, Fl. Afr. Nord. 2: 217. 1953; Keith, Prelim. Check List Lib. Fl. 259. 1965; Scholz in Willdenowia, 7: 442. 1974. (Fig. 63)

Donax arundinaceous P. Beauv., Ess. Agrost. 161. 1812; *A. bifaria* Retz., Obs. Bot. 4: 21. 1786; *A. bengalensis* Retz., Obs. Bot. 5: 20. 1799.

Perennial, strongly rhizomaceous. Culms up to 4 m in height. Leaf up to 60 cm long and 3-5 cm broad, 2-ranked, auricled, tip pointed. Panicle up to 70 cm long, plumose, oblong-lanceolate. Spikelets 8-16 mm long, usually 2-flowered, rarely 4-5 florets; rachilla glabrous; glumes glabrous, lanceolate; lemma hairy on the back, lanceolate, 3-nerved; palea very small, 2-keeled, lodicules 2; stamens 3. 2n = 60, 100, 110.

Type: Described from Spain, Galloprovincia, Herb. Linn. 97/3 & 4 (LINN).

A-2 Telil, c. 11 km from Sabratha on way to Zwara, sandy soil, 25.11.1976, *Ghafoor, Alavi & Fathi* 47; **A-7** Farm between Ras El Helal and Derna, 17.10.1977, *M. Ahmad & M.A. Siddiqi* 1495; Ras El Hilal Wadi Glaa near Water fall - Ein Kortabpolis, 24.3.1980 *A. EL-Gadi & M.A. Siddiqi* 3320. **D-3** Wadi as Shati Bir Ghalmayah, 13.2.1978, Ricceri & Steinberg 99.

Also reported from South Cyrenaica and Fezzan by Maire l.c.

Distribution: Mediterranean region, Pakistan, India, Burma.

Introduced into various places in the world.

Fl.: July-Nov. *Vern.* gasba, gassba Ghaneem.

57. **PHRAGMITES**

Adans., Fam. Pl. 2: 34, 559. 1763.

Perennials with creeping rhizome. Culm tall, robust, hollow. Panicle large, bran-

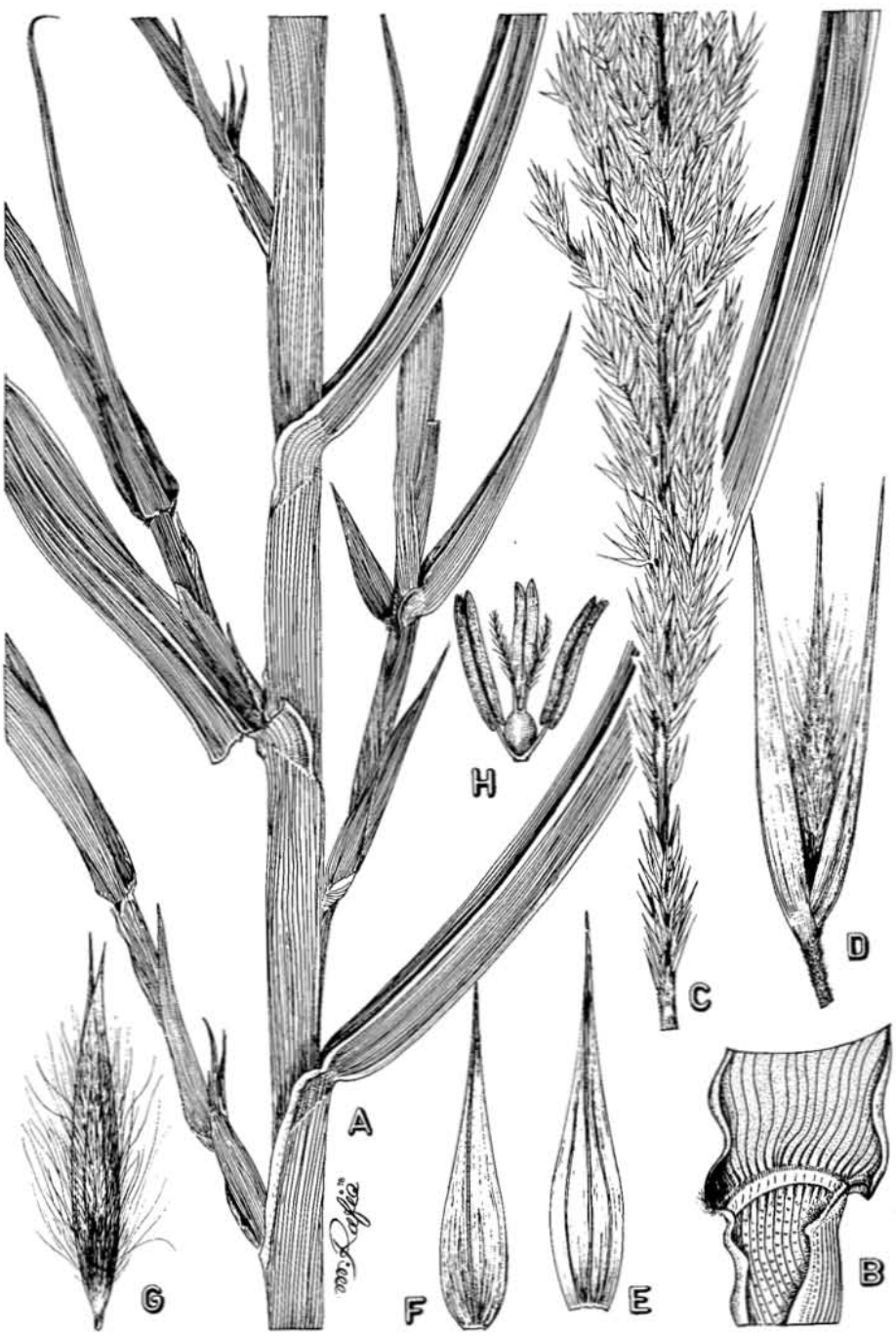


Fig. 63 **Arundo donax**: A, habit × 0.5; B, portion of lamina, sheath and ligule × 3; C, portion of panicle × 0.5; D, spikelet × 5; E, upper glume × 5; F, lower glume × 5; G, floret showing lemma × 5; H, stamens and pistil × 10.

ched, plumose (more lax than in Arundu). Spikelets laterally compressed, 2-10-flowered; rachilla disarticulating above the glumes, villous; glumes, equal or unequal; lower lemma neuter or male, much longer than the glume, the others bisexual, 3-nerved, glabrous; palea much shorter; stamens 3; lodicules 2; caryopsis enclosed by lemma and palea.

3 species, distributed all over the world; only 1 species is recorded from Libya.

Phragmites australis (Cav.) Trin. ex Steud., Nom. Bot. ed. 2, 2: 324. 1841; Scholz, l.c. 442. (Fig. 64)

Arundo phragmites L., Sp. Pl. 81. 1753; *A. vulgaris* Lam., Fl. Fr. 3: 615. 1778; *A. australis* Cav. Anal. Hist. Nat. 1: 100. 1799; *P. communis* Trin., Fund. Agrost. 134. 1820; Pamp., Pl. Trip. 32. 1914; Prod. Fl. Cir. 112. 1931; Corti, Fl. Veg. Fezz. 52. 1942; Maire, l.c. 219; Keith, l.c. 759; *P. vulgaris* (Lam.) Bonnet, Cat. Tun. 470. 1896; Durand & Barratte, Fl. Lib. Prod. 262. 1910.

Tall, stout perennial with strongly creeping rhizome. Culm unbranched, smooth, cylindrical, glabrous. Leaf flat, 20-60 cm long, tip long and narrow. Panicle ovate-lanceolate, somewhat one sided; glumes quite unequal; lower lemma much longer than the glume, long-acuminate, glabrous; rachilla highly villous. 2n = 36, 48, 96.

Type: Described from Madrid (Spain).

A-3 Leptis Magna, stream bed, 9.1.1970, *I.I. Chaudhri;* Bughailan, N. Gharian, 1.12.1967, *Boulos* 1843; **A-7** Wadi Derna, 201.1967, *Boulos* 1290; **C-8** Jaghbub, near water, 10.12.1982, *M.A. Siddiqi* 504; **D-3** 5 km from Brak towards Idri, 16.2.1977, *M.Ahmad, Latiaf & Siddiqi* 1120; Brak, 7.3.1978, *Faruqi* 1600. **E-8** Kufra, 27.1.1979, *A. El-Gadi & others* 2313 & 2317; *id.* 7.11.1968, *L. Boulos* 3221, 3307 & 3350.

Also reported from Ghat and Tibesti by Corti (l.c.) etc.

Distribution: Widespread in temperate regions of the world and extending into the tropics.

The plant grows in ponds, streams, river beds in fresh or brackish water. The young leaves can be used as fodder. The older ones are used for making mats, baskets and can be utilized successfully in making 'reed boards', wall lining and partitions. In ancient

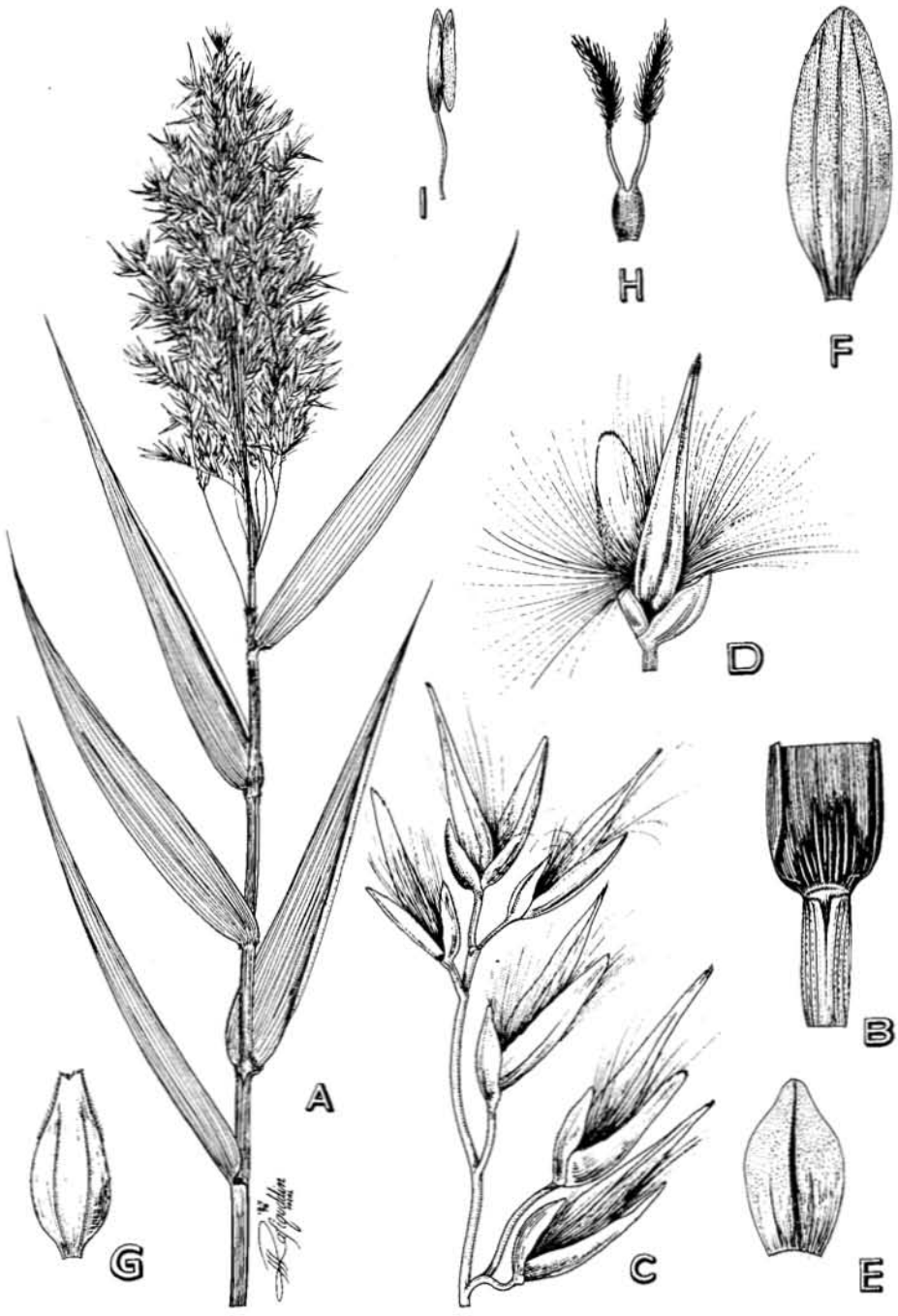


Fig. 64 **Phragmites australis**: A, habit × 0.5; B, portion of lamina, sheath and ligule × 2; C, portion of panicle × 4; D, spikelet × 5; E, lower glume × 8; F, upper glume × 8; G, lemma × 8; H, pistil × 8; I, stamen × 5.

Egypt, pens, arrows and similar other objects were made from the culms, sleeping mats from leaves and a popular diaphoretic and diuretic medicine from the rhizomes. The chinese use its tender buds as salad.

A fungus *Schirrhia rimosa* which infects the leaves, causes cattle poisoning. In Central Asia dried and crushed rhizomes are used in making bread. Also the plant is used as fence, thatching, light screens and stores for fish preservation. It is also reported to be suitable as a raw material for making paper and light bricks (vide Bor, Fl. Iraq, 9: 375. 1968).

Fl.: June-March *Vern.* gaspa.

58. ASTHENATHERUM

Nevski, in Acta Univ. As. Med. Ser. 8b, Bot. fasc. 17: 8. 1934.

Perennials, erect, tufted, glaucous. Roots fibrous. panicle spike-like, covered at the base with the uppermost leaf sheath. Spikelets 2-3-flowered, hermaphrodite; glumes subequal, enclosing all the florets; lemma many-nerved, bifid at the apex into two acuminate lobes, awned in the sinus, pilose; palea 2-keeled, truncate; stamens 3; lodicules 2, fleshy; caryopsis oblong-oblanceolate.

3 species of Central Asia, 2 of which are reported from Libya.

+ Panicle 10-20 cm long; glume glabrous to scabrous; awn 2.5-3 mm long — **2. A. fragile**
– Panicle 4-5 (-7) cm long; glume shortly pubescent; awn 4-4.5 mm long — **1. A. forskalii**

1. **Asthenatherum forskalii** (Vahl.) Nevski in Act. Univ. As. Med. Ser. 8b, Bot. fasc. 17: 8. 1934; Scholz in Willdenowia 7: 442. 1974. (Fig. 65)

Avena forskalii Vahl., Symb. Bot. 2: 25. 1791; *Danthonia forskalii* (Vahl.) R. Br. in Denh. & Clapp., Narr. Trav. North & Centr. Afr. App. 244. 1826; Maire, Fl. Afr. Nord. 2: 361. 1953; Kkeith, l.c. 426; *D. forsskalii* Trin., Sp. Gram. 1. tab. 49. 1828; Durand & Barratte, Fl. Lib. Prodr. 259. 1910; Pamp., Pl. Trip. 21. 1914; Prod. Fl. Cir. 110. 1931; Corti, Fl. Veg. Fezz. 50. 1942.

Perennial, tufted, erect to decumbent 10-30 cm tall. Culms wooly. Roots fibrous, branches thick. Leaf hairy, glaucous, sharp-pointed, sheath covered with silky hair.

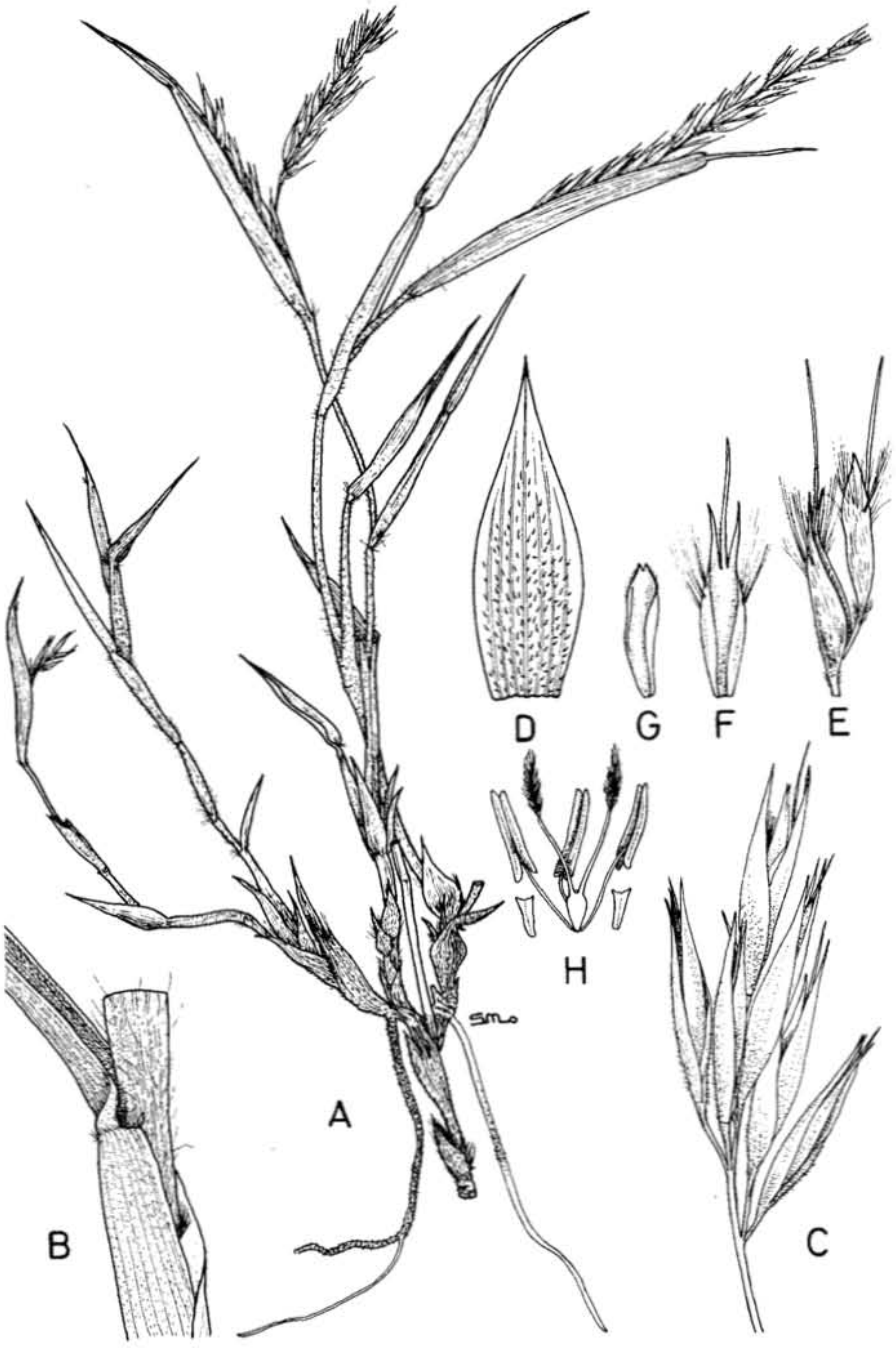


Fig. 65 **Asthenatherum forskalii**: A, habit × 1; B, portion of lamina, culm, ligule and sheath × 4; C, portion of panicle with spikelets × 4; D, lower glume × 6; E, florets × 6; F, lemma × 6; G, palea × 6: H, stamens and pistil × 10.

Panicle dense, 4-5 (-7) cm long, narrow, lower part enclosed by spathe-like leaf-sheath. Spikelets 2-3-flowered; glumes subequal; lemmas with tufts of hairs between the nerves; awned, awn 4-4.5 mm long, anthers 0.5-1.2 mm long. 2n = 24.

Type: Described from Egypt.

B-4 120 km from Bughrain, along the road to Hun, 2.4.1973, *S.I. Ali* 1579; 15 km from Bu Njem, 27.3.1975, *S.I. Ali* 2414; **C-6** Sirtica, Maatan Risam a Gasr es Sahabi, 18.4.1928, *Krueger s.n.* (FI).

Also reported from other parts of Libya by Durand & Barratte (l.c.).

Distribution: North & Tropical Africa, Arabia, Palestine, Iraq, Iran, Afghanistan, Central Asia.

Fl.: April *Vern.* Sharai, tagamait.

2. **Asthenatherum fragile** (Guinet. et Souvage) Monod, in Bull. Inst. Franc. Afr. Noire, 14: 421. 1952; Scholz in Willdenowia, 6: 355. 1971; l.c. 7: 442. 1974.

Danthonia fragile Guinet. et Souvage, in Compt. Rend. Seanc. Mens. Soc. Sci. Nat. Maroc. 17: 73. 1951; Guinet. et Faurel in Maire, Fl. Afr. Nord. 2: 363. 1953.

Perennial, up to 1 m tall. Culm branched, upper nodes fragile, glabrous. Leaf blade flat, lanceolate, leaf sheath often inflated, loose and glabrous, usually much larger than the blade. Panicle usually subtended by a prominent leaf sheath, 10-20 cm long, dense and narrow. Spikelets 2-3-flowered; glumes subequal 8-9 mm long, acuminate, glabrous to scabrous; lemma awned, much smaller than the glume, awn 2.5-3 mm long, anthers 1.5-2.5 mm long.

Type: Described from Sahara Central.

Reported from Tripolitania by Scholz (l.c.).

Distribution: Libya, Algeria, Chad, and Egypt.

59. SCHISMUS

P. Beauv., Ess. Agrost. 73, t. 15. fig. 4. 1812.

Tufted annual. Leaf filiform; ligule a rim of hairs. Inflorescence a contracted panicle with short pedicels. Spikelets laterally compressed, 5-10 florets, bisexual or the uppermost reduced; glumes subequal, strongly-nerved, much longer than the lowest lemma, hyaline at tip and margins; lemma bifid, 9-nerved, awnless or shortly awned; palea equal or subequal to lemma, 2-keeled; stamens 3; lodicules 2, truncate, fleshy; caryopsis elliptic.

5 species distributed in Africa and from S. Europe to N.W. India; 2 species are recorded from Libya.

+ Lobes of the lowest lemma acuminate; fissures 1/3-1/2 the length of lemma; tip of the palea reaching the base of the fissure or a little longer	2. **S. arabicus**
— Lobes of the lowest lemma obtuse or acute; fissure a notch, 1/6-1/4 the length of lemma; tip of the palea exceeding the base of the fissure, often as long as lemma	1. **S. barbatus**

1. **Schismus barbatus** (L.) Thell. in Bull. Herb. Boiss. Ser. 2,7: 391. 1907; Maire, l.c. 367; Keith, l.c. 869; Scholz in Willdenowia, 7: 442. 1974.

Festuca barbata L., Amoen. Acad. 3: 400. 1756; *F. calycina* Loefl., Inter Hisp. 166. 1758; *F. calycina* L. Sp. Pl. ed. 2: 110. 1762; *S. calycinus* (Loefl.) C. Koch in Linnaea, 21: 397. 1848; Durand & Barratte, l.c. 266; Pamp., Pl. Trip. 34. 1914; Prod. Fl. Cir. 118. 1931; Corti, l.c. 57.

Annual, highly tufted, delicate and geniculately ascending. Culm very slender, slightly bent on nodes, 10-25 cm high, glabrous. Leaves filiform, pubescent with long hairs, up to 5 cm long and 0.5-1.0 mm broad; ligule ciliate, glumes equal-subequal, acute, lemmas 2-3 mm long, bifid fissure 1/6-1/4 the length of lemma, margins hairy at the base, palea exceeding the base of the fissure. 2n = 12.

Type: Described from Spain, *Loefling*.

A-2 Road bifurcation to Yafran and Nalut, 27.3.1976, *Faruqi* 540; 2 km from Bir el Ghanam, towards Nalut, 16.6.1977, *Faruqi* 1406; **A-3** Zanzur beach, 24.3.1976, *Faruqi*

523; 56 km from Tripoli, towards Bu-Ghelan, 20.5.1976, *Faruqi* 715, 716, 717, 718, 719 and 720; Bu Ghelan hills near Gharian, 21.5.1976, *Faruqi* 724; Suk ul Khamis, 23.3.1977, *Faruqi* 1285; Valley, 44 km from Tripoli on way to Khoms, 5.4.1977, *Faruqi* 1334; Wadi Kam Bridge on main highway, 7.4.1977, *Faruqi* 1350; **B-1** 20 km from Nalut on way to Ghadamas, 26.1.1977, *H.B. Quraish, M.A. Siddiqi & M. Ahmad* 1075, 1076, 1077, 1078, 1079 and 1080; 2 km from Nalut, on way to Ghadamas, *Faruqi* 1417; **B-2** Kabao, 27.1.1977, *H.B. Quraish, M.A. Siddiqi & M.* Ahmad 1081; Farsetta, 27.1.1977, *H.B. Quraish, M.A. Siddiqi & M. Ahmad* 1086, 1087, 1088, 1089, 1090 and 1091; **B-3** 46 km from Gharian, towards Mizda, *M.A. Siddiqi & M. Ahmad* 1101; **B-4** 55 km before Sirt towards Tripoli, 1.8.1977, *Faruqi & K. Maghboob* 1052; Tawargha, 6.4.1977, *Faruqi* 1343; 15 km from Bughrain on way to Hun, 4.3.1978, *Faruqi* 1554; **B-5** 55 km from Ras Lanuf towards Benghazi, 25.5.1977, *Faruqi* 1401-a; **B-6** 15 km to Ajdabia, coming from Benghazi, 27.5.1977, *Faruqi* 1400.

Distribution: From Mediterranean region to N. and E. of India. Introduced into other parts of the world.

1. **Schismus arabicus** Nees, Fl. Afr. Austr. 1: 422. 1841; Scholz, l.c. 442. (Fig. 66)

   S. spectabilis Figari & De Not. in Mem. Accad. Sci. Torino 12: 255. 1852; *S. calycinus* C. Koch var. *arabicus* (Nees) O. Kuntze in Acta Horti. Petrop. 10: 254. 1887; *S. calycinus* var. *arabicus* (Nees) Bown. et Barr., Cat. Tun. 475. 1896; Durand & Barratte, l.c. 267; Pamp., Prod. Fl. Cir. 118. 1931; Keith, l.c. 870; *S. arabicus* Nees var. *violaceus* Muschler in Verh. Bot. Ver. Brandenb. 49. 75. 1908; *S. barbatus* (L.) Thell. ssp. *arabicus* (Nees) Maire & Weiller in Bull. Soc. Hist. Nat. Afr. Nord. 30. 310. 1939; Maire, Fl. Afr. Nord. 2: 269. 1953.

This species is difficult to be distinguished from the previous one because of overlapping of characters. However, it is separated on the basis of its acuminate lemma, 1/3-1/2 long lemma fissure and the palea shorter than lemma. These differences are pronounced in the lemma of the lower most floret of the spikelets. 2n = 12.

Type: Described from valley Hamma Arabiae petreae, *Schimper* 391(B).

A-6 2 km from Benina towards El Rajma project, 22.5.1977, *Faruqi* 1354, 1355 and

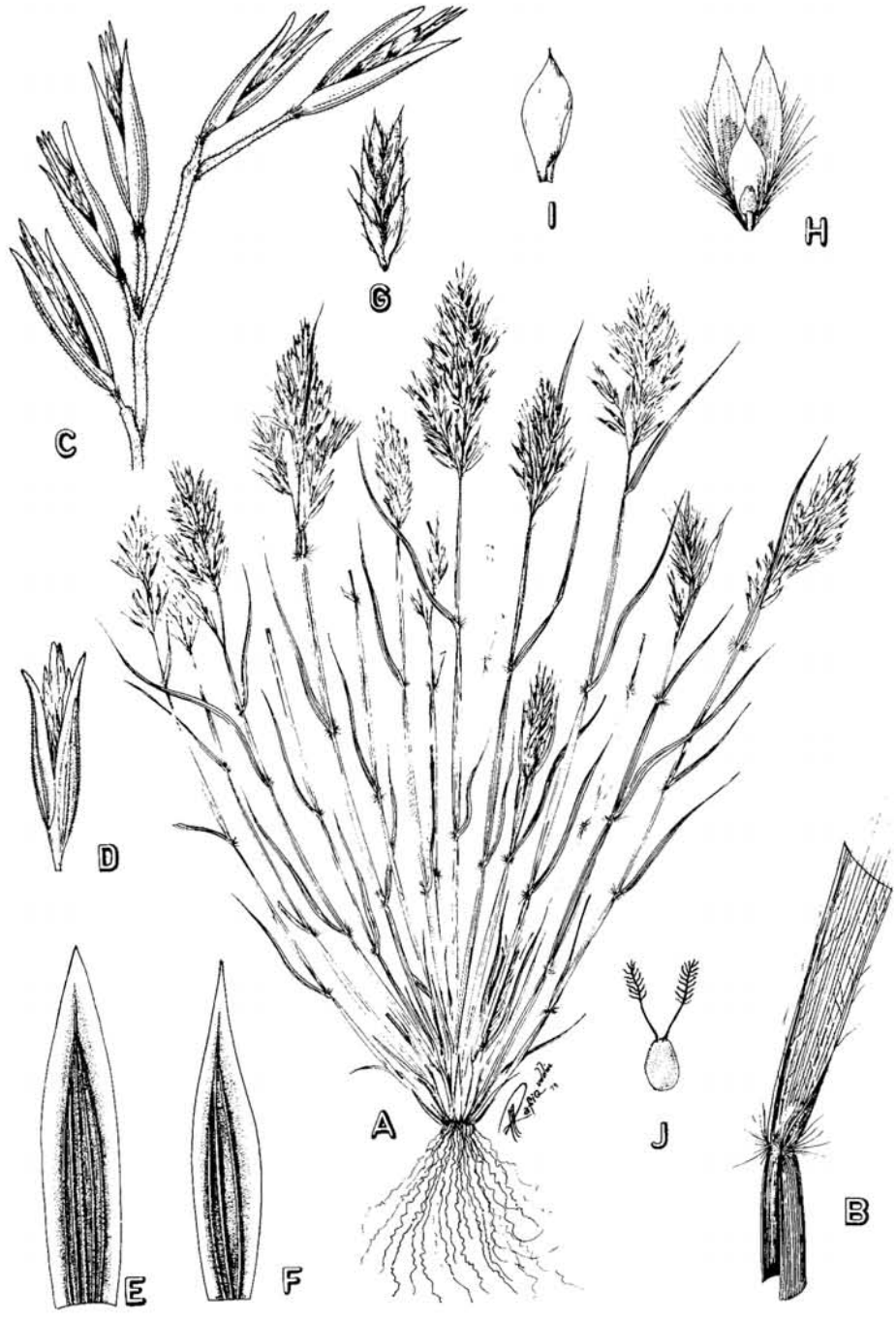


Fig. 66 **Schismus arabicus**: A, habit × 1; B, portion of lamina, ligule and sheath × 5; C, portion of panicle × 5; D, spikelet × 5; E, lower glume × 10; F, upper glume × 10; G, florets × 5; H, lemma with palea × 10; I, palea × 10; J, pistil × 10.

1360-d; Garyunus, 13.3.1978, *Faruqi* 1669; **A-7** 59 km from Martuba on way to Faidiya, 25.5.1977, *Faruqi* 1392-ae; 65 km from Martuba on way to Faidiya, 25.5.1977, *Faruqi* 1392-al; 2 km after Martuba on way to Faidiya, 25.5.1977, *Faruqi* 1392-x; **B-3** 46 km from Gharian, towards Mizda, 12.2.1977, *M. Ahmad, Lataif & Siddiqi* 1103.

Distribution: Mediterranean region, S.W. & Central Asia, Kashmir. Introduced into other parts of the world.

Schismus arabicus does well in a colder climate and it is present in places close to Jabal Akhdar and to a much lesser degree in Jabal Al Gharbi. *S. barbatus*, however, extends to warmer regions of the coastal plain and it also extends into Jabal Al Gharbi. It seems that it does not extend beyond Ajdabia towards east. Plants intermediate in characters were found in Ajdabia as well as Nalut and Farsetta areas. These are the areas where the two species meet. Since the hybrids back cross with *S. barbatus* and show a continuous variation, the hybrids are included with *S. barbatus*.

Fl.: Feb.-May

60. **STIPA**

L., Sp. Pl. 78. 1753; Gen. Pl. ed. 5: 34. 1754.

Perennial, rarely annual. Leaf convolute or flat. Inflorescence a panicle of pedicelled or sessile spikelets. Spikelets 1-flowered, bisexual; glumes hyaline, 1-3-nerved; lemma firm, convolute, acute or acuminate, finely lobed or not at the tip, awned at the tip or between the lobes; awn usually with a twisted column and a bristle, glabrous or hairy; palea hyaline, 2-nerved; stamens 3; anthers often hairy at the tips; caryopsis enclosed by palea and lemma; hilum linear.

About 300 tropical and temperate species, mostly of arid lands; 6 species are recorded from Libya.

1. + Annual; panicle dense with silvery spikelets; awns eventually twisted into a tail — 3. **S. capensis**
   — Perennial; panicle loose (if dense, then not with silvery spikelets); awns not twisted into a tail — 2

2. + Awn conspicuously hairy all over — 4. **S. barbata**

	– Awn scabrous-glabrous (if hairy, then only on the lower half)	3
3.	+ Upper glume 7-10 mm long; awn weakly kneed or curved	5. **S. parviflora**
	– Upper glume longer; awn strongly kneed or curved	4
4.	+ Awn densely hairy on the lower half, awns of basal florets not exceeding 1/2 of the inflorescence	5
	– Awn not hairy on the lower half, awns of basal florets exceeding 1/2 of the inflorescence	6. **S. legascae**
5.	+ Inflorescence with sessile spikelets; glumes 13-17 mm long	1. **S. nitens**
	– Inflorescence with pedicellate spikelets; glumes 25-30 mm long	2. **S. tenacissima**

1. **Stipa nitens** Ball, Journ. Bot. 206: 1875; et Spicil. Maroc, 712.1878; Maire, l.c. 2: 73; Keith, l.c. 939.

Perennial with dense clumps; culms erect, scabrous, up to 40 cm tall. Leaves usually shorter than 15 cm, sometimes as long as 30 cm, narrow, rolled and pointed. Panicle loose, up to 15 cm long, axis scabrous-pubescent, nodes barbed. Spikelets sessile, glumes membranous, 3-nerved, unequal, 13-17 mm long, slightly scabrous on the keels; lemma 5-6-nerved, convolute, c. 5 mm long, callus with long hairs, awned, awns 6-10 cm long, base of the awn plumose; palea linear, truncate, glabrous, membranous; lodicules 2; anthers 3, hairy at the tip.

Type: Described from the Atlas Mts.

Reported from Libya by Keith (l.c.)

Distribution: Probably endemic to the mountains of N. Africa.

2. **Stipa tenacissima** L., Cent. Pl. 1: 6. 1755; Amoen. Acad. 4: 266. 1759; Durand & Barratte, l.c. 257; Pamp., Pl. Trip. 38. 1914; Maire, l.c. 63; Keith, l.c. 939; Scholz, l.c. 442. (Fig. 67)

Perennial with strong rhizome, forming dense tufts, up to 1 m or more tall. Culm glabrous. Leaf convolute, tough, tip spiny, glabrous, old one fibrous, up to 60 cm long, ligule densely hairy. Inflorescence a large panicle, sometimes as long as 40 cm, usually smaller, contracted and without silvery spikelets, ovate or linear. Spikelets on scabrous pedicels; glumes subequal, linear-lanceolate, acuminate, 2.5-3 cm long; lemma subequal to palea, pubescent, 8 mm long bifid at the tip with a strong awn from its sinus, awn strongly kneed or curved and densely hairy on the lower half; palea pubescent, bifid; rachilla pointed, 2 mm long, villous; stamens 3, 1 cm long, anther lobes sparsely hairy at the tip; lodicules 2, glabrous. 2n = 72.

Type: Described from Spain, *Loefling*

A-2 c. 6 km from Yafran towards Gharian, *S.I. Ali* 1886; **A-3** Gasbat, 7.2.1977, *Faruqi* 1296; *Gharian, 29.4.1981, Zenab Abou Raya* 371; En Naggasa, 1.5.1974, *G. Faris* 589; **B-2** Gwalish, 21.5.1976, *Faruqi* 772, 773 and 774; 14 km after Kleba towards Mizda, 10.4.1974, *S.I. Ali* 1946; 17 km from Jadu to Yefren, 18.3.1970, *Davis* 49705; **B-1** Wadi Malah, c. 10 km from Nalut, 4.5.1972, *S.I. Ali & M.M. Khalifa* 296.

Distribution: Iberian Peninsula, N. Africa, and Baleares.

Fl.: Apr.-June *Vern.* Halfa

Mats and several other articles of daily use are made from the leaves of halfa. Although the plant is not highly palatable to livestock, sometimes young growth is collected for feeding livestock.

3. **Stipa capensis** Thunb., Prodr. Fl. Cap. 19. 1794; Scholz, l.c. 442. (Fig. 68)

S. retorta Cav., Osb., S. el R. de Valencia, 1: 119. 1795; 2: 325. 1797; Maire, l.c. 2: 68; Keith, l.c. 939; *S. tortilis* Desf., Fl. Atlant. 1: 99. t. 31. f. 1. 1798; Durand & Barratte, l.c. 256; Pamp., Pl. Trip. 38. 1914; Prod. Fl. Cir. 99. 1931.

Annual, branching from the base, up to 50 cm tall, or less. Leaf convolute, fi-

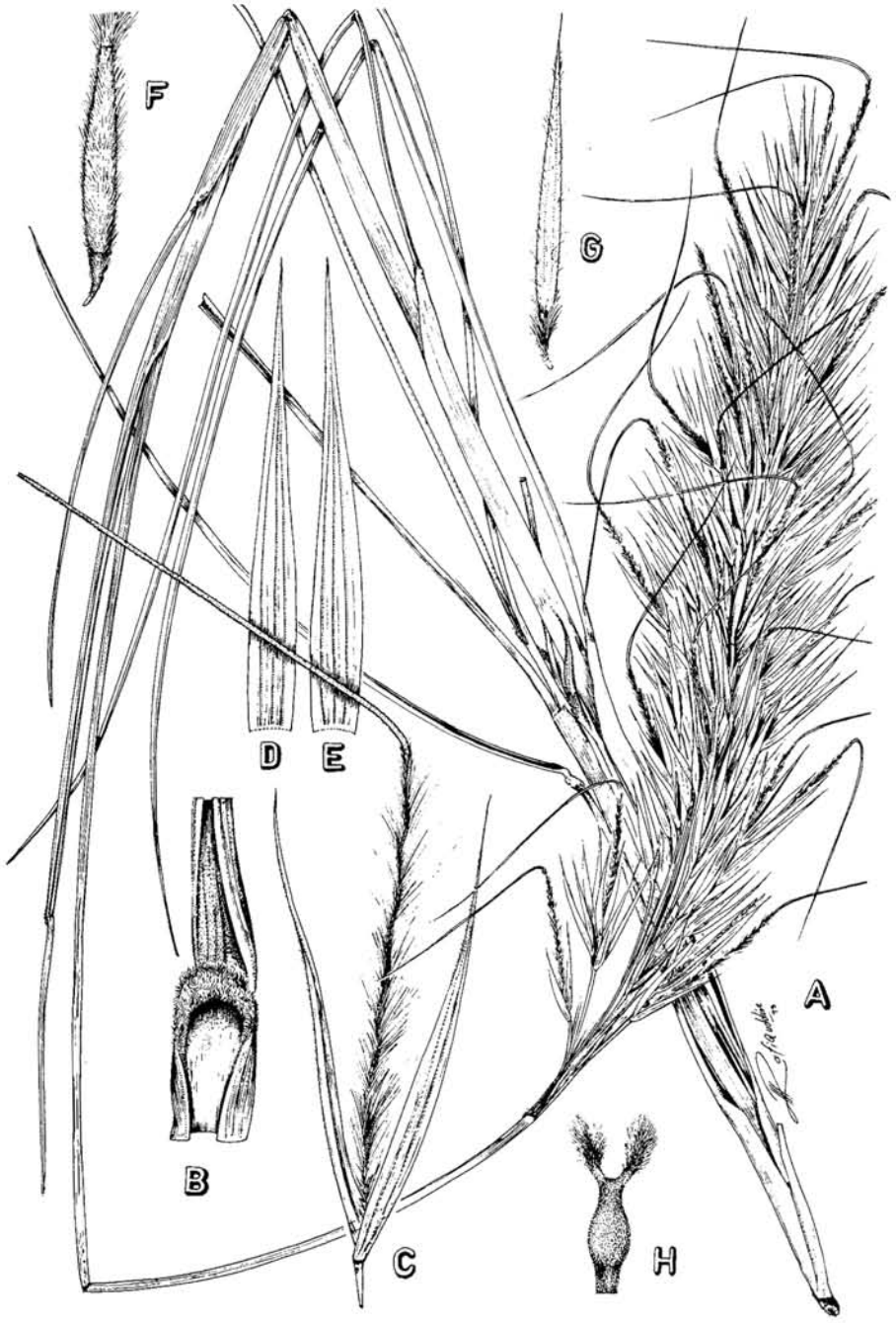


Fig. 67 **Stipa tenacissima**: A, habit × 0.5; B, portion of lamina, ligule and sheath × 3; C, spikelet × 2; D & F, upper and lower glumes × 2; caryopsis with the callus × 3; G, lemma; H, pistil × 5.

