

AL FAATEH UNIVERSITY
FACULTY OF SCIENCE
DEPARTMENT OF BOTANY

FLORA OF LIBYA

29

30th. July, 1977

Editors :

S.M.H. JAFRI & A. EL-GADI
Al Faateh University,
Faculty of Science,
Department of Botany, Tripoli.

JUNCACEAE

by S.M.H. JAFRI

Illustrations by
Sami MAKAR
M. Y. SALEEM

JUNCACEAE

S.M.H.JAFRI

Grass-like herbs, mostly perennial, rhizomatous, usually erect and simple. Leaves alternate, linear, flat or terete, mostly basal, sheathing at base, sometimes reduced to sheath only; sheaths open or closed. Inflorescence cymose, often subtended by leaf-like bract. Flowers small, usually in clusters, with or without bracteoles, mostly bisexual. Perianth segments (tepals) 6 (rarely 3), biseriate, free, often glumaceous, equal or subequal, persistent. Stamens (3-) 6, free, opposite tepals; anthers longitudinally interorse; pollen in tetrads, Ovary 3-carpellary, syncarpous, superior, 1(-3)-celled, with or without septum, 3-many ovuled on basal, axile or parietal placentas; stigmas 3, on short a conspicuous style. Capsules often $\pm$ triangular, ovate, elliptic or lanceolate, 3-valved, loculicidal; seeds very small, sometimes tailed or appendiculate, albuminous, with usually straight embryo.

A family of 8 genera and nearly 300 species, chiefly in temperate and cold regions; represented in Libya by a single genus with 8 or 9 species.

JUNCUS

L., Sp. Pl. 325. 1753; Gen. Pl. ed. 5: 152. 1754.

Perennial rarely annual herbs, often tufted and rhizomatous. Leaves only basal or basal and cauline both, with open basal sheaths, glabrous. Inflorescence terminal or seemingly lateral with usually leaf-like subtending bract, often continuous with the stem; floral bracts much smaller, hyaline or submembranous. Flowers often clustered, sessile or subsessile. Tepals 6, glumaceous, equal or the inner 3 shorter. Stamens (3-) 6 free or subconnate at the base of tepals; filaments filiform; anthers basifixed, short or long. Capsules 1-3-celled, shortly to conspicuously beaked, often brownish, many seeded; seeds minute, usually many on parietal placentas, generally in the middle of the capsule, with or without tails, ovoid to oblong, $\pm$ striated, yellowish to brownish, often mucilaginous on wetting.

Over 200 species, chiefly of wet habitats. « Rushes » may be used for netting chairs, mats or baskets etc.

JUNCACEAE

- | | | |
|----|---|--|
| 1. | + Annuals
— Perennials | 2
4 |
| 2. | + Flowers singly and distantly placed on the branches (sometimes 2-3 together)
— Flowers usually in terminal glomerules or inflorescences | 2. J.bufo nus
3 |
| 3. | + Cauline leaves present, at least some exceeding the flowering heads, filiform, ± knotty
— Cauline leaves almost absent or not exceeding the flowering heads, ± plane, unseptate. | 5. J.mutabilis
8. J.capitatus |
| 4. | + Leaves and subtending bract pungent
— Leaves and bract not pungent | 5
7 |
| 5. | + Inner tepals prominent, broadly auricled above; (capsules 4-6 mm long with broad conical apex).
— Inner tepals neither prominent nor auricled above | 3. J.acutus
6 |
| 6. | + Capsule ± narrowed above, not or hardly exceeding the tepals
— Capsules narrowed above, usually much exceeding the tepals | 4(a). J.maritimus
var. maritimus
4(b) J.maritimus
var. arabicus |
| 7. | + Flowers without involucre of bracteoles
— Flowers with bracteoles; (leaves cylindrical, fistular). | 8
1. J.subulatus |
| 8. | + Plants robust, rigid, usually more than 50 cm tall; leaves mostly basal and only 1 cauline
— Plants up to 30 (-50) cm tall; leaves mostly cauline | 6. J.punctorius
7. J.fontanesii |

JUNCACEAE



Fig. 1, *Juncus subulatus*: A, habit x 0.5; B, portion of inflorescence x 5; C, capsule x 10; D, seed x 40.