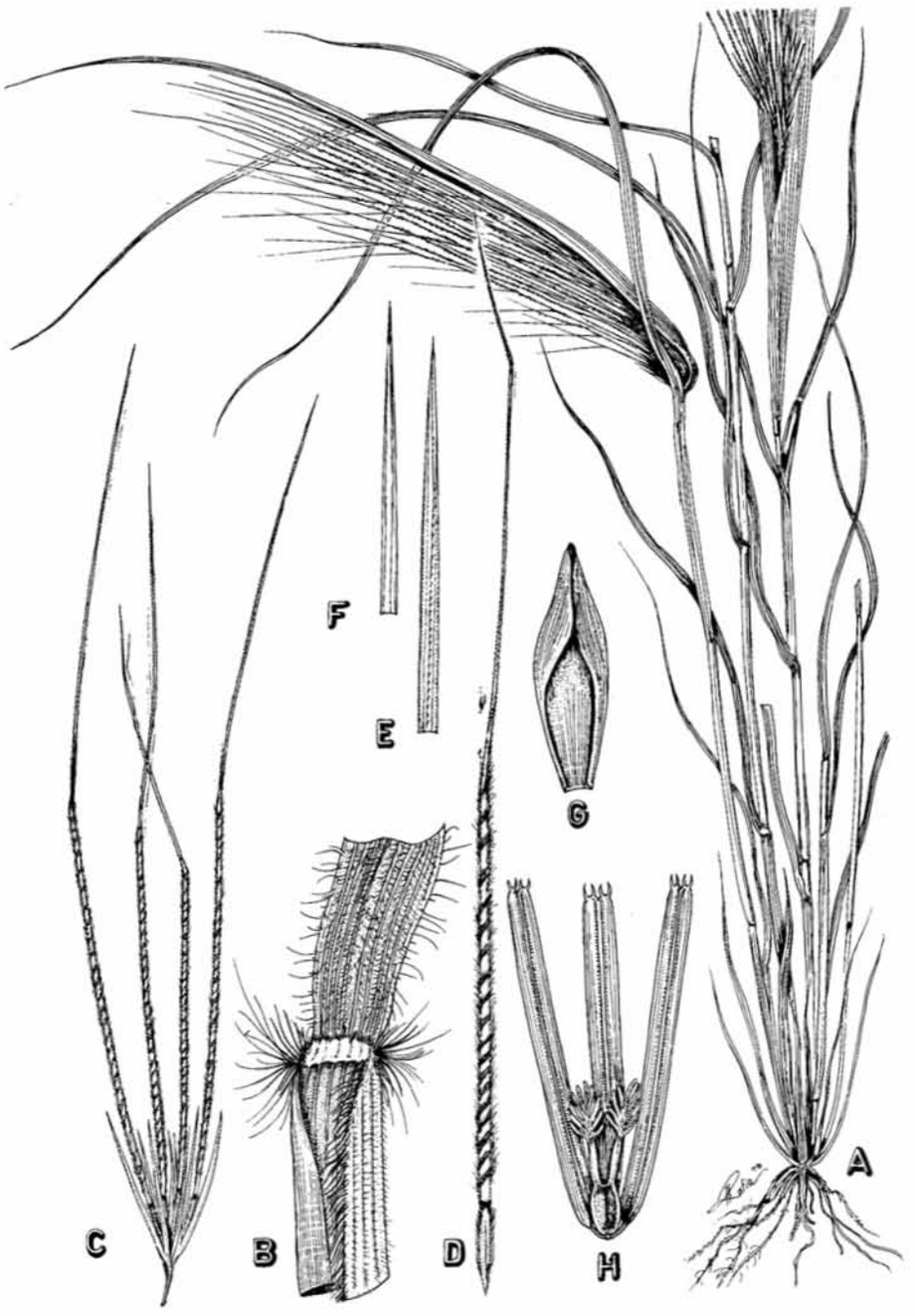


Fig. 68 **Stipa capensis**: A, habit × 0.5; B, portion of lamina, ligule and sheath × 10; C, group of spikelets × 1; D, caryopsis with awn × 1.5; E and F, lower and upper glumes × 2.5; G, palea × 20; H, stamens and pistil × 20.

liform; sheath loose, enclosing the base of the inflorescence. Inflorescence a panicle with its awns twisted to form a tail, dense, very variable in size. Spikelets silvery; glumes unequal, hyaline, the lower longer, up to 2.5 cm long, tapering into a fine point; lemma slightly hairy, 4-5 mm long, awned; awns 8-10 cm long, base twisted and hairy; palea much smaller than lemma; stamens 3, filiform, tip with few hairs. 2n = 34.

Type: Promontorium Bonae Spei Africae, *Thunberg* (UPS).

A-2 Tagma, near Yafran, 9.4.1974, *S.I. Ali* 1862; **A-3** Tripoli, Hadba Khadra, 7.5.1976, *Faruqi* 654; c. 20 km on Old Airport Road, 7.5.1976, *Faruqi* 688; **A-6** Benina Road, 10 km from Benghazi, 22.5.1977, *Faruqi* 1351; **A-7** Tokra, 3.3.1973, *S.I. Ali & Faruqi* 1288; **B-8** 109 km from Tobruk on way to Jaghbub, 19.8.1978, *Ramadan, Fathi & Siddiqi* 585-z; 33 km from Baida on way to Derna, 25.5.1977, *Faruqi* 1392-ak; Wadi Kuf, 8.5.1978, *Faruqi* 1843; **B-1** 2 km from Nalut on way to Ghadamas, 16.6.1977, *Faruqi* 1420; 10 km from Nalut on way to Ghadamas, 16.6.1977, *Faruqi* 1422; **B-2** 65 km from Mizda towards Al Ghariat, 13.2.1977, *M. Ahmad, Lataif & Siddiqi* 1104 and 1105; Zentan, 21.5.1976, *Faruqi* 804; **B-3** 99 km from Mizda towards Al Ghariat, 13.2.1977, *M. Ahmad, Lataif & Siddiqi* 1108; **B-4** 25 km from BuNjem on way to Hun, 4.3.1978, *Faruqi* 1555; **B-6** 35 km from Gaminis, towards Benghazi, 13.3.1978, *Faruqi* 1674; **C-4** 33 km from Hun, towards BuNjem, 8.3.1978, *Faruqi* 1620.

Distribution: Mediterranean region, North and South Africa, Palestine, Arabia, Iraq, Iran, Afghanistan, Pakistan, India.

This grass is very abundant in dry sandy and stony places, more especially in highly overgrazed areas. Its abundance makes it an important forage grass at early stages of its growth and as dry pasture after its piercing awned caryopsis are blown away.

Fl.: Feb.-June *Vern.* Behma.

4. **Stipa barbata** Desf., Fl. Atlant. 1: 97. tab. 27. 1798; Pamp., Pl. Trip. 37. 1914; Prod. Fl. Cir. 101. 1931; Maire, l.c. 72; Keith, l.c. 938; Scholz, l.c. 443. (Fig. 69)

Perennial, erect, 50-60 cm tall, glabrous, smooth. Leaf glabrous, conduplicate, filiform, flexuous with a pointed tip. Inflorescence a loose and narrow panicle, enclosed at the base by leaf sheath. Glumes unequal, drawn into a very long point, up to 4 cm



Fig. 69 **Stipa barbata:** A, habit × 0.5; A_1, portion of lamina, ligule and sheath × 5; B, glumes × 2.5; B_1, lower glume × 3; C, spikelet × 1.

long; the upper half of the glume hyaline, soft, flexous; lemma 10 mm long, hairy on the lower half, tip swollen, awned; awn loosely twisted towards the base, plumose all over, hairs shorter below the knee; palea subequal, glabrous, somewhat pointed; lodicules 2; linear-lanceolate; anthers 3, with short hairs at the tip.

Type: Habitat in collibus incultis circa Mascar et Tlemsen, *Desfontaines,* P.

A-2 Al Awenia, 11.4.1974, *S.I. Ali* 2009; *ibid, M. Godeh* 213; **B-2** Jinawan, 21.5.1976, *Faruqi,* 805.

Also reported from Cyrenaica (Pamp. l.c.; Maire, l.c.; Keith, l.c.; Scholz, l.c.).

Distribution: Spain, Mediterranean region, Jordan, Sinai, Caucasus, Iran, Pakistan, Afghanistan, Kashmir, C. Asia and N. Africa.

This is considered as a good fodder grass in the U.S.S.R. (vide Bor, Fl. Iraq, 9: 400. 1968). In Libya this plant is not very common.

Fl.: Apr.-June *Vern.* Aadame (Tunisia); Adem rhazel.

5. **Stipa parviflora** Desf., Fl. Atlant. 1: 98, tab. 29. 1798; Durand & Barratte, l.c. 256; Pamp., Fl. Trip., 37. 1914; Prod. Fl. Cir. 99. 1931; Corti, Fl. Veg. Fezz., 48. 1942; Maire, l.c. 75; Keith, l.c 939; Scholz, l.c. 443. (Fig. 70)

Perennial, tufted, glabrous, erect. Culms up to 50 cm tall. Leaf conduplicate, flexuous. Inflorescence a loose panicle. Spikelets gaping; glumes unequal, hyaline, the lower up to 15 mm and the upper up to 10 mm long, drawn into a long, fine acuminate tip; lemma pubescent-scabrous, 4-6 mm long; awned, awns not obviously kneed, scabrous-glabrous, up to 10 cm long; palea much smaller; anthers 3, with hairs on the tip. 2n = 28.

Type: "Habitat in collibus aridis prope Mascar et in regno Tunetano, *Desfontaines",* P.

A-3 Sidi Jilani, on way to Wadi Mjinin Dam, 23.3.1977, *Faruqi* 1289 and 1290; **A-6** 10 km from Benina towards El Rajma Project, 22.5.1977, *Faruqi* 1363 and 1364; **A-7** Ain Mara, 5.5.1978, *Faruqi* 1776; **B-2** 5 km after Gwalish on way to Jadu, 21.5.1976, *Faruqi* 786; Zentan, 21.5.1976, *Faruqi* 802; Jadu, 24.1.1977, *H.B. Quraish, M. Ahmad & Sid-*

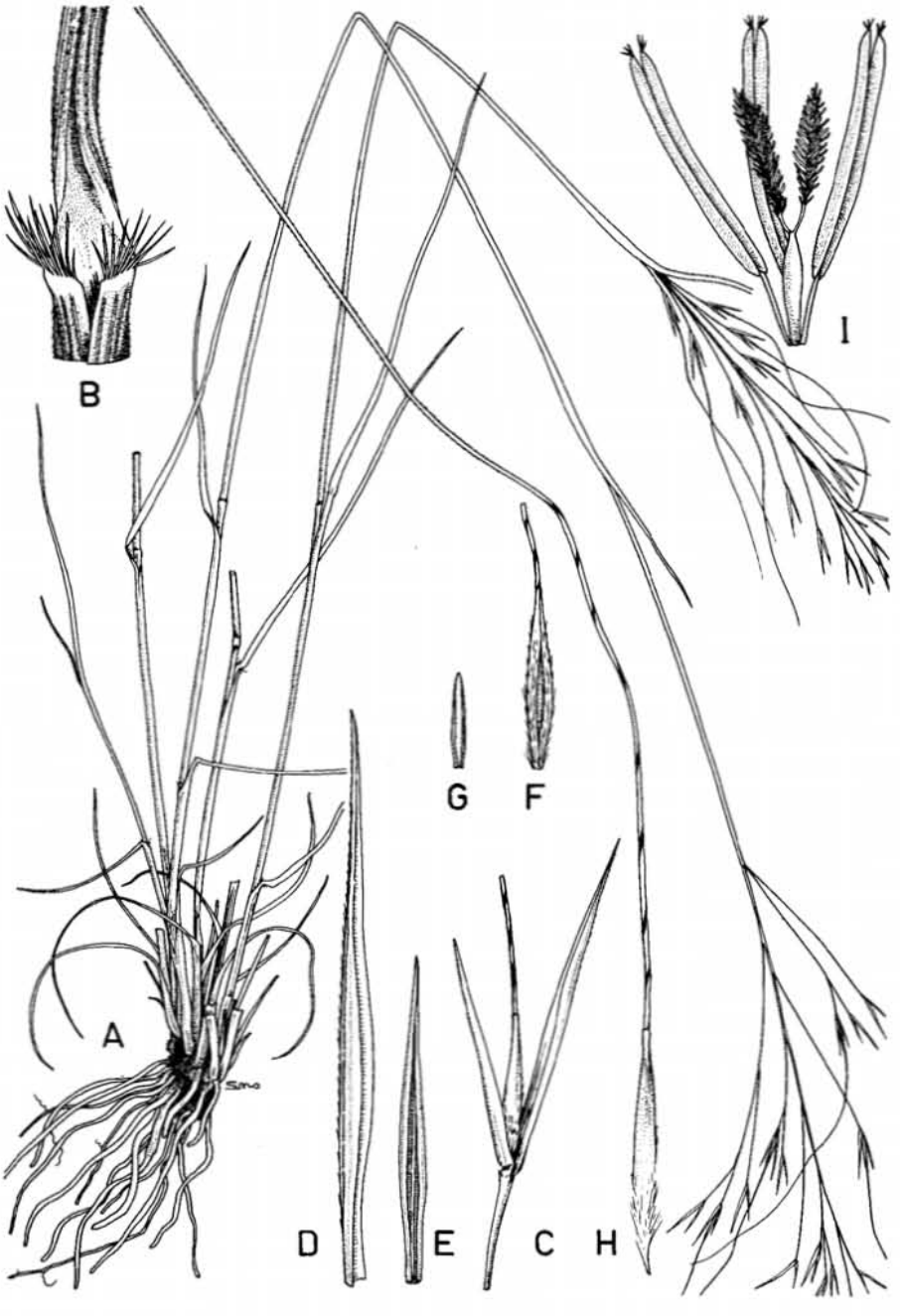


Fig. 70 **Stipa parviflora**: A, habit × 0.5; B, portion of lamina, sheath and ligule × 10; C, spikelet × 3; D, lower glume × 5; E, upper glume × 5; F, lemma with an awn × 5; G, palea × 5; H, floret × 5; I, stamens and pistil × 10.

diqi 1063; Kabau, 27.1.1977, *H.B. Quraish, M. Ahmad & Siddiqi* 1083; 15 km from Kleba towards Mizda, 10.4.1974, *S.I. Ali* 1933; Hinshir bu Idder, 8.4.1974, *S.I. Ali* 1745.

Also reported from Fezzan by Corti (l.c.) and Scholz (l.c.).

Distribution: Mediterranean Europe, N. Africa, Crete, Syria, Palestine, Jordan and Iran.

Fl.: Jan.-June

6. **Stipa lagascae** Roem. et Schult., Syst. Veg. ed. 15, 2: 333. 1817; Pamp., Prod. Fl. Cir. 100. 1931; Maire, l.c. 2: 77; Keith, l.c. 939; Scholz, l.c. 443.

S. gigantea Lag., Gen. et Sp. No. 27. 1816; Durand & Barratte, l.c. 257; Pamp. Pl. Trip. 37. 1914.

Perennial, tufted, up to 80 cm tall. Culm smooth, glabrous. Leaf conduplicate, filiform, flexuous, with scattered retrorse white hairs. Inflorescence up to 40 cm long, lax panicle with spaced spikelets; glumes glabrous, drawn into a fine acuminate hyaline tip, up to 5 (-6) cm long; lemma up to 17 mm long, hairy on the basal half, awned; awns very long, up to 20 -(30) cm, glabrous, minutely barbed, anthers with hairs at the tip.

Type: "In collibus pr. Matritum, en el Cerro-Negro, etc.", *Persoon.*

A-3 Tripoli, 1 km from Bil Ashhar on Lepur hospital Road (Ain Zara), 6.3.1977, *Faruqi* 1214 and 1215; Sidi Jilani, on way to Wadi Mjinin Dam, 23.3.1977, *Faruqi* 1286 and 1287; **B-2** Gwalish, 21.5.1976, *Faruqi* 775; 40 km after Gwalish on way to Jadu, 21.5.1976, *Faruqi* 797; Kaleba, 10.4.1974, *S.I. Ali* 1891; **B-6** 70 km from Ajdabia on way to Gaminas 13.3.1978, *Faruqi* 1695; **B-6** 17 km from Ajdabia on way to Ojla, 16.4.1978, *Ramadan, Fathi and Siddiqi* 346-Z.

Also reported from Fezzan by Maire (l.c.); Keith, l.c.; Scholz, l.c.

Distribution: Southern Europe, Mediterranean area, Anatolia, Syria, Iraq, Iran, Afghanistan, Turkestan, Transcaucasia.

Fl.: Feb.-June

A highly variable species with regard to pubescence.

61. **PIPTATHERUM**

P. Beauv., Ess. Agrost. 17. 1812.

Perennial. Leaf long, linear, flat or involute. Inflorescence an open panicle. Spikelets pedicellate, dorsally compressed, solitary or in loose groups, 1-flowered; rachilla disarticulating above the glumes; glumes equal, pointed; lemma with a circular scar, callus straight, somewhat hairy, awned at the tip; awn straight, caducous; palea ± similar to lemma; stamens 3; lodicules 2-3, lanceolate, acuminate; caryopsis grooved adaxially; hilum linear.

A genus segregated from *Oryzopsis*; represented by more than 10 species; 3 species in Libya.

1. + Panicle branches 4-8 or more at a node; spikelets not more than 4 mm long ..... 1. **P. miliaceum**
   — Panicle branches 1-3 (4) at a node; spikelets more than 6 mm long 2
2. + Awn up to 3 mm long; culm leaves 1.5-3 mm wide; lemma glabrous ..... 2. **P. coerulescens**
   — Awn 6-14 mm long; culm leaves 5-9 mm wide; lemma hairy ..... 3. **P. holciforme**

1. **Piptatherum miliaceum** (L.) Cosson, Not. Pl. Crit. 129. 1851; Durand & Barratte, l.c. 257. (Fig. 71)

   Agrostis miliacea L., Sp. Pl. 61. 1753; *Oryzopsis miliacea* (L.) Bentham et Hooker f. ex Ascherson et Schweinf. Illust. Fl. Egypte in Mem. Inst. Egypt. 2: 169. 1887; Pamp., Pl. Trip. 30. 1914; Prod. Fl. Cir. 101. 1931; Maire, Fl. Afr. Nord. 2: 82. 1953; Keith, l.c. 721; Scholz, l.c. 443.

Perennial, erect or geniculately ascending, 1 m or more tall. Culm smooth, glabrous. Leaves 35 cm × 2-6 mm, linear-acuminate; ligule 1-2 mm long. Inflorescence up to 30 cm long, bearing 4-8 or more branches at each node; spikelets 4 mm or less long, dorsally compressed; glumes subequal, glabrous, acuminate; lemma glabrous, terminated by a 2-4 mm long awn; caryopsis 2 mm long, glabrous, obovate. 2n = 24.

Type: Described from Europe, Herb. Linn. 84/2 (LINN).

A-2 7 km south of Bir Ayad, 16.6.1977, *Faruqi* 1408 and 1409; Sabrata, 10.2.1967, *Boulos* 1510; **A-3** Tripoli, 7.5.1976, *Faruqi* 638 and 684; Wadi Mijnin Dam, 23.3.1977,

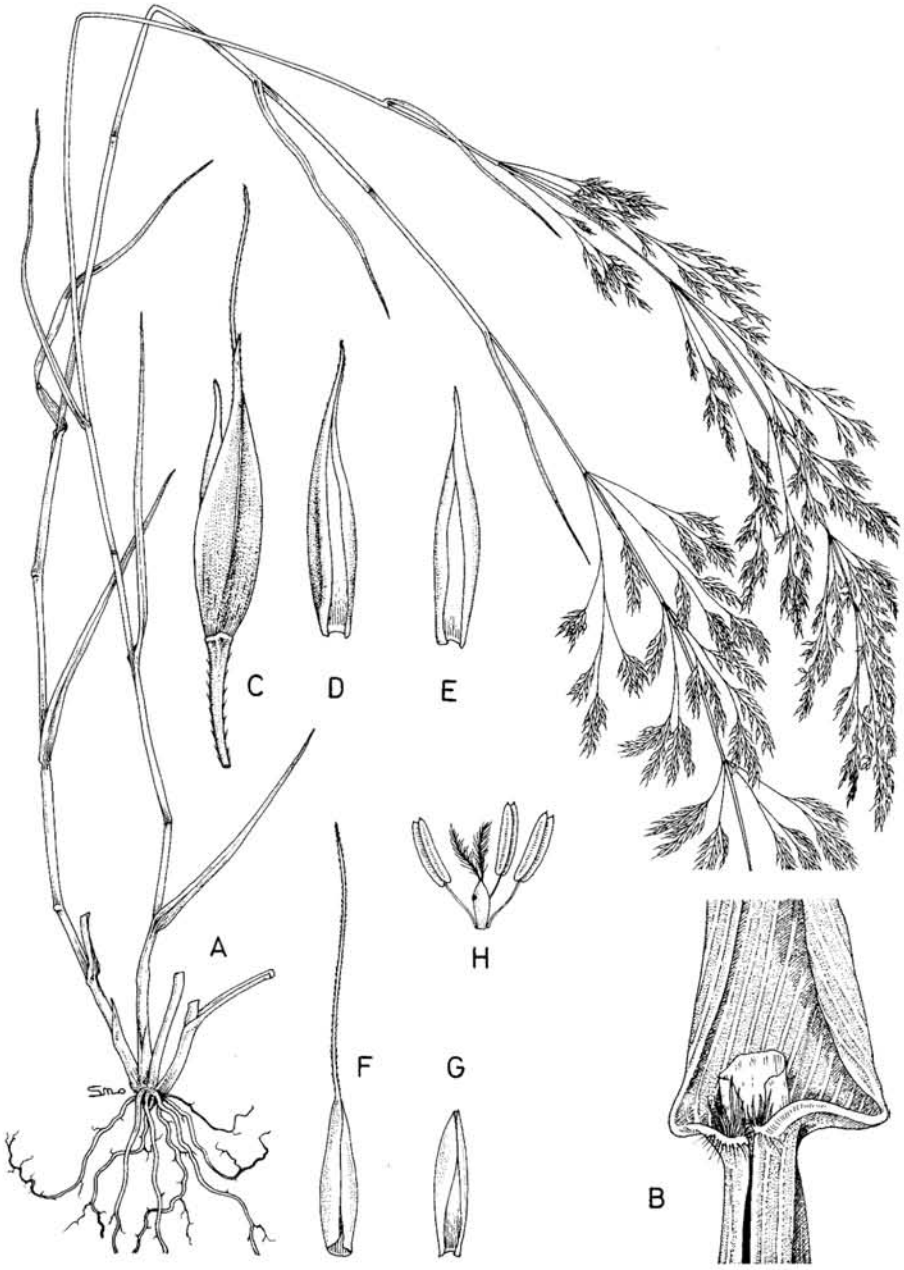


Fig. 71 **Piptatherum miliaceum**: A, habit × 0.5; B, portion of lamina, sheath and ligule × 10; C, spikelet × 10; D, lower glume × 10; E, upper glume × 10; F, lemma × 10; G, palea × 10; H, stamens and pistil × 20.

Faruqi 1292; 22 km West Khoms, on calcareous slopes, 25.4.1967, *Boulos* 1774; Gharian hills, 21.5.1977, *Faruqi* 735; **A-6** 10 km East of Tokra, 10.3.1978, *Faruqi* 1626; **A-7** Wadi El-Kuf, Jabel Akhder, 25.1.1967, *Boulos* 1466; Ras el Hilal hill forest, 24.5.1977, *Faruqi* 1390; 5 km east of Susa, 22.9.1977, *M. Ahmad 1473; Shahat, 24.5.1977, Faruqi* 1381; Messa, c. 5 km from Baida, 18.6.1972, *S.I. Ali* 599; Near Hut on way to Ras el Helal, 5.5.1976, *A. El-Gadi, Jafri & others* 1602-G; **B-1** Wadi Malah, 3 km from Nalut, 18.4.1975, *S.I. Ali* 2864.

Distribution: Mediterranean region, Syria, Jordan to Iran.

This species has great prospects as a forage grass and it is recommended for cultivation in the Mediterranean region (Whyte, Moir & Cooper in F.A.O. Agric. St. No. 42. 1959).

Fl.: Jan.-Dec.

2. **Piptatherum coerulescens** (Desf.) P. Beauv., Ess. Agrost. 18. 1812; Durand & Barratte, l.c. 257. (Fig. 72)

Milium coerulescens Desf., Fl. Atlant. 1: 66, tab. 12. 1798; *Oryzopsis coerulescens* (Desf.) Hack. in Denkschr. Acad. Wiss. Wien, 50, 2: 8. 1885; Pamp., Pl. Trip. 30. 1914; Prod. Fl. Cir. 102. 1931; Maire, l.c. 86; Keith, l.c. 721; Scholz, l.c. 443.

Perennial, tufted, up to 1 m or more tall. Culm glabrous, striated. Leaf flat or rolled, filiform-linear, acuminate, up to 25 cm or more long, 1.5-3 mm wide; ligules 5-9 mm long, dentate. Inflorescence an open panicle up to 20 cm long, narrow, branches 1-3(-4) at each node. Spikelets pedicelled, purple, 6-8 mm long; glumes equal or inner glume slightly smaller, ovate-lanceolate, acuminate, glabrous, 6-8 mm long; lemma glabrous, awned at the tip, awn up to 3 mm long; palea smaller than lemma, glabrous, caryopsis 8 mm long, lanceolate, hairy with a ridge, dark brown at maturity, and with a tuft of hair at the base.

Type: "Habitat (Morocco) in fissuris rupium Atlantis, *Desfontaines*", P.

A-7 Ras el Hilal, 6.5.1978, *Faruqi* 1788 and 1789.

Also reported from Lebda by Durand & Barratte (l.c.).

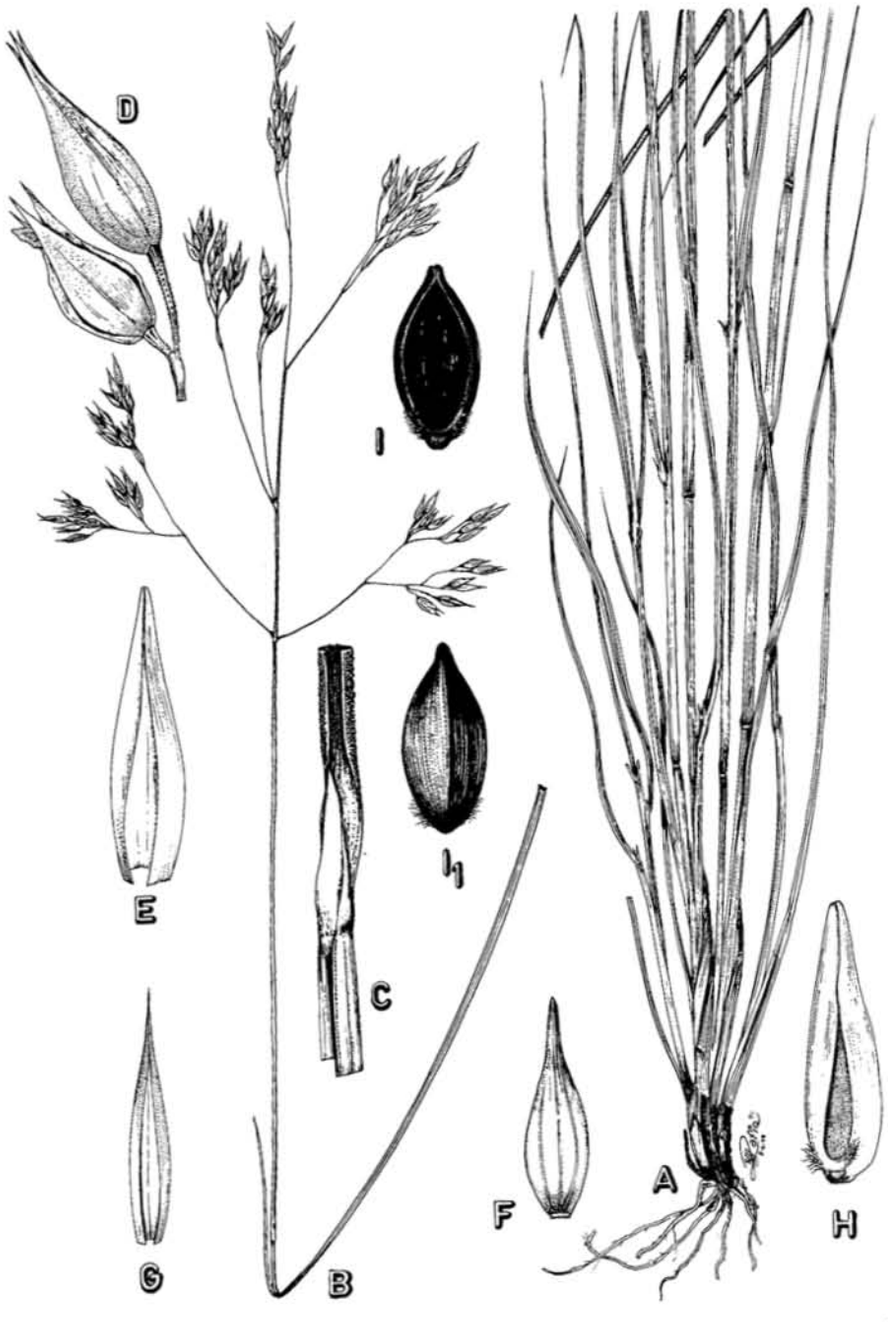


Fig. 72 **Piptatherum coerulescens**: A, habit × 0.5; B, culm with inflorescence × 0.5; C, portion of lamina, ligule and sheath × 4; D, spikelets × 4; E, lower glume × 5; F, upper glume × 5; G, lemma × 5; H, palea enclosing Caryopsis × 10; I, I_1, ventral and dorsal views of Caryopsis.

Distribution: Mediterranean region, Syria, Anatolia (Turkey), Iran.

A species growing in association with other bushes in Libya.

Fl.: Apr.-May

3. **Piptatherum holciforme** (Bieb.) Roem. et Schult., Syst. Veg. ed. 15, 2: 328. 1817.

Agrostis holciformis Bieb., Fl. Taur.-Cauc., 1: 54. 1808; *Oryzopsis holciformis* (Bieb.) Hack. in Denkschr. Math.-nat. Kl. Akad. Wiss. Wien, 50(2): 8. 1885; Maire, l.c. 85; Scholz, l.c. 443; *O. coerulescens* (Desf.) Richter var. *grandis* Pamp., in Archiv. Bot. 12: 20. 1936; *O. grandis* (Pamp.) Maire et Weiller, in Maire, Fl. Afr. Nord. 2: 87. 1953.

Perennial, tufted; base woody. Culm up to 1 m tall, glabrous. Leaves flat, up to 40 cm long and 5-9 mm wide; ligule up to 1 cm long. Panicle open and lax, branches long, sterile towards the base, 2 at each node. Spikelets elliptic, acuminate, 8-10 mm long; glumes equal to subequal, acuminate, glabrous, 7-8 mm long; lemma pubescent, fusiform, shorter than glume, awned, awn 6-14 mm long; palea pubescent; lodicules 2, linear, obtuse; caryopsis elliptic, 5 mm long, dark-brown with scanty hairs and a tuft of hair at the base. 2n = 24.

Type: Habitat in Tauria meridionali, Circa pag. Alupkam, *Marschall-Bieberstein.*

A-7 Ain Mara, 28.4.1934, *Pampanini & Pichi-Sermolli* 926 (FI).

Distribution: Mediterranean region, C. and S.E. Europe, Syria, Jordan, Turkey, Armenia, Caucasus, Iran, Afghanistan and C. Asia.

Fl.: Mar.-Apr.

Seed is used as poultry feed in Uzbekistan etc.

62. ENNEAPOGON

Desv. ex P. Beauv. Ess. Agrost. 81. 1812; Desv., Jour. Bot. 3: 70. 1814.

Annual or perennial. Leaf flat and narrow; ligules reduced to a rim of hairs. Inflorescence a small, compact panicle, spike-like or lobed. Spikelets shortly pedicelled, branches pubescent, 3-6 florets, the lower 1-3 bisexual, upper sterile and reduced; rachilla disarticulating above the glumes; glumes unequal; lemma much smaller than the glumes, orbicular, 9-nerved, 9-feathery awns from the tip of lemma; palea often longer than lemma, 2-keeled, ciliate on the keels; stamens 3; lodicules 2, truncate, undulate at the apex; caryopsis elliptic, hilum a basal spot.

About 40 Australian and African species; 1 species is reported from Libya.

Enneapogon desvauxii P. Beauv., Ess. Agrost. 82, 161. 1812; Scholz, Willdenowia, 7. 443. 1974.

Pappophorum brachystachyum Jaub. et Spach, Illustr. Pl. Or. 4: 34, tab. 324. 1850-1853; *Enneapogon brachystachyus* (Jaub. et Spach) Stapf in Dyer, Fl. Cap. 7: 654. 1900; Maire, Fl. Afr. Nord. 2: 194. 1953.

A small perennial herb, fascicled, up to 15 cm high, glandular pubescent. Leaf filiform up to 10 cm long. Inflorescence a dense spike-like panicle up to 5 cm long, branches villous; peduncles smaller than spikelets, pubescent. Spikelets of 3 florets, the upper two sterile and rudimentary; outer glume 5 mm long, inner 3.5 mm long, pubescent; lemma 2 mm, villous, 9-nerved, each nerve extending into an awn, awns 3-4 mm long; palea 2-keeled, shortly pubescent on keels.

Type: Arabia Felix, Taifa, Botta.

Reported from South Cyrenaica (Scholz, l.c.).

Distribution: North Africa, Sinai, Arabia, Iran, N.W. India, China, Tropical and South Africa.

63. AELUROPUS

Trin., Fund. Agrost. 143. 1822.

Perennial. Leaf folded. Inflorescence a dense head-like or spike-like panicle. Spi-

kelets subsessile, arranged on one side of branches, 4-18-florets, laterally compressed; florets bisexual; glumes unequal, keeled, mucronate; lemmas 7-9 (-11)-nerved, mucronate; palea ciliate on keels; stamens 3; lodicules 2, truncate, slightly cuneate; caryopsis loosely enclosed in palea and lemma.

About 5 species, distributed from Mediterranean region to India; represented by 2 species in Libya.

A genus of halophytic species, with high tolerance of salinity.

+ Inflorescence elongate with spikes arranged on a rather long axis	1. **A. littoralis**
– Inflorescence of condensed spikes, somewhat head-like	2. **A. lagopoides**

1. **Aeluropus littoralis** (Gouan) Parl., Fl. Ital. 1: 461. 1850; Pamp., Pl. Trip. 7. 1914; Maire, Fl. Afr. Nord. 3: 69. 1955; Keith, l.c. 200; Scholz in Willdenowia, 7: 443. 1974.

Poa littoralis Gouan, Fl. Monsp. 470. 1765; *Dactylis littoralis* (Gouan) Willd., Sp. Pl. ed. 4, 1: 408. 1797.

Perennial, strongly rhizomatous, forming mats of spreading shoots, sending erect branches at intervals. Culm internodes glabrous, shiny or with scanty hairs, cylindrical, axis below the spikelets ribbed, distinctly scabrous over ridges. Leaf lanceolate, acuminate, glabrous, sheath glabrous; ligule a rim of hair. Inflorescence a panicle of several one-sided spikes arranged on a long axis. Spikelets glabrous to somewhat pubescent; lemma glabrous to somewhat hairy; palea membranous. 2n = 20, 30.

Type: (France) "Habitat in Maritimis arenosis a Villeneuve, Maguelone".

Reported from Misurata, Zuara, Benghazi, Giuliana, Bomba and Tobruk by Pampanini (l.c.); Maire (l.c.) and Keith (l.c.).

Distribution: Mediterranean region, Iraq, Iran, Turcomania, Afghanistan, C. Asia and Pakistan.

Bor (l.c.) mentioned spikelets completely glabrous in Iraqi and Iranian plants, but N. African plants show somewhat pubescent spikelets. Further, the inflorescence axis, in North African plants, is much smaller and spikes fewer. When pubescence and shor-

tening of axis is correlated, it gives an idea that the plants of N. Africa designated as *A. littoralis* could be a hybrid involving *A. lagopoides.*

Fl.: Mar.-Oct.

2. **Aeluropus lagopoides** (L.) Trin. ex Thw., Enum. Pl. Zeyl. 374. 1864; Keith, l.c. 200; Scholz, l.c. 443. (Fig. 73)

Dactylis lagopoides L., Mant. Pl. 1: 33. 1767; *A. repens* (Desf.) Parl., Fl. Ital. 1: 462. 1848; Durand & Barratte, l.c. 266; Pamp., Pl. Trip. 7. 1914; Prod. Fl. Cir. 116. 1931; *A. littoralis* var. *repens* (Desf.) Coss. et Dur., Expl. Sci. Alg. 155. 1855; Maire, l.c. 71.

Perennial, with long running stem and few erect shoots. Axis below the spikelets ribbed, scabrous and with few scattered soft cilia. Leaf short, pungent, lanceolate, acuminate, with few scattered hairs, sheath hairy; ligule a rim of hair. Inflorescence a single terminal spike-like panicle, subglobose, very dense, pubescent. Spikelets 3-6, rarely more; lemma pubescent.

Type: Described from India, *Burman*, Herb. Linn. 90/5, 6, 7 (LINN).

A-2 c. 10 km from Zwara on way to Farwa, sandy soil, *A. Ghafoor* 121; **A-3** Tawargha, 14.5.1975, *A. Gammudi* 449; *id.,* 15.5.1975, *S.I. Ali* 2916; *id.,* 28.10.1975, *Jafri* 6184; id., 14.3.1978, *Faruqi* 1705; **B-4** 1 km W. of chicken farm, before Sirt, 2.5.1978, *A. El-Gadi, Jafri & others* 1293; Road between Bugrain and Al-Buwairat, 15.1.1967, *Boulos* 1073; **B-5** 66 km E. of Sirt, 9.5.1978, *A. El-Gadi, Jafri & others* 2119-G; **D-3** 18 km North Brak, 7.3.1978, *Faruqi* 1598; Ashkada, 30.3.1973, *S.I. Ali* 1414.

Distribution: Mediterranean region, Syria, Jordan, Transcaucasica, Iran, Afghanistan, C. Asia, Pakistan and India.

Some of our gatherings, cited above, have globose flowering heads, axis below the spikelets pubescent and leaves more crowded and more pungent than in true *A. lagopoides. A. massauensis* (Fres.) Mattei is quite similar to this species, but differs in having hairy ligule. Since the plants grow vegetatively, all kinds of variations including those being produced as a result of hybridization are likely to get fixed. This is the reason for including these plants under *A. lagopoides.*

Fl.: Mar.-May

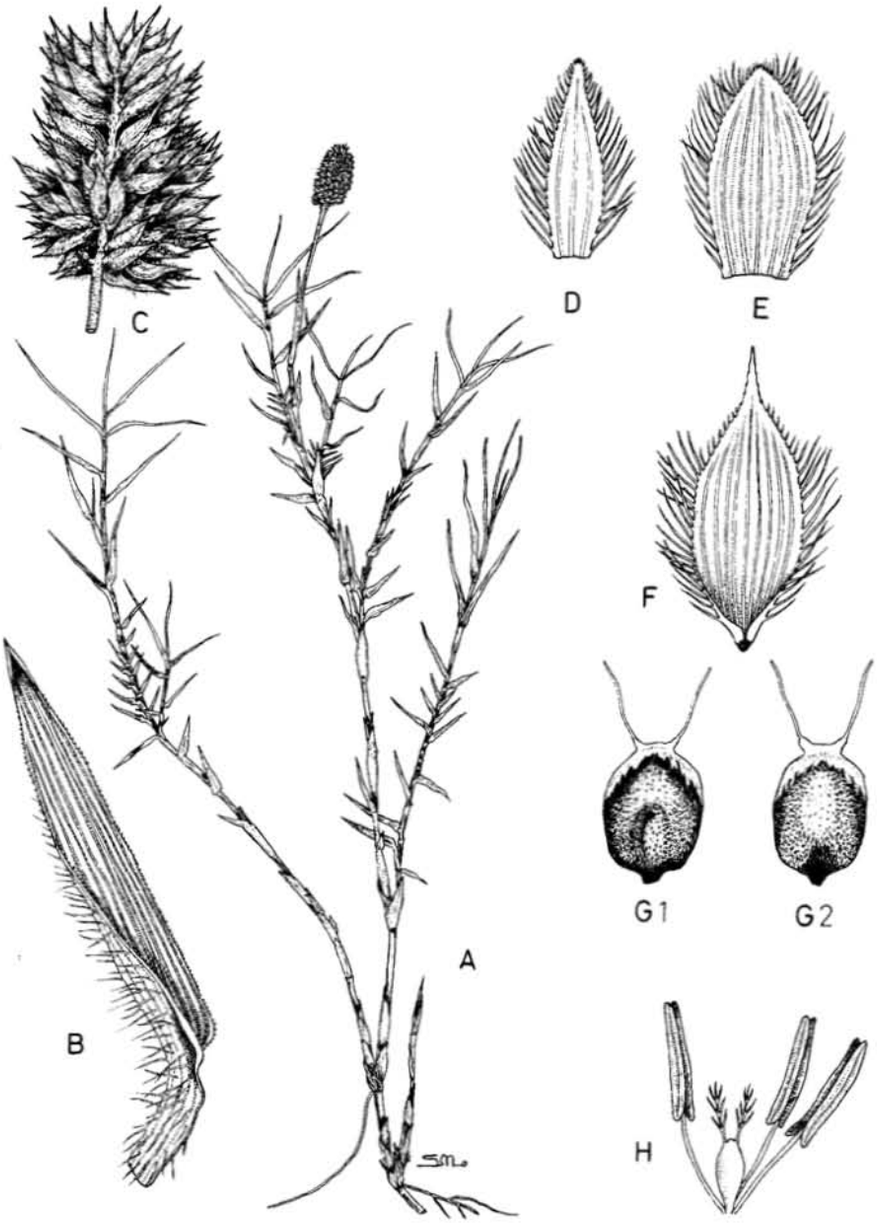


Fig. 73 **Aeluropus lagopoides**: A, habit × 1; B, portion of leaf and sheath × 5; C, inflorescence × 3; D, lower glume × 15; E, upper glume × 15; F, lemma × 15; G_1, G_2, mature pistil × 20; H, stamens and pistil × 15.

64. ARISTIDA

L., Sp. Pl. 82. 1753; Gen. Pl. ed. 5: 35. 1754.

Perennials, rarely annual, tufted. Leaf narrow, mostly convolute. Inflorescence a lax or dense panicle. Spikelets pedicelled, awned, 1-flowered, hermaphrodite; rachilla disarticulating above the glumes, not prolonged beyond the floret; glumes equal or unequal, rarely the lower longer than the upper, persistant, awnless or awned, lemma convolute with a bearded, pungent, obtuse or rarely forked callus, with a trifid awn; palea 2-nerved or nerveless; stamens 3 or 1; lodicules 2 or 3, oblong truncate or oblanceolate, glabrous, strongly nerved; grain terete, enclosed tightly by lemma, hilum linear, nearly as long as the grain.

Some 260 species in the temperate and subtropics of the world; 4 species are found in Libya.

1.	+ The 3 bristles of the awn fused into a column; spikelets green	2
	— The 3 bristles of the awn separated from the base, column absent; spikelets usually purple	4. **A. adscensionis**
2.	+ Articulation at the base of the column	1. **A. funiculata**
	— Articulation at the tip of the column, just below the awn branching point	3
3.	+ Panicle lax, up to 15 cm long, with branches naked from the base to the middle	3. **A. mutabilis**
	— Panicle dense, contracted, 5-7 cm long, with branches bearing spikelet almost to the base	2. **A. meccana**

1. **Aristida funiculata** Trin. et Rupr., Sp. Gram. Stip. 159. 1842; Maire, Fl. Afr. Nord. 2: 49. 1953; Scholz, in Willdenowia, 7: 443. 1974.