JUNCACEAE

1. **Juncus subulatus** Forsk., Fl. Aeg.-Arab. 75. 1775; Durand & Barratte, Fl. Lib. Prodr. 240. 1910; Pamp., Pl. Trip. 46. Prodr. 1914; Fl. Cir. 148. 1931; Maire, Fl. Afr. Nord. 4: 259. fig. 703. 1957; Keith, Prelim. Check List Lib. Fl. 580. 1965. (Fig. 1)

J. multiflorus Desf., Fl. Atl. 1: 313. tab. 91. 1798; *J. siculus* Tin. in Guss., Fl. Sic. Syn. 2: 2. 1844.

Perennial, up to 1 m tall, with spreading rhizome and slender culms. Basal sheaths 2-3, brown below; cauline leaves 2-4 terete, unseptate, unitubulose, hardly pungent; upper reaching up to the inflorescence. Inflorescence terminal, lax, many flowered with flowers $\pm$ singly and closely placed. Lower bract $\pm$ leaflike, upper scarious. Flowers small, bracteolate; bracteole ovate, acuminate scarious, c. half as long as the flower. Tepals 2.5-3.5 mm long, equal or subequal, greenish to brownish, outer lanceolate, or narrowly ovate, apiculate to acute, inner ovate, apiculate to acute, with membranous margins. Stamens 6, included; anthers c. 1.3 mm long, oblong-linear; style c. 1 mm long with c. equally long stigmas. Capsules not exceeding the perianth, trigonous-obovoid, obtuse or subobtuse, shortly mucronate, 3-locular, brownish; seeds c. 0.6 (-0.7) mm long, shortly appendiculate, oblong, striate-reticulated. $2n=42$

Lectotype: Forskal (C).

A-3 Tarhuna, *Pampanini (FI)*: A-6 Benghazi, *Petrovitch*

Reported from Jebel Nafousa, Benghazi etc. by Durand & Barratte (l.c.) etc.

Distribution: W. & S. Europe, N. Africa, S.W. Asia.

Vern. Dis, dees, smar

2. **Juncus bufonius** L., Sp. Pl. 328. 1753; Durand & Barratte, l.c. 240; Pamp., Pl. Trip. 40. 1914; Prodr. Fl. Cir. 148. 1931; Maire, l.c. 263, fig. 705; Corti, Fl. Fezzan. 69. 1942. (Fig. 2)

J. hybridus Brot. Fl. Lus. 1: 513. 1804; *J. bufonius* var. *hybridus* (Brot.) Coss. et Dr., Fl. Alg. Glum. 275. 1862; Durand & Barratte, l.c.; *J. bufonius* var. *congestus* Wahlb., Fl. Goth. 38. 1820; Maire, l.c. 265; Keith, l.c. 579.