Annual, up to 30 cm tall. Culm densely branched, glabrous, slightly decumbent at the base. Leaves flat, somewhat convolute, linear acuminate, sharp pointed, minutely puberulent, base with long hairs. Panicle lax, 10-15 cm long, axis and branches scabrous. Spikelets linear, glabrous; lower glume linear, 3-nerved, 20-30 mm long, the upper linear, 1-nerved, 3-5 mm shorter; lemma terete, glabrous, 4 mm long, articulating with the column; callus retrorsely hirsute, column 2-4 cm long, scabrous, highly twisted; awn branches subequal; anthers 3, with few hairs at the tip.

Type: Described from Senegal, *Leprieur* (P).

Reported from Jabal Uwainat by Scholz (l.c.)

Distribution: Central Sahara, Arabia, Afghanistan, Pakistan, India.

Fl.: After summer rains.

2. **Aristida meccana** Hochst. in Trin et Rupr., Sp. Gram. Stip. 152. 1842; Maire, l.c. 57; Scholz, l.c. 7: 423. 1974.

Annual herb, glaucous, up to 35 cm high. Culms branched, geniculately ascending, nodes dark purple. Leaf convolute, 4 cm long, 1 mm wide, sharp-pointed, scabrous; sheath compressed, keeled, long ciliate. Panicle dense, contracted, spiciform, 5-7 cm long, branches mostly 2 cm long, spikelets more or less up to the base. Spikelets usually on very short peduncles; glumes 1-nerved, unequal, the lower 5-5.5 mm long, scabrous on the keel, sharp-pointed and shortly awned or subobtuse, the upper 7-8 mm long, keel scabrous above or glabrous, shortly bifid with a short awn in the sinus; lemma linear-lanceolate, convolute; the callus densely hairy with hairs up to 1 mm long; columns 2-3 mm long, articulating at the tip, branches of the awn subequal; anthers 3; caryopsis fusiform with hairs at the tip.

Type: Described from Arabia.

Reported from Jabal Uwainat by Scholz (l.c.).

Distribution: S. Sahara, Egypt, Arabia.

Fl.: After summer rains.

Editor's note: *A. meccana* Hochst. in Trin. & Rupr. is very similar to, and perhaps conspecific with *A. mutabilis* Trin. & Rupr. It differs mainly in the relative lengths of the glumes, hence Cope in Nasir & Ali, Fl. Pak. 143: 48. 1982 considers *A. meccana* as a variety, or at the most a subspecies of *A. mutabilis*, however Bourreil in Boissiera 24a: 173-196. 1975 is quite certain that the two should be regarded as distinct species.

3. **Aristida mutabilis** Trin. et Rupr., Sp. Gram. Stip. 150. 1842; Scholz, l.c. 423 & 444. 1974.

Annual, up to 40 cm tall. Culms fascicled, geniculately ascending, scabrous. Leaf flat near the base, convolute, linear, acute, curved; sheath shorter than internode, compressed, keeled, ciliate. Panicle more or less 15 cm long, lax, axis smooth, nodes glabrous, with branches naked from the base to the middle. Spikelets yellowish, glumes subequal, 1-nerved, lower 4-6 mm long, keel scabrous, the upper little longer, glabrous, tip bifid; lemma cylindrical, convolute, 3-5 mm, scabrous above; callus shortly barbed; columns 3-4 mm long, articulating at the tip; branches capillary, usually subequal, scabrous.

Type: Cordofan, Sudan Republic, in arenae saxis graniticis delitescantibus formata, *Kotschy* 103 (K).

Reported to be present in Jabal Uwainat by Scholz (l.c.).

Distribution: Sahara Central, Tropical Africa, Pakistan and India.

Fl.: After rains.

4. **Aristida adscensionis** L., Sp. Pl. 82. 1753; Pamp., Pl. Trip., 11. 1914; Prod. Fl. Cir. 98. 1931; Maire, l.c. 58; Keith, l.c. 250; Scholz, l.c. 444. (Fig. 74)

Annual, branching from the base, branches slender, up to 80 cm tall. Culm glabrous, ribbed. Leaf usually convolute, sometimes flat, linear, acuminate, scabrous, up to 20 cm long, 2-3 mm wide. Inflorescence a loosely branched panicle with usually purplish spikelets aggregated towards the tip of the branches. Glumes unequal, glabrous, acuminate, single-nerved, lower shorter, 5 mm long, the upper 6 mm long; lemma continuous with the awn, scabrous, 3-nerved, convolute, 2 lateral branches of the awn shorter than the middle one, no definite column present; lodicules 2; anthers 3. 2n = 22.

Type: Habitat in insula Adscensionis.

A-2 Jenawen, Jadu-Shakshuk Road, 24.1.1977, *H.B. Quraish, M.A. Siddiqi & M. Ahmad* 1065, 1066. **A-3** El Naggaza area, 98 km from Tripoli, 5.4.1977, *S.A. Alavi & S.A. Faruqi* 1250-S; Gharian hills, *A. Karim El-Ruby* 55; **B-4** c. 2 km from Washka, Wadi Zaggar, 26.3.1975, *S.I. Ali* 2349.

Also reported from Cyrenaica & South Cyrenaica by Pampanini (l.c.); Maire (l.c.); Keith (l.c.) and Scholz (l.c.).

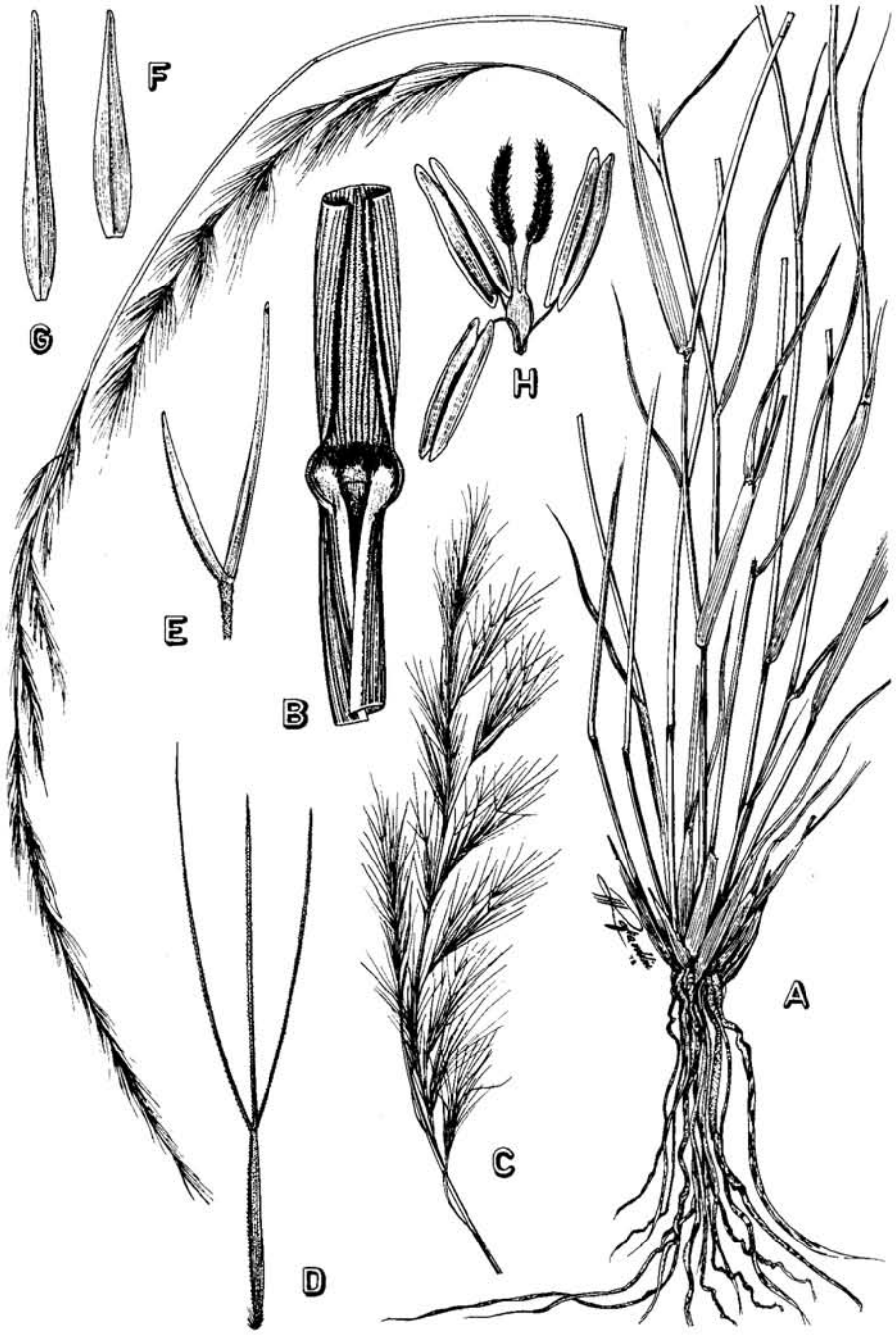


Fig. 74 **Aristida adscensionis**: A, habit × 0.5; B, portion of lamina, sheath and ligule × 8; C, panicle × 0.5; D, floret × 3; E, spikelet with floret detached × 5; F, lower glume × 5; G, upper glume × 5; H, stamens and pistil × 15.

Distribution: N. Africa, Southern Europe, Egypt.

Fl.: Jan.-Mar.

65. **STIPAGROSTIS**

Nees in Linnaea 7: 290.1832.

Perennials, tufted. Leaf convolute; ligule hairy. Panicle contracted or loose. Spikelets 1-flowered, hermaphrodite, pedicelled; rachilla disarticulating above the glumes; glumes equal or unequal, persistant, mostly 3-nerved; lemma 3-nerved, glabrous or scabrid, terminating into a column which soon divides into 3 awns, usually only the central awn plumose and the lateral branches naked, less frequently all 3 awns plumose; palea small; callus pungent or minutely bifid, glabrous or bearded; stamens 2; lodicules 2 or absent; caryopsis tightly enclosed by lemma; hilum linear, as long as the grain.

About 50 species, in dry regions of Africa, S.W. Asia, Pakistan & N.W. India; represented here by 13 species.

1	+ Awn with all three branches plumose	2
	— Awn with only central branch plumose and 2 lateral branches naked	4
2.	+ Lower glume conspicuously longer than the upper one (18-22mm long); the three feathers often not exserted from the long glumes	3. **S. scoparia**
	— Lower glumes shorter than or mostly as long as the upper one (7-16mm long); the three feathers exserted from the short glumes	3
3.	+ Panicle with pubescent pedicles	2. **S. vulnerans**
	— Panicle with glabrous-minutely scabrous pedicel	4. **S. pungens**
4.	+ Culm conspicuously bearded at the node	1. **S. ciliata**
	— Culm naked at the node	5
5.	+ Plumose awn obtuse and not prolonged into naked tip	6
	— Plumose awn acute and prolonged into naked tip	8

6.	+ Leaves conspicuously covered with long, villous hairs; callus bifid	13. **S. foexiana**
	— Leaves glabrous-minutely scabrous but definitely not villous; callus not bifid	7
7.	+ Culm many-noded; leaf 15cm or more long; central awn upto 15mm long	10 **S. zittelii**
	— Culm single-noded; leaves much shorter, crowded at base; central awn much longer	12 **S. obtusa**
8.	+ Plumose awn not exceeding 15mm long	11. **S. acutiflora**
	— Plumose awn much longer	9
9.	+ Glumes more than 3-nerved	10
	— Glumes 1-3-nerved	11
10.	+ Plants annual, 15cm high; base of upper glume with 2 tufts of hairs	9. **S. shawii**
	— Plants perennial, 30cm high; base of upper glume without 2 tufts of hairs	8. **S. multinerva**
11.	+ Glumes strongly rough; plants annual	7. **S. libyca**
	— Glumes not strongly rough; plants perennial	12
12.	+ Sheaths of lower leaves wooly; lemma callus 2mm or less long	6. **S. plumosa**
	— Sheaths of lower leaves not wooly; lemma callus 2mm or more long	5. **S. rigidifolia**

1. **Stipagrostis ciliata** (Desf.) de Winter in Kirkia 3:133.1963; Scholz in Willdenowia, 7:444.1974.

Aristida ciliata Desf. in Schrad. Neues Journ. Bot. 3,1-2:255.1809; Pamp., Pl. Trip. 11.1914; Maire, Fl. Afr. Nord. 2:32.1953; Keith, Prelim. Check List Lib. Fl. 250.1965.

Perennial, 70-80 cm tall, glabrous, nodes bearded with 5 mm long hair; few branches from the base. Leaves glabrous, filiform, rolled, thick hair under the rolled por-

tion, tips pointed, needle-like. Inflorescence an open panicle, 15 cm long. Spikelets one-flowered, glabrous 14 mm long, 2 mm broad;outer glume 10 mm, inner 12 mm long, tip of outer glume broadly truncate; central awn feathered, 4-5.5 cm long, acute, lateral awns 1.5-2.5 cm long, naked.

Type: Described from Kerwan, Tunisia, *Desfontaines.*

A-2 130 km from Nalut on way to Tripoli, 23.5.1976, *Faruqi* 976,977 and 978; Project Wadi Bai, near cultivated fields, 4 km from Nalut, 11.2.1976, *A. El-Tiafe* 74; 16.6.1977, *Faruqi* 1403-b; **B-1** 17 km from Nalut on way to Tripoli, 23.5.1976, *Faruqi* 948; **B-2** Jinawen, 21.5.1976, *Faruqi* 817 and 818; Al-Ghazaya, 25.1.1977, *H.B. Quraish, M.A. Siddiqi and M. Ahmad* 1073, 1074.

Distribution: N. Africa, Sudan, S. Africa, S.W.Asia and N.W. Indo-Pakistan.

This is a variable species. Maire (l.c.) has divided it into 3 varieties on the basis of hairs on the glumes and at the nodes. This species varies also in the presence, absence or variation of cilia at the joint of the awns. This character, however, is quite distinct in another species, *S. papposa* Trin. et Rupr. which is absent in Libya, but is present in Algeria.

Fl.: Jan.-July *Vern.* Sbut

2. **Stipagrostis vulnerans** (Trin. et Rupr.) de Winter in Kirkia 3:136.1963; Scholz, l.c. 423 & 444.

Aristida vulnerans Trin. et Rupr. in Mem. Acad. Petersb. Ser. 6,7:175.1849.

A tall, woody, rhizomatous perennial. Leaves highly pungent. Panicle profusely branched; axil bearded. Spikelets borne on pubescent pedicels; glumes shortly awned; lemma awns 3, all plumose.

Type: Described from Egypt.

Reported from South Cyrenaica by Scholz (l.c.)

Distribution: Egypt, Sudan and Chad.

3. **Stipagrostis scoparia** (Trin. et Rupr.) de Winter in Kirkia 3:133.1963; Scholz, l.c. 423 & 444. (Fig. 75)

Aristida scoparia Trin. et Rupr. in Mem. Acad. Petersb. Ser. 6,7:176.1849.

A highly branched, woody perennial. Culm glabrous. Leaf up to 25 cm long, pungent, margins convolute, scabrous. Inflorescence 30-40 cm long, 15 cm broad, a much branched, loose panicle with single spikelets on long pedicels, up to 2 cm long, somewhat scabrous; glumes unequal, the lower longer, 1.8-2.2 cm long, the upper shorter 1.5-1.6 cm long, glabrous, acuminate; lemma glabrous 5-6 mm long, callus small; branches of the awn subequal, 7-9 mm long, not exserted from the long glumes, all plumose.

Type: Described from Egypt.

B-1 30 km from Derj on Nalut-Ghadames road, 30.1.1977, *H.B. Quraish and M. Ahmad* 1096.

Also reported from Fezzan (Scholz, l.c.)

Distribution: Egypt, Niger and Algeria.

Fl.: Mar.-April

4. **Stipagrostis pungens** (Desf.) de Winter in Kirkia 3:135.1963; Scholz, l.c. 444.

Aristida pungens Desf., Fl. Atlant. 1:109, tab. 35.1798; Durand & Barratte, l.c. 256; Pamp., Pl. Trip. 11.1914; Prod. Fl. Cir. 99.1931; Maire, l.c. 34; Keith, l.c. 252; *Aristida pungens* Desf. var. *transiens* Maire in M.C. 3382 bis 1941.

Very tall woody, rhizomaceous perennial grass, nodes glabrous. Leaves up to 15 cm long, rolled, terete, spine-like. Inflorescence an open panicle up to 20 cm long, with glabrous-minutely scabrous pedicel. Spikelets on clavate peduncles scabrous above; glumes glabrous, the lower pointed, 3-5-nerved, shorter than or as long as the upper one, the upper bidentate with a minute mucro in the sinus, 1-3-nerved; lemma with callus 5-7 mm long, the callus glabrous or hairy; branches of the awn plumose and subequal, the middle up to 15 mm long, the laterals up to 12 mm long. $2n = 44$

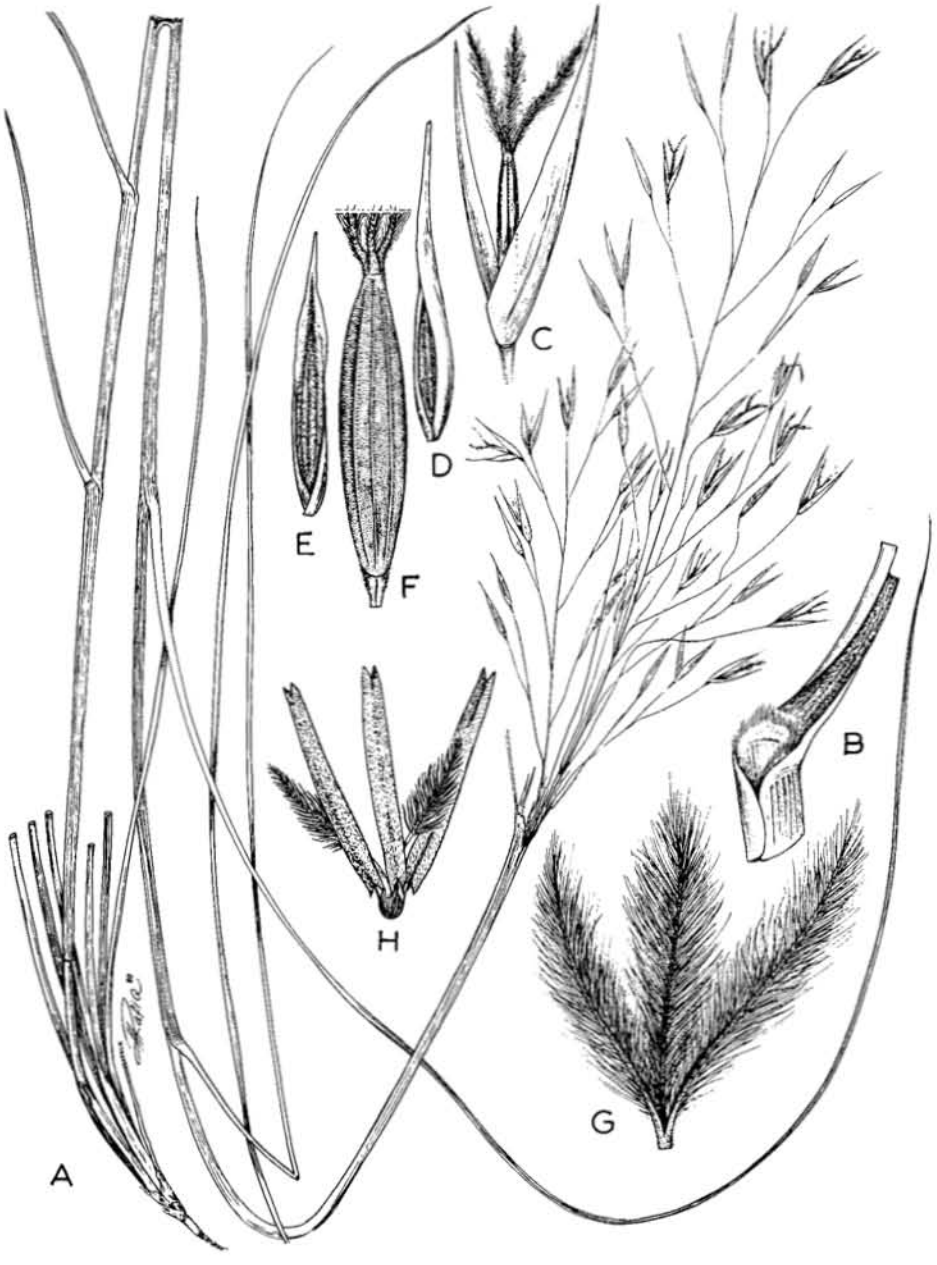


Fig. 75 **Stipagrostis scoparia**: A, habit × 0.5; B, portion of lamina, sheath and ligule × 5; C, spikelet × 2.5; D, lower glume × 2.5; E, upper glume × 2.5; F, floret with portion of awns × 7.5; G, awn × 5; H, stamens and pistil × 5.

Type: Described from Tunisia, Sfax, *Desfontaines.*

A-1 30 km from Nalut, towards Ghadames, 22.5.1976, *Faruqi* 933, 934, 035 and 936; **A-2** 56 km from Tripoli, towards Bu-Ghelan, 20.5.1976, *Faruqi* 711; 2 km from Josh on way to Tripoli, 23.5.1976, *Faruqi* 966; **A-3** Wadi Mijneen on main highway, 23.3.1977, *Faruqi* 1283 and 1284; 1 km from Ben Gashir towards Tripoli, 23.3.1977, *Faruqi* 1275; Airport Road, Tripoli, 5.3.1977, *Faruqi* 1187 and 1188; c. 60 km from Tarhuna, on way to Tripoli, 6.8.1977, *Faruqi* 1472; **A-4** Tawargha, 14.5.1975, *Zenab Abou Raya* 413; **B-2** 40 km after Gwalish on way to Jadu, 21.5.1976, *Faruqi* 796; **B-4** Gulf of Sirte, 25.3.1970, *Davis* 49852.

Distribution: Western Sahara, Egypt, Nubia, South Africa, Arabia and Iran.

This species was divided by Maire into three varieties and three forms. Scholz (l.c.) however, has raised the status of the 3 varieties into sub-species i.e. ssp. *pungens*, ssp. *transiens* and ssp. *pubescens*. In Libya, however, only the former 2 of the three ssp. of Scholz are reported. It is very widely distributed here and forms large mounds, especially over sand dunes. The plant is quite useful as a sand binder. The seeds of this plant are known to have been consumed by man.

Fl.: Mar.-Oct. *Vern.* Sbut, drin.

5. **Stipagrostis rigidifolia** H. Scholz, in Willdenowia, 6:295.1971; l.c. 6:524.1972.

Tufted perennial, up to 15 cm tall, erect-geniculately ascending. Culm covered with wooly hair at the internodes. Leaves 2-3 cm long, rigid, scabrous, curved, mucronate, mucro spiny. Inflorescence a loose panicle, 5-7 cm long, one or more from the same culm. Spikelet 16 mm long, narrow, tip truncate; plumose awn acute, up to 4 cm long, lower half naked, lateral awns 1.7 cm long, reaching the base of the plume, seed 3 mm long, shorter than the column, column 5-10 mm long, callus 2.0-2.2 mm long.

Type: Described from Tibesti.

Reported from South Cyrenaica, Fezzan, and Uwainat by Scholz (l.c.).

Distribution: North Africa, Sudan and Chad.

Fl.: Feb.-Mar.

6. **Stipagrostis plumosa** (L.) Munro ex T. Anders. in Jour. Linn. Soc. Bot. 5, Suppl. 1:40.1860; H. Scholz in Willdenowia, 6:529.1972.

Aristida plumosa L., Sp. Pl. ed. 2,2:1666.1762; Durand & Barratte, l.c. 256; Pamp., Pl. Trip. 11.1914; Prod. Fl. Cir. 98.1931; Corti, Fl. Veg. Fezz. 43.1942; Maire, l.c. 36.

Perennial, densely caespitose. Culms erect, or slightly geniculately ascending, 10-40 cm high, 2-3 naked nodes, basal portion particularly covered with wool, internodes glabrous or finely hairy above. Leaf blade convolute, rigid, filiform, flexuous, curved in a sickle or circle, tip sgarply pointed. Panicle somewhat loose, up to 15 cm long, branches and peduncle slightly scabrous; glumes unequal, lanceolate, the lower about 15 mm long, 1-3-nerved, somewhat obtuse, the upper narrow, 1-nerved; lemma callus pointed, densely hairy, awn column 10 mm long, glabrous, the central branch plumose, prolonged into a naked tip, acute, lateral branches naked, reaching up to half of the plumose awn.

Type: Described from Armenia, *Schreber*, Herb. Linn. 98/6, 7 (LINN).

A-2 Project of Wadi Bai, 16.6.1977, *Faruqi* 1403-c; 48 km from Bir Ayad, 16.6.1977, *Faruqi* 1415 and 1416; **B-1** 80 km from Nalut on way to Ghadamas, 17.6.1977, *Faruqi* 1428; Near Derj, 18.6.1977, *Faruqi* 1439 and 1440; 5 km from Ghadamas on way to Derj, 18.6.1977, *Faruqi* 1439 and 1440; 5 km from Ghadamas on way to Derj, 18.6.1977, *Faruqi* 1435 and 1436; 10 km from Senawan on way to Ghadamas, 17.6.1977, *Faruqi* 1430; **B-4** 35 km from Bugrain on way to Hun, 4.3.1978, *Faruqi* 1558 and 1561; **C-3** 159 km from Bir Shwarif towards Brak, 14.2.1977, *M.A. Siddiqi & M. Ahmad* 1115; **C-4** 75 km from Hun towards Sebha, 5.3.1978, *Faruqi* 1567; **C-7** 40 km North of Ojla on Ajdabia Road, 14.3.1979, *A. El-Gadi* 2455.

Distribution: North and Tropical Africa, Pakistan and Kashmir.

Fl.: Feb.-June *Vern.* alemmus

7. **Stipagrostis libyca** (H. Scholz) H. Scholz in Osterr. Bot. Z. 117:289.1969; in Willdenowia, 6:545.1972; l.c. 7: 444. 1974.

Aristida libyca H. Scholz in Willdenowia, 5:121.1968.

A small and delicate annual, 5-12 cm tall. Culm many-branched, spreading, villous, naked at the nodes, base woody. Leaves conduplicate, glabrous, up to 3 cm long, curved in semi-circles, acuminate, needle-like; ligule a tuft of hair, auricles barbate. Panicle up to 6 cm long. Spikelet 15 mm long, 1 mm broad, single-flowered; glumes 2, unequal, 3-nerved, lower 12 mm long, scabrous, pilose, upper glabrous, 14 mm long, acuminate; awn 3, the central acute, plumose, 4 cm long, tip naked 1-2 mm long, basal sterile zone 15 mm long, the lateral awns naked, 10-17 mm long; palea minute.

Type: Described from Libya.

Reported from Cyrenaica, South Cyrenaica and Fezzan by Scholz (l.c.).

Distribution: Endemic to Libya.

Fl.: Mar.-Nov.

8. **Stipagrostis multinerva** H. Scholz, in Osterr. Bot. Z. 117:289.1969; in Willdenowia, 6:548.1972; l.c. 7:444.1974.

Perennial, tufted, erect, up to 30 cm high. Culm with lower internodes wooly, the upper somewhat glabrous. Lower leaf sheaths wooly, ligule a ring of short hairs, auricle barbate. Panicle partly enclosed, about 12 cm long, contracted, rachis scabrous on angles. Spikelets erect, green; glumes unequal, minutely scabrous; lower glume 5-7-nerved, about 14 mm long, pilose, upper glume 3-5-nerved, 14-16 mm long, pilose above; lemma smooth, callus 2.0-2.5 mm long, lemma 6-7 mm long; plumose awn 35-45 mm long, 12-20 mm naked below, 2 mm naked above; lateral awn branches 14 mm long, non-plumose, palea minute.

Type: Described from Southern Arabia, *Philley*.

Reported from South Cyrenaica by Scholz (l.c.).

Distribution: Algeria, Libya, Arabia, Sinai, Iran, Afghanistan.

Fl.: Mar.-Apr.

9. **Stipagrostis shawii** (H. Scholz) H. Scholz, in Osterr. Bot. Z. 117:290.1969; Willdenowia, 6:546.1972.

Aristida shawii H. Scholz in Willdenowia, 5:475.1969; l.c. 6:546. 1972; l.c. 7: 444. 1974.

Annual, 15 cm tall, fascicled, branches cauline. Culm covered with short appressed hairs. Leaves 10 cm long and filiform, 0.5 mm wide; leaf sheath wooly to scabrous. Panicle loose, 10 cm long, tip of pedicel hairy; glumes puberulent, scabrous in the middle, outer glume shorter than the inner, the outer 11-14 mm long, 7 (-9)-nerved, the inner 15-16 mm long, 5-nerved, 2 tufts of hair at the base on either side of the glume; lemma 3-4 mm long; callus 2-2.5 mm long; column 3-5 mm long; the plumose awn 45-47 mm long, with 15-18 mm naked base, lateral awns 12-15 mm long, barely touching the base of the plumose portion of the central awn; palea minute.

Type: Uwainat, Libya, *Shaw*.

Reported from Uwainat by Scholz (l.c.).

Distribution: Endemic to Libya (Uwainat area)

Fl.: Mar.

10. **Stipagrostis zittelii** (Aschers.) de Winter, in Kirkia, 3:136.1963; Scholz in Willdenowia, 7:444.1974; Täckh. St. Fl. Egypt ed. 2, 725. 1974.

Aristida zittelii Aschers., in Verh. Bot. Ver. Brandenb. 21:70.1880; *A. acutiflora* Trin. et Rupr. ssp. *zittelii* (Aschers.) Maire et Weiller, Fl. Afr. Nord. 2:41.1953.

A tufted annual or perennial. Culm several-noded, glabrous. Leaf 15 cm or more long, usually not curved. Panicle richly branched and open. Spikelet one-flowered; lower glume scabrous; central awn plumose up to the tip, obtuse, up to 15 mm long; lateral awns half as long as the plumose awn.

Type: Described from Egypt (Uweinat) Ascherson.

Distribution: Libya and Egypt.

11. **Stipagrostis acutiflora** (Trin. et Rupr.) de Winter, in Kirkia 3:133.1963; Scholz in Willdenowia, 7:445.1974. (Fig. 76)

Aristida acutiflora Trin. et Rupr., Gram. Stip. 167.1842; Maire, Fl. Afr. Nord. 2:40.1953.

Tufted annual or perennial, 30-40 cm tall. Culm pubescent, especially lower internodes covered with long white hair, erect branches slender. Leaves glabrous, linear, needle-like, curved into a sickle, 3-4 cm long; leaf sheath glabrous; ligule hairy. Inflorescence a branched panicle, 7-10 cm long, spikelet single-flowered; glumes 2, glabrous or densely pubescent, somewhat unequal, the lower 8 mm long and 1-nerved, the upper 9 mm long and 3-nerved, acuminate or mucronate; lemma 3 mm long; callus barbed, central awn bearded, 11 mm long, acute, naked tip 1.5 mm long, naked base 3 mm long, 2 lateral awns, naked, 5.5 mm long.

2 ssp. are recognized here.

+ Panicle branches short; lower glume glabrous	1. ssp. **acutiflora**
– Panicle branches thinner and larger; lower glume densely pubescent,	2. ssp. **algeriensis**

1. ssp. **acutiflora.**

Panicle branches short, lower glume glabrous, scabrous on keels.

Type: Described from Egypt and Arabia.

B-1 70 km from Ghadamas on way to Nalut, 18.6.1977, *Faruqi* 1438. **E-8** Kufra, 27.1. 1979, *A. El-Gadi* 2318-G.
Also reported from Fezzan, South Cyrenaica and Jabal Uwainat by Scholz (l.c.).

Distribution: North and West Africa.

Fl.: June

2. ssp. **algeriensis** (Henrard) H. Scholz, in Osterr. Bot. Z.117:286.1969; Scholz, in Willdenowia 7:445.1974.

Aristida zittelii Aschers. var. *algeriensis* Henr., Monogr. Genus *Aristida*



Fig. 76 **Stipagrostis acutiflora**: A, habit × 1; B, portion of lamina, sheath and ligule × 5; C, portion of panicle × 2; D, glumes ×5; D_1, floret × 5; E, lower glume × 5; E_1, upper glume × 5; F, stamens and pistil × 10.

62.1929; *A. acutiflora* var. *algeriensis* (Henr.) Maire and Weiller in Maire, Fl. Afr. Nord. 2:41.1953.

Panicle branches thinner and larger; lower glume densely pubescent, more or less ciliate on keels.

Type: Described from Algeria.

Reported from Fezzan by Scholz (l.c.).

Distribution: Algeria, Tunisia and Libya.

12. **Stipagrostis obtusa** (Delile) Nees in Linnaea 7:293.1832; Scholz in Willdenowia 7:445.1974.

Aristida obtusa Delile, Fl. Egypt. Expl. Pl. 13, tab. 13, fig. 3: 31. 1813; Maire, Fl. Afr. Nord. 2: 47. 1953; *Arthratherum obtusum* (Delile) Nees, Fl. Afr. Austr. 1: 179. 1841.

Plant erect, densely caespitose. Culms delicate, 20 (-30) cm tall, single-noded. Leaves up to 10 cm long, 0.5 mm wide, crowded at the base, curved, delicate, tip spiny, glabrous, pubescent on the base; ligule a tuft of hair, lower sheaths wooly at the margins. Panicle exserted above the crowded leaves, linear-lanceolate, up to 15 cm long. Spikelets 7-10 mm long; glumes subequal, 8-9 mm long, glabrous, narrowly lanceolate, acuminate; central awn plumose, up to 25 mm long, obtuse, plumose part up to 17 mm long, lateral awns naked, c. 13 mm long; lemma oblong-cylindrical, 2-3 mm long, callus hairy; anthers about twice as long as the lemma. 2n = 22.

Type: Described from Egypt.

A-2 68 km after Tiji, towards Tripoli, 18.4.1975, *S.I. Ali* 2893; **A-3** c. 20 km N. Gharian hills, 7.6.1968, *Boulos* s. n.; **B-1** 17 km from Nalut on way to Tripoli, 23.5.1976, *Faruqi* 945, 946 and 947; **B-2** Jinawan, 21.5.1976, *Faruqi* 814, 815 and 816; 65 km from Mizda towards Al Ghariat, 13.12.1977, *Faruqi* 1106; c. 24 km from Mizda, 10.4.1974, *S.I. Ali* 1982; **B-3** 116 km from Mizda towards Bir Shwarif, 13.2.1977, *M.A. Siddiqi & M. Ahmad* 1110; Bir el Azar, Wadi Suf el Gin, 4.12.1978, *Gintzburger* 78120403.

Distribution: Africa, Sinai, Palestine, Arabia, Kuwait and Pakistan.

This species, according to Bor (Fl. Iraq. 9:389.1968) and Keith (l.c.), is a very palatable forage for the grazing animals. The arid and sandy habitat of this species makes it an important plant to be exploited as a forage.

Fl.: Dec.-May *Vern.* nisha.

13. **Stipagrostis foexiana** (Maire et Wilczek) de Winter in Kirkia, 3:134.1963; Scholz in Osterr. Bot. Z. 117.287.1969; in Willdenowia, 7:445.1974.

Aristida foexiana Maire et Wilczek in Bull. Soc. Hist. Afr. du Nord 25:322.1934; Maire, Fl. Afr. Nord. 2:48.1953; *A. obtusa* Delile f. *araneosa* Corti, Fl. Veg. Fezz. 43.1942; Keith (l.c.) 251.

Perennial, highly tufted, up to 10 cm high, cushion-like. Leaves filiform, semicircularly bent, 3-4 cm long, 0.5 mm wide, covered with villous hairs; long hairy ligule. Inflorescence 10-15 cm long, axis and branches scabrous. Spikelets somewhat loose on various sized branches; 10 mm long, 1 mm wide or less; glumes subequal, lower smaller, 10-12.5 mm long, lanceolate, 3-nerved, scabrous above, obtuse, lacerated; the upper 11-13 mm long, very narrow, 3-nerved, shortly mucronate; plumed awn obtuse, (2.5)-4.2 cm long; lateral branches naked, 14-22 cm long, longer than the naked zone of the plumose awn; callus bifid; lemma oblong; palea very small.

Type: Described from Tafilalet oasis, Morocco.

B-3 Bir el Azar, Wadi Suf el Jin, 4.12.1978, *Gintzburger* 78120405. **C-4** 87 km from Bu Njem, 27.3.1975, *S.I. Ali* 2437.

Also reported from Fezzan by Corti (l.c.) and Scholz (l.c.).

Distribution: Libya, Tunisia, Algeria, Chad and Arabia.

Fl.: Dec. *Vern.* alemmouz; naussi; nessa; n'sa; n'sha.

The bifurcated callus in this species is unique and it is not found in any other species of the genus *Stipagrostis.* Long hairs on leaves is also an important diagnostic character.

66. DACTYLOCTENIUM

Willd., Enum. Pl. Hort. Berol.:1029.1809.

Annual or perennial. Leaf flat. Inflorescence 2-5 digitate spikes, rarely reduced to 1, spikes terminated by the naked tip of the rachis. Spikelets crowded, laterally compressed, breaking at maturity with 3-6 sessile florets; florets hermaphrodite; glumes subequal, the outer persistent and shortly awned or mucronate, mucro scabrous and curved; lemma similar to outer glume, mucronate or awned, awn or mucro curved; stamens 3, styles 2, plumose; lodicules 2; caryopsis sculptured.

About 10 species in tropics and subtropics; only 1 species is found in Libya.

Dactyloctenium aegyptium (L.) P. Beauv., Ess. Agrost. 15.1812; Scholz in Willdenowia, 7:445.1974. (Fig. 77)

Cynosorus aegyptius L., Sp. Pl. 72.1753; *D. aegyptiacum* (L.) Willd., Enum. Hort. Berol. 2:10291809; Durand & Barratte, l.c. 261; Pamp., Pl. Trip. 21.1914; *D. aegyptium* (L.) Asch. & Schw., 3. Fl. Egypt. 171. 1889; Maire, Fl. Afr. Nord. 2: 188. 1953.

Annual. Culms erect or prostrate, rooting at nodes, smooth, glabrous, branches ascending. Leaf sheath loose, glabrous or with few scattered hairs; blade up to 10 cm long, 5 mm wide, linear-lanceolate, acuminate, bulbous based hair on margins and scattered on the surfaces. Spikes 2-5 (rarely 1), 2-3 cm long, axis flat with an acuminate tip. Spikelets arranged in 2 rows along the ventral side of the axis. 2n = 20,34,36,40,48.

Syntypes: Described from Africa, Asia and America.

A-2 Kabao, roadside valley, 5.5.1972, *Ali* and *M. Khalifa* 341; **A-3** Tripoli, University campus, 14.7.1977, *Faruqi* 1453; c. 60 km from Tarhuna, on way to Tripoli, 6.8.1977, *Faruqi* 1470; **G-8** Jebal Uwainat, 7.11.1968, *Boulos* 3160.

Distribution: Throughout the tropics and subtropics of the world.

Fl.: May-Nov.

A common weed of shady and moist places during warm months. A grass of little fodder value. The seeds have been used in the treatment of inflamation of kidneys, nervous disorders and the roots for amenorrhoea.

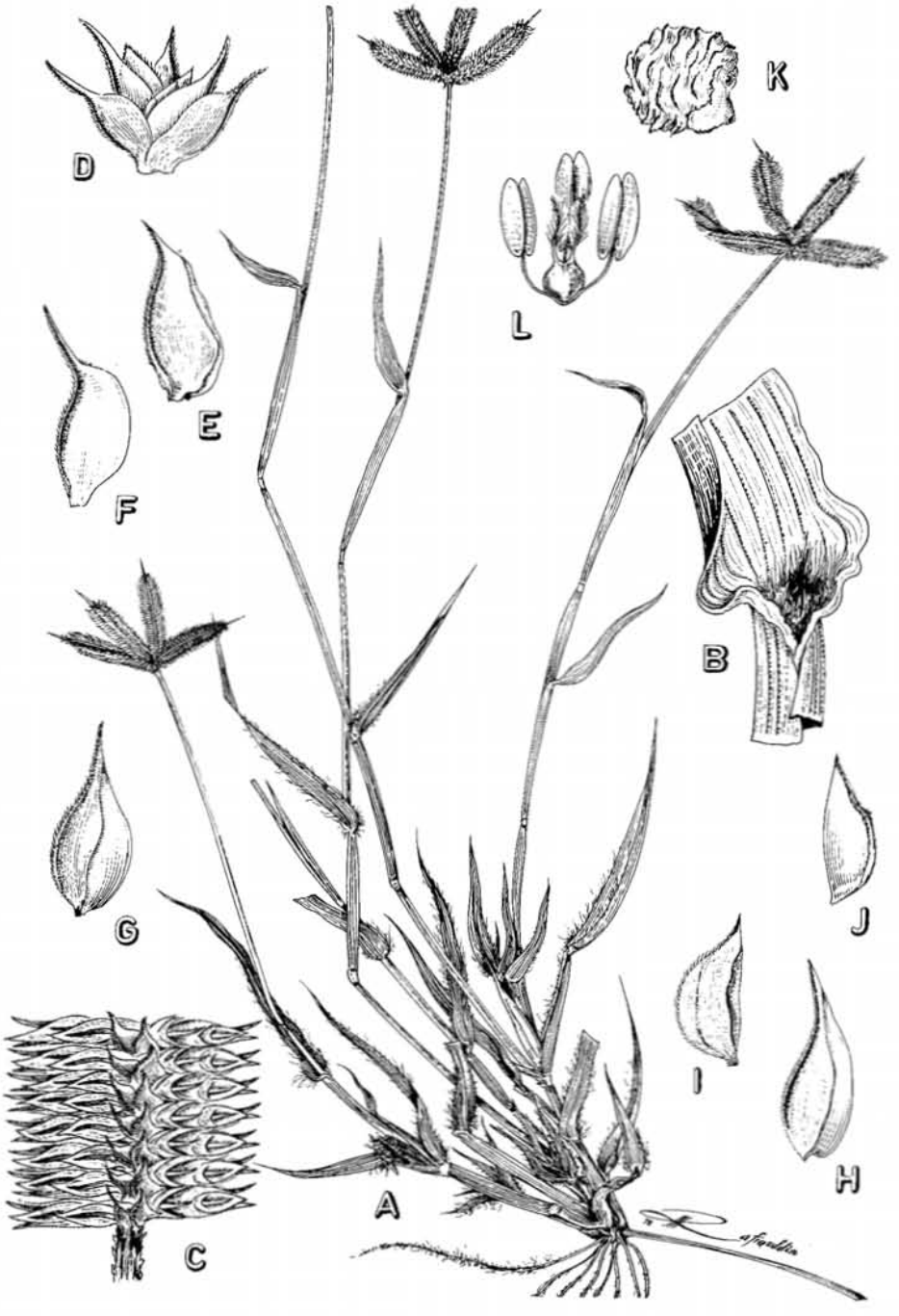


Fig. 77 **Dactyloctenium aegyptium**: A, habit × 0.5; B, portion of lamina, ligule and sheat × 5; C, portion of spike × 4; D, spikelet × 6; E, lower glume × 8; F, upper glume × 8; G,H. lemma × 8; I, J, palea × 8; K, caryopsis × 20; L, stamens and pistil × 20.