JUNCACEAE

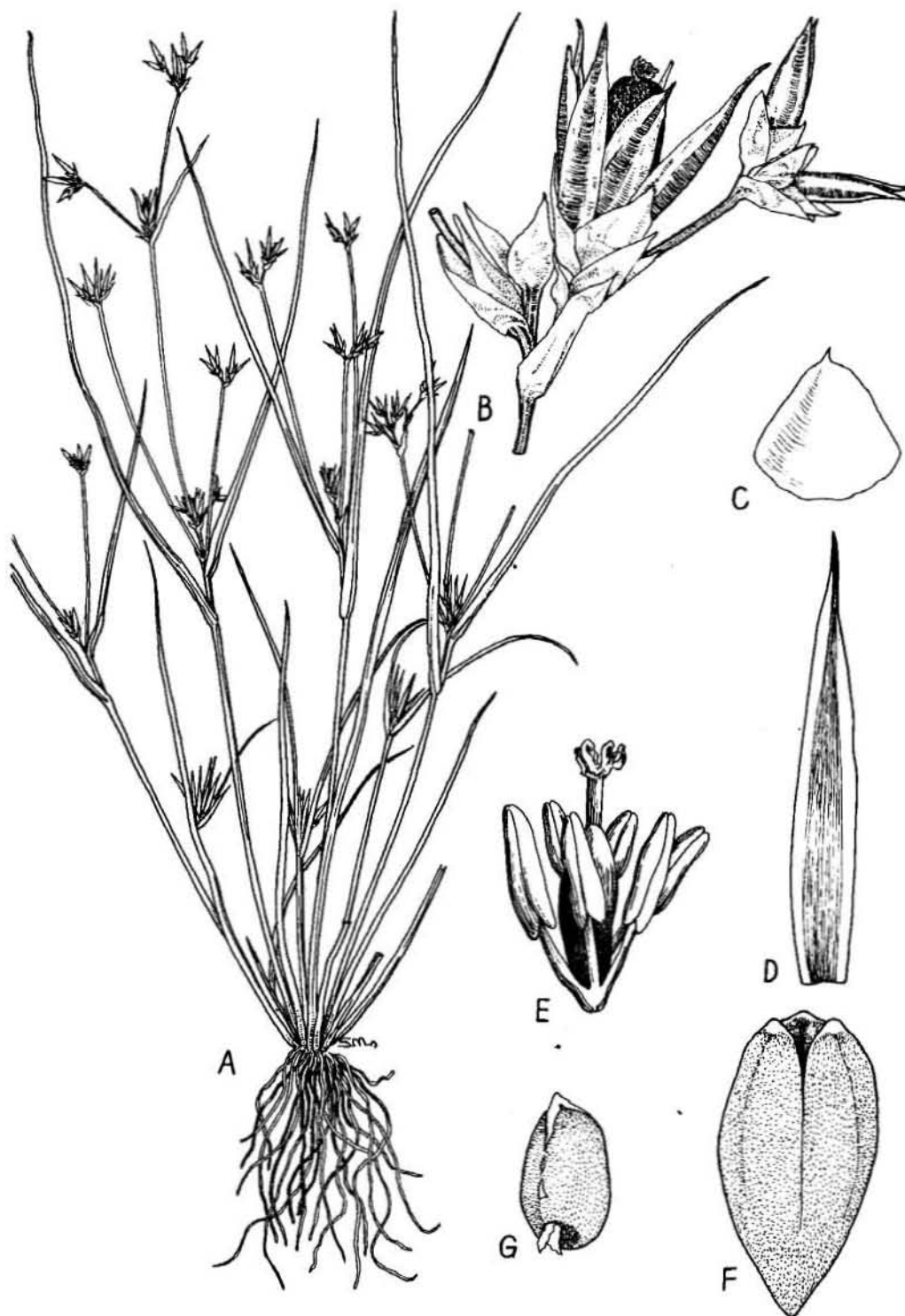


Fig. 2, *Juncus bufonius*: A, habit x 1; B, portion of inflorescence x 5; C, bracteole x 10; D, tepal x 10; E, stamens and gynoecium x 20; F, capsule opened above x 10; G, seed x 50.

JUNCACEAE

Annual, up to 30 cm tall, often much branched from the base with thin, erect to ascending leafy culms. Leaves 1-12 cm x (0.5-) 1-2 mm, often convolute, channelled above, linear, green, not pungent at tip. Inflorescence lax, with flowers singly (sometimes 2-3 together) placed on the main stem and branches. Bracteoles 2(-3), ovate, acute, scarious, 1.5-2.5 mm long. Tepals unequal, narrowly ovate; outer (4.5-) 6-8 mm long, apiculate or acuminate, inner 4-6 (-6.5) mm long, usually apiculate and scarious at the margins. Stamens 6, up to half as long as the tepals; anthers c. 1 mm long; style c. 0.5 mm long with 1-1.5 mm long stigmas. Capsules 3-5 mm long, ovoid or sub-ellipsoid, obtuse or subobtuse, 3-locular; seeds c. 0.5 mm long, ellipsoid, suboblique, faintly to conspicuously striated. $2n=100-110$.