67. **DESMOSTACHYA**

Stapf. in Dyer, Fl. Cap. 7:632.1900.

Stapfiola O. Kuntze in Post and Kuntze, Lexic.532.1903.

Perennial. Leaves very long, flat, glabrous. Inflorescence of an elongated many-noded axis with spikes on each node. Spikelets hermaphrodite, many-flowered, awnless; glumes unequal, membranous, 1-nerved; lemma ovate, acute; palea 2-keeled, shorter than lemma; lodicules 2; stamens 3; stigmas plumose, styles 2, caryopsis ovate.

A monotypic genus of the old world tropics and subtropics.

Desmostachya bipinnata (L.) Stapf. in Dyer, Fl. Cap. 7:632.1900; Corti, Fl. Veg. Fezz., 55.1942; Maire, Fl. Afr. Nord. 2:180.1953; Keith, l.c. 432; Scholz in Willdenowia, 7:445.1974. (Fig. 78)

Briza bipinnata L., Syst. Nat., ed. 10,2:875.1759; *Uniola bipinnata* (L.) L., Sp. Pl. ed. 2, 1:104.1762; *Eragrostis cynosuroides* (Retz.) P. Beauv., Ess. Agrost. 162. 1812. Boiss., Fl. Or. 5: 583. 1884; Durand & Barratte, Fl. Lib. Prodr. 265. 1910; *Eragrostis bipinnata* (L.) K. Schum. in Engl., Planzenw. Ost. Afr. C:113. 1895; *Stapfiola bipinnata* (L.) O. Ktze in Post. & O. Ktze, Lexic. Gen. Phan. 532. 1903.

A rhizomaceous perennial. Culm up to 80 cm tall, glabrous. Leaf linear, convolute up to 50 cm long, sheath leathery, glabrous, lighter in colour than the blade. Inflorescence up to 60 cm long, 2-3 cm wide, narrow, linear, tapering towards the tip. Spikelets up to 8-(18)-flowered; upper glume 2 mm and lower glume 1.5 mm long; lemma with a blunt mucro.

Type: Egypt, *Hasselquist.*

D-3 Idri, 17.2.1934, *Corti* 847 (Fl); **E-1** Birkit, very common along the valleys in sandy ground, 24.2.1976, *S.M.H. Jafri* 6340; 7 km from Ghat in Barkat, 19.2.1977, *M.A. Siddiqi & M. Ahmad* 1132.

Distribution: Tropics and subtropics of the old world.

Fl.: Feb.-Mar.

This species is quite common in sandy soil with a high water table and has little

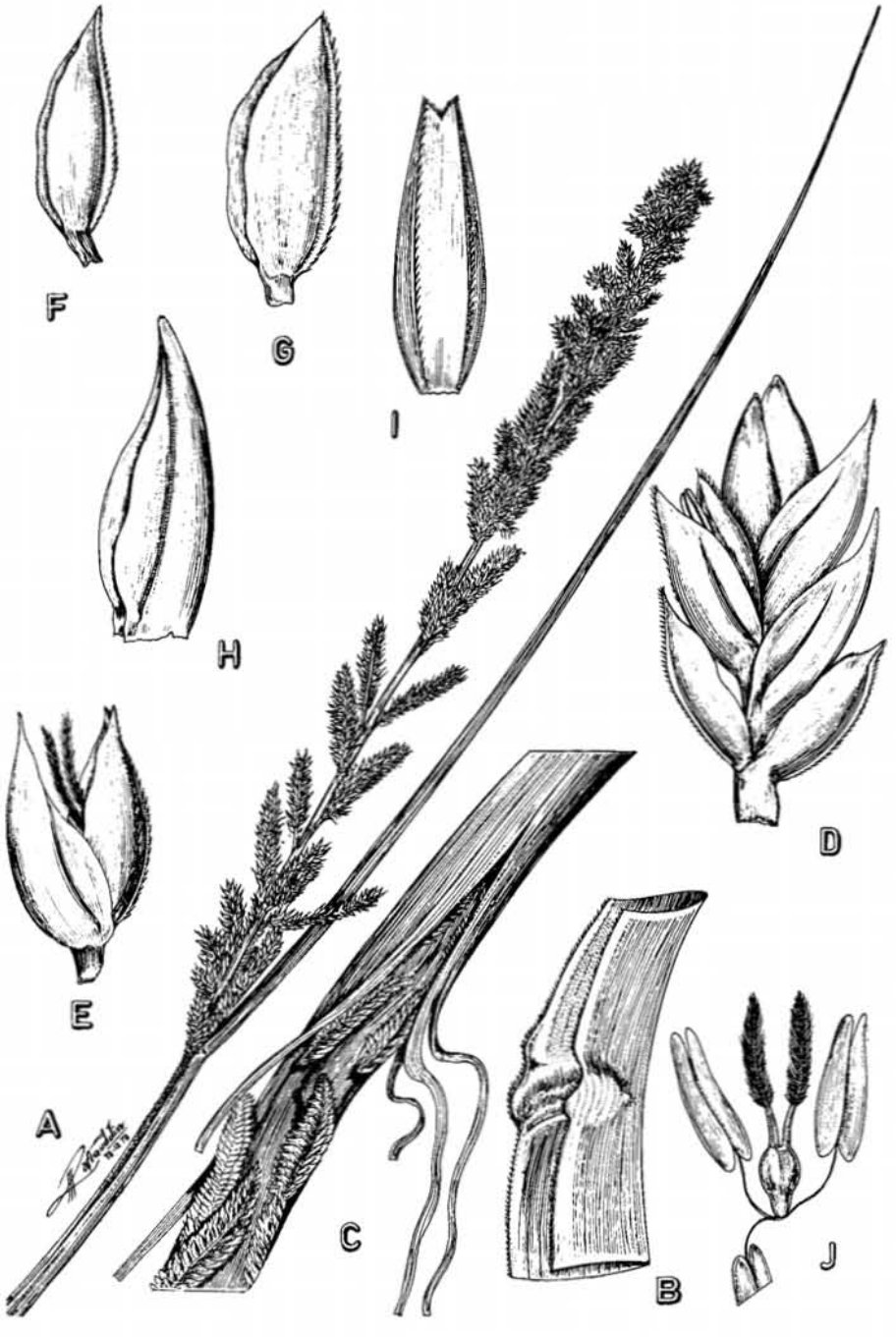


Fig. 78 **Desmostachya bipinnata**: A, flowering shoot × 1; B, portion of lamina, ligule and sheath × 6; C, portion of spike × 3; D, spikelet × 15; E, floret × 20; F, lower glume × 20; G, upper glume × 20; H, lemma × 20; I, palea × 20; J, stamens and pistil × 20.

fodder value. Ropes, roofs, baskets and other items are made from its leaves and can also be used for making low quality paper.

68. ELEUSINE

Gaertn., Fruct. Sem. Pl. 1:7, tab.1.1789.

Mostly annual, rarely perennial. Leaves conduplicate or flat; ligule reduced to a ring of hair. Inflorescence of 2-several digitate or subdigitate spikes terminated by spikelets. Spikelets sessile, 2-rowed on one side of rachis, 3-12-flowered, laterally compressed, awnless; florets all hermaphrodite or uppermost reduced, rachilla disarticulating between the glumes and the lemma; glumes subequal, persistent, lower 1-nerved, upper 3-nerved; lemma 3-nerved, longer than the glume, pointed; palea keeled, narrowly elongated, anthers usually 3. Caryopsis rugose.

9 species from tropics and subtropics of the world, represented by 3 species in Libya.

1. + Perennials, stem creeping and rooting at nodes; basal sheaths wooly — 2. **E. compressa**
   — Annuals, stem ascending and not rooting at nodes; basal sheaths glabrous or hairy on the margins only — 2

2. + Spikes 8-10 mm wide — 3. **E. coracana***
   — Spikes 3-6 mm wide — 1. **E. indica**

1. **Eleusine indica** (L.) Gaertn., Fruct. Sem. Pl. 1:8.1789; Durand & Barratte, l.c. 260 & 322; Maire, l.c. 186; Keith, l.c. 452; Scholz in Willdenowia, 7:446.1974. (Fig. 79)

   Cynosurus indicus L., Sp. Pl. 72.1753.

Annual, fascicled, glabrous, culm compressed, somewhat glaucescent, up to 60 cm tall. Leaves up to 35 cm × 2-8 mm, linear, tip pointed bluntly, flat or folded; sheath margins with long hairs. Inflorescence long peduncled, subdigitate with 2-4 verticillate spikes at the tip and 1-2 below, rarely more; spikes up to 15 cm long and up to 6 mm wide, rachis pubescent or villous at the base. Spikelets 2-4 mm long, 3-6 florets, glabrous; glumes lanceolate, pointed, unequal, 3-nerved, the lower 2-3 mm, the upper 3-4

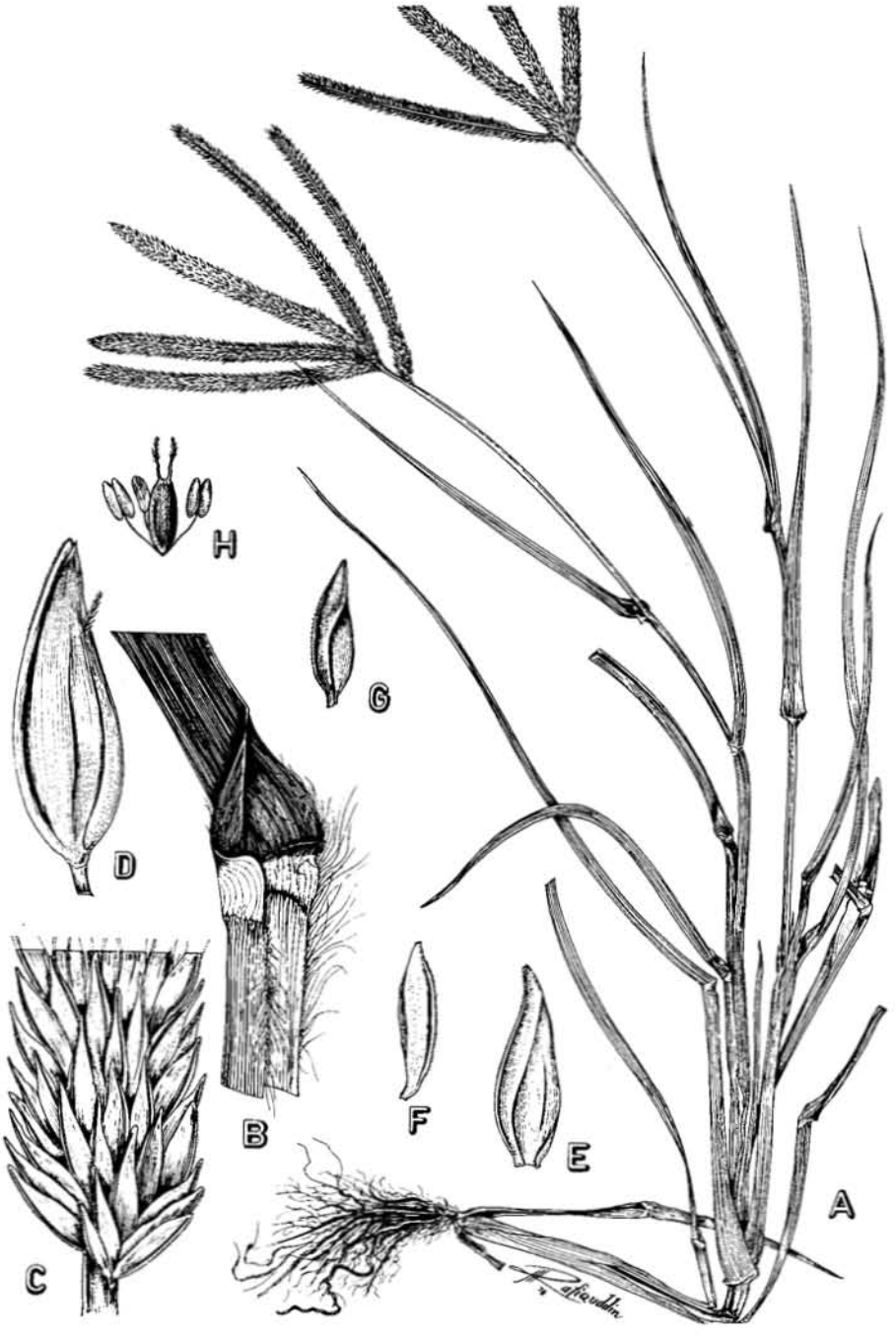


Fig. 79 **Eleusine indica**: A, habit × 0.5; B, lamina base, sheath and ligule × 5; C, basal portion of spike × 5; D, floret × 20; E, upper glume × 10; F, lower glume × 10; G, lemma × 10; H, stamens and pistil × 10.

mm long; lemma 3-4 mm long, lanceolate, pointed, 3-nerved; palea very small, bidentate, 2-keeled, finely ciliolate; anthers 3; caryopsis rugose. 2n = 18,36.

Type: Described from Indies (Jamaica), Herb. Linn. 91/15 (LINN).

A-3 Tripoli University campus, 14.7.1977, *Faruqi* 1448, 1449, 1450 and 1452; *id.*, 17.11.1975, *Fathi, B.R.* 4.

Distribution: Distributed in the tropics and subtropics of the world.

It is a very important forage grass of summer months.

Fl.: June-Nov.

2. **Eleusine compressa** (Forsk.) Aschers. & Schw. ex Christensen, in Dansk Bot. Ark. 4,3:12.1922.

Panicum compressum Forsk., Fl. Aeg.-Arab.18.1775; *E. flagellifera* Nees, in Linnaea 16:220.1842; Keith, l.c. 451.

Prennial, woody, prostrate with erect branches from the node, glabrous, glaucous, nodes pilose. Leaves glaucous, linear, acuminate, margin scabrous, up to 10 cm × 3 mm; basal sheaths wooly. Inflorescence shortly peduncled, spikes 2-5, digitate. Spikelets 3-8-flowered, laterally compressed; glumes lanceolate, 1-nerved, glabrous, pointed, unequal, the lower 2.5 mm, the upper 4 mm long; lemma lanceolate-acuminate, mucronate, 3-nerved, villous; palea very small, 3 mm long, bidentate, 2-keeled, shortly ciliate; lodicules 2, glabrous; anthers 3.

Type: Arabia, "In montibus Hadiensibus", *Forskal* 46 (C).

Reported by Keith (l.c.) from Tibesti.

Distribution: North Africa, Arabia, Persia, Afghanistan and Pakistan.

A species of warmer arid or sandy areas, may be expected from the southern parts of Libya.

Editor's note: Cope in Nasir & Ali, Fl. Pak. 143: 81. 1982, treated *E. compressa*

(Forssk.) Asch. & Schweinf. under *Ochthocloa* Edgew (a monotypic genus) as *O. compressa* (Forssk.) Hilu.

3. ***Eleusine coracana** (L.) Gaertn., Fruct. Sem. Pl. 1:8,tab.1,fig. 11.1789; Durand & Barratte, l.c. 260; Corti, Fl. Veg. Fezz. 469.1942; Maire, l.c. 187; Keith, l.c. 451; Scholz, l.c. 446. (Fig. 80)

Cynosurus coracanus L., Syst. Nat. ed. 10,2:875.1759.

Annual, tufted, up to 30 cm tall. Culm highly ridged. Leaf flat, soft, up to 15 cm long and 5 mm wide, sheath loose and glabrous. Inflorescence a digitately or subdigitately arranged 2-4 or more spikes, up to 8 cm long, 8-10 mm wide. Spikelets arranged on one side of axis, the tip of the axis is terminated by spikelets, axis flat, winged and with scattered glandular hairs; glumes highly keeled, hairy, obtuse; lemma keeled, obtuse; caryopsis globose, c. 1.5 mm diameter. 2n = 36.

Type: Locality not given.

A-3 Tripoli, University Agriculture farm, 30.10.1978, *Faruqi* 1851; **D-3** Brak, in cultivation, 7.3.1978, *Faruqi* 1594.

Distribution: Cultivated in the Tropics of the Old World.

Sometimes grown as a fodder, especially in the southern parts of Libya.

Fl.: Oct.-Mar. Vern. Beshna, Gtania beda (the white grain var.): hamra (the red grain var.); sawda (the black grain var.)

69. DINEBRA

Jacq., Fragm. 3:t.121.f.1:77.1809.

Annual. Leaf flat. Inflorescence of narrow spikes arranged on a long axis, spikes spreading or drooping. Spikelets sessile, 2-rowed on a flat rachis, 2-3-flowered; glumes subequal, narrow, acuminate, keeled, narrowed to an awn-like point; florets bisexual; lemmas much shorter than glumes, awnless, 2-toothed at the apex; palea as long as the lemma; stamens 3; lodicules 2; caryopsis elliptic, 3-angled.

A monotipic genus in the tropics and subtropics of the world.

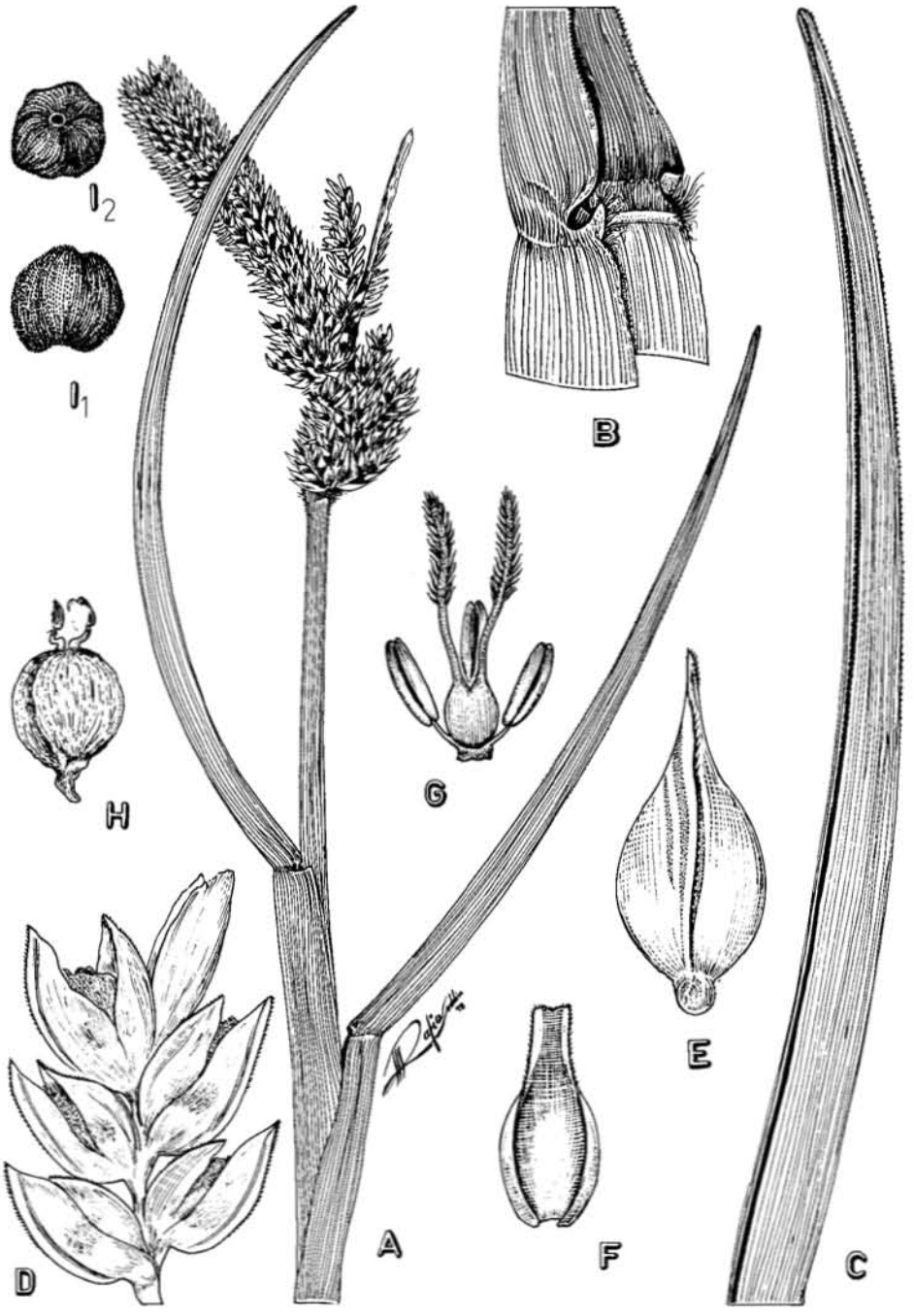


Fig. 80 **Eleusine coracana**: A, portion of flowering shoot × 0.75; B, lamina base, sheath and ligule × 5; C, lamina × 2; D, portion of spike × 5; E, lower glume × 10; F, upper glume × 10; G, stamens and pistil × 15; H, floret at fruiting state × 10; I_1, I_2, caryopsis (2 views) × 10.

Dinebra retroflexa (Vahl) Panz. in Denschr. Akad. Wiss. Munchen: 1813:270. 1814; Boiss., Fl. Or. 5: 557. 1884. (Fig. 81)

Cynosurus retroflexus Vahl, Symb. Bot. 2:20.1791.

Annual, erect. Culm glabrous up to 70 cm tall. Leaf up to 15 cm long, 6 mm wide, glabrous. Inflorescence with alternate and opposite, spaced spikes arranged on a long and flattened axis, decreasing in length from the base to the top, at least some of the mature spikes reflexed, lower ones up to 6 cm long. Spikelets with mucros up to 1 mm long; glumes glabrous, narrowly lanceolate, tapering into a 1-5 mm long awn; lemma glabrous, hyaline, especially near the tip, mucronate, keeled at the midnerve; palea smaller than the lemma, tip bifurcated, 2n = 20.

Type: India, *La Mark* (C).

A-7 Jabal Akhdar, Oct. 1970, *L. Boulos* 4472.

Distribution: World tropics and subtropics.

Fl.: Oct.

The Libyan material based on a single gathering shows spikes 5-20 mm long, while the spikelets 5-8 mm long.

It is an uncommon weed of little or no economic value. Grows on irrigated lands and along the water channels. It is harmful as a fodder in the dry state as its bristles injure the mouth of the animals, but when green it may be utilized as a fodder.

70. ERAGROSTIS

Wolf, Gen. Pl. Vocab. Char. Def. 23. 1776.

Annual or perennial. Leaf narrow, linear, with or without glandular hairs. Inflorescence an open and branched panicle, rarely contracted. Spikelets pedicelled, 2-many florets, laterally compressed; rachilla disarticulating from above downwards, or tough and persistent, falling from below upwards; florets hermaphrodite; glumes more or less unequal, 1-(3)-nerved, smaller than the lowest lemma; lemma usually pointed, or shortly mucronate, 3-nerved, more or less overlapping, keeled; palea subequal, 2-keeled, with or without cilia on keels; stamens 2-3; lodicules 2, minute, rarely absent; ovary



Fig. 81 **Dinebra retroflexa**: A, habit × 0.5; B, portion of lamina, ligule and sheath × 5; C, spikelet × 8; D, lower glume × 8; E, upper glume × 8; F, stamens and pistil × 15; G, lemma × 10; H, palea × 10; I,J, caryopsis × 15.

glabrous; caryopsis subglobose.

About 300 species distributed mostly in sub-tropics of the world; 6 species are reported from Libya.

1.	+ Palea with long ciliate hairs on the keel	6. **E. ciliaris**
	— Palea not as above	2
2.	+ Lowest panicle branches whorled (3 or more); palea not persistent on rachilla	3
	— Lowest panicle branches not whorled (less than 3); palea persistent on rachilla	4
3.	+ Lowest panicle branches pilose in the axil; lemmas 1-1.8 mm long, florets deciduous, grain ellipsoid; wild plants	1. **E. pilosa**
	— Lowest panicle branches not pilose in the axil; lemmas 2-2.7 mm long, florets persistent, grain ovate-oblong, turgid; cultivated plants	5. **E. tef***
4.	+ Spikelets 2 mm or more wide; leaf blades glandular on the margins	4. **E. cilianensis**
	— Spikelets less than 2 mm wide; leaf blades eglandular on the margins	5
5.	+ Inflorescences spiciform, contracted, all terminal on leafy stem	3. **E. aegyptiaca**
	— Inflorescences an open panicle, both terminal above and axillary below (lower leaf sheath with small axillary inflorescence)	2. **E. barrelieri**

1. **Eragrostis pilosa** (L.) P. Beauv., Ess. Agrost. 162.1812; Maire, Fl. Afr. Nord 2:171.1953; Scholz in Willdenowia, 7: 424. 1974. (Fig. 82)

Poa pilosa L., Sp. Pl. ed. 1: 68. 1753.

Annual, tufted, branched, erect-geniculately ascending, glabrous, up to 50 cm tall. Leaf glabrous, without glands, up to 20 cm long, 3 mm wide; sheath loose; ligule hairy.

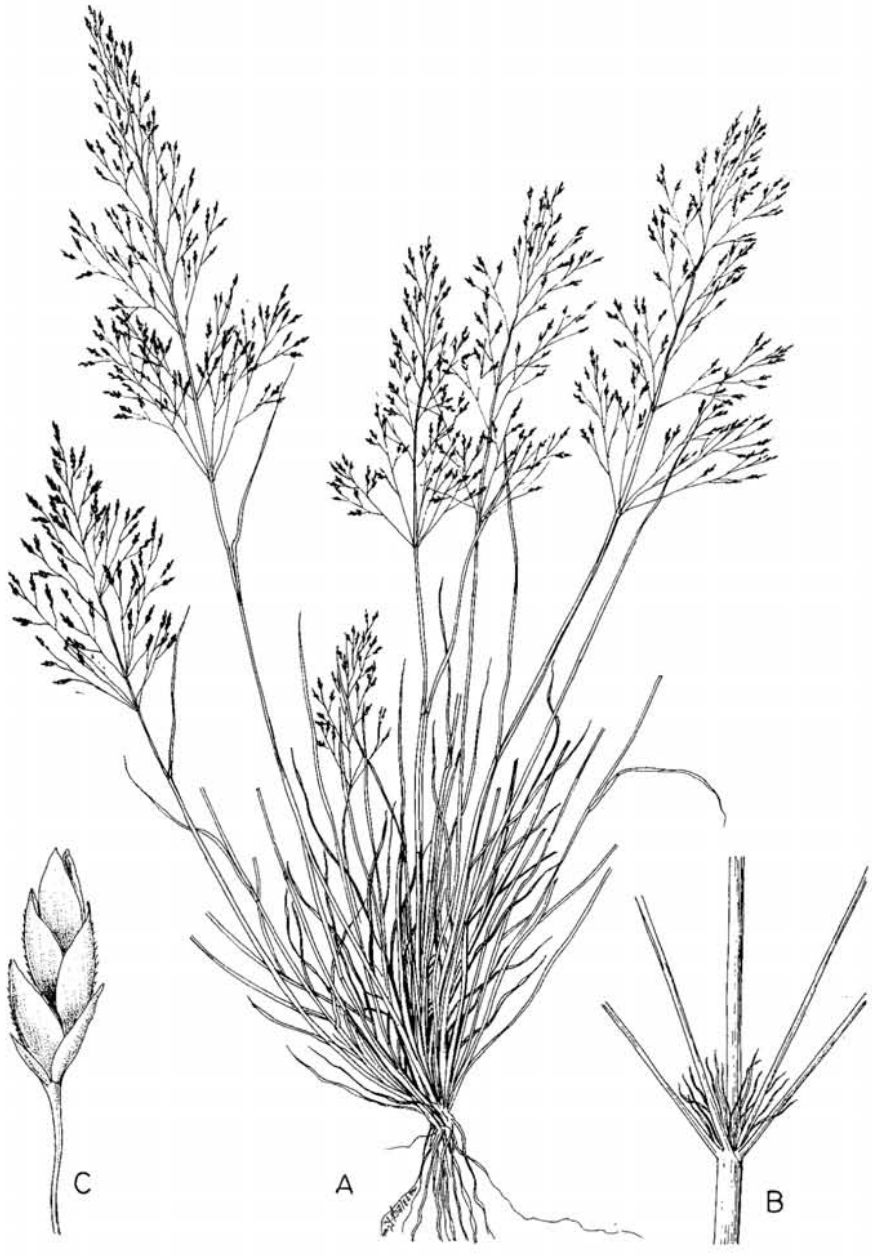


Fig. 82 **Eragrostis pilosa**: A, habit × 0.5; B, lower panicle branches showing pilose hairs in the axils × 5; C, spikelet × 10.

Inflorescence a highly branched large panicle, up to 25 cm long, the lowest axis of the panicle pilose, the rest glabrous; lower branches verticillate, the upper verticillate or alternate. Spikelets linear to linear-lanceolate, up to 5 mm long, 1 mm wide, long and narrow, 6-10 florets; glumes membranous, unequal, the lower 0.5 mm long, the upper 1.2 mm long, 1-nerved, glabrous; lemma 1-1.8 mm, ovate-lanceolate, 3-nerved, emarginate, glabrous; palea smaller, keeled, scabrous over keels, not persistent on rachilla. Caryopsis oblong. 2n = 35, 40, 60.

Type: Described from Italy, *Triumfettus.*

E-1 70 km from Ghat, behind new airport, 19.2.1977, *M.A. Siddiqi & M. Ahmad* 1129, 1131 and 1131-a.

Also reported to be present in Tripolitania by Scholz (l.c.).

Distribution: Tropics and subtropics of the world.

FL.: Feb.

2. **Eragrostis barrelieri** Dav. in Morot, Jour. Bot. 8: 289. 1894; Maire, l.c. 172; Keith, l.c. 459; Scholz, l.c. 7: 445. (Fig. 83)

E. minor auct. non Host, Gram. Austr. 4: 15. 1809; Durand & Barratte, Fl. Lib. Prod. 265. 1910; Pamp., Pl. Trip. 22. 1914.

Annual, somewhat glaucescent, geniculately ascending, sparsely branched, up to 60 cm tall. Leaf blade linear-lanceolate, acuminate, up to 10 cm long, 5 mm wide, margins glandular, sheath loose. Inflorescence a loosely branched terminal and axillary panicle, oblong-lanceolate, 10-20 cm long, axis glabrous, branches angular, barbed; pedicel with a raised band-like crateriform gland. Spikelets linear to linear-lanceolate 8-15 mm long and less than 2 mm wide; glumes unequal, lanceolate, 1-nerved, scabrous, the lower 1 mm, the upper 2 mm long; lemma oblong to oblong-lanceolate, obtuse, up to 2 mm long, 3-nerved, glabrous to scabrous; palea obtuse, 2-keeled, persistent on rachilla; lodicules 2; anthers 3. Caryopsis broadly oblong and 0.7-8.8 mm long. 2n = 60.

Type: Described from Egypt, *Ascherson* 336 (K).

D-3 Wadi Ash Shati, fields near Brak, 11.10.1978, *C. Ricceri & C.H. Steinberg* 107.



Fig. 83 **Eragrostis barrelieri**: A, habit × 0.5; B, mature spikelet showing persistent palea × 5; C, spikelet × 5.

Also reported from Tripolitania and Fezzan by Pamp. (l.c.), Maire (l.c.), and Scholz (l.c.).

Distribution: Mediterranean, S.W. Europe, S.W. Asia, Tropical and S. Africa. Introduced into Australia and N. and C. America.

3. **Eragrostis aegyptiaca** (Willd.) Link, Hort. Berol. 1: 191. 1827; Scholz, l.c. 446. (Fig. 84)

Poa aegyptiaca Willd., Enum. Pl. Hort. Berol. 2: 107. 1809.

Short, geniculate or erect, tufted, annual. Leaf lanceolate, acuminate, up to 6 cm long, 4 mm wide. Panicle spike-like and terminal. Spikelet 1.5-2 mm wide; pedicel short, 6-12 florets per spikelet; glumes subequal, cup-like, keel prominent; lemma 1.5-2.0 mm long, glabrous, 3-nerved, caducous; palea persistent.

Type: Described from Egypt.

E-1 70 km from Ghat, behind new airport, 19.2.1977, *M.A. Siddiqi & M. Ahmad* 1128 and 1130.

Distribution: W. Africa, Egypt, Sudan.

Fl.: Jan.-Mar.

4. **Eragrostis cilianensis** (All.) Vign.-Lutati Malpighia 18:386.1904; Maire, Fl. Afr. Nord 2:174.1953. (Fig. 85)

Poa cilianensis All., Fl. Ped. 2: 246. 1785; *Briza eragrostis* L., Sp. Pl. 70. 1753, non *Poa eragrostis* L., *Poa megastachya* Koel., Descr. Gram. 181. 1802; *E. megastachya* (Koel.) Link, Hort. Berol. 187.1827; Pamp., Pl. Trip. 22.1914; Keith, l.c. 459; Scholz, l.c. 445.

Annual, fasciculated, up to 80 cm tall, geniculately ascending, glabrous, leaves flat, up to 20 cm long and 8 mm wide, linear-lanceolate, acuminate, glabrous; sheath with long hairs at the throat, raised glands present at the margins of leaf-blades. Inflorescence a branched panicle, up to 30 cm long, 6-12 cm wide. Spikelets 2 mm or more wide, ovate or ovate-oblong, with or without crateriform glands; glumes unequal, the

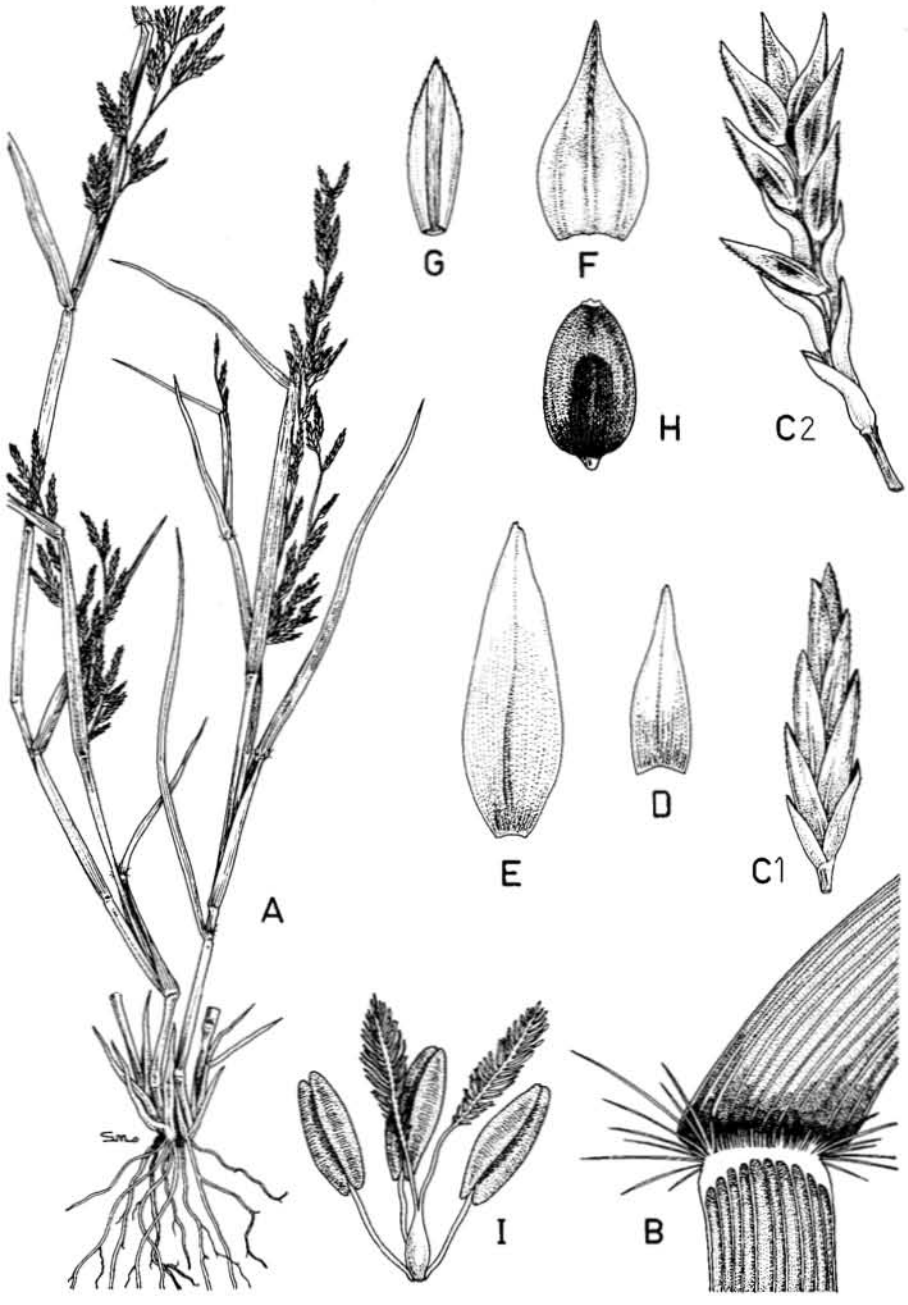


Fig. 84 **Eragrostis aegyptiaca**: A, habit × 1; B, portion of lamina, sheath and ligule × 8; C_1, young spikelet × 10; C_2, old spikelet × 8; D, lower glume × 20; E, upper glume × 20; F, lemma × 15; G, palea × 15; H, caryopsis × 30; I, stamens and pistil × 40.



Fig. 85 **Eragrostis cilianensis**: A, habit × 0.5; B, portion of leaf-blade showing grands on the margins × 20; C, spikelet × 5.

lower narrow, short and 1-nerved, the upper broad, 3-nerved; lemma 2-2.8 mm long, glabrous to granulated; palea persistent on rachilla, long after lemma has fallen, margin finely hairy; stamens 3; caryopsis globose-subglobose. 2n = 20, 40.

Type: In agris patrio Ciliani, Italy, *Bellardi* (TO).

A-3 Tripoli, University campus nursery, 14.7.1977, *Faruqi* 1454; c. 50 km from Khoms on way to Tripoli, 3.8.1977, *Faruqi* 1461.

Also reported from Fezzan and Jabal Uwainat by Scholz, (l.c.).

Distribution: Mediterranean, S.W. Asia. Introduced into other parts of the world.

Cufodontis (Enum. Pl. Aethiop. Sperm. 2:1253.1968) is of the opinion that the names *Poa cilianensis* All. (l.c.) and *Eragrostis cilianensis* All. (l.c.) Vign.-Lutati are ambiguous.

The species is highly variable and it includes plants with and without glands in the inflorescence. In the Libyan material, however, glands are present.

Fl.: Jul.-Oct.

5. ***Eragrostis tef** (Zucc.) Trotter in Bull. Soc. Bot. Ital. 62. 1918.

Poa tef Zucc., Diss. 1st. Pianta Panizz. Abiss. 1774; *P. abyssinica* Jacq., Misc. Austr. 2: 364. 1781; *E. abyssinica* (Jacq.) Link, Hert. Berol. 1: 192. 1827; Keith, l.c. 459.

Cultivated annual, 1 metre tall. Leaves flat, glands absent. Inflorescence an open terminal panicle, lowest branches whorled and not pilose in the axil, pedicels without cratiform glands. Spikelets not breaking up at maturity, 1.5 mm wide; glumes unequal, lower small, upper large, lemma lanceolate, 2-2.7 mm long, without glands; anthers 3; caryopsis ovate-oblong. 2n = 40.

Type: Described from Ethiopia.

Reported to be in cultivation in Tripolitania and Jabal Uwainat (Keith, l.c.; Scholz, l.c.).

Distribution: Ethiopia. Introduced as a fodder in different parts of the world.

This plant is native of Ethiopia, where, according to Bor (Grasses Ind. Burm. & Ceyl. 513. 1960) it is used as food grain. But in other parts of the world it is used as a hay fodder.

6. **Eragrostis ciliaris** (L.) R. Br. in Tuckey, Narr. Exped. Congo, App. 478. 1818; Scholz, Willdenowia, 7: 446. 1974.

Poa ciliaris L., Syst. Nat. ed. 10, 2: 875. 1759.

Annual, fasciculated, branches slender, procumbent, geniculately ascending, up to 60 cm tall. Leaves glabrous, linear-acuminate, up to 7.5 cm long, 2-3 mm wide, scabrous. Inflorescence a spike-like panicle, dense, interrupted, up to 6 cm long. Spikelets 2-2.5 mm long, 3-4-flowered; glumes subequal; lemma 1.75 mm long, truncate, scabrous, ciliate on keels; palea with long cilia on keels. 2n = 20, 40.

Type: Described from Jamaica, *Browne* (LINN).

Reported to be present in Jabal Uwainat by Scholz (l.c.).

Distribution: Tropics and subtropics of the world.

71. CHLORIS

Swartz, Prodr. Veg. Ind. Occ. 25. 1788.

Perennial, sometimes annual, usually erect, sometimes decumbent at the base. Leaf flat. Inflorescence a digitate panicle of 2-many spikes. Spikelets sessile, 2-4-flowered, laterally compressed, and arranged on two rows on the rachis; glumes unequal, persistent; rachilla disarticulating above the glumes; lower floret hermaphrodite, the remaining barren; lemma keeled, often broad, sterile lemmas much smaller, 3-nerved, often villous on the callus and ciliate on the marginal nerves, awned below the tip; palea equal to lemma; stamens 3; styles 2, short; lodicules 2, minute.

About 40 species in the tropics and the warm temperate regions; 1 species is recorded from Libya.

Chloris virgata Swartz, Fl. Ind. Occ. 1: 203. 1797; Scholz in Willdenowia, 7:

446. 1974. (Fig. 86)

Annual, decumbent, rooting from the nodes, finally erect, quite variable in height. Leaf linear-lanceolate, flat, scattered hairs with a tendency to increase towards the base, sheath especially uppermost inflated. Inflorescence of 4-9 spikes, soft and silky; spikes up to 6 cm long. Spikelets 3-4 mm long with 2 awns; lemma with long and dense hairs on the upper half margins, awned; sterile lemma smaller, glabrous, awned.
2n = 14, 20, 26, 30.