Type: « in Europae inundatis ».

A-2 Ain Rumia, 3.4.1968, *L. Boulos* s.n. (ULT); **A-3** Tripoli, University Campus, Faculty of Agriculture field, 1.4.1977, *A. Ghaffoor* 285 (ULT); **A-7** Wadi Derna, 14.3.1968, *L. Boulos* 2391 (ULT).

Distribution: A cosmopolitan species.

A very widely distributed and variable species. The specimens cited above have $\pm$ congested inflorescences, with 1-3 flowers together (often called as variety *congestus* Wahlb.).

3. ***Juncus acutus*** L., Sp. Pl. 325. 1753; Durand & Barratte, l.c. 239; Pamp., Pl. Trip. 45. 1914; Prodr. Fl. Cir. 147. 1931; Corti, Fl. Fezz. 67. 1942; (Fig. 3)

J. spinosus Forsk., Fl. Aegypt.-Arab. 75. 1775; *J. karelini* Steud., Syn. Pl. Glum. 297. 1853.

Stout erect, robust perennial, up to 1.5 m tall, densely caespitose, rhizomatous, with rigid culms. Basal leaves 2-5, rigid, shorter to exceeding the inflorescence, terete, unseptate, pungent, brown at the sheathing base. Inflorescence seemingly lateral, usually densely paniced, many-flowered, yellowish-brownish in colour; lower bract, stout, long, seemingly continuous with the culm, pungent like leaf, upper much smaller and most of it representing the sheath. Flowers 4-6 mm long, mostly in groups of few flowers (or in singles), close, with pair of subtending smaller secondary bract, scarious-brownish in colour and very variable in size,