Type: Provenit in Antigua, *Swartz* (S).

E-1 70 km from Ghat, behind new airport, 19.2.1977, *M.A. Siddiqi & M. Ahmad* 1127.

Also reported from Jabal Uwainat by Scholz (l.c.).

Distribution: Tropical and subtropical regions of the world.

Fl.: Feb.-Mar.

A very good forage grass in the warmer parts of the World. It also grows in the arid and saline areas.

72. **TETRAPOGON**

Dsef., Fl. Atlant. 2: 388, tab. 255. 1799.

Annual or perennial. Leaves flat, ligule very small. Inflorescence a terminal spike. Spikelets many-flowered, and always with more than 2 awns; lower florets hermaphrodite, upper neuter or reduced; glumes subequal; fertile lemmas villous, truncate and bilobed, awned below the tip; palea smaller; lodicules 2; stamens 3; caryopsis fusiform.

Distinguished from *Chloris* by its solitary (or rarely 2-spikes), many-flowered spikelets and more than 2 awns.

About 6 species, distributed in the Mediterranean region, Trop. & S. Africa, Pakistan & India; 1 species is reported from Libya.

Tetrapogon villosus Desf., Fl. Atlant. 2: 388, tab. 255. 1799; Durand & Barratte, l.c. 260; Pamp., Prod. Fl. Cir. 111.1931; Maire, l.c. 2: 206; Keith, l.c. 956; Scholz in Willdenowia, 7: 446. 1974.

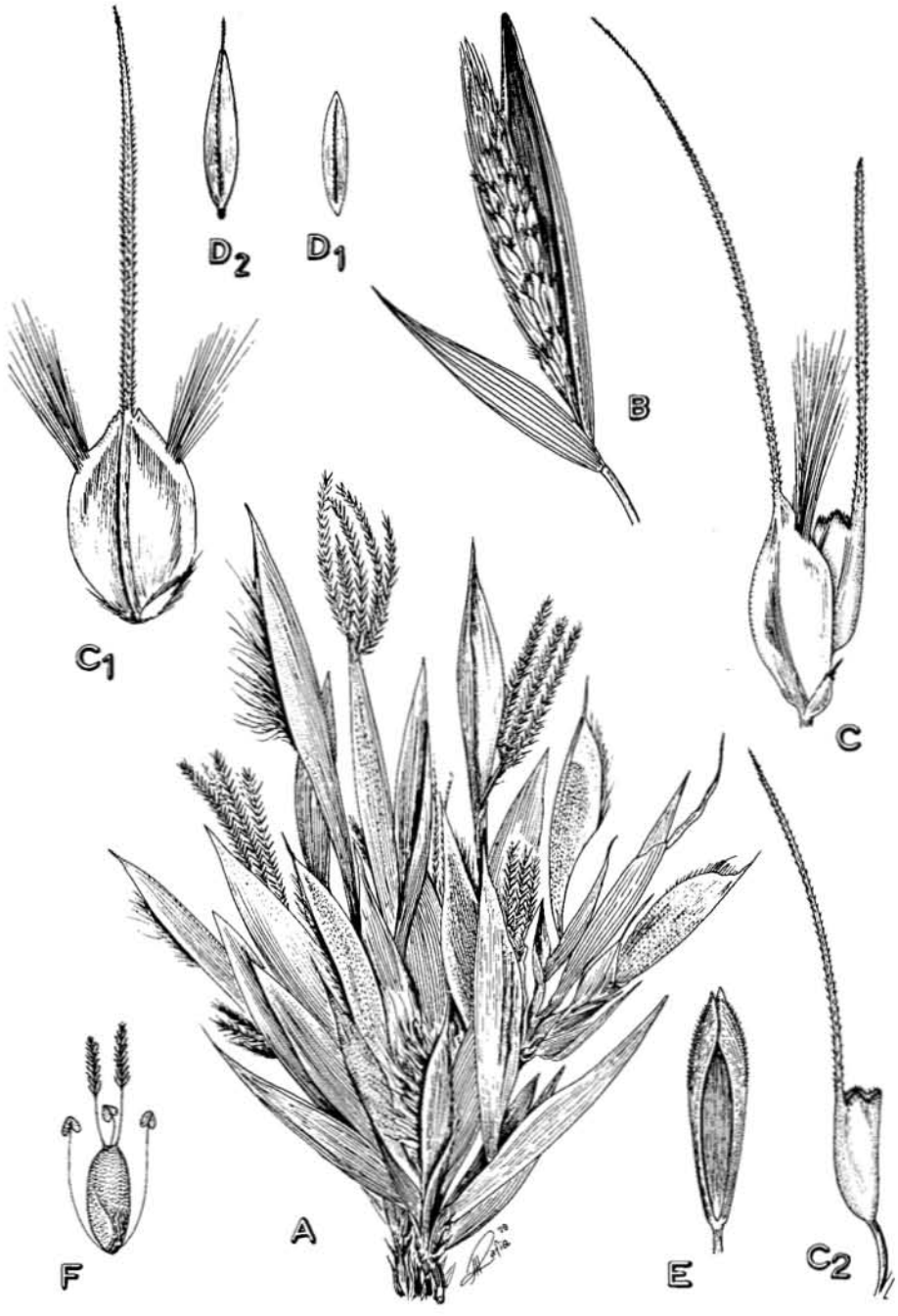


Fig. 86 **Chloris virgata**: A, habit × 1; B, young panicle × 2; C, C_1, C_2, florets × 10; D_1, lower glume × 10; D_2, upper glume × 10; E, palea × 15; F, stamens and pistil × 10.

Chloris villosa (Desf.) Pers., Syn. Pl. 1: 87. 1805.

Perennial, tufted. Culm up to 40 cm tall. Leaf linear, up to 15 cm long and 3 cm broad. Inflorescence up to 6 cm long, wholly or partly enclosed in a spathe-like uppermost leaf sheath. Spikelets sessile, rachilla disarticulating above the glumes, 3-4-awned; glumes persistent, unequal, the outer acuminate, exceeding the spikelet; lemma of fertile floret obovate, highly villous, emarginate, awned, awn 10 mm long; palea 2-nerved, ciliate on the nerves, truncate.

Type: Cafsam, Tunisia, *Desfontaines* (P).

Reported from former Tripolitania and Cyrenaica by Durand & Barratte (l.c.), etc.

Distribution: N. Africa, Ethiopia, Arabia, Iran, Afghanistan and Pakistan.

Fl.: Mar.-June

73. CYNODON

Rich. in Pers., Syn. Pl. 1: 85. 1805 (*nom. cons.*)
Capriola Adans. Fam. Pl. 2: 31, 532. 1763.
Dactilon Vill., Hist. Pl. Dauph. 2: 69. 1787.

Perennial, rhizomaceous, creeping with erect flowering shoots. Leaf short and narrow. Inflorescence a group of digitately arranged spikes. Spikelets all alike, awnless, arranged in two rows on a flattened rachis, 1-flowered, bisexual; glumes somewhat equal, keeled; lemma larger than the glumes; palea 2-keeled; stamens 3; lodicules 2; caryopsis oblong and triangular in cross section.

About 10 tropical and subtropical species; 1 species is recorded from Libya.

Cynodon dactylon (L.) Pers., Syn. Pl. 1: 85. 1805; Durand & Barratte, l.c. 260; Pamp., Pl. Trip. 19. 1914; Prod. Fl. Cir. 111. 1931; Corti, Fl. Veg. Fezz. 51. 1942; Maire, l.c. 208; Keith, l.c. 416; Scholz, l.c. 446. (Fig. 87)

Panicum dactylon L., Sp. Pl. 58. 1753.

Perennial with creeping stolon, spreading and sending erect leaf shoots. Leaf up to 6 cm × 2 mm, flat, lanceolate to linear-lanceolate. Inflorescence of digitate spikes at the

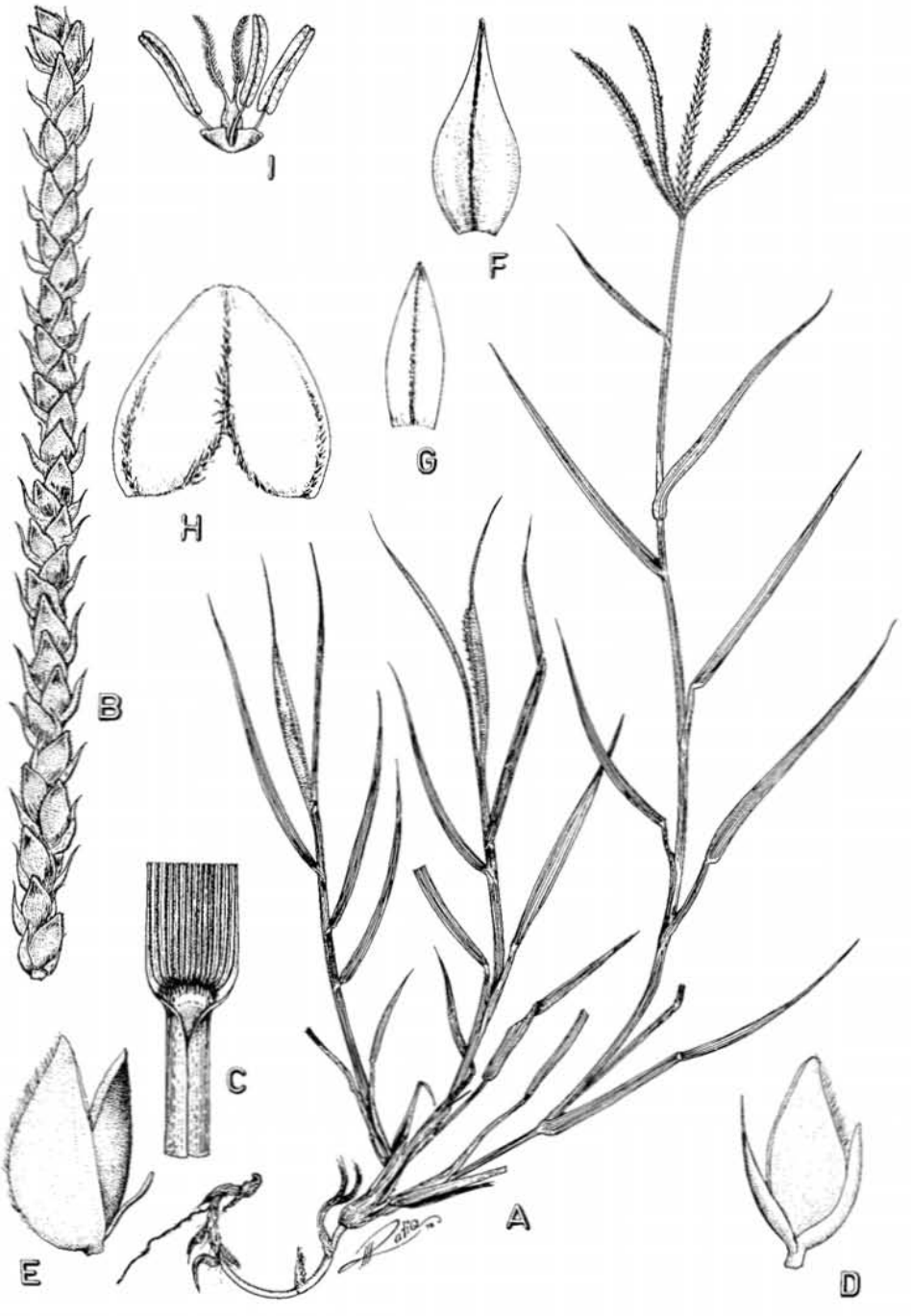


Fig. 87 **Cynodon dactylon**: A, habit × 0.75; B, spike × 3; C, portion of lamina base, ligule and sheath × 6; D, spikelet × 10; E, floret showing prolonged rachilla × 15; F, upper glume × 15; G, lower glume × 15; H, lemma × 15; I, stamens and pistil × 10.

tip of the erect shoot; spikes not plumose. Spikelets minute, 1-flowered; glume lanceolate, mucronate; lemma toothed at the margin, 2.5 mm long, keels ciliate. 2n = 18, 27, 30, 36 + 1-2B, 40.

Type: Described from Portugal (LINN).

A-2 Bir Ayad Project, 20.1.1978, *S.A. Alavi, Siddiqi & Fathi* 1561-S; 56 km from Tripoli towards Bu-ghelan, 20.5.1976, *Faruqi* 695, 701, 702, 703; **A-3** c. 20 km from Tripoli on Old Airport Road, 7.5.1976, *Faruqi* 690; c. 25 km from Gussbat, Algwazi, 26.3.1979, *El-Gadi* 2773; Tripoli, University Campus, 17.11.1975, *Fathi, B.R.* 1; 10 km after Zwara, *S.A. Alavi & F.B. Rataib* 120 AG; **A-7** Wadi Derna, 15.4.1979, *M.A. Siddiqi & Ramadan* 2581-Z; Susa, 20.6.1972, *S.I. Ali* 799; **C-4** Sokna, 25.3.1975, *S.I. Ali* 2328; **C-5** Zilla, 19.2.1978, *S.A, Alavi, Fathi & Ramadan* 1852-S; **C-8** Al Jaghbub, 19.4.1978, *Ramadan, Fathi & Siddiqi* 629-Z; **D-3** Gregra, c. 150 km from Sebha, towards Jarma, 20.3.1973, *S.I. Ali* 1355; **F-3** c. 16 km from Tumb army post, 26.3.1973, *S.I. Ali* 1380.

Distribution: Cosmopolitan.

A common grass, growing near water; mostly used for lawns and fodder. It could be risky to feed wilted grass in dry weather when it produces hydrocyanic acid.

Fl.: July-Oct. *Vern.* Najem; Nagil; Najil, Nejieel.

74. **CRYPSIS**

Ait., Hort. Kew. 1: 48. 1789; emend.-C.E. Hubbard
in Hook., Ic. Plant. Sub. tab. 3457. 1947 *(nom. cons.)*
Heleochloa Host., Grain. Austr. 1: 23. 1801.

Annual, decumbent, branches finally erect. Leaf flat, ligule a fringe of hairs. Inflorescence a spike-like panicle, globose to cylindrical, uppermost leaf sheathing the panicle. Spikelets shortly pedicelled, dense, 1-flowered, awnless, strongly laterally compressed; rachilla disarticulating above the glumes; flower hermaphrodite; glumes subequal, persistant; lemma keeled, 1-nerved, membranous, acute or mucronate; palea equal to lemma; lodicules absent; stamens 2-3; caryopsis laterally compressed, oblong or elliptic-oblong, pericarp free and membranous.

About 12 species, distributed from Mediterranean region to N. China, also in Tro-

pical Africa; 1 species is reported from Libya.

Crypsis schoenoides (L.) Lam., Encycl. 1: 166, t. 42, f. 1. 1791; Maire, Fl. Afr. Nord 2: 93. 1953; Scholz, in Willdenowia, 7: 446. 1974.

Phleum schoenoides L., Sp. Pl. 60. 1753; *Heleochloa schoenoides* (L.) Host, Icon. Gram. Austr. 1: 23. 1801; Boiss., Fl. Or. 5: 476. 1884.

Annual, tufted, branching from the base, geniculately ascending, up to 30 cm tall. Leaf with scattered long hairs, lanceolate, acuminate, up to 6 cm long. Inflorescence elliptic to ovate, longer than broad, base sunken within 2 broad and distichous sheaths; spikelets 3-3.5 mm long; glumes unequal, strongly compressed, 1-nerved, lower 2.5 mm long, linear-acute, upper elliptic-acute, 3 mm long; lemma longer than the glumes, mucronate, 1-nerved; palea ovate, 2-nerved; anthers 3, each 1 mm long.

Type: Described from Spain, *Löefling* (LINN).

Reported from Jabal Uwainat by Scholz (l.c.).

Distribution: S. Europe, North and Tropical Africa, Iraq, Iran, Pakistan and N. India; introduced into N. America.

A rare species in Libya, confined to S. East part of Libya.

75. **SPOROBOLUS**

R. Br., Prodr. Fl. Nov. Holl. 169. 1810.

Perennial with creeping stolon, rarely annual. Leaf flat or involute, often pungent; ligules hairy. Inflorescence a panicle, open or contracted. Spikelets 1-flowered, laterally compressed, hermaphrodite, awnless, minute, rachilla disarticulating above the glumes; glumes 2, unequal, outer smaller and nerveless, the inner 1-nerved, palea as long as lemma, 2-nerved; lodicules minute or absent; stamens 2-3; caryopsis with free pericarp.

About 150 species, distributed in the Tropics and warm temperate regions; 3 species are reported from Libya.

1. + Panicle spiciform, branches not visible, contracted, not interrupted, narrow, 2-3(-4) mm wide **2. S. spicatus**

— Panicle branches clearly visible, open, interrupted, 5 mm or more wide 2

2. + Lower glume ± 2/3 as long as the upper, acute, not awn-tipped 1. **S. virginicus**
— Lower glume ± equal to the upper, acuminate, somewhat awn-tipped 3. **S. helvolus**

1. **Sporobolus virginicus** (L.) Kunth, Rev. Gram. 1: 67. 1829; Keith, Prelim. Check List Lib. Fl. 931. 1965; Cope in Nasir & Ali, Fl. Pak. 143: 138. 1982; Kit Tan in Davis, Fl. Turk. 9: 581. 1985.

Agrostis virginica L., Sp. Pl. 1: 63. 1753; *A. arenaria* Gouan, Ill. Obs. Bot. 3. 1773; *Sporobolus pungens* (Schreb.) Kunth, Rev. Gram. 1: 68. 1829; Durand & Barratte, l.c. 254; Pamp., Pl. Trip. 37. 1914; *S. arenarius* (Gouan) Duval-Jouve in Bull. Soc. Bot. Fr. 16: 294. 1869; Pamp., Prodr. Fl. Cir. 102. 1931; Scholz in Willdenowia 7: 446. 1974; *S. virginicus* (L.) Kunth var. *arenarius* (Gouan) Maire in Jehand et Maire, Cat. Pl. Maroc. 928. 1941; Maire, Fl. Afr. Nord. 2: 162. 1953.

Perennial with creeping rhizome rooting at the nodes. Culm branching, glabrous, glaucous. Leaf often hard and spiny, margins rolled-in, lanceolate, acuminate, up to 8 cm long and 5 mm broad, scabrous; sheath scabrous, older glabrous and glaucous. Inflorescence pyramidal somewhat open panicle, 5 mm or more wide, glumes keeled, scabrous, acute, unequal, the lower 2 mm and the upper 3 mm long; lemmas as large as the upper glume, palea smaller than lemma, glabrous, anthers 3.

Type: U.S.A., in Virginia, *Clayton* (BM).

A-6 Benghazi, August 1919, *Zanon* 157 (FI); Tocra-Tolmeta, 23.4.1933, *Pampanini* 1142 (FI); Cyrenaica, Bomba, 12.5.1934, *Pampanini & Pichi-Sermolli* 1143 (FI).

Distribution: Mediterranean and Atlantic coasts, Iberian Peninsula, Cape Verde islands.

Fl.: Apr.-Oct.

2. **Sporobolus spicatus** (Vahl) Kunth, Rev. Gram. 1: 67. 1829; Durand & Bar-

ratte, l.c. 254; Pamp., Prodr. Fl. Cir. 103. 1931; Corti, Fl. Veg. Fezz. 49. 1942; Maire, l.c. 162; Keith, l.c. 931; Scholz, l.c. 446. (Fig. 88)

Agrostis spicata Vahl, Symb. 1: 9. 1790.

Tufted perennial, geniculately ascending, glaucous, spreading with stolon and rhizome, branches both ramal and cauline. Leaf convolute, pungent, up to 8 cm long, few to many, hairs on the upper surface; ligule hairy. Inflorescence compact and spike-like, panicle 4-10 cm long, 2-3 (-4) mm broad; inner glume 2.5-3 mm long, the outer less than half as long, nerveless and membranous, lemma longer than the inner glume.

Type: Described from Arabia.

D-2 Ain Ailet el Jadid 'hatia Viva' 17.3.1933, *Caporiacco* 892 (FI); Ramlet Zellaf, 8.4.1933, *Corti* 890 (FI); **D-3** c. 96 km from highway towards Ghat, 30.3.1973, *S.I. Ali* 1407; 37 km from Brak on way to Hun, 7.3.1978, *Faruqi* 1603; **E-7** Kufra, Zighen Bir Bu Harash, 14.3.1933, *Caporiacco* 891 (FI); **E-8** Jabal Uwainat, 7.11.1968, *L. Boulos* 3248; **F-3** c. 16 km from Tumb army post, 26.2.1973, *S.I. Ali* 1379.

Distribution: N. and E. Africa, Tropical Arabia and India.

This species grows on sandy and saline soils forming conspicuous mounds.

Fl.: Mar.-Apr.

3. **Sporobolus helvolus** (Trin.) Th., Durand & Schinz, Consp. Fl. Afr. 5: 820. 1895; Scholz, l.c. 446.

Vilfa helvola Trin., Mem. Acad. Sc. Petersbg. Ser. 6, 5: 52. 1840.

Perennial with long thin runners rooting at node, rhizome compact and woody, branches glabrous. Leaves lanceolate to linear-lanceolate, acuminate, flat, slightly pungent, glabrous, up to 8 cm long and 2 mm wide. Inflorescence an open and narrow panicle up to 20 cm long, 5 mm or more wide, branches ascending; glumes subequal, membranous, lower highly acuminate, somewhat awn tipped.

Type: Described from Wadi Diara, Habessin, *Ehrenberg* (LE).

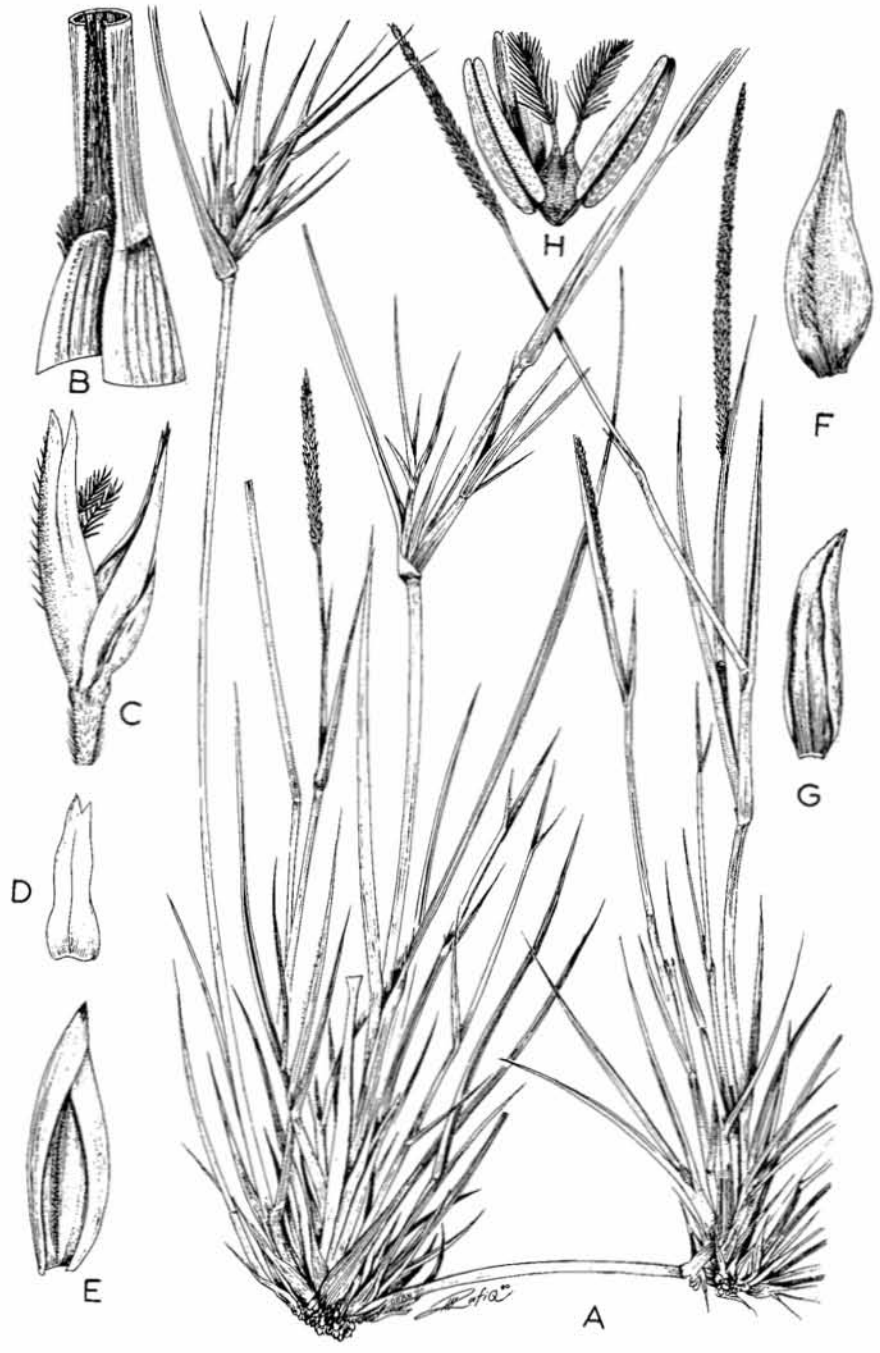


Fig. 88 **Sporobolus spicatus**: A, habit × 0.5; B, portion of lamina, sheath and ligule × 5; C, spikelet × 20; D, lower glume × 15; E, upper glume × 15; F, lemma × 15; G, palea × 15; H, stamens and pistil × 15.

Reported from Fezzan by Scholz (l.c.).

Distribution: Tropical Africa, Pakistan.

76. PANICUM

L., Sp. Pl. 55. 1753; Gen. Pl. ed. 5: 29. 1954.

Annual or perennial. Inflorescence an open panicle. Spikelets pedicelled, 2-flowered, awnless, falling as a whole; glumes membranous, the outer smaller than the inner, the inner equalling the spikelet; lower floret with lemma as long as the inner glume, male or neuter, palea present or absent; upper floret hermaphrodite, lemma with involute margins; stamens 3; lodicules 2, truncate, with upper margin uneven; grain elliptic.

About 500 tropical and sub-tropical species; 3 species are found in Libya.

The genus *Panicum* includes some economically important grasses.

1.	+ Plants annual with fibrous rootstock	1. **P. miliaceum***
	— Plants perennial with creeping stolon-like rhizome	2
2.	+ Lower glume acute, ± as long as the spikelet; bushy	3. **P. turgidum**
	— Lower glume truncate, much shorter that the spikelet; not bushy	2. **P. repens**

1. ***Panicum miliaceum*** L., Sp. Pl. 58. 1753; Corti, Fl. Veg. Fezz. 470. 1942; Maire, Fl. Afr. Nord. 1: 314. 1952; Keith, l.c. 726; Scholz, in Willdenowia 7: 446. 1974.

Plants annual with fibrous rootstock, tufted, erect or geniculately ascending. Culm juicy, up to 120 cm tall. Leaf flat, up to 30 cm long and 2 cm broad, acuminate, glabrous or hairy; sheaths scabrous, hirsute with tubercled-based hairs. Inflorescence a dense panicle of numerous branches. Spikelet ovate-acuminate, 4.5-5 mm long; glumes highly unequal, the outer about 1/2-3/4 as long as the spikelet, the inner glume as long as the spikelet, 11-nerved; the inferior flower neuter, the superior hermaphrodite; lemma elliptic-oblong; palea truncate, emarginate, 2/3 the length of lemma. 2n = 36, 40, 54, 72.

Type: Described from India, Herb. Linn. 80/49 (LINN).

Reported to be cultivated in the former Tripolitania and Fezzan by Pamp., (l.c.), Corti (l.c.), etc.

Distribution: Distributed in the tropics of the world.

Fl.: In summer *Vern.* Gasab, Aleli, Eneli.

The plant provides excellent succulent and green fodder to the cattle and cereal to man. It is a summer crop and can withstand a fair amount of drought and heat.

2. **Panicum repens** L., Sp. Pl. ed. 2: 87. 1762; Corti, l.c. 31; Maire, l.c. 315; Keith, l.c. 727; Scholz, l.c. 447.

Plants perennial with long stolon-like rhizome. Culm up to 60 (-200) cm tall, often swollen at the nodes, erect branches coming out of each node, glabrous, nodes numerous. Leaves stiff, blade linear, acuminate, 7-15 cm long and 3-6 mm broad, hairy towards the base, 2-ranked, covering the entire culm with leaf sheath in sterile shoots; sheath hairy on margins with tubercled-based hairs. Inflorescence an open panicle up to 10 cm long with ascending branches. Spikelets elliptic, acute, about 2.5 mm long; outer glume truncate, reduced and cup-like at the base of spikelet, the inner long, 9-nerved; outer lemma as long as the inner glume, 9-nerved; inferior flower male, superior hermaphrodite; anthers 2 mm. 2n = 36, 40, 45.

Type: Described from Spain? *Alstroemer*, Herb. Linn. 80/47 (LINN).

A-3 Sharshara, 6.8.1977, *Faruqi* 1462 & 1464.

Also reported to be present in Fezzan & Ghat by Corti (l.c.).

Distribution: Mediterranean region, Tropical and South Africa, Tropical Asia. Naturalized in Tropical America.

A variable species in culms and panicle size, depending on available moisture. This plant is not common in Libya but it is a good forage grass.

Fl.: Aug. *Vern.* Rhadi, Tarallerelt.

3. **Panicum turgidum** Forsk., Fl. Aeg. Arab. 18. 1775; Durand & Barratte, l.c. 251; Pamp., Pl. Trip. 30. 1914; Corti, l.c. 31; Maire, l.c. 316; Keith, l.c. 727; Scholz, l.c. 447. (Fig. 89)

Perennial. Culms up to 1.5 m tall, woody, glaucous, glabrous, much branched and bushy, rhizomatous. Roots thick. Leaf 4-6 cm long, narrow, acuminate, lower sheaths loose and peeling. Inflorescence an open panicle with 4-6 spreading branches. Spikelets pedicellate, glaucous, glabrous, turgid, 4 mm long; the glumes more or less equal, the outer acute, as long as the spikelet, 7-nerved, the inner 9-nerved; inferior floret male with lemma 9-nerved; superior floret hermaphrodite; anthers 2 mm long. $2n = 18$.

Type: Described from Kahirini desert (Egypt), Forsskal (C).

C-4 84 km from Hun on way to Bughrain, 8.3.1978, *Faruqi* 1616; 37 km from Hun on way to Sebha, 5.3.1978, *Faruqi* 1566; **E-8** Jabal Uwainat, 7.11.1968, *L. Boulos* 3279, 3375 & 3405.

Also reported from Fezzan, Ghat, South Cyrenaica and Jabal Uwainat by Durand & Barratte, l.c., etc.

Distribution: Egypt, Sudan, Ethiopia, Socotra, Arabia, Palestine, Iran and Pakistan.

This grass is very widely distributed in Libya and usually grows in wadi beds. It is extensively grazed by camels and other grazing animals. The young shoots are fairly soft and succulent and taste like bamboo shoot. They make a very good forage grass during growing season. This plant is recommended for dry land pasture. Protection of over-grazed wadi beds should result in a high yield of this grass.

Fl.: Feb.-Mar. *Vern.* Afezu, Bu'rucba, Tehaua.

77. DIGITARIA

Haller, Hist. Stirp. 2: 244. 1768.

Annual or perennial. Culm erect, usually with stolons or runners. Leaf flat, often soft; ligules membranous. Inflorescence usually digitately arranged, whorled or alternate or paired spike-like racemes, rarely a panicle; rachis flattened, often winged. Spikelets subsessile or short pedicelled, awnless, 2-flowered, arranged in 2 rows along one

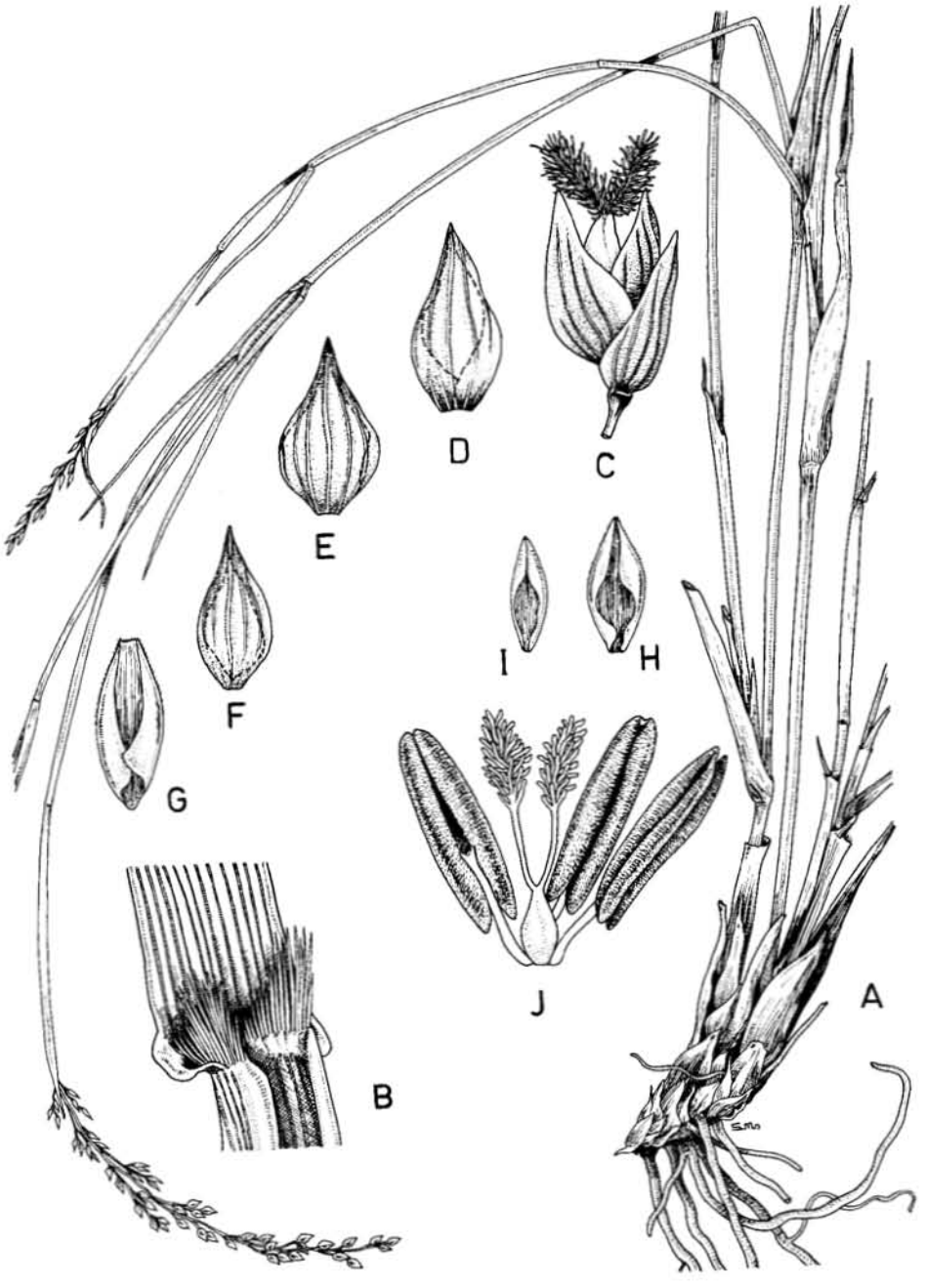


Fig. 89 **Panicum turgidum**: A, habit × 0.5; B, portion of lamina, sheath and ligule × 15; C, spikelet × 6; D, lower glume × 6; E, upper glume × 6; F, lower lemma × 6; G, its palea × 6; H, upper lemma × 6; I, its palea × 6; J, stamens and pistil × 20.

side of rachis; glumes unequal, the outer very small or absent, the inner sometimes as long as the spikelet, often smaller, rarely absent; lower lemma as long as spikelet, 5-7-nerved; upper lemma 3-nerved, hermaphrodite; palea similar to lemma; stamens 3; lodicules 2; caryopsis planoconvex in cross section, oblong-elliptic.

About 380 species in the warmer parts of the world, more especially in Africa; 2 species are recorded from Libya.

+ Lemma of lower (sterile) floret densely villous on margins; leaf blades glabrous or sparsely pubescent with papilla-based hairs	1. **D. bicornis**
– Lemma of lower (sterile) floret scabrous-hispid but never villous on margins; leaf blades densely covered with papilla-based hairs	2. **D. sanguinalis**

1. **Digitaria bicornis** (Lam.) Roem. et Schult., Syst. Veg. ed. 15, 2: 470. 1817; Scholz in Willdenowia, 7: 447. 1974.

Paspalum bicorne Lam., Encycl. 1: 176. 1791.

Annual, decumbent, rooting from the nodes, erect, branches up to 30 (-60) cm tall. Leaf flat, soft, glabrous to sparsely pilose with papilla based hairs, linear, up to 23 cm long; sheath pilose-glabrous, ligule truncate. Inflorescence of (-2) 6-10 spikes, digitate or up to 3 whorls on a 8 (-40) cm long peduncle; rachis winged, scabrous or serrate on margins; spikes 3-6 (-10) cm long. Spikelets 2-florets, usually heteromorphic, the sessile one glabrous to slightly pubescent, the pedicelled pubescent, lanceolate, 2.7-3.5 mm long; lower glumes very variable, nearly absent to a triangular scale, acute to bifid; upper glume 1-2 (-2.7) mm long, 3-nerved, pubescent; sterile lemmas of sessile-subsessile spikelets as long as the spikelet, usually glabrous - slightly pubescent, 5-7-nerved; those of pedicelled spikelets often pubescent and densely villous on the margins; fertile lemma slightly shorter than the spikelet; anthers 3, 0.5-0.6 mm long. 2n = 36.

Type: Described from Sonnerat, in Hb. Lamark (P).

A-3 Tripoli, Faculty of Science, Sidi El-Masri, 22.4.1967, *L. Boulos* 1765; Godaida, 8 km from Tripoli University (from a potato crop), 3.12.1975, *Fathi, B.R.* 26; University campus, behind canteen, 14.7.1977, *S.A. Faruqi* 1448; About 50 km from Khoms on way to Tripoli, 3.8.1977, *S.A. Faruqi* 1459, 1460; **D-3** Wadi ash Shati, fields near Brak, 9.2.1978, *C. Ricceri & C.H. Steinberg* 49.

Also reported from Tripolitania and Fezzan by Scholz (l.c.).

Distribution: Tropics and subtropics of the world.

Fl.: Mar.-Oct.

2. **Digitaria sanguinalis** (L.) Scop., Fl. Carn. ed. 2, 1: 52. 1772; Durand & Barratte, l.c. 251; Maire, Fl. Afr. Nord. 1: 298. 1952; Keith, l.c. 435; Scholz, l.c. 447. (Fig. 90)

Panicum sanguinale L., Sp. Pl. ed. 1: 57. 1753; Pamp., Prod. Fl. Cir. 95. 1931.

Annual, decumbent, creeping and rooting on nodes, geniculately ascending, up to 40 cm tall, nodes hairy, internodes smooth and glabrous. Leaves lanceolate, densely covered with papilla-based hairs, flat, margin scabrous and wavy, very variable in size; ligule very small (c. 1 mm long), truncate. Inflorescence 4-10 spike-like racemes, digitate to subdigitate, up to 20 cm long; rachis winged, scabrous; peduncle up to 40 cm long. Spikelets 2.5-3.5 mm long, ovate-elliptic to oblong-elliptic; glumes unequal, lower minute; upper ciliate, 1/2 as long as the spikelet; lemma 5-nerved, margins ciliate; lower lemma with long spicules, nerves scabrous; upper lemma chartaceous.

Type: Cultivated at Leiden, *Van Royen* (L.).

A-3 Hodba, garden, lawn, 26.6.1976, *Faruqi* 1035; **A-7** Baida, 24.9.1977, *M. Ahmad* 1486; Agriculture farm between Ras el Helal and Derna; 17.10.1977, *M. Ahmad* 1496.

Distribution: Tropics, subtropics and temperate zones of the world.

Another perennial species *D. commutata* Schult. is doubtfully reported by Keith (l.c.) from Tripolitania.

FL.: July-Oct.

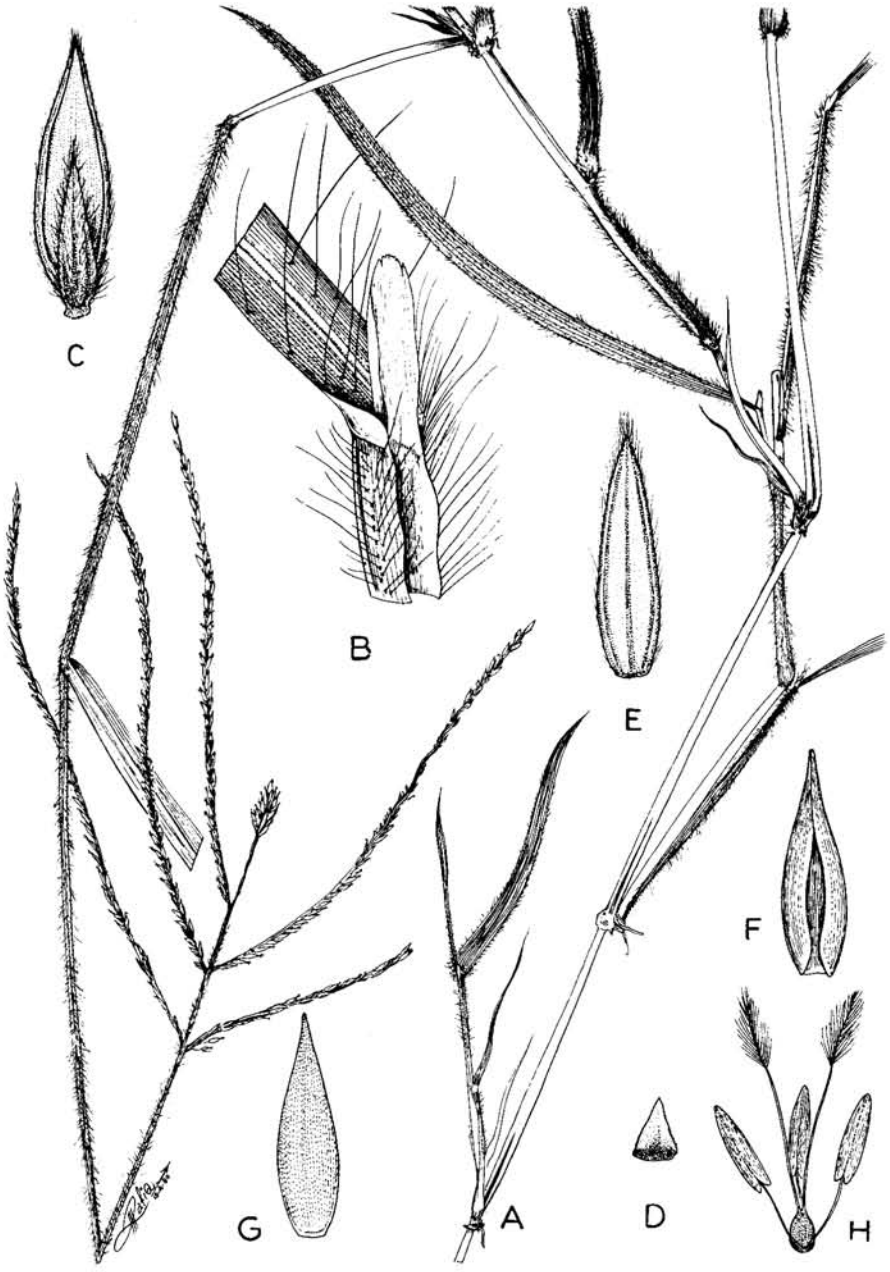


Fig. 90 **Digitaria sanguinalis**: A, habit × 0.5; B, portion of lamina, sheath and ligule × 5; C, spikelet with upper glume × 15; D, lower glume × 15; E, sterile lemma × 10; F, fertile lemma × 10; G, palea × 10; H, stamens and pistil × 10.