JUNCACEAE

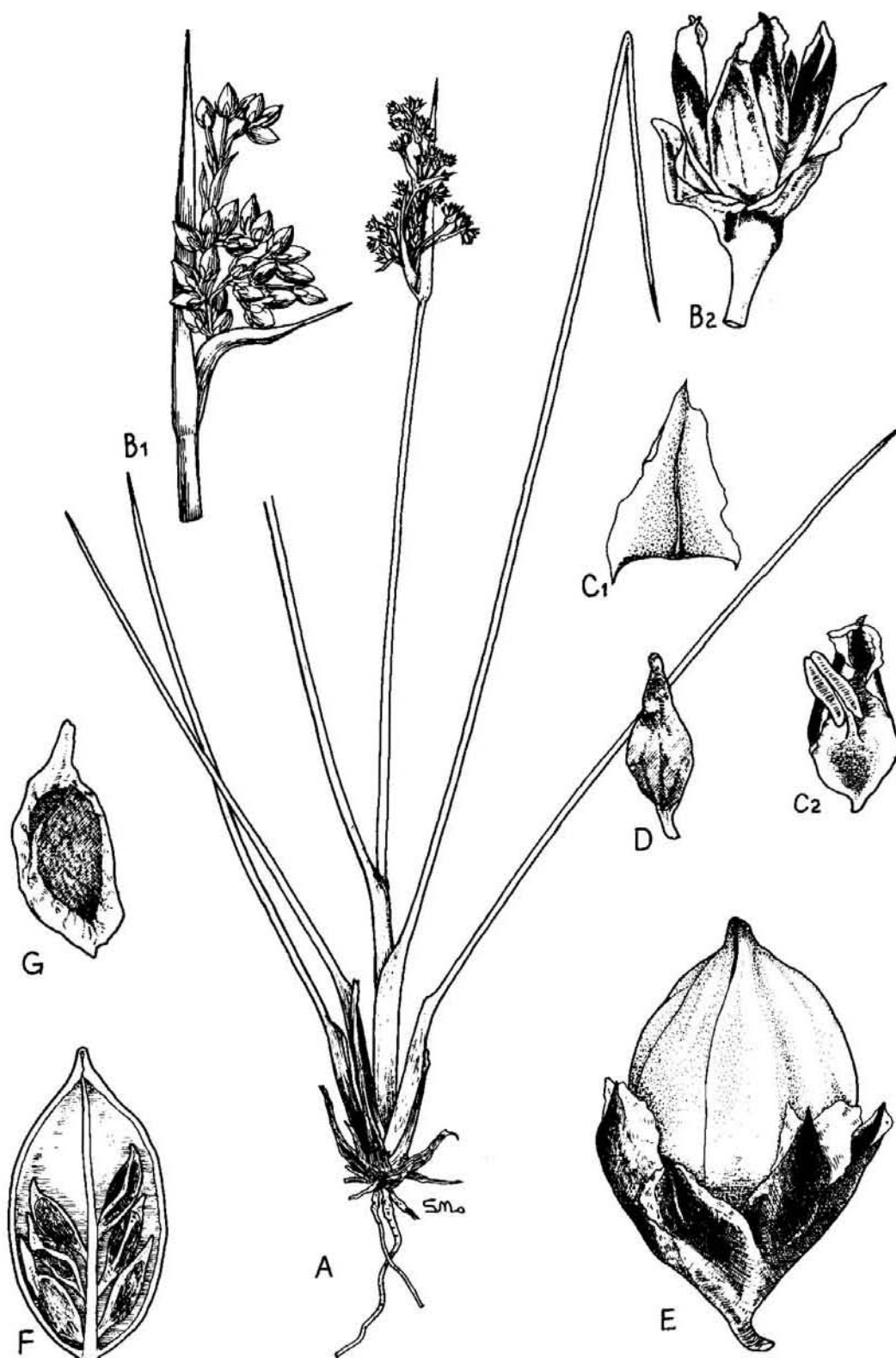


Fig. 3, *Juncus acutus*: A, habit x 0.5; B₁, portion of inflorescence at fruiting stage x 1; B₂, flower x 8; C₁, floral bract x 8; C₂, tepal with stamen x 8; D, ovary x 8; E, capsule x 10; F, capsule opened showing seeds x 10; G, seed x 25.

JUNCACEAE

lower larger. Tepals usually equal in length, rigid, outer oblong, obtuse to acute with hyaline margins, shortly mucronate, inner with usually broad, auricled, hyaline-membranous margin above. Stamens 6, equalling or shorter than tepals; anthers 3-4 times as long as the filament, prominently large; style 0.5-0.8 mm long, with stigmas twice as long. Capsules usually conspicuously exceeding the tepals, 4-6 mm long, ovate-subglobose, subtrigonus, shortly mucronate, incompletely 3-locular, brownish, usually 80-120-seeded; seeds obovate-oblong, c. 1 mm long, excluding the appendages (with appendages up to 2.5 mm long).

Syntype: « In Angliae, Galliae, Italiae maritimis paludosis ».

A-3 20-23 km east Tripoli, along the coastal road to Khoms, 8.3.1967, *L.Boulos* 1588 (ULT); A-7 Gebel Akhdar, Derna beach, Feb.-March, 1973, *Samira* s.n. (ULT); A-*El Tiafe* 93 (ULT); *Nuria*, E. s.n. (ULT); Wadi Derna, 14.3.1968, *L.Boulos* 2436 (ULT); Derna beach, 1.3.1973, *Ali & Faruqi* 1164 (ULT).

Distribution: S. Europe, Canaries, N. Africa to Iran.

A variable species in laxness of inflorescence and size of capsules etc. A widely occurring species from Ghat to the coastal belt of Libya, often found in saline, sandy and wet habitats and called « prickly sea Rush ».

Fl. Feb.-March. Vern. dis, dees, smar.

4. ***Juncus maritimus*** Lam., Encyc. Method. Bot. 3:264.1789; Durand & Barratte, Fl. Lib. Prodr. 239.1910; Pamp. Pl. Trip. 46.1914; Prodr. Fl. Cir. 147.1931; Maire, Fl. Afr. Nord. 4:280.1957; Keith, l.c. 580.