78. **PASPALUM**

L., Syst. Nat. ed. 10: 855. 1759.

Annual or perennial with linear flat leaves. Inflorescence solitary, digitate or racemosely arranged spikes; rachis flat and often winged. Spikelets 2-flowered, solitary or paired, arranged in 2 or sometimes 4 rows, orbicular, obovate or ovate, awnless, plano-convex; glumes highly unequal, the inner as long as the spikelet, the outer absent or reduced to scale; outer lemma similar to inner glume, barren; superior lemma hermaphrodite; palea of the same texture as lemma with broad flaps; stamens 3; lodicules 2, glabrous; stigmas purple-black; caryopsis orbicular, plano-convex.

Over 200 species, especially of tropical and temperate America, also present in the Old World; 1 species is recorded from Libya.

Paspalum paspalodes (Michx.) Scribn. in Mem. Torr. Bot. Club. 5: 29. 1894 (as P. paspaloides); Scholz in Willdenowia, 7: 447. 1974. (Fig. 91)

Digitaria paspalodes Michx., Fl. Bor. Amer. 1: 46. 1803; *P. distichum* L., ssp. *paspalodes* (Michx.) Thell, Fl. Adv. Montpellier 77. 1912.

Perennial with exceedingly creeping stolon and rhizome. Culm decumbent rooting at nodes, finally erect, glabrous with pubescent nodes. Leaf blade linear, acute, rounded and hairy at the base, up to 12 cm × 5 mm. Inflorescence of paired racemes. Spikelets in 2 closely packed rows on a flat rachis, subsessile, elliptic-oblong, acute, 3 mm long; upper glume minutely pubescent; lower glume absent or minute. 2n = 48, 60.

Type: South Carolina, U.S.A.

A-3 Sharshara, Tarhuna, 6.8.1977, *Faruqi* 1463, 1465, 1466.

Distribution: Tropics and subtropics of the world.

Fl.: June-Nov.

79. **PASPALIDIUM**

Stapf in Prain, Fl. Trop. Afr. 9: 582. 1920.

Perennial grass. Inflorescence a false compound spike with sessile or subsessile ra-

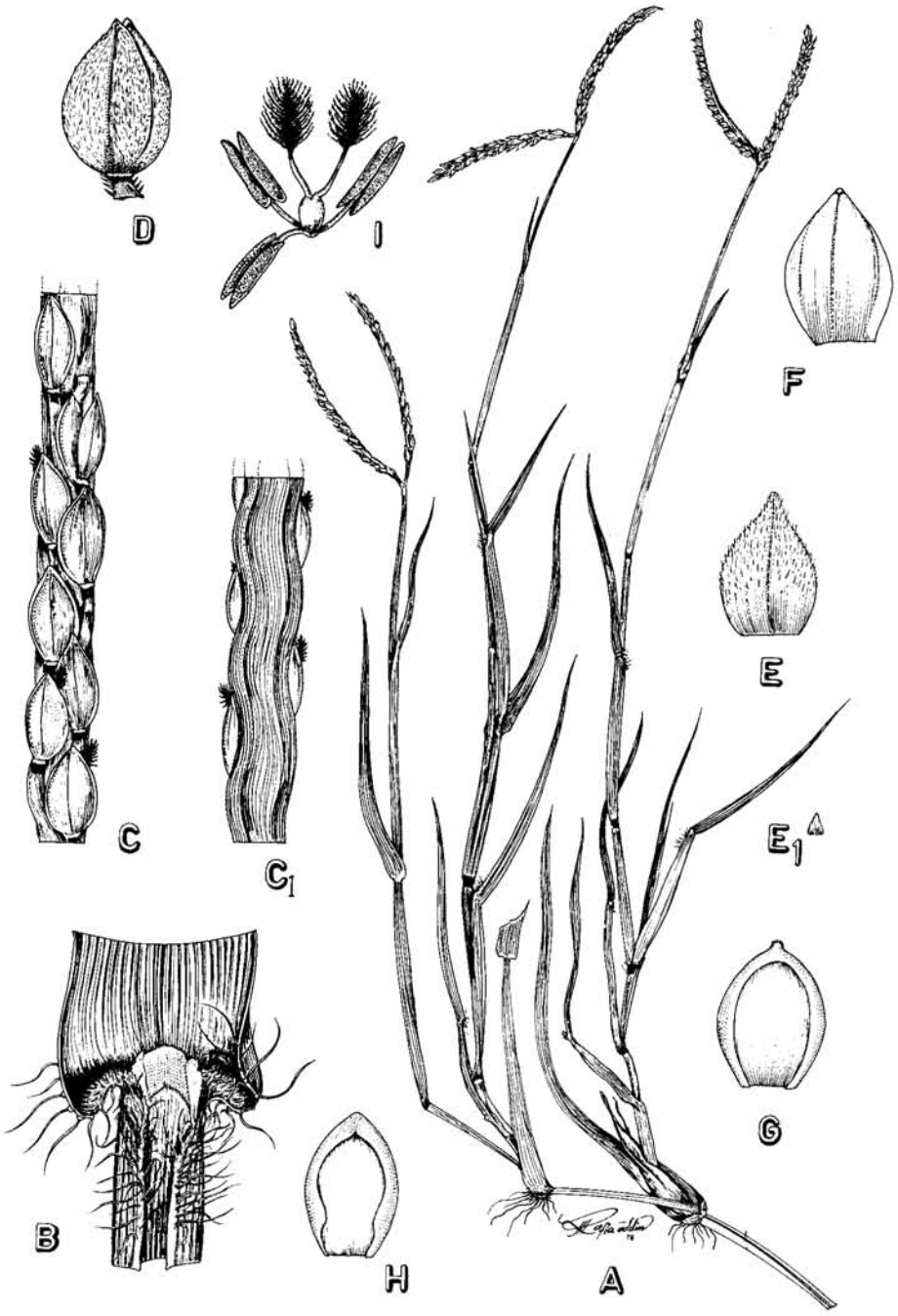


Fig. 91 **Paspalum paspalodes**: A, habit × 0.5; B, lamina base, ligule and sheath × 5; C, C_1, 2 views of a portion of spike × 5; D, spikelet × 10; E, upper glume × 10; E_1, lower glume × 10; F, outer lemma × 10; G, inner lemma × 10; H, palea × 10; I, stamens and pistil × 10.

cemes on a long axis. Spikelets glabrous, in 2 rows, one-sided, 2-flowered, inferior flower male or barren, superior bisexual; glumes highly unequal, outer reduced or 1/2 as long as the spikelet, the inner as long as the spikelet; lower lemma as large as the glumes; stamens 3; lodicules 2.

About 20 species in tropics and subtropics, especially of the Old World; 1 species is reported from Libya.

Paspalidium geminatum (Forsk.) Stapf in Prain, Fl. Trop. Afr. 9:583. 1920; Maire, Fl. Afr. Nord. 1. 310. 1952; Scholz, in Willdenowia, 7:447. 1974.

Panicum geminatum Forsk., Fl. Aeg.-Arab. 18. 1775; *P. fluitans* Retz., Obs. 3:8 and 5:18. 1783; Durand & Barratte, l.c. 251.

Perennial, culms decumbent, spreading, finally erect, glabrous. Leaf blade linear, up to 25 cm long, 10 mm broad. Inflorescence up to 30 cm long, many-noded, narrow, spiciform; racemes sessile, appressed. Spikelets obovate; glumes very unequal, outer 1 mm long, nerveless, broader than long, truncate, the inner more or less as long as the spikelet, 5-7-nerved; lower floret male; the upper hermaphrodite; lemma ovate, transversely rugose. 2n = 46, 60.

Type: Described from Egypt, *Forsskal* (C).

Reported from the former Tripolitania by Durand and Barratte, (l.c.).

Distribution: Tropical regions of the world.

It is a summer grass and grows in highly moist habitat; rare in Libya.

80. ECHINOCHLOA

P. Beauv., Ess. Agrost. 53:161 & 169, pl. 11, f. 2.1812.

Annual or perennial. Leaf flat; ligule absent. Inflorescence a panicle of false spike-like racemes on an elongated axis. Spikelets sessile or pedicellate, awned or unawned, flat on ventral surface, rounded on the back; glumes unequal, the outer much smaller and mucronate, the inner as large as the spikelet, mucronate or short-awned; inferior lemma male or barren, as long as the inner glume, awned or mucronate; superior lemma bisexual; palea similar to lemma; stamens 3; lodicules 2; caryopsis plano-convex.

POACEAE

About 30 species, distributed in the warmer parts of the world; 1 species is recorded from Libya.

Echinochloa colona (L.) Link, Hort. Berol. 2:209. 1833 (as E. colonum); Maire. Fl. Afr. Nord. 1:311. 1952; Keith, l.c. 442; Scholz, l.c. 447. (Fig. 92)

Panicum colonum L., Syst. Nat. ed. 10, 2:870. 1759; Durand & Barratte, l.c. 251; Pamp., Prodr. Fl. Cir. 94. 1931.

Annual, tufted, decumbent below, finally erect, rooting at the base. Leaf linear-lanceolate, up to 12- (30) cm × 6 mm, glabrous, lower sheaths loose; ligule absent. Inflorescence spaced, up to 15 cm long; racemes alternate, 1-3 cm long, longer towards the base, shorter towards the tip. Spikelets 3 mm long, subsessile, acute, closely aggregated, arranged in 4-rows, ovate to elliptic ovate, planoconvex; glumes unequal, minutely hairy between the nerves, margins ciliate, the lower c. 1 mm long, the upper 3-3.5 mm long; lower floret male or neuter, upper bisexual. 2n = 36, 48, 54, 72.

Type: Jamaica, Browne (LINN).

A-6 Benghazi, 9. 14. 1916, *V. Zanon* s.n. (FI); **A-7** 40 km from Shahat towards Ras El Helal, 17. 10. 1977, *M.A. Siddiqi & Mohammad Ahmad* 1497; Kursa Farm, Shahat-Derna Old Rd., 22. 9. 1977, *M.A. Siddiqi & Mohammad Ahmad* 1478, 1479.

Also reported from the former Tripolitania by Durand and Barratte (l.c.).

Distribution: Tropics and temperate regions of the world.

E. colona is a nitrophilous, aquatic or semiaquatic grass, rated as very good fodder. The grains are consumed in some parts of the world just like rice.

Fl.: Jul.-Oct. *Vern.* Bu shrinta

81. SETARIA

P. Beauv., Ess. Agrost:51, t. 13, fig. 3. 1812. (*nom. cons.*)

Annual or perennial. Leaf flat; ligule a tuft of hair. Inflorescence spiciform, dense or lobed. Spikelets shortly pedicelled, subtended by 1-many persistent bristles, (spikelets

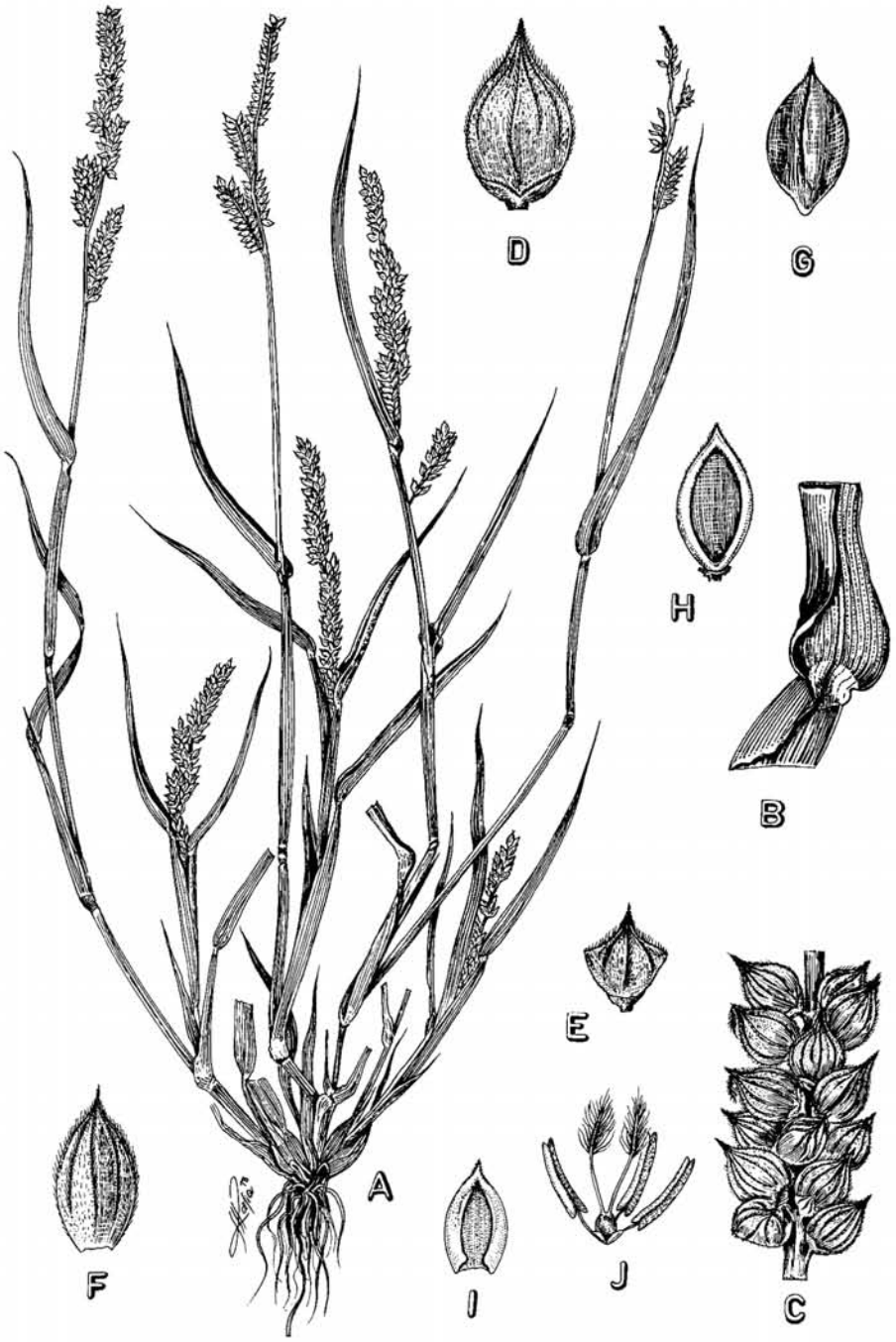


Fig. 92 **Echinochloa colona**: A, habit × 0.5; B, lamina base and sheath × 5; C, portion of spike × 5; D, spikelet × 8; E, lower glume × 8; F, upper glume × 8; G, sterile lemma (dorsal view) × 8; H, fertile floret (ventral view) × 8; I, fertile lemma × 8; J, stamens and pistil × 8.

falling with bristles remaining attached to rachis); glumes unequal, the outer much smaller, 3-5-nerved, upper as long as the spikelet or shorter, 5-nerved; lower lemma male or barren, with or without a palea; upper lemma bisexual, acuminate; palea as long as lemma; stamens 3; lodicules 2, truncate; caryopsis enclosed tightly within the palea and lemma.

About 140 species, of tropical and warm temperate regions; 5 species are reported from Libya.

1.	+ Lemma of upper floret transversely wrinkled; upper glume shorter than the upper lemma	5. **S. glauca**
	– Lemma of upper floret not transversely wrinkled; upper glume as long as the upper lemma	2
2.	+ Bristles retrorsely scabrid	3
	– Bristles antrorsely scabrid	4
3.	+ Margins of leaf sheaths hyaline, glabrous; leaf blades (at least the upper ones) conspicuously hispid with papilla-based hairs	1. **S. adhaerens**
	– Margins of leaf sheaths pilose; leaf blades scabrous or with scattered hairs	2. **S. verticillata**
4.	+ Panicle 10-30cm or more long, 2-3cm wide, lobed; spikelets not deciduous	4. **S. italica***
	– Panicle shorter, 1-10 cm long and narrower, not lobed; spikelets deciduous	5
5.	+ Inflorescence cylindrical and very dense, not interrupted; margins of leaf sheath pilose	3. **S. viridis**
	– Inflorescence interrupted with spikelets crowded on short branches; margins of leaf sheaths hyaline, glabrous	**S. verticillata** x **viridis**

1. **Setaria adhaerens** (Forsk.) Chiov. in Nuov. Giorn. Bot. Ital. n.s. 26:77: 1919; Henr. in Blumea, 3. 415. 1940; Scholz, in Willdenowia, 7:447. 1974. (Fig. 93)

Panicum adhaerens Forsk., Fl. Aeg. Arab. 20. 1775. *S. verticillata* sensu Boiss., Fl. Or. 5: 443. 1884 p.p. non (L.) P. Beauv. 1812; *P. aparine* Steud.

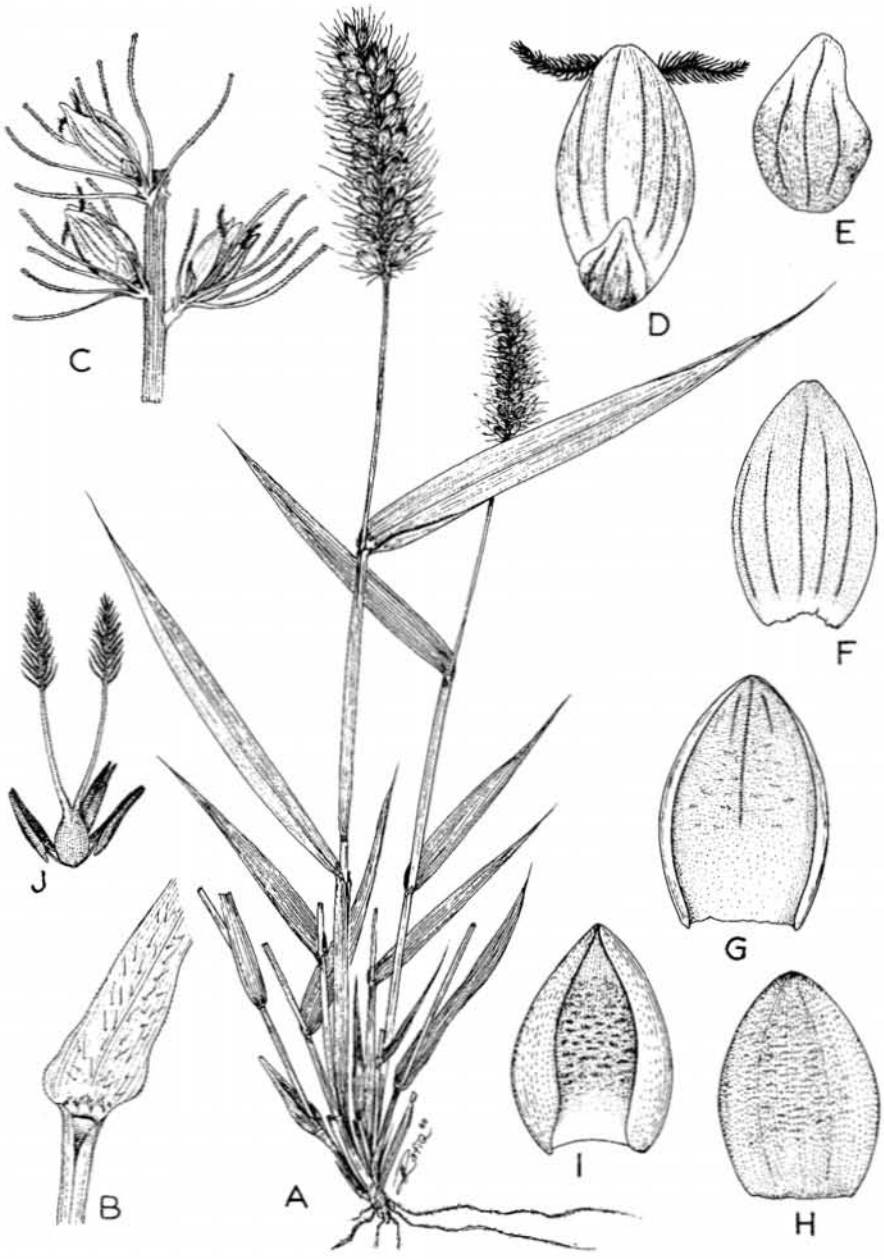


Fig. 93 **Setaria adhaerens:** A, habit × 1; B, portion of lamina sheath and ligule × 5; C, portion of panicle with spikelets × 5; D, spikelet × 15; E, lower glume × 30; F, upper glume × 15; G, sterile lemma × 15; H, fertile lemma × 15; I, palea × 15; J, stamens and pistil × 15.

emend. A. Braun in Ind. Sem. Hort. Berol. App. 6. 1871; *S. verticillata* (L.) P. Beauv. ssp. *aparine* (Steud.) Aschers. & Schweinf., Ill. Fl. Egypte 161. 1887; Durand & Barratte, Prodr. Fl. Lib. 251. 1910.

Annual, branched from the base, nearly 1 m tall, erect or geniculately ascending. Leaves flat, linear, acuminate, rough, margins of leaf sheath hyaline and glabrous, leaf blades conspicuously hispid with papilla-based hairs, up to 25 cm long and 8 mm broad. Panicle smooth when young, but irregularly lobed at maturity, bristly, straight or curved, branches stout. Spikelets usually solitary, 1-several bristles arising from the base of spikelets, bristles retrorsely scabrid; glumes very unequal, upper glume as long as the spikelet, lower about 1/3 as long; lemma of upper florets transversely wrinkled; palea small, bilobed; carypopsis ovate. 2n = 18.

Type: Described from Hadie (Yemen), *Forsskal*

A-3 Tripoli University, 14.7.1977, *Faruqi* 1451 and 1451-a; Khoms, 3.8.1977, *Faruqi* 1458; Sharshara, Tarhuna, 6.8.1977, *Faruqi* 1467; c. 60 km from Tarhuna on way to Tripoli, 6.8.1977, *Faruqi* 1471; Tripoli University, Faculty of Agriculture Farm, 9.12.1975, *Fathi, B.R.* 47; Tripoli, 11.6.1972, *S.I. Ali* 439; Khoms, 3.8.1977, *Faruqi* 1457; c. 60 km from Tarhuna on way to Tripoli, 6.8.1977, *Faruqi* 1469; **A-6** 13 km from Benina on way to Baida, 20.10.1977, *M. Ahmad* 1505, 1506 and 1507; **A-7** Kursa Farm, Shahat-Derna old road, 22.9.1977, *M.A. Siddiqi & M. Ahmad* 1481; Agriculture farm between Ras el Hilal and Derna, 17.10.1977, *M.A. Siddiqi & M. Ahmad* 1498; **B-1** Ghadames, 18.6.1977, *Faruqi* 1434; **C-5** Zilla, 19.2.1978, *S.A. Alavi, Fathi and Ramadan* 1855-S.

Also reported from Fezzan, South Cyrenaica and Jabal Uwainat by Scholz (l.c.).

Distribution: Mediterranean region, Africa, Caucasia, S.W. Asia, Sinai, Arabia, C. & E. Asia and N. America.

Fl.: Aug.-Oct.

2. **Setaria verticillata** (L.) P. Beauv., Ess. Agrost. 51, 178. 1812. Durand & Barratte, Fl. Lib. Prodr. 251. 1910; Pamp. Pl. Trip. 37. 1914; Prodr. Fl. Cir. 95. 1931; Corti, Fl. Veg. Fezz. 33. 1942; Maire, Fl. Afr. Nord. 2:321. 1952; Keith, Prelim. Check List Lib. Fl. 2:892. 1965. (Fig. 94)

Panicum verticillatum L., Sp. Pl., ed. 2, 1:82. 1762.

Annual, erect or geniculate, up to 1 m high. Leaf blades flat, linear, scabrous or with scattered pilose; sheaths pilose on the margin. Panicle at first spiciform, dense and bristly, at maturity, untidily lobed, with short, stout branches bearing retrorsely scabrid bristles. Spikelet ellipsoid, often solitary and supported by 1- numerous bristles, lower glume c. 1/3 - 1/2 as long as the spikelet, upper glume ± as long as the spikelet; upper lemma not rugose, 2n = 18, 36, 54.

Type: Described from S. Europe & the Orient, Herb. Linn. 80/7 (LINN).

A-7 Agriculture farm between Ras-el-Hilal and Derna 17.10.1977, *M.A. Siddiqi & M. Ahmed* 1498.

Distribution: Europe, N. Africa, Arabia, Pakistan, C. Asia, India, Malaysia, and Vietnam.

Fl.: Throughout the year.

3 **Setaria viridis** (L.) P. Beauv., Ess. Agrost. 51. 171. 178. 1812; Durand & Barratte, l.c. 252; Pamp., Pl. Trip. 37. 1914; Prodr. Fl. Cir. 95. 1931; Maire, Fl. Afr. Nord. 1. 321. 1952; Keith, l.c. 893; Scholz, l.c. 447.

Panicum viride L., Syst. Nat. ed. 10:870. 1759.

Annual, erect or geniculate, up to 1/2 m. in height. Leaf flat, soft, lanceolate-acuminate, glabrous, up to 22 cm long and 8 mm wide; ligule ciliate. Panicle a cylindrical false spike, 1-10 cm long. Spikelets 1-several in a group seated on a cushion-tipped pedicel with 1-3 bristles at the base, bristles antrorsely scabrid, spikelets 2-3 mm long, deciduous; rachis pilose to villous, glumes very unequal, upper glume as long as the spikelet, lower glume 1/4-1/3 as long; lemma of upper floret not transversely wrinkled; palea of the fertile flower finely rugulose. 2n = 18, 36.

Type: Described from Europe, Herb. Linn. 80/12 (LINN).

Reported by Durand & Barratte (l.c.).

Distribution: Europe, N. Africa, S.W. & C. Asia, China, Japan, Vietnam. Introduced



Fig. 94 **Setaria verticillata:** A, habit × 1; B, basal portion of leaf blade, sheath and ligule × 8; C, spikelet with retrorsely scabrid bristles × 12.5.

into N. & S. America, Philippine & Australia.

Fl.: July-Oct.

4 ***Setaria italica** (L.) P. Beauv., Ess. Agrost. 51, 170. 178. 1812; Maire, l.c. 320; Scholz, l.c. 447.

Panicum italicum L., Sp. Pl. 56. 1753.

Cultivated annual, robust, more than 1 m tall, glabrous, erect or a little geniculate below. Leaf flat and large up to 45 cm long and 20 mm broad, upper surface scabrous; sheath hairy on margins; ligule a ring of hairs. Inflorescence a false spike, 10-30 cm or more long, lobed. Spikelets 2-3 mm long in groups of 2-4, obtuse, not deciduous, bristles 1-5, usually few, antrorsely scabrid, equal to or shorter than the mature spikelets; glumes quite unequal, the lower 1/3 the lenght of the spikelet, the upper almost as long as the lemma; lemma of upper floret not transversely wrinkled. 2n = 18, 35.

Type: Described from India, Herb. Linn. 80/14 (LINN).

Reported to be cultivated in Tripolitania by Scholz (l.c.).

Distribution: Cultivated in S. Europe, Mediterranean region, S.W. and C. Asia.

Commonly known as fox millet or Italian millet, *S. italica* was cultivated since prehistorical times in China, India and other parts of Asia. Its grain ripens within two months of sowing, thus it could be harvested quickly. It provides fodder for domestic animals and grain for human consumption even today. In Europe it is cultivated mainly to provide grains to cage birds. In U.S.A. it is cultivated for pasture and hay.

5 **Setaria glauca** (L.) P. Beauv., Ess. Agrost. 51, 169, 178. 1812. (Fig. 95)

Panicum glaucum L., Sp. Pl. 56. 1753; *P. pumilum* Poir., Encyc. Suppl. 4:273. 1816; *S. lutescens* (Weigel) F.T. Hubbard in Rhodora, 18:232. 1916; Maire, Fl. Afr. Nord. 1:319. 1952; Keith, Prelim. Check List Lib. Fl. 892. 1965.

Annual, erect or geniculately ascending, up to 40 cm tall. Culm glabrous, scabrous below the panicle. Leaf flat, up to 30 cm long, 8 mm wide, linear, acuminate, drawn



Fig. 95 **Setaria glauca:** A, habit × 0.62; B, spikelet showing rugose lemma and short upper glume × 9.

into a fine point; ligule a row of hairs. Inflorescence a dense and cylindrical spike-like panicle; axis finely hairy. Spikelets 3 mm long, 1-2-flowered, the lower male or neuter; glumes membranous, unequal, the lower c. 1 mm long, 3-nerved, acute; the upper 2 mm long, 5-nerved, acute, ovate; upper lemma membranous, 5-nerved, as long as the spikelet, transversely rugulose; palea sub-equal. $2n = 36$.

Type: Described from "The Indies" (Ceylon) (holo. Hermann 44, BM).

A-8 Wadi Derna, 20.1.1967, *L. Boulos* 1283.

Also reported to be present in Tripolitania and Cyrenaica by Keith (l.c.).

Distribution: Subtropical and warm temperate zones of the World; naturalized in America, Australia and S. Africa.

Setaria verticillata × **viridis** Lloyd, Fl. Ouest Fr. ed. 5:391. 1898.

S. ambigua Guss., Fl. Sic. Syn. 1: 114. 1842, non (Ten.) Merat, Fl. Par. ed. 4, 2: 11. 1836; *S. verticillata* (L.) P. Beauv. var. *ambigua* (Guss.) Parl., Fl. Palerm. 1: 36. 1845; *S. viridis* (L.) P. Beauv. var. *ambigua* (Guss) Coss. & Dur., Expl. Sc. Alg. Glum. 36. 1855.

Annual with erect or geniculately ascending culms. It is more like *S. verticillata* especially in the structure of inflorescence and spikelets but differs from it in having antrorsely scabrid bristles which is the characteristic of *S. viridis*.

Type: Sicilia, *Gussone*.

A-3 Leptis Magna ruins, 1.5.1974, *B. Faris* 337; Tripoli, University campus, 14.7.1977, *S.A. Faruqi* 1451; About 60 km from Tarhuna, on way to Tripoli, 6.8.1977, *S.A. Faruqi* 1468.

Distribution: N. Africa (Morocco to Egypt), Europe, Turkey, Syria, Arabia, W. Iran and Pakistan.

Fl.: July-Oct.

82. PENNISETUM

L.C. Rich. in Pers., Syn. Pl. 1:72. 1805.

Tufted perennials or annuals, often branched. Leaf flat. Inflorescence spike-like panicle. Spikelets awnless, sessile, solitary or in groups of 2-5, pedicelled, surrounded by a group of glabrous-hairy bristles, at maturity spikelets falling with the bristles (usually persistent in cultivated species), 2-flowered; lower floret male or barren, the upper hermaphrodite; glumes equal or the lower smaller than the upper; lower lemma equal to spikelet or a little shorter; palea more or less similar to lemma; lodicules very small or absent; stamens 3, the tips of anthers sometimes bearded; caryopsis obovate-globose.

Over 100 species, mainly in tropics and some of the subtropics; 4 species are reported from Libya.

1.	+ Cultivated annual; anthers bearded at tip	4. **P. americanum***
	— Wild perennial; anthers not bearded	2
2.	+ Bristles scabrous all over	1. **P. divisum**
	— Bristles ciliate below and scabrous towards apex	3
3	+ Leaf blades shorter than internodes	2. **P. elatum**
	— Leaf blades longer than internodes	3. **P. setaceum**

1. **Pennisetum divisum** (Forsk. ex Gmel.) Henr., in Blumea 3:162. 1938; Scholz in Willdenowia, 7:448. 1974. (Fig. 96)

Panicum divisum Forsk ex Gmel., Syst. Nat. 2:156. 1791; *P. dichotomum* Forssk., Fl. Aeg.-Arab. 20. 1775, non L. (1753); *Pennisetum dichotomum* (Forssk.) Delile, Fl. Egypt 159, tab. 8, fig. 1. 1813; Durand & Barratte, l.c. 252; Pamp., Pl. Trip., 31. 1914; Prod. Fl. Cir. 95. 1931; Corti, Fl. Veg. Fezz., 34. 1942; Maire, Fl. Afr. Nord. 1. 329. 1952; Keith, l.c. 740.

Perennial, rootstock woody, with empty sheaths, nodes swollen, up to 150 cm tall, tufted much branched, forming dense bush. Leaf pungent, stiff, up to 15 cm long, usually much smaller, scabrous on the upper surface. Inflorescence a false spike, cylindrical, somewhat dense, up to 10 cm long and 10 mm wide; axis scabrous. Spikelets single, rarely in pairs, involucre of bristles longer than the spikelet, bristles numerous, unequal and scabrous antrorsely; glumes unequal, the lower 4.5-6 mm long and 1-3-

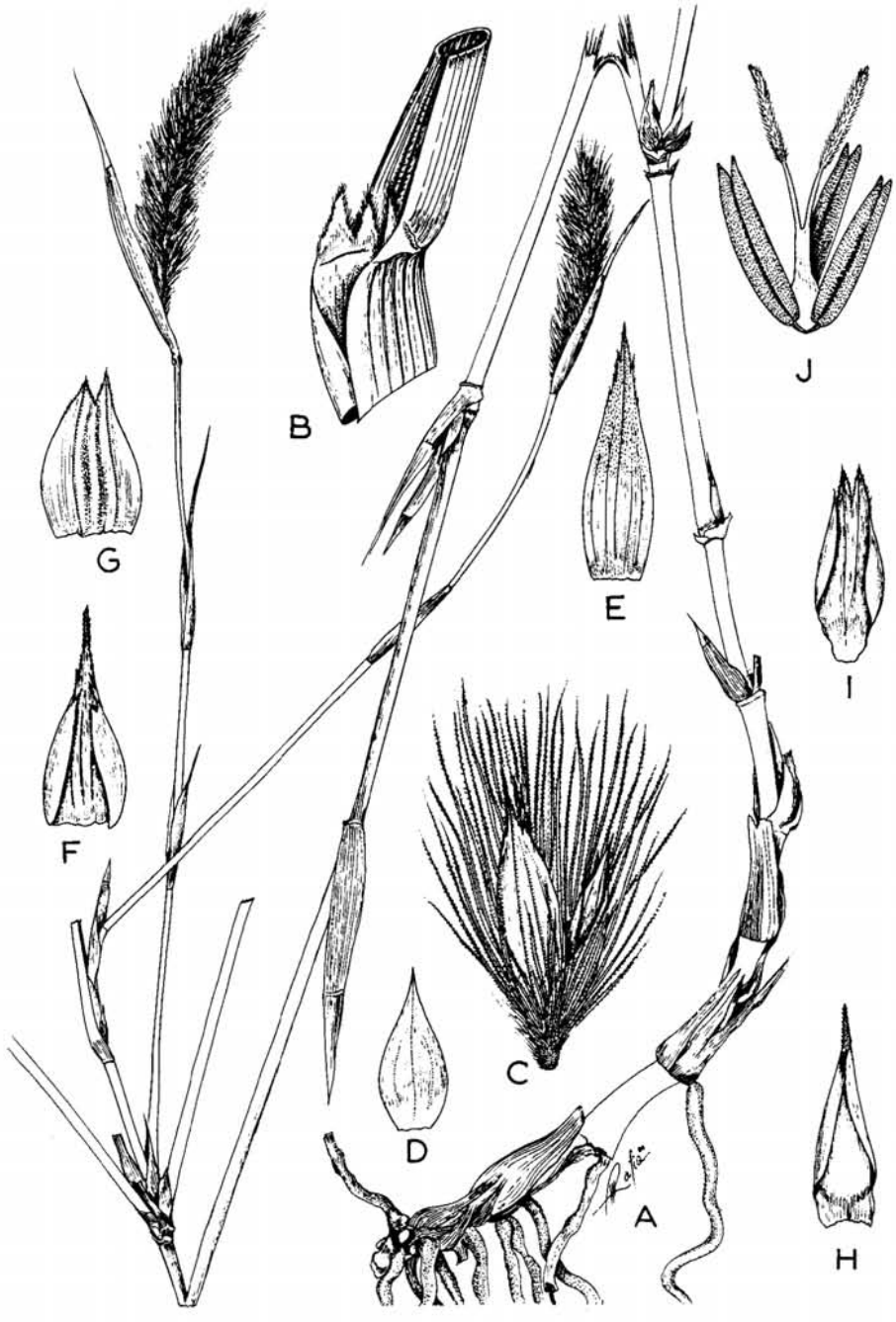


Fig. 96 **Pennisetum divisum**: A, habit × 0.5; B, portion of lamina, sheath and ligule × 7.5; C, spikelet × 5; D, lower glume × 5; E, upper glume × 5; F, lemma of hermaphrodite flowers × 5; G, palea of the same × 5; H, lemma of male flower × 5; I, its palea × 5; J, stamens and pistil × 10.

nerved, upper 5-7-nerved, mucronate, equal to the spikelet; lower flower male, lemma longer than the upper glume, aristately acuminate, awned; palea shorter, acuminate; upper floret bisexual; anthers not bearded. 2n = 36.

Type: Described from Arabia, *Forsskal* (C).

A-3 Wadi Kaam bridge on main highway, 7.4.1977, *Faruqi* 1346, 1347; **C-4** 84 km from Hun to Bugrain, 8.3.1978, *Faruqi* 1615.

Also reported from Cyrenaica, South Cyrenaica and Fezzan by Durand & Barratte (l.c.).

Distribution: N. Africa, Arabia, Iraq, Iran, Afghanistan, Pakistan and India.

Growing in clumps, similar to *Panicum turgidum*. Grain eaten by human as well as livestock. According to Keith (l.c.) at one time cultivated in Fezzan by Tuareg. It was introduced into Misrata area during Italian occupation. It is one of the most favourite grasses of the grazing animals.

Fl.: Mar.-June *Vern.* bu'rukba, mekhamla, talem-fezzout, tarfade, tarfave, tehaua.

2. **Pennisetum elatum** Hochst. ex Steud., Syn. Pl. Glum. 1: 106. 1854; Maire, l.c. 331; Keith, l.c. 740; Scholz, l.c. 448.

Perennial, woody, highly tufted and branched. Culm up to 1 m tall, branches glabrous, scabrous below the panicle. Leaves shorter than the internodes, often reduced. Inflorescence a cylindrical false spike, up to 13 cm long and 1 cm broad; peduncle glabrous; rachis villous. Spikelets solitary, rarely in groups, 2-flowered; bristles numerous, unequal, ciliate below with long tubercle based hair; lower glume 1/2-2/3 the length of spikelet, the upper glume equal or 3/4 to equal the length of spikelet; lower floret male, lemma shortly awned, palea ciliolate-scabrous; upper floret bisexual; lemma acuminate and shortly-awned, palea hyaline, anthers not bearded. 2n = 36, 54.

Type: Descibed from Arabia.

A-2 48 km from Bir Ayad on way to Nalut, 16.6.1977, *Faruqi* 1412; **B-2** 7 km from Nalut on way to Tripoli, 19.6.1977, *Faruqi* 1442.

Distribution: N. Africa (Tunisia, Libya), Arabia and Sinai.

Fl.: June.

Editor's note: Cope in Nasir & Ali, Fl. Pak., 143: 239. 1982, treated this species as a synonym of *P. divisum* (Gmel.) Henr.

3. **Pennisetum setaceum** (Forssk.) Chiov. in Bull. Soc. Bot. Ital. 113. 1923; Maire, l.c. 332; Keith, l.c. 740; Scholz, l.c. 448.

Phalaris setacea Forsk., Fl. Aeg. - Arab. 17. 1775; *Pennisetum asperifolium* (Desf.) Kunth, Rev. Gram. 1:49. 1829; Pamp., Pl. Trip. 30. 1914; *Cenchrus asperifolius* Desf., Fl. Atlan. 2:388. 1799.

A densely tufted perennial, more than 1 m tall. Culm unbranched, glabrous, except below the panicle scabrous or finely pubescent. Leaves up to 30 cm long and 3 mm broad. longer than the internodes, finely hairy on the margins, glabrous to slightly hairy towards the base, linear-lanceolate. Inflorescence a dense, false spike 10- (25) cm long and up to 2 cm wide; pedicel with long silky hair. Spikelets in groups of 1-3, 2-flowered, surrounded by a number of unequal bristles; bristles up to 25 mm long, much longer than the spikelets, ciliate with tubercle based hairs towards the lower half and scabrous towards apex; upper glume almost as long as the spikelet, 3-nerved, lower much smaller, 1-2 mm long, 1/3 the lenght of spikelet, lower floret neuter or rarely male; lemma with awn-like tip; upper floret bisexual, lemma awned, anthers not bearded. $2n = 36$.

Type: Described from Egypt.

A-2 21 km from Bir Ayad on way to Nalut, 16.6.1977, *Faruqi* 1411; **A-3** Leptis Magna, 8.3.1968, *L. Boulos* 1883; Gharian hills, 29.11.1975, *S.M.H. Jafri* 6232; *ibid,* 21.5.1976, *Faruqi* 732, 733; Awlad Mohammad, 5.4.1977, *Faruqi* 1344, 1345.

Distribution: N. Africa, W. Asia, Egypt, Ethiopia, Somalia, Tanganyka.

According to Keith (l.c.) this grass is fed to horses during winter. Although not a good pasture grass, still it is eaten by goats and camels.