J. acutus L., var. b. L., Sp. Pl. 325.1753; *J. broteri* Steud., Syn. Pl. Glum. 2:322.1854; *J. ponticus* Stev., in Bull. Soc. Nat. Mosc. 3:94.1857.

A rhizomatous perennial, up to 1 (-1.5) m tall, with cylindrical rigid stem, pale yellowish-green; basal sheaths 2-5; basal leaves 2-5 with terete, unseptate blade, pungent at the apex, rigid. Inflorescence seemingly lateral, usually lax, many flowered panicle, up to 30 cm long. Flowers and fruits nearly like the previous species but the inner tepals not cordate at the apex and without the conspicuous

JUNCACEAE

hyaline membranous margins; stamens some times 3 only and anthers 1-2 mm long. Capsules (2.5-) 3-5 mm long, ovate-trigonate, mucronate; seeds appendiculate, c. 1.2 mm long (including appendages).

A variable species in fruit size (i.e. capsule slightly to much exceeding the tepals) narrowed or almost so at the apex and shortly mucronate. However, the following 2 varieties can be recognized among our plants. It is not easy to separate them out unless the plants have mature fruits.

4(a) var. **maritimus**

Capsules 2.5 - 3.5 mm. long.

Type: « Angleterre, France etc. aux lieux maritimes et marec ageux » (P).

A-3 On way to Gharian from Tripoli, in stream beds, 4.11.1969, *I.I. Chaudhri* (ULT);
E-1 Ghat, Barkat, in and around a pond in date palm gardens, common, 24.2.1976, *S.M.H. Jafri* 6342 (ULT).

Distribution: Europe, N.Africa and W.Iran.

4(b) var. **arabicus** Aschers. & Buchen. in Boiss., Fl. Or. 5:354.1882; Corti, l.c. 67; Maire, l.c. 281, fig. 713; Keith, l.c. 579 (Fig. 4).

J. rigidus Desf., Fl. Atl. 1:312.1798; *J. maritimus* f. *rigidus* (Desf.) Maire, l.c.;
J. maritimus var. *rigidus* (Desf.) Keith, l.c. 580; *J. arabicus* (Aschers. & Buchen.) Adam., Rev. S. Afr. Juncus in J.Linn. Soc. Bot. 10-11.1935;
J. caffer Bert. in Mem. Acad. Sc. Inst. Bologna ser. 3:253.1851; *J. nevskii* Krecz. & Gontsch. in Kom., Fl. URSS. 3:629.1935.

Capsules 3.5 - 5 mm. long.

G-8 Gebel Uweinat, 7.11.1968, *L. Boulos* 3288 (ULT).

Distribution: S.Europe, Africa, S.W.Asia to Pakistan.