Fl.: Mar.-Nov. *Vern.* summa; adem; bu'rukba; haffan; harsha; harsheh; tmam.

4. ***Pennisetum americanum** (L.) Schumann in Engl., Pflanzenw. Ost.-Afr. B. 51, C. tab. 4, fig A & B (1895); Maire, Fl. Afr. Nord. 1: 338. 1952

Panicum americanum L., Sp. Pl. 56. 1753; *Alopecurus typhoides* Burm., Fl. Ind. 27. 1768; *Pennisetum typhoides* (Burm.) Stapf & C.E. Hubb., in Kew Bull. 1933:271. 1933; *Pennisetum typhoideum* Rich. ap. Pers., Syn. 1, 72. 1805; Durand & Barratte, Prodr. Fl. Lib. 252. 1910; Corti, Fl. Veg. Fezz. 469. 1942.

Annual. Culm solid, erect, simple or branched, up to 3 m tall, nodes densely barbate, below the inflorescence villous, puberulous, scabrous or glabrous. Leaves flat, linear-lanceolate, acuminate, glabrous-scabrous to shortly hairy, margins scabrous, 60 cm long, up to 15- (30) mm wide. Inflorescence a dense cylindrical spike, up to 30 cm long, 2.5 cm wide, axis villous; involucre shortly pedicelled; outer bristles scabrous, inner plumose. Spikelets in groups of 2-5, rarely solitary, oblong or elliptic oblong; lower glume 1.75 mm long, upper 2.5 mm, truncate; lower florets male, upper bisexual; lemma almost equal to the spikelet, minutely hairy, anthers bearded at the tip; caryopsis oblong-elliptic, 3-4 mm long. 2n = 14.

Type: Described from America.

B-1 Ghadamas, 18.6.1977, *Faruqi* 1431.

Distribution: In the tropics and the subtropics of the World.

It is an important drought resistant crop of the Old World, and flourishes in 300 mm rainfall. Grains are used for human consumption and stalks for livestock fodder in Africa, India and Pakistan. Exotic. Reported in cultivation in 1912 in Khoms, Misrata and Tripoli (Keith, l.c.).

Fl.: May-June *Vern.* Gsab, abora; beshna; draa el ili.

83. CENCHRUS

L., Sp. Pl. 1049. 1753; Gen. Pl. ed. 5:470. 1754.

Annual or perennial. Leaf flat and narrow. Inflorescence a solitary spike-like panicle of a zigzag rachis. Spikelets solitary or 2-3 enclosed in a bur-like sessile involucre formed by bristles and spines fused at the base and falling with the spikelets, 2-flowered, the lower male or neuter, the upper bisexual; glumes unequal, the lower smaller, the upper as long as the spikelet; stamens 3; lodicules absent; caryopsis oblong-ellipsoid or obovate.

About 25 species of tropics and warm temperate region; 2 species are found in Libya.

+ Burs (involucre) lacking stiff spines with flattened base; plants perennial	1. **C. ciliaris**
— Burs (involucre) contain stiff spines with flattened base; plants annual	2. **C. incertus**

1. **Cenchrus ciliaris** L., Mant. Alt. 2.302. 1771; Maire, Fl. Afr. Nord. 1. 341.1952; Keith, Prelim. Check List Lib. Fl. 342. 1965; Scholz, in Willdenowia, 7:448. 1974. (Fig. 97)

   Pennisetum ciliare (L.) Link, Hort. Berol. 1:213. 1827; Durand & Barratte, Prodr. Fl. Lib. 252. 1910; Pamp., Pl. Trip. 31. 1914; Prod. Fl. Cir. 95. 1931.

Perennial with a woody rootstock, tufted, erect or geniculately ascending, up to a metre tall. Leaf linear, acuminate, glabrous or with tubercle based scattered hair;sheath glabrous or with scattered hair; ligule a ring of hairs up to 4 mm long. Inflorescence a false spike, up to 10 cm long. Spikelets dense, solitary or 2-3 in a group, subsessile with short and thick pedicels, on which two kinds of bristles forming an involucre, the outer circle of slender, short and scabrid bristles and an inner flattened and long bristles with tubercle based antrorsely arranged cilia on the lower half, involucre lacking stiff spines with flattened base; glumes unequal ovate or oblong, lower 2-3 mm long, 1-nerved; upper 2-3.5 mm long, 1-3-nerved; lower floret male or neuter; lemma ovate, upper floret bisexual, palea subequal; lodicules absent. 2n = 32, 34, 36, 40, 44, 52, 54.

Type: Described from S. Africa *Koenïg* (LINN).

A-2 68 km after Tiji, towards Tripoli, 18.4.1975, *S.I. Ali* 2900; Bir Ayad, *Gintzburger*

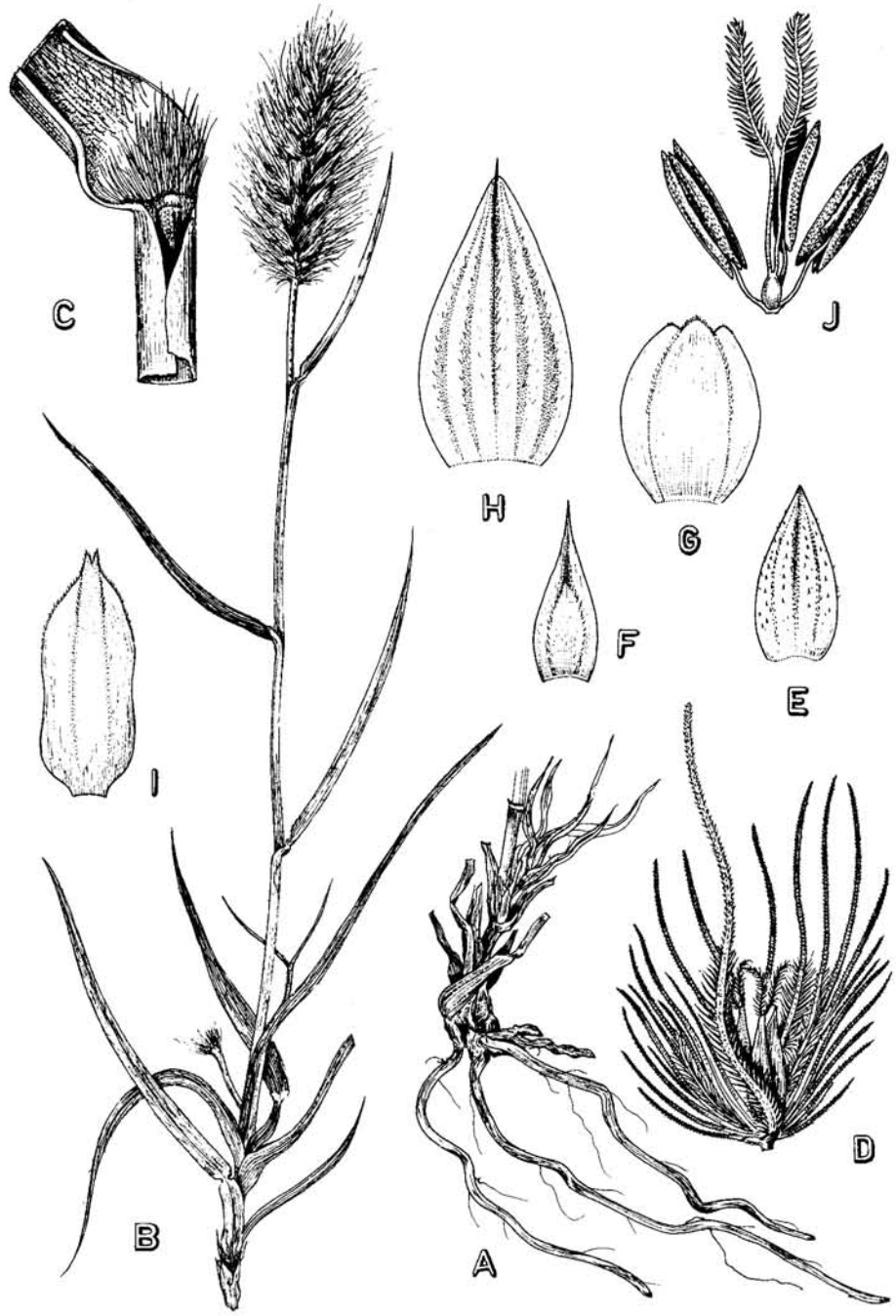


Fig. 97 **Cenchrus ciliaris:** A, basal part of plant × 1; B, habit × 1; C, basal portion of lamina, sheath and ligule × 5; D, spikelet × 5; E, upper glume × 10; F, lower glume × 10; G, lower lemma × 10; H, upper lemma × 10; I, upper palea × 10; J, stamens and pistil × 10.

76111403; **A-3** Jafara plains, Gharyan, *Gintzburger* 77050019; Tripoli, University Campus, 5.3.1977, *M.A. Siddiqi* 189; **B-2** Shakshuk, wadi bed, *Gintzburger* 7701311; Between Jinawan and Shakshuk, 24.1.1977, *M.A. Siddiqi & F.B. Rateeb* 216.

Also reported from Cyrenaica by Durand & Barratte, (l.c.) etc.

Distribution: S. Europe, N. Africa, Arabia, eastwards to Iran, Afghanistan, Pakistan, India also in tropical and S. Africa; widely introduced.

This is regarded as one of the finest pasture grass, especially of warm dry climates. It can be grown on local dry ranges rather well. Lately it has shown an appreciable come back on recently built range enclosures especially in Bu-Gheilan area.

Fl.: Mar.-Apr. *Vern.* Zewan, kram kram.

2. **Cenchrus incertus** M.A. Curtis, Boston Journ. Nat. Hist. 1: 135. 1837; Clayton in Tutin et al Fl. Eur. 5: 264. 1980. (Fig. 98)

C. pauciflorus Benth., Bot. Voy. Sulph. 56. 1844; Schulz, l.c. 448.

Annual, up to 35 cm tall, ribbed; internodes conspicuously barbed below the inflorescence. Leaf flat and narrow, linear-acuminate, glabrous or with scattered tubercled hairs, 10-12 cm long, 3 mm wide; ligule a ring of hairs. Inflorescence a spike-like panicle of sessile spikelet, 4-5 cm long. Spikelets solitary, 7-8 mm long; involucre spiny, spines 4 mm long, lower 1/2-3/4 of spines with 1 mm long cilia, the tip naked and smooth; glumes unequal, lower 2 mm long, 1-nerved, upper 5 mm long, 3-nerved; lower floret neuter, the upper bisexual,; lemma 6 mm, ovate, acuminate, 5-nerved; palea 5 mm long, 2-nerved, ovate, acuminate. 2n = 34, 36.

Type: Described from Baja California. Mexico.

A-3 Tripoli, Oil Company School, 20.10.1976, *Faruqi* 1040-b; University, Tripoli, 7.6.1977, *S. Faruqi* 1403-a; *ibid,* 14.7.1977 *S. Faruqi* 1455.

Distribution: North America, introduced into the Mediterranean region.

An obnoxious weed of lawns and cultivated areas.

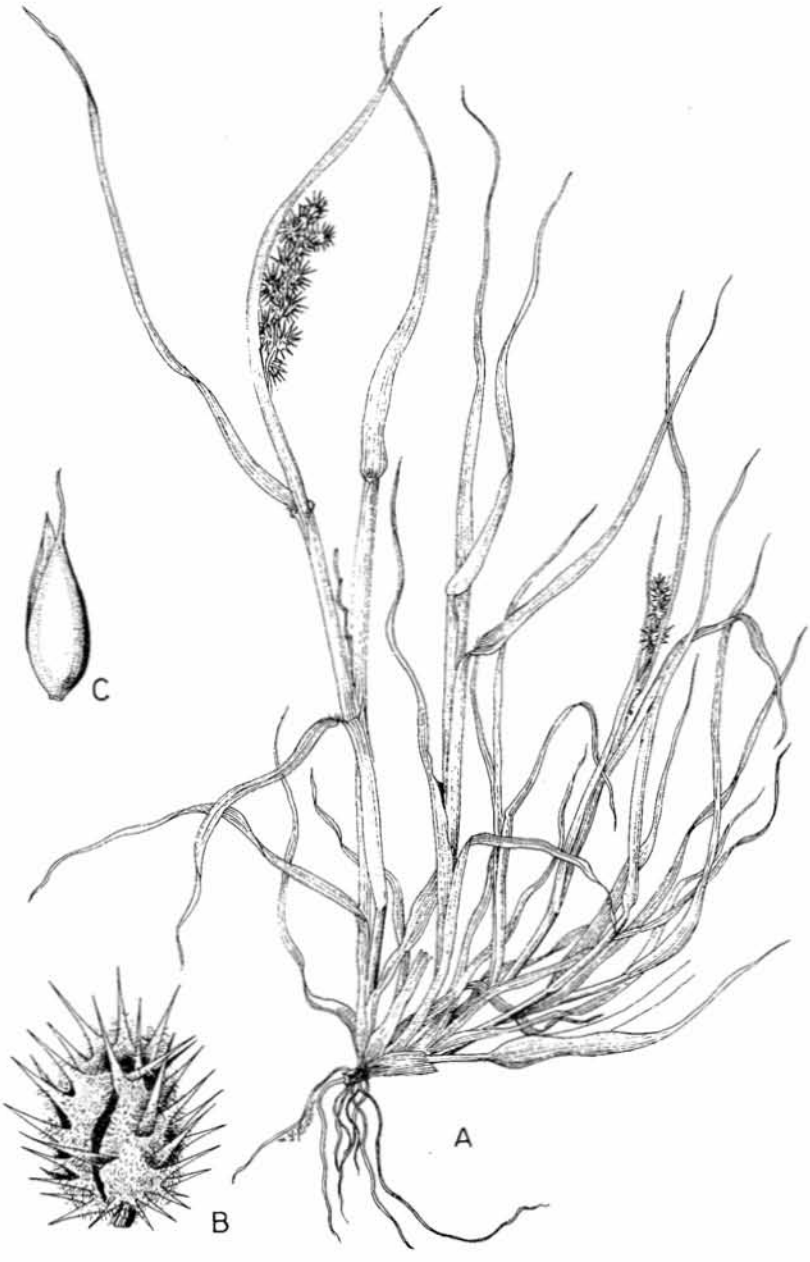


Fig. 98 **Cenchrus incertus:** A, habit × 0.5; B, bur × 3; C, floret × 3.

Fl.: June-Oct.

84. **HYPARRHENIA**

Anderss. ex Fourn., Mex. Pl. Gram:51 & 67. 1886.

Annual or perennial, coarse. Leaf flat. Inflorescence a simple or compound spatheate panicle of paired racemes at the apex of culm or their branches; each raceme pair subtended by a small spatheole. Spikelets in pair, sessile and pedicellate, 2-flowered; sessile spikelets hermaphrodite and awned; pedicellate spikelets male and awned; the lowest pair of spikelets homogamus, male or sterile; glumes equal, the lower flat, the upper shallowly boat-shaped; lower lemma hyaline, enclosing a male floret, with or without minute hyaline palea; upper lemma of the sessile spikelet 2-toothed at the apex between which awn is present; awn hairy below the knee; palea of the sessile spikelet absent or a hyaline scale, that of the pedicelled spikelet a hyaline scale; stamens 3; lodicules 2, glabrous; caryopsis oblanceolate.

About 75 species, mostly in Tropical Africa; only 1 species is recorded from Libya.

Hyparrhenia hirta (L.) Stapf in Prain, Fl. Trop. Afr. 9:315. 1919; Corti, Fl. Veg. Fezz. 40. 1942; Maire, Fl. Afr. Nord. 1. 289. 1952; Keith, l.c. 565; Scholz in Willdenowia, 7:448. 1974. (Fig. 99)

Andropogon hirtus L., Sp. Pl. 1046. 1753 var. *pubescens* Vis, Fl. Dalm. Suppl. 1, 14. 172; Durand & Barratte, l.c. 250; Pamp. Pl. Trip. 10. 1914; Prodr. Fl. Cir. 94. 1931.

Densely tufted perennial, up to 1 m tall, glabrous. Leaf narrow, rolled or folded, scabrous. Inflorescence 10-20 cm long of numerous divergent pairs of racemes and 2-3 cm long; each raceme pair subtended by a linear-lanceolate and glabrous spatheole; peduncle of the racemes finely hairy; pedicel 3-4 mm long, villous. Spikelets of the lower pair homogamous male; sessile spikelets of the upper pair oblong, 4-5 mm long; glumes equal, lower flattened on the back, truncate at the apex, 9-11-nerved, long-villous mostly on the upper half; the upper 3-nerved, obtuse with long hairs near the tip; lower lemma obtuse, ciliate, 2-nerved; upper lemma 2-fid, awned; awn up to 3.5 cm long; column twisted and somewhat villous. $2n = 36, 40, 54, 56$.

Type: Italy, *Burser* 1119 (UPS).

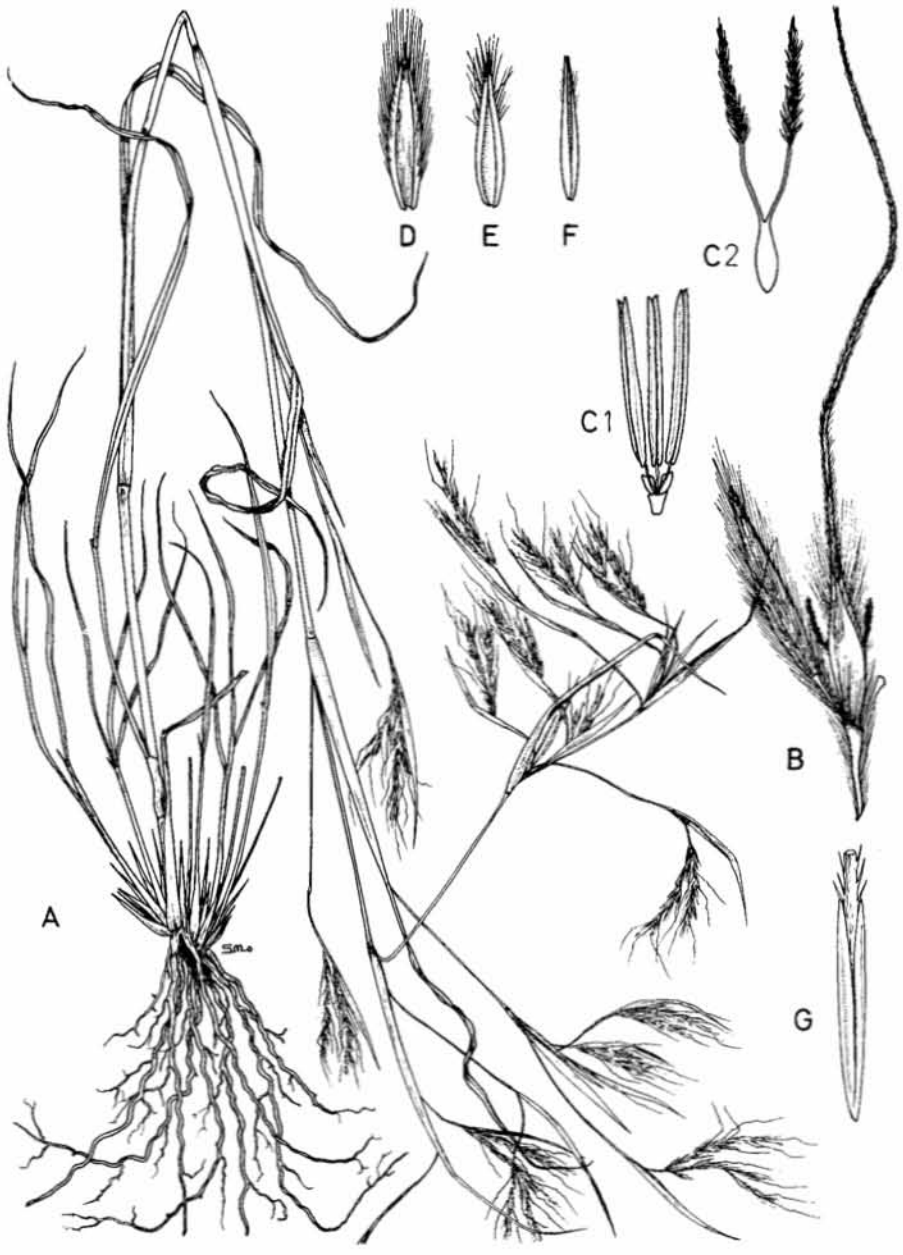


Fig. 99 **Hyparrhenia hirta:** A, habit × 0.5; B, spikelet pair × 5; C_1, male flower × 10; C_2, pistil × 10; D, lower glume × 5; E, upper glume × 5; F, lower lemma × 5; G, upper lemma with awn × 10.

A-2 Jenawan, between Jadu and Shakshuk, 24.1.1977, *H.B. Quresh & M. Ahmad* 1064, 1067, 1068, 1069, 1070, 1071, 1072; 2 km from Gharian Hills towards Tripoli, 27.3.1977, *M. Ahmad* 1319, 1320; 48 km from Bir Ayad towards Nalut, 16.6.1977, *Faruqi* 1413; **A-3** 4 km from Tripoli on Swani Rd., 3.3.1977. *Faruqi* 1180; *ibid,* 3.3.1977, *Faruqi* 1178; Tripoli, Airport Road, near Refinery, 5.3.1977, *Faruqi* 1195, 1196, 1197, 1198; Wadi Majinin Dam, 23.3.1977, *Faruqi* 1293, 1294, 1295; **A-7** 4 km from Susa towards Shahat, 24.5.1977, *Faruqi* 1383, 1384; Wadi Al-Agar, c. 14 km from Susa towards Derna, 24.5.1977, *Faruqi* 1388.

Distribution: Mediterranean region, S.W. Asia, Pakistan, N.W. India, S. and E. Africa.

Fl.: All the year round.

85. **CYMBOPOGON**

Spreng., Pugillus 2:14. 1815.

Aromatic, tufted, perennial, erect. Leaf coarse. Inflorescence a paired racemes, one sessile and the other subtended by a boat-shaped spatheole, raceme pairs borne on a short peduncle. Spikelets in pairs, one sessile and the other pedicellate, seated on each joint of the rachis of the raceme, the lower 1-2 pairs homogamous male or neuter, 2-flowered; glumes subequal, the lower flat, grooved or with a slit, the upper boat-shaped, lemmas hyaline, the lower entire, the upper bifid with a glabrous awn from the sinus; paleas absent or minute; stamens 3; lodicules 2, minute, glabrous; caryopsis ellipsoid.

About 55 species of the tropics and subtropics of Africa, Asia and Australia; 1 species is found in Libya.

Cymbopogon schoenanthus (L.) Spreng. Pugillus. 2:15. 1815; Corti, Fl. Veg. Fezz. 38. 1942; Maire, Fl. Afr. Nord. 1:286. 1952; Keith, l.c. 413; Scholz in Willdenowia, 7:448. 1974. (Fig. 100)

Andropogon schoenanthus L., Sp. Pl. 1046. 1753. *A. laniger* Desf., Fl. Atlan. 2:379. 1799; Pamp., Prod. Fl. Cir. 94. 1931.

Culm erect, 20-50 (-130) cm high, glabrous. Leaf filiform to flat, 1.5-4 mm wide, scabrous below; ligule membranous, glabrous, truncate or rounded; sheath glabrous.

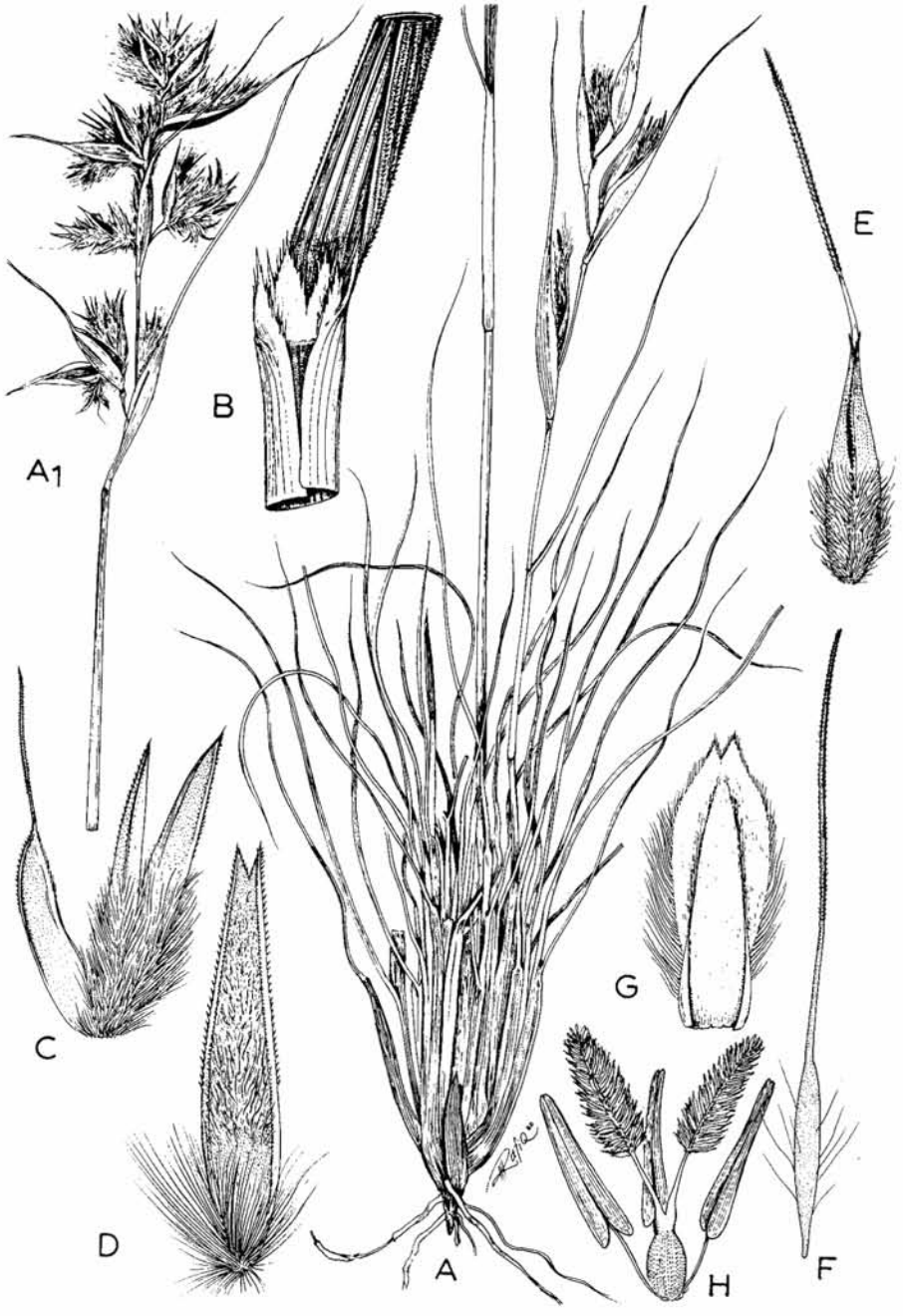


Fig. 100 **Cymbopogon schoenanthus:** A, A_1, habit × 0.5; B, portion of lamina, sheath and ligule × 7.5; C, sessile and pedicellate spikelets × 5; D, lower glume × 10; E, upper glume enclosing florets (awned) × 10; F, sterile lemma × 10; G, fertile lemma × 10; H, stamens and pistil × 10.

Inflorescence a spatheolate panicle, 10-30 cm long; spatheole 15-36 mm long, glabrous; peduncle 3.5-25 mm long, slender, sparsely tomentose in the upper part or sometimes glabrous; raceme 13-29 mm long, lower raceme base not swollen, fused with the swollen lowermost pedicel; rachis internodes and pedicels densely pilose along the margins and on the back. Spikelets in pairs, sessile spikelets 4-7 mm long, lower glume narrowly lanceolate, dorsally concave, glabrous or minutely tomentose; lemma awned, awns 6-9 mm long; anthers exerted, very prominent, 2.75 mm long; pedicellate spikelets 5-7 mm long, lower glume lanceolate. 2n = 20

2 subspecies are recognized here.

+ Lower glume of sessile spikelet glabrous; awn conspicuously exserted	(a) ssp. **schoenanthus**
– Lower glume of sessile spikelet minutely tomentose on the back; awn not exserted or little exerted	(b) ssp. **proximus**

(a) ssp. **schoenanthus**

Type: Described from Arabia, W. Schimper 789 (K, Isotype!).

B-2 21 km from Nalut, towards Tripoli, 19.6.1977, *S.A. Faruqi* 1447; **C-3** Jabal As Sawda, Wadi Qabri Jumah, 13.2.1978, *C. Ricceri & C.H. Steinberg* 31; *id,* 12 km. N.M.W. Tower, 19.2.1978, *C. Ricceri & Steinberg* 33.

Fl.: May

(b) ssp. **proximus** (Hochst. ex A. Rich.) Maire et Weiller, Fl. Afr. Nord. 1:287. 1952; Corti, Fl. Veg. Fezz. 39. 1942.

Andropogon proximus Hochst. ex A. Rich., Tent. Fl. Abyss. 2:464. 1851; *Cymbopogon proximus* (Hochst. ex A. Rich.) Stapf in Prain, Fl. Trop. Afr. 9: 271. 1919.

Type: Described from Ethiopia, *Schimper.*

Reported from Tibesti, Tripolitania and S. Cirenaica by Corti (l.c.)

Distribution: Morocco, Algeria, West Africa to Sudan and Kenya.

86. ANDROPOGON

L., Sp. Pl. 1045. 1753; Gen. Pl. ed. 5:468. 1754.

Inflorescence spike-like raceme in a single terminal pair. Spikelets in pairs at each joint of a hairy rachis, one sessile and the other pedicellate, 2-flowered, the lower neuter and reduced to one sterile lemma; sessile spikelets heterogamous; glumes subequal, lower 2-nerved, the upper 1-nerved; sterile lemma hyaline, 2-nerved, fertile lemma bifid and awned; palea small, hyaline; lodicules 2, very small, glabrous; stamens 3; 2 feathery stigmas; pedicellate spikelets male, glumes muticous or shortly awned.

About 113 tropical and subtropical species. Only 1 species is recorded from Libya.

Andropogon distachyos L., Sp. Pl. 1046. 1753; Pamp., Prod. Fl. Cir. 93. 1931; Maire, l.c. 283; Keith, l.c. 233; Scholz in Willdenowia, 7:449. 1974. (Fig. 101)

Pollinia distachya (L.) Sprengel, Pug, Pl. Minus Cogn. 2: 12. 1815.

Tufted perennial, up to 1 m tall. Culm glabrous, usually 3-noded, simple or branched from the base. Leaves mostly basal, glabrous or with scattered hairs, 5-15 (-20) cm × 1.5-3 (-4) mm, linear, acuminate; ligule 1-2 mm, truncate, with long hairs from the base. Inflorescence a terminal paired raceme with villous nodes, one raceme branch with a short sterile zone and the other sessile; axis barbed with 2 rows of villous hairs. Spikelets paired, one sessile and the other pedicellate; sessile spikelets heterogamous, lanceolate, acuminate, 7-12 mm long, callus barbed; lower glume glabrous (or somewhat pubescent), bifid, not awned; upper glume finely ciliate, shortly 2-toothed, with a fine awn from the sinus; lower florets reduced to a lemma, 5-6 mm long, 2-nerved; upper floret hermaphrodite; lemma bifid with an awn from the centre, tip of lemma twisted around the base of awn; awn 2.5 cm long, column twisted; pedicellate spikelet 8-10 mm long; pedicel glabrous to minutely hairy; lower glume 2-toothed with an awn arising from the sinus; upper glume shorter and with a small awn; lemma hyaline. $2n = 36$.

Type: Described from Switzerland, Burser, Herb. Linn. 1211/10, photo (LINN).

A-7 Ras El Helal, 6.5.1978, *Faruqi* 1786, 1787; *id.* Hill Forest, 24.5.1977, *Faruqi* 1391, 1392; Baida, 22.4.1934, *Pampanini & Pichi-Sermolli* 249 (FI); Wadi Kuf, 24.4.1922,



Fig. 101 **Andropogon distachyos:** A, habit × 0.5; B, lamina base, ligule and sheath with culm × 5; C, pedicellate spikelet × 2; D, lower glume of the same × 5; E, lower glume of sessile spikelet × 5; F, upper glume × 5; G, fertile lemma × 5; H, sterile lemma × 5; I, stamens and pistil × 5.

Maugini s.n. (FI); Wadi Mahbool, Baida-Derna coastal road, 1.3.1973, *S.I. Ali & Faruqi* 1084.

Distribution: Mediterranean region, Canaries, Arabia, Ethiopia, Tropical Africa.

Fl.: Mar.-May

87. **DICHANTHIUM**

Willemet in Usteri, Neue Ann. d. Bot. 18.11.1796.

Usually perennial, rarely annual. Leaf flat. Inflorescence 2-many, sub-digitate, spike-like racemes, axis jointed, disarticulating at maturity. Spikelets paired, one sessile and the other pedicellate, situated at the articulation, 2-flowered, the lowest 2-4 pairs male or neuter; the remaining sessile spikelets with 1-bisexual floret, the lower neuter; pedicellate spikelets with 2-male florets or 1-male and 1-neuter floret or both neuter; glumes equal, the lower 2-keeled, flat, many-nerved, the upper boat-shaped, 3-nerved, keeled; lemmas hyaline, the upper narrow, gradually passing into a slender awn; paleas minute or absent; anthers 3; lodicules 2; caryopsis dorsally compressed, oblong-elliptic.

About 20 species of tropics and subtropics of the Old World; 2 species are recorded from Libya.

+ Lower glume of sessile spikelet pitted; racemes solitary	1. **D. foveolatum**
– Lower glume of sessile spikelet not pitted; racemes digitate to sub-digitate	2. **D. annulatum**

1. **Dichanthium foveolatum** (Del.) Roberty in Boissiera 9:170. 1960. (Fig. 102)

Andropogon foveolatus Del., Fl. Egypt. Explic. Pl. 16, tab. 8, fig. 2. 1812; *Eremopogon foveolatus* (Del.) Stapf, in Prain, Fl. Trop. Afr. 9:183. 1917; Corti, l.c. 39; Maire, Fl. Afr. Nord. 1.275. 1952; Keith, l.c. 460; Scholz in Willdenowia, 7:449. 1974.

Tufted perennial with small rhizome, erect or geniculately ascending, branched; branches slender, nodes bearded. Leaves narrow, linear, glabrous above, scabrous below, 2.5-8 cm × 1-2 mm, sheath glabrous-scabrous, lower villous. Inflorescence a solitary raceme at the end of each branch, 3-5 cm long, peduncles exceeding the spathe.

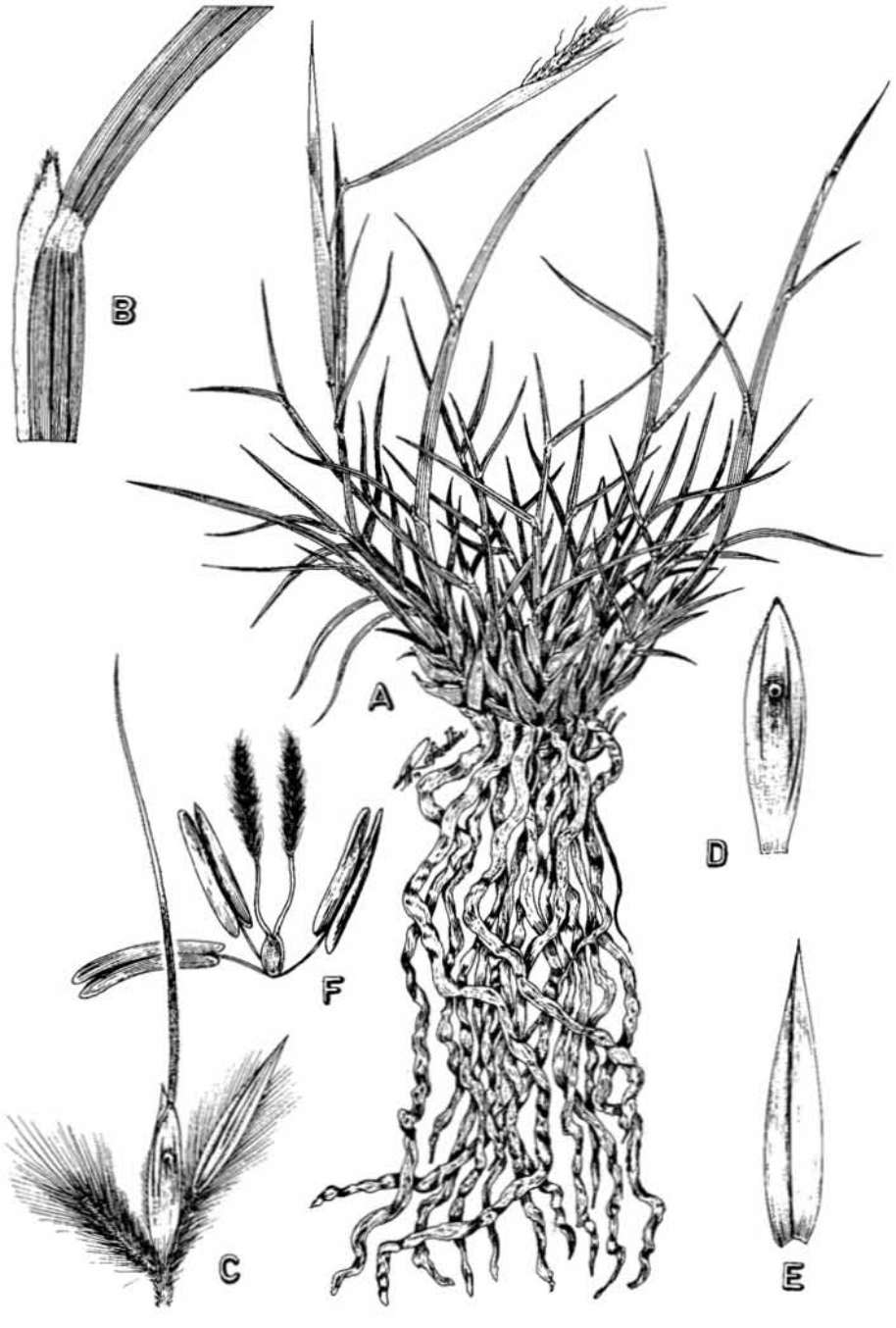


Fig. 102 **Dichanthium foveolatum**: A, habit × 1; B, lamina base, ligule and sheath × 5; C, sessile and pedicellate spikelets × 5; D, lower glume × 10; E, upper glume × 10; F, stamens and pistil × 10.

Spikelets paired; sessile spikelet 4 mm long, oblong-lanceolate, glabrous; callus short, hairy; lower glume with a circular pit in the middle, upper glume lanceolate, acute; lower lemma short, upper lemma modified into an awn; pedicellate spikelet as long as the sessile one; pedicel 2.5 mm long, with 2-rows of long silky hair, lower glume with or without a circular pit. 2n = 40.

Type: Egypt: 'Fleurit en hiver dans les vallees sablonneuses de l'isthme de Soneys, *Delile*' (K).

C-4 33 km from Hun towards Bugrain, 8.3.1978, *Faruqi* 1613, 1614; **D-3** Sebha, 18.5.1933, *Corti* 914 (FI).

Also reported from S. Cyrenaica and Jabal Uwainat by Corti, l.c. and Scholz, l.c.

Distribution: N. Africa, Sudan, Ethiopia, Canaries, Arabia, Iran and Pakistan.

Fl.: Mar.-May

2. **Dichanthium annulatum** (Forsk.) Stapf, in Prain, Fl. Trop. Afr. 9:178. 1917; Maire, Fl. Afr. Nord. 1:281, 1952; Scholz, in Willdenowia, 7.449. 1974. (Fig. 103)

Andropogon annulatus Forsk., Fl. Aeg.-Arab. 173. 1775.

A tufted perennial, geniculately ascending or erect, up to 1 m tall. Culms glabrous with bearded nodes. Leaf flat, scabrous-scattered tubercle based hairs, sheath glabrous; ligule scarious 2 mm long, glabrous. Inflorescence digitate with a short primary axis, axils with few short hairs, racemes usually solitary, sometimes lower one's branched. Spikelets paired; sessile spikelets oblong, obtuse, the lower 1-3 awnless, male or neuter, the others bisexual and awned; lower glumes truncate, pubescent all over with long hair, hairs on the tip of the lower glume bulbous based; upper glume lanceolate, acute, glabrous or ciliate; lower lemma linear-oblong, obtuse; upper lemma reduced to a hyaline, flattened base of a geniculate awn; pedicels solid (without a median furrow); pedicellate spikelets male or neuter. 2n = 20, 40, 60.

Type: Ad ripas Nili, Forssk., C.

B-3 60 km S.E. Beni Walid, *Gintzburger,* 78042510

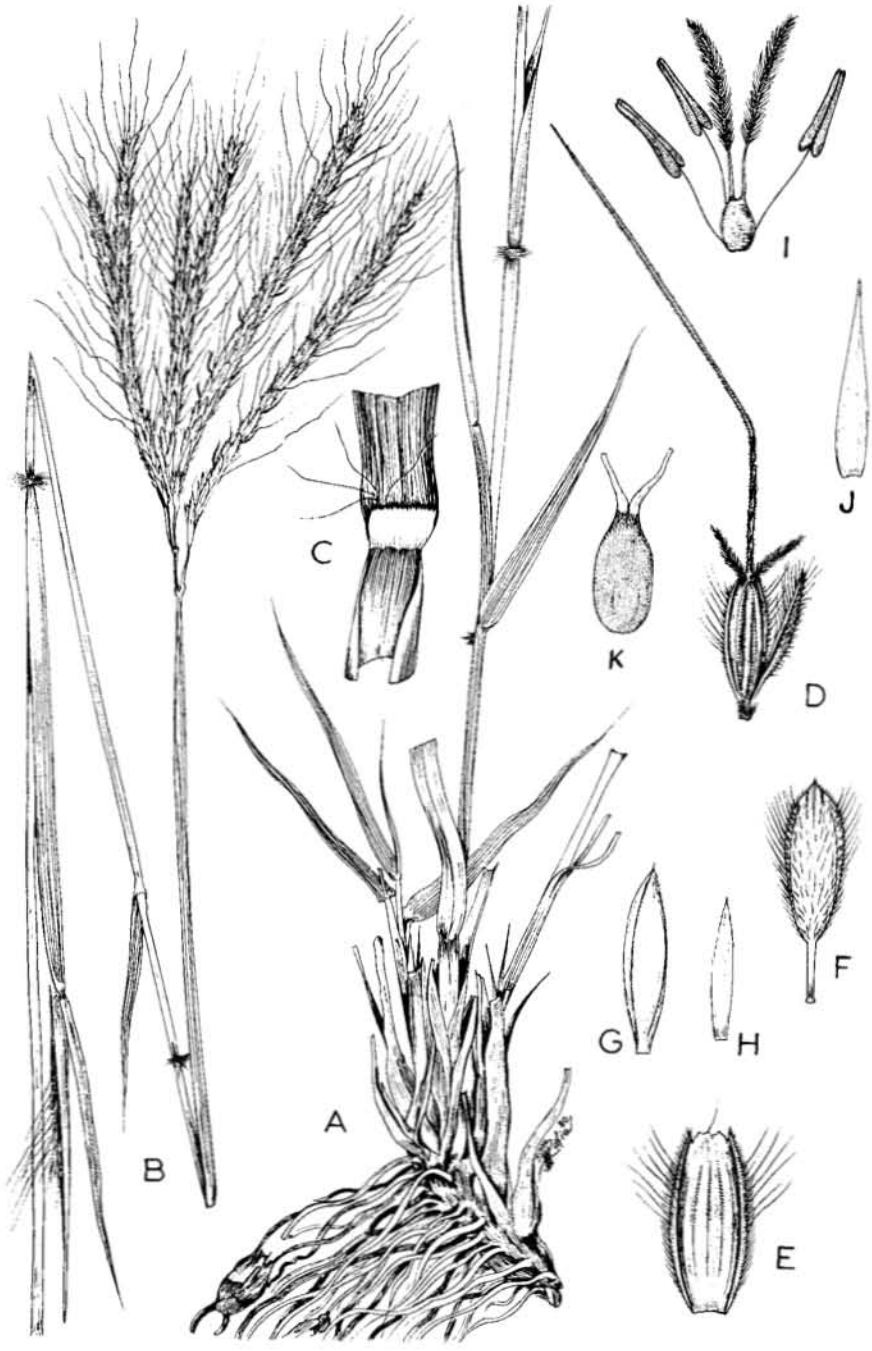


Fig. 103 **Dichanthium annulatum**: A, habit × 1; B, flowering shoot × 1; C, portion of lamina, sheath and ligule × 5; D, sessile and pedicellate spikelet pair × 7.5; F, lower glume of pedicellate spikelet × 7.5; G, H, their lemmas × 7.5; I, stamens and pistil × 7.5; J, sterile lemma of sessile spikelet × 7.5; K, pistil × 15.

Distribution: N. Africa, Egypt, Syria, Jordan, Palestine, Arabia, Iran, Afghanistan, Pakistan, India and Burma.

Fl.: Mar.-Apr.

88. **SORGHUM**

Moench, Meth. Pl. 207. 1794, nomen conservatum.

Annual or perennial, erect, stout. Leaves flat and large. Inflorescence a branched panicle. Spikelets paired, one sessile and the other pedicellate, 2-flowered, the lower floret reduced to an empty lemma, the upper floret bisexual in the sessile spikelet, and male or neuter in the pedicellate spikelet; glumes equal, coriaceous, the lower flattened, the upper boat-shaped; lemmas hyaline, the upper 2-lobed, awnless or awned from the sinus; paleas minute or absent; stamens 3; lodicules 2, truncate-cuneate, ciliate above; caryopsis elliptic-obovate.

About 60, tropical and subtropical species; 3 species are reported from Libya; of these 2 are known from cultivation.

1.	+ Spikelets ovate to globose; caryopsis exceeding the glumes	3. **S. bicolor***
	— Spikelets lanceolate to elliptic-oblong; caryopsis included within the glumes	2
2	+ Perennial; nodes pubescent	1. **S. halepense**
	— Annual; nodes glabrescent	2. **S. sudanense***

1. **Sorghum halepense** (L.) Pers., Syn Pl. 1:101. 1805; Durand & Barratte, l.c. 249; Pamp., Fl. Cir. 93. 1931; Maire, Fl. Afr. Nord. 1:265. 1952; Keith, l.c. 922; Scholz in Willdenowia, 7:449. 1974. (Fig. 104)

   Holcus halepense L., Sp. Pl. 1047. 1753. *Andropogon halepense* (L.) Brotl., Fl. Lusit. 1:89. 1804.

A spreading rhizomatous perennial. Culms up to 1.5 m tall, stout, erect and branched, with pubescent nodes. Leaf flat, linear, acuminate, sheath glabrous, somwhat loose. Inflorescence a branched open panicle, pyramidal. Spikelets paired, 1-sessile and the other pedicellate; sessile spikelets lanceolate-elliptic, shortly hairy, 4.5-5.5 mm long, awned; glumes equal; lower lemma as long as the upper glume, obtuse, margins ciliate; upper lemma ciliate, 2-lobed, awned from the sinus; pedicellate spikelet as long as the sessile, awnless. 2n = 20, 40.

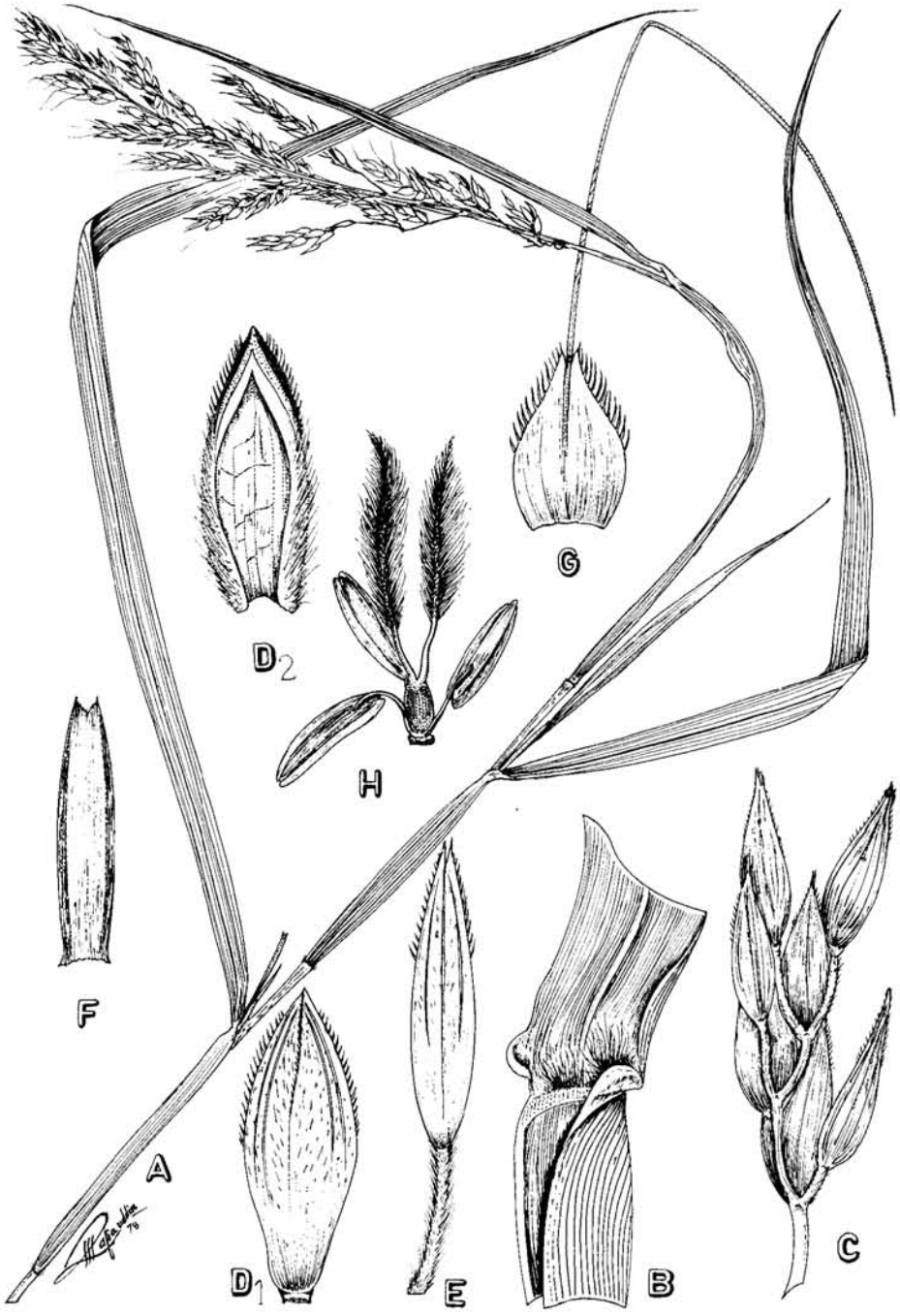


Fig. 104 **Sorgum halepense**: A, portion of flowering shoot × 0.5; B, lamina base, ligule and sheath × 5; C, portion of panicle × 5; D_1, sessile spikelet with lower glume × 8; D_2, upper glume of the same × 8; E, lower glume and pedicel of the pedicellate spikelet × 8; F, palea × 8; G, lower lemma × 8; H, stamens and pistil × 8.

Syntypes: Described from Syria and Mauritania, Hb. Linn. 1212/7 (LINN).

A-7 Wadi Ras El Helal, between Shahat and Derna, Old Rd., 22.9.1977, *M.A. Siddiqi & M. Ahmad* 1476, 1477; Kursa Farm, Shahat Derna Old Rd., 22.9.1977, *M.A. Siddiqi & M. Ahmad* 1480. c. 5 km from Baida, towards Shahat, 20.6.1972, *S.I. Ali* 762.

Distribution: Tropics, subtropics and warm temperate regions of the World.

Fl.: May-Oct. *Vern.* hashishat el faras.

2. ***Sorghum sudanense** (Piper) Stapf in Prain, Fl. Trop. Afr. 9:113. 1917; Maire, l.c. 268; Keith, l.c. 923.

Andropogon sorghum Brot. ssp. *sudanensis* Piper in Proc. Biol. Soc. Wash. 28:33. 1915.

A slender annual up to 3 m tall. Culm with glabrous nodes. Leaf linear, strongly tapering at the base, acuminate, up to 30 × 2 cm. Panicle ovate-pyramidal, with obliquely ascending branches, open. Spikelets falling at maturity; sessile spikelets elliptic-oblong to lanceolate; callus shortly barbed; glumes equal, the lower glabrous, the upper hairy; lemma hyaline, ciliate, the lower 5 mm long, the upper 2.5 mm long, bilobed, awned; pedicellate spikelets male or neuter, linear-lanceolate, 6 mm long.

Type: Hewison (semina a Khartum, cultus Virginia).

Reported to be cultivated in Cyrenaica by Keith (l.c.).

Distribution: Sudan, Tropical Africa, introduced into N. Africa and other parts of the world.

Introduced into Libya during 1926. An important forage grass of summer months. Produces a heavy bulk of green leafy shoot.

Fl.: All the year around. *Vern.* awaysha, hasheesh sudani

3. ***Sorghum bicolor** (L.) Moench., Meth. Pl. 207. 1794; Scholz, l.c. 449.

Holcus bicolor L., Mant. Alt. 301. 1771; *Andropogon sorghum* Boot., Fl. Lusit. 1: 88. 1804; *S. vulgare* Pers., Syn. 1:101. 1805; Durand & Barratte, l.c. 250; Corti, Fl. Veg. Fezz. 469. 1942; Maire, l.c. 268; Keith, l.c. 923. *Andropogon bicolor* (L.) Roxb., Fl. Ind. 1:272. 1820.

Annual or perennial with erect and robust culm, smooth and glabrous, up to 4 m tall, unbranched, often sweet. Leaf flat, linear-acuminate, 30-60 × 5-8 cm; margins scabrid, sheaths glabrous; ligule membranous, ciliate. Inflorescence a branched panicle, loose or dense, glomerate, erect or nodding. Sessile spikelets ovate to subglobose in many shades of colour such as yellow, orange, red and black; glumes glabrous to hairy; fertile lemma muticous or awned; caryopsis of many colours and sizes, exceeding glumes; pedicellate spikelets male or neuter. 2n = 20.

Type: Described from Lerche (Iran).

Reported from Tripolitania, Cyrenaica and Fezzan by Durand and Barratte (l.c.).

Distribution: Pakistan, India, Burma and Ceylon.

Fl.: All the year around. *Vern.* Beshna, Gtania

89. SACCHARUM

L., Sp. Pl. ed. 1:54. 1753; Gen. Pl. ed. 5:28. 1754.
Erianthus Michx., Fl. Bor. Am. 1:54. 1803.

Perennial, erect. Culms shining and solid. Leaf flat, linear, narrow to very broad. Inflorescence a branched silky panicle, often dense. Spikelets similar, paired, one sessile, the other pedicellate, attached to the joints of very fragile raceme; the pedicellate spikelet falling from its pedicel; the sessile spikelet falling along with the adjoined pedicel; florets 2, lower reduced to an empty lemma, the upper bisexual; glumes somewhat equal, membranous or slightly coriaceous at the base; lemma hyaline, awnless or awned.

About 33 species in the tropics and subtropics; 3 species are reported from Libya.

1.	+ Spikelets awned.	1. **S. ravennae**
	– Spikelets not awned	2
2.	+ Leaves up to 1 cm wide; culm not filled with sugary juice	2. **S. spontaneum**
	– Leaves 5 cm or more wide; culm filled with sugary juice	3. **S. officinarum***

1. **Saccharum ravennae** (L.) Murr., Syst. Veg. ed. 13:88. 1774; Corti, Fl. Veg. Fezz. 37. 1942; Maire, Fl. Afr. Nord. 1:258. 1952. (Fig. 105)

Andropogon ravennae L., Sp. Pl. ed. 2:1481. 1763; *Erianthus ravennae* (L.) P. Beauv., Ess. Agrost. 14. 1812; Scholz in Willdenowia, 7:449. 1974.

Rhizomaceous perennial, densely tufted, up to 3 m or more tall. Leaf flat, the lower up to 1 m long, linear, midrib thick and very prominent, scabrous on both surfaces, margins very scabrid (razor sharp); sheath hairy; ligule membranous with long silky hair. Inflorescence a branched, dense, plumose panicle, 20-50 cm long. Spikelets 3-7 mm long, awned, surrounded by long silky hair; pedicel with 2-opposite rows of long hairs; lower glume lanceolate, very acuminate, upper glume slightly longer than the lower; lower lemma narrowly lanceolate, hyaline; upper lemma ovate-lanceolate, extending into an awn. 2n = 20, 20 + 1B, 60.

+ Panicle fairly large; upper glume quite long and subulate; spikelets 5-7 mm long, awn up to 2 mm long; leaves very scabrous	(a) ssp. **ravennae**
– Panicle quite small and dense; upper glume with a short point, (awn 0.5 mm long), spikelets quite small (4 mm long); leaves slightly scabrous	b) ssp. **parviflorum**

(a) ssp. **ravennae**

Type: Described from Italy. Based on 'Canna piena delle Valli di Ravenna' Zanoni, Ist. Bot. 64, t. 24 (as 'Canna fissa di Ravenna') (1675), collected 'verso Boschi, e valle di Ravenna', Herb. Linn. 77/4 (LINN).

Reported to be present in Libya by Corti (l.c.).

Distribution: Mediterranean region, S.W. Asia.

(b) ssp. **parviflorum** (Pilger) H. Scholz, in Willdenowia 6:291. 1971.

Erianthus parviflorum Pilger in Engl. Jahrb. liv. Beibl. 120. 63. 1917.

Type: Described from Sahara.

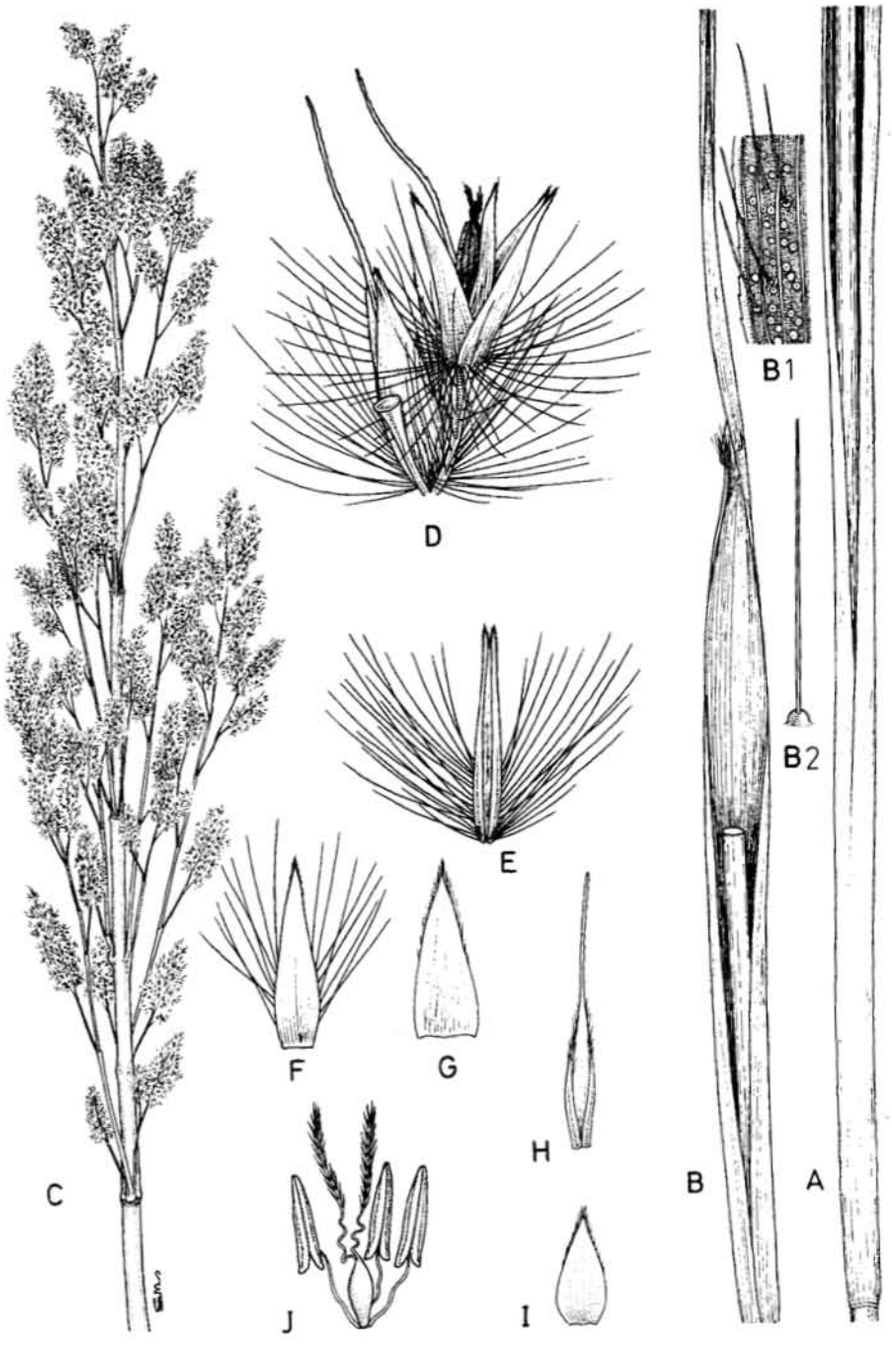


Fig. 105 **Saccharum ravennae** ssp. **parviflorum**: A, B, portion of culm, sheath and leaf × 0.5; B_1, bulbous based hairs on the lower surface of the leaf × 5; B_2, hair × 10; C, panicle × 0.5; D, sessile and pedicellate spikelets × 10; F, upper glume × 10; G, lower lemma × 10; H, upper lemma × 10; I, palea × 10; J, stamens and pistil × 10.

A-3 130 km from Nalut on way to Tripoli, 19.6.1977, *Faruqi* 1447-a; **D-3** Shati, 17.2.1934, *Corti* 839 (FI); Sebha, 25.4.1933, *Corti* 838 (FI); **E-1** Ghat, 1.3.1934, *Corti* 840 (FI).

Also reported from Ain Cherichira (Maire, l.c.); Scholz, (l.c.).

Distribution: Central Sahara.

Fl.: Oct.-June *Vern.* Gasba; tesengelt (Tuar.).

2. **Saccharum spontaneum** L., Mant. ed. 2:183. 1771; Keith, l.c. 852.

An erect rhizomaceous perennial, up to 2.5 m tall. Culm hairy below the panicle, not filled with sugary juice. Leaves glabrous, up to 1 cm wide, very acuminate, margin barbed. Panicle up to 50 cm long, elongate, dense. Spikelets disarticulating, the pedicellate disarticulating from the tip of the pedicel, the sessile with the rachis, awnless; callus hairs silky white, up to several times longer than the spikelet. 2n = 40-130.

A very variable species. Only 2 subspecies are recognized here.

+ Spikelets 3-4 mm long; callus hair much longer than the spikelet	(a) ssp. **spontaneum**
– Spikelets 4-6 mm long; callus hair shorter than the spikelet	(b) ssp. **aegyptiacum**

a) ssp. **spontaneum**

Type: Described from Malabar, India, *Koenig* (LINN).

A-3 Tripoli near Gargarish, 9.10.1980, *S.A. Faruqi* 2056 (ULT); Garabulli along asphalt road to sea, 4.2.1983, *Naviglio Lucia* s.n. (ULT).

Distribution: Turkistan, Afghanistan, Pakistan and Tropical Asia.

b) ssp. **aegyptiacum** (Willd.) Hackel, Monogr. Andropog. 115. 1889.

S. aegyptiacum Willd., Enum. H. Berol. 1:82. 1809; *S. biflorum* Forssk., Fl. Aeg.-Arab. 1:16. 1775.

Type: Described from Egypt.

Reported to be present in Tibesti by Keith (l.c.).

3. ***Saccharum officinarum*** L., Sp. Pl. 54. 1753; Durand & Barratte, l.c. 249; Maire, Fl. Afr. Nord 1:257. 1952; Scholz in Willdenowia, 7:449. 1974.

Perennial. Culm up to 6 m tall, 3-5 cm in diameter, erect, solid, smooth, waxy below the node. Leaf blades flat, 1.5 m long, 5 cm or more wide, midrib very prominent, margins highly scabrid; sheaths pubescent towards the throat; ligules very short, membranous, ciliate. Inflorescence very large, dense, ovate-pyramidal, pubescent towards the base, bearded at the nodes, pedicels glabrous. Spikelets surrounded by dense silky hairs, not awned, linear-oblong, muticous 3.5-4 mm long; lower glumes 3.5-4 mm long, acute; upper glumes of the same size, lanceolate, acute, glabrous or ciliate; lower lemma lanceolate, acute, hyaline; upper lemma very much reduced or absent. 2n = 20, 40, 60.

Type: "Hab. in Indiae utriusque locis inundatis", Herb. Linn. 77/2, photo (LINN).

Reported to be present in Cyrenaica by Durand and Barratte, (l.c.) and Scholz (l.c.). It is also being cultivated in Fezzan area in the Agricultural Projects.

Distribution: Cultivated in the tropics and subtropics of the Old and the New World.

Fl.: Does not flower in Libya. *Vern.* Gassb-Soukar.

Another species *S. sinensis* Roxb. was introduced in 1929 into Tripolitania by Keith, l.c. 852.

90. IMPERATA

Cyr., Pl. Rar. Neap. 2:26, t. 11. 1792.

Erect, perennial, rhizomaceous. Culms solid. Leaf long, flat or convolute. Inflorescence a silvery, terminal, spike-like panicle. Spikelets similar, paired, with one short and the other long pedicelled, disarticulating from the pedicel; 2-flowered, the lower reduced to an empty lemma or rarely male, the upper bisexual; callus with long silvery hairs surrounding the spikelets; glumes subequal, lower half covered with long silky hair; lemma smaller, hyaline; paleas shorter, the lower narrow, the upper broad; stamens 1-2; lodicules absent; caryopsis oblong-elliptic.

About 6 species in the tropics and subtropics; 1 species is found in Libya.

Imperata cylindrica (Linn.) Raeuschel, Nom. Bot. ed. 3, 10. 1797; Clayton in

Tutin et al., Fl. Eur. 5: 256. 1980; Cope in Nasir & Ali, Fl. Pak. No. 143: 252. 1982. (Fig. 106)

Lagurus cylindricus L., Syst. Nat., ed. 10, 2: 878. 1759; *Saccharum cylindricum* (L.) Lam., Encycl. Meth. Bot. 1: 594. 1785; *Imperata cylindrica* (L.) P. Beauv., Ess. Agrost. 165, t. 5. 1812; Durand & Barratte, l.c. 249; Pamp., Pl. Trip. 23. 1914; Prod. Fl. Cir. 93. 1931; Corti, l.c. 35; Maire, Fl. Afr. Nord. 1:255. 1952; Keith, l.c. 570; Scholz in Willdenowia, 7:449. 1974.

Rhizome spreading, creeping or oblique. Culms 30-150 cm long, glabrous, covered at the base with leaf sheaths. Leaf blades linear, acuminate, flat or convolute with stiff tip, very variable. Inflorescence a terminal, dense, spike-like panicle, very variable in size. Spikelets 3-6 mm long, covered with long silvery hair of the callus; hair 2-3 times as long as the spikelet; glumes subequal, dorsally villous; lower floret an empty lemma; upper floret bisexual; lemmas nerveless, ciliate, acute, hyaline; anthers 2. 2n = 20, 40, 60.

Type: Europe (LINN).

A-2 Sabrata, 12,6,1976, *S.M.H. Jafri* 6690; **A-3** Tripoli, univerisity campus, 3.5.1976, *S.M.H. Jafri* 6640; Gasr Khiar area, 14.4.1978, *A. El-Gadi* 1005; Tripoli, sand dunes, 30.5.1970, *I.I. Chaudhri* s.n.; Farm Road, Bil Ashar, Tajura, 10.3.1977, *S.A. Faruqi* 1240, 1250; Tourist City Beach, Tajura, 12.3.1977, *S.A. Faruqi* 1262; Valley Wadi Torghot 44 km from Tripoli on way to Khoms, 5.4.1977, *Faruqi* 1328; **D-3** Along water channel of cultivated field, Brak, 7.3.1978, *Faruqi* 1595; **D-1** Ghat, 18.3.1934, *Corti* (FI).

Distribution: Mediterranean region, S.W. & C. Asia; introduced into other areas.

A widely occurring species in Libya.

This species is quite variable hence a number of varieties are recognized in it. Of these 2 are also found here. The type variety *cylindrica* with flexous and pungent leaves and unbearded nodes widely occurs from S. and W. Europe, N. Africa, Arabia, Turkey, Central Asia to Afghanistan. Quite similar to this is var. *parviflora* (or var. *africana* (Anders.) C.E. Hubbard) but the spikelets are smaller.

It is sometimes used as a forage or fodder plant. The lower parts of this plant are sometimes used in making brushes or the leaves are woven into mats, hats or peasants

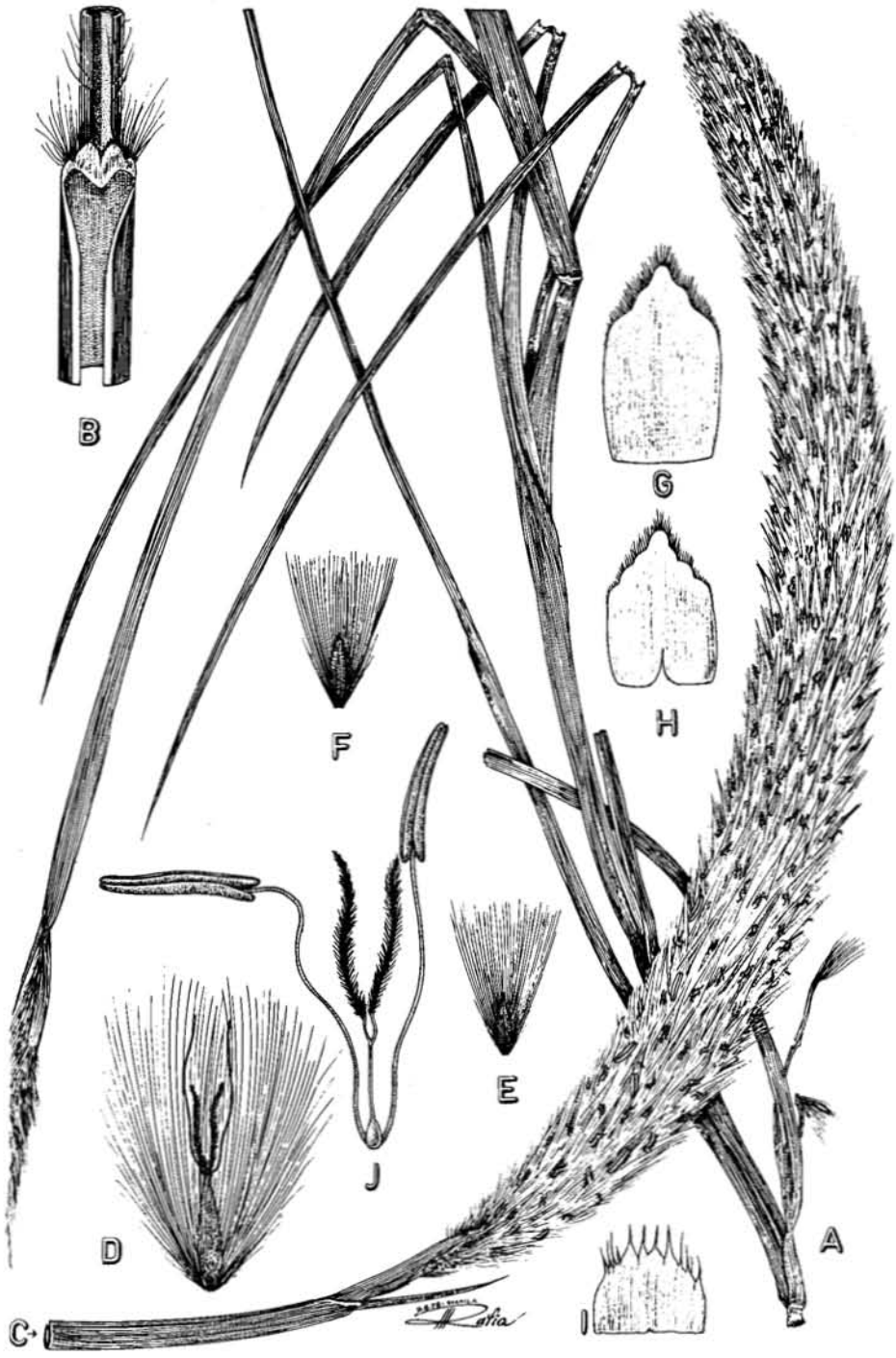


Fig. 106 **Imperata cylindrica**: A, habit × 0.5; B, lamina base, ligule and sheath × 3; C, inflorescence × 1; D, spikelet × 3; E, lower glume × 2; F, upper glume × 2; G, lower lemma × 10; H, upper lemma × 10; I, upper palea × 10; J, stamens and pistil × 5.

raincoats elsewhere. In China it is often mixed with rice straw for the manufacture of paper. In Tropical Africa the cotton-like flower is used for stuffing cushions.

Fl.: Mar.-May *Vern.* dees, basto

91. LASIURUS

Boiss., Diag. Pl. Nov. Or. ser. 2, 4.145, 1859.

Densely tufted perennial, rootstock woody. Leaf flat or convolute with persistant sheath. Inflorescence a solitary, terminal spike-like raceme. Spikelets in pairs or in triplets, the former with 1-sessile and 1-pedicellate and the latter with 1-sessile and 2-pedicellate spikelets; sessile spikelets 2-flowered, the lower male, the upper bisexual; the pedicellate spikelet male; pedicel and joints with long bearded hairs; rachis fragile; glumes unequal, the lower with long hairs, flat on the back, the upper boat-shaped; lemmas and paleas hyaline; stamens 3; lodicules 2, obliquely truncate with a sharp tooth on the outer corner undulate on the top between the 2-teeth; caryopsis terete, oblong, loosely enclosed between the palea and the lemma.

2 species in tropical Africa to N.W. India; represented by 1 species in Libya.

Lasiurus hirsutus (Forssk.) Boiss., Diagn. ser. 2, 4:146. 1859; Maire, Fl. Afr. Nord. 1:262. 1952; Keith, l.c. 593; Scholz in Willdenowia, 7:449. 1974. (Fig. 107)

Saccharum hirsutum Forssk., Fl. Aeg.-Arab. 16. 1775; *Rottboellia hirsuta* (Forsk.) Vahl, Symb. Bot. 1: II. 1790; Corti, Fl. Veg. Fezz. 38. 1942; Keith, l.c. 854; *Elionurus hirsutus* (Vahl) Munro ex Benth. in Jour. Linn. Soc. (Bot.) 19:68. 1881.

Perennial with a woody base, covered with persistent scales, highly tufted, bushy, erect. Culms with scattered appressed hairs, nodes shortly hairy or glabrous. Leaf very variable in size, up to 30 cm long, with appressed silky basally tuberculate hair; sheath loose, glabrous or shortly hairy at the top; ligule a fringe of hairs. Inflorescence a spikelike raceme, silky all over, up to 10 cm long; glume of sessile spikelet up to 10 mm long, tip bifid, beaked, long silky hair along the margins; upper glume 6 mm long, acuminate, rounded on the back, ciliate at the tip; pedicellate spikelets shorter, lower glume 5-6 mm long, hairy on the margins, pedicel 4 mm long, shorter than the joints, covered with long silky hair. $2n = 18, 56$.

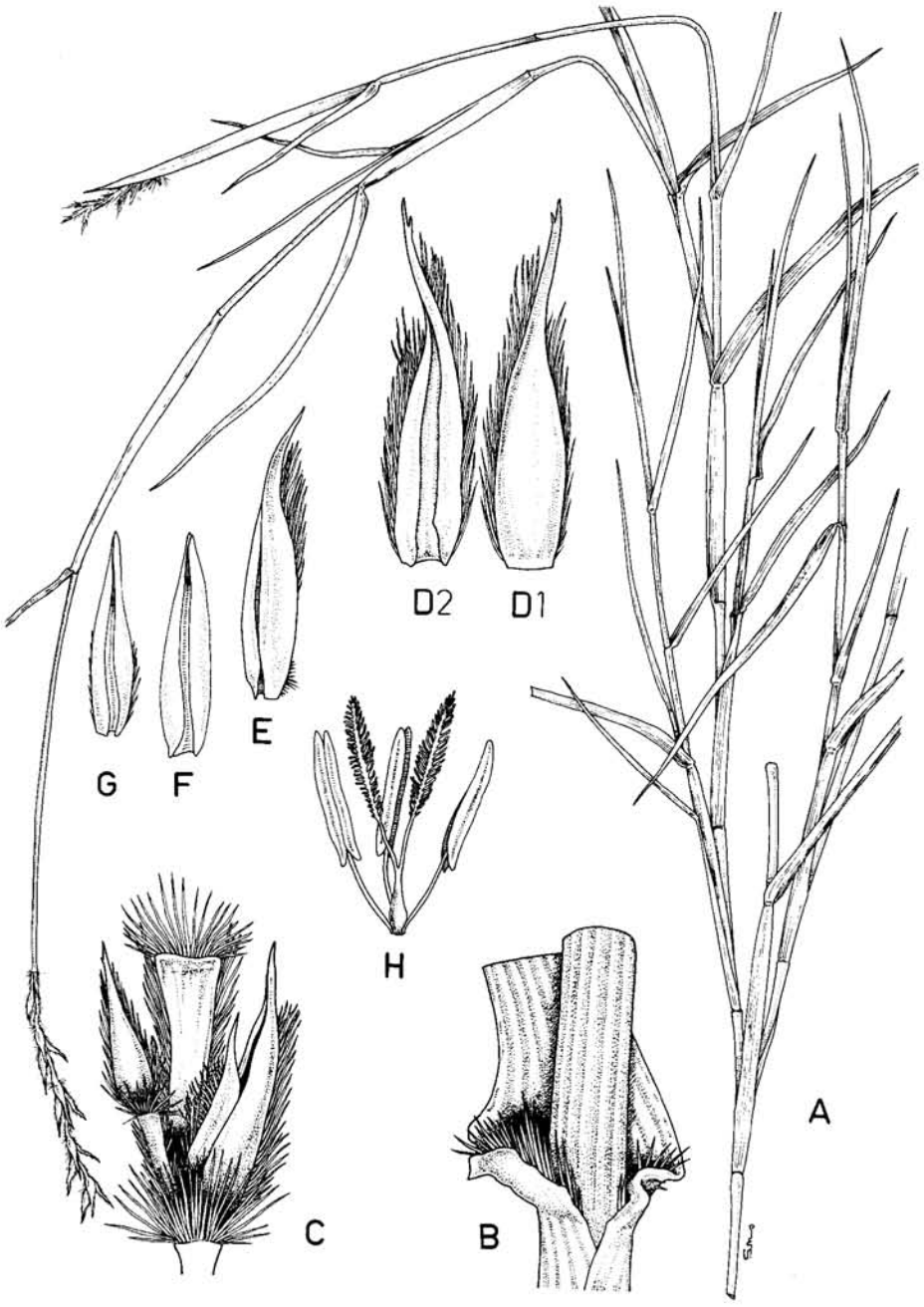


Fig. 107 **Lasiurus hirsutus**: A, portion of flowering shoot × 0.5; B, portion of lamina, sheath, ligule and culm × 10; C, pedicellate and sessile spikelets × 4; D_1, D_2, dorsal and ventral view of lower glume × 5; E, upper glume × 5; F, lemma × 5; G, palea × 5; H, stamens and pistil × 5.

Type: Described from Egypt, Kahiri desert, *Forsskal* (C)

C-3 El-Ghariat, 11.5.1932, *Bargagli-Petrucci* s.n. (FI); **C-4** 20 km from Washka, 1.4.1973, *S.I. Ali* 1538; 200 km from Brak towards Hun, 7.3.1978, *Faruqi* 1607; **E-1** El-Barkat, 16.3.1934, *Corti* 894 (FI).

Distribution: Morocco, Algeria, Egypt, Chad, Somalia, Sudan, Arabia, Afghanistan and India.

Fl.: Mar.-May *Vern.* ezerired (Tuar.); gdom; rezedid (Tuar.).

92. ZEA*

L., Sp. Pl. 971. 1753; Gen. Pl. ed. 5:419. 1754.

Tall, erect, stout. Leaf flat, broad, and drooping. Inflorescence monoecious, terminal and axillary; terminal with numerous spike-like racemes forming spreading panicles, generally male, the lateral covered with sheath, consisting of mumerous spikelets seated upon a spongy axis supposedly of several spike-like raceme fused into a thick spongy axis, generally female. Spikelets of the terminal raceme in pairs, one sessile and the other pedicellate, 2-flowered, glumes equal; lemmas and paleas hyaline, those of lateral spikelets 2-flowered, the lower fertile, the upper sterile; glumes subequal; lodicules absent, styles very long and silky, slightly 2-fid at the apex.

1 species of Central American origin; cultivated in Libya.

***Zea mays** L., Sp. Pl. 971. 1753; Durand & Barratte, l.c. 250; Corti, l.c. 469. 1942; Maire, Fl. Afr. Nord. 1:251. 1952; Keith, l.c. 1021; Scholz in Willdenowia 7:450. 1974.

Robust culms up to 4 m tall. Leaf blades up to 10 cm wide, linear, acuminate, 1 metre long. Male panicle terminal with spreading spike-like racemes; female inflorescence axillary, enclosed within a number of spathe-like husk up to 30 cm long; styles very long, silky and drooping. 2n = 20.

Type: "Habitat in America".

A-3 Tripoli, Faculty of Agriculture field, Al-Faateh University, 25.5.1978, *El Hadi, M. El-Megherbi* 33; *id.* 14.6.1978, *A. Daw Ahmed s.n.*.

Also reported to be cultivated in Cyrenaica and Fezzan by Durand and Barratte (l.c.), Corti, (l.c.) etc.

Distribution: A species of Mexican origin. Now cultivated in warm temperate to tropical regions of both the New and Old World.

Fl.: Summer months. *Vern.* dhurah, dhurah Shamiyah, sbul, spul abeed.

93. **TRAGUS**

Haller, Hist. Stirp. Helv. 2:203. 1768.

Low annual or perennial with weak culm. Leaf blades short, flat, slender with pectinate-ciliate margins; ligule a rim of very short hairs. Inflorescence spike-like or racemes made up of clusters of 2-5 spikelets seated at the tip of a common pedicel. Spikelets hermaphrodite, one-flowered, all alike or one or more of a cluster somewhat reduced, lanceolate-ovate, awnless, falling in a clusters of 2-5; glumes unequal, the lower glume thin, small, highly reduced or absent, the upper well-developed, as long as the spikelet, covered with stout, hooked spines arising from the nerves; lemma almost as long as the glume, hyaline, lanceolate, 3- (-5)-nerved; paleas as long as lemmas, glabrous; lodicules 2; stamens 3; caryopsis ellipsoid-oblong, ± dorsally compressed.

A genus of 7 species widely distributed in tropics and subtropics of old and new world; only one species is reported from Libya.

Tragus racemosus (L.) All., Fl. Pedem. 2:24. 1785; Boiss., Fl. Orien. 5:450. 1884; Post, Fl. Syr. Pal. & Sin. 2:703. 1933; Tackholm, Stud. Fl. Egy. ed. 2:737. 1974; A. El-Gadi et al. in Willdenowia 16: 412. 1987. (Fig. 108)

Cenchrus racemosus L., Sp. Pl. ed. 1:1049. 1753; *Lappago racemosa* (L.) Henck., Syn. Pl. Germ. 1:440. 1792.

Annuals with fascicled, prostrate or ascending culms. Leaf blades short. flat or folded, margins usually thickened, whitish, coarsely hispid-ciliate, sheaths smooth and glabrous, usually shorter than culm internodes; ligule a ring of hairs. Inflorescence c. 3 cm or more long and 4-7 mm wide, spike-like clusters of 2-5 spikelets on a short common basally disarticulating pedicel. Spikelets in group of 2-5 per node, closely placed on a puberulent axis, 1-flowered; glumes unequal, lower glumes small, thin, much reduced or wanting, upper glume large, firm, much developed, as long as spikelet, covered with



Fig. 108 **Tragus racemosus**: A, habit × 1; B, stamens and pistil × 12; C, bur × 8.

rows of hooked prickles; lemmas thin and flat; paleas glabrous, lodicules 2; stamens 3; caryopsis elliptic or lanceolate-oblong. 2n = 40.

Type: Habitat in Europe australioris maritimis, Herb. Linn. 1217/183.

D-3 Taush area on way to Jarmah, 24.11.1984, *El-Gadi & El-Taif* 6478.

Distribution: N. S. and tropical Africa, Mediterranean Europe, Palestine, Iran, C. Asia, China, introduced into N. C. and S. America.

Fl.: Mostly in Summer.

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