JUNCACEAE

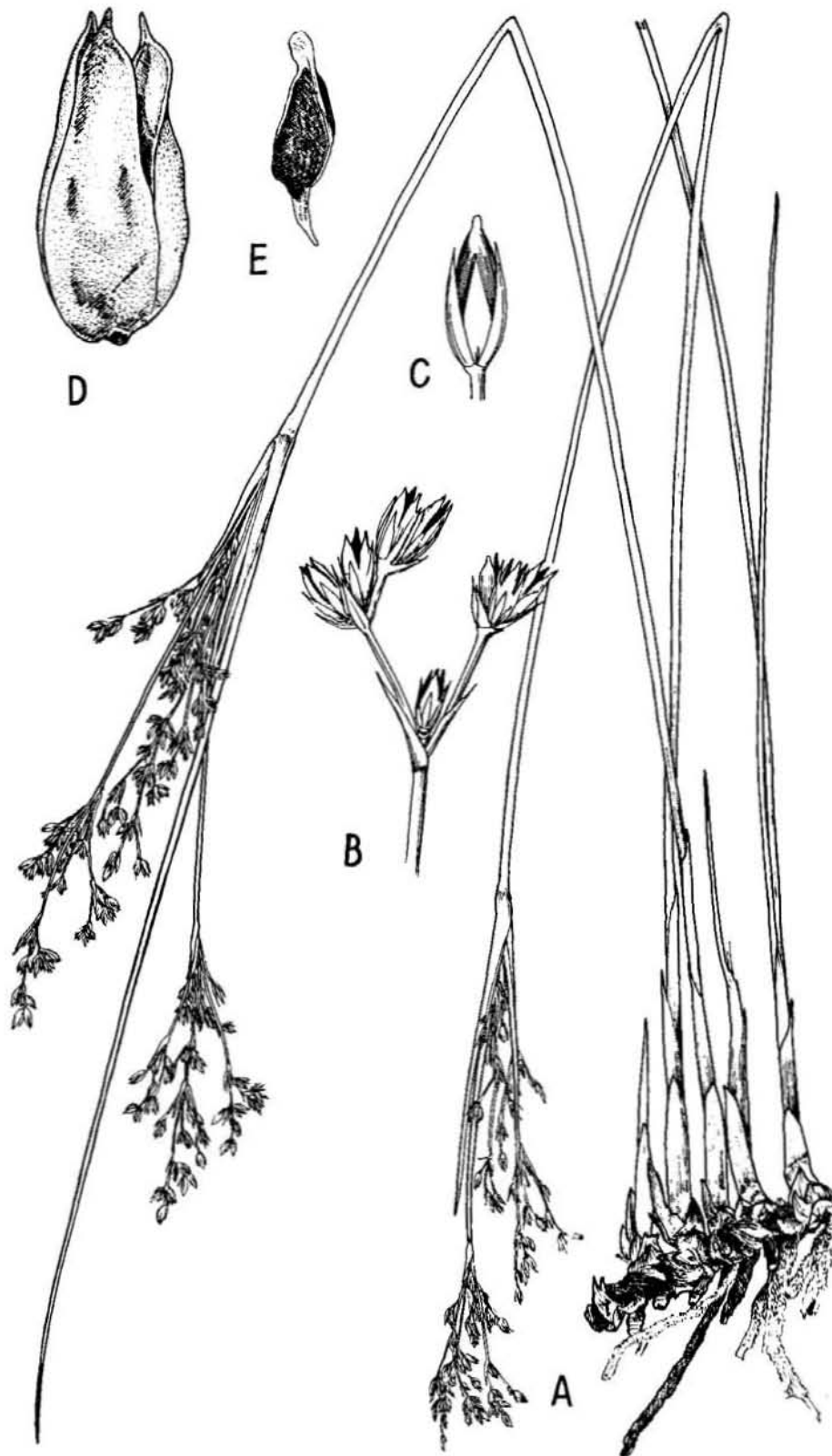


Fig. 4, *Juncus maritimus* var. *arabicus*: A, habit x 0.5; B, portion of inflorescence at fruiting stage x 2; C, flower at fruiting stage x 4; D, capsule opened above x 10; E, seed x 20.

JUNCACEAE

Vern. Agertil, dis, dees, tallegit.

5. **Juncus mutabilis** Lam., Encyc. 3: 270. 1789; Reichgelt in Fl. Neederland. (Juncaceae). 186. fig. 50. 1964.

J. pygmaeus Rich. ex Thuill., Fl. Env. Paris ed. 2: 178. 1799; Maire, Fl. Afr. Nord. 4: 282, fig. 714. 1957; Keith l.c. 580. (Fig. 5, A-C).

Small, annual herb, up to 12 cm tall, ascending, with filiform culm and very narrow, $\pm$ knotty cauline leaves, c. 0.5 mm in diam. Inflorescences mostly in terminal, sessile to peduncled glomerules, each 2-5 (-9)-flowered. Lower bract usually exceeding the inflorescences, leaf-like; upper bract short, scarious. Flowers 3-8 mm long, bracteolate; tepals almost equal, linear-lanceolate with scarious margins, subobtuse. Stamens 6 (sometimes 3-5 only); anthers ovoid-oblong, 1/2-1/3 of the filament; style almost absent; stigmas 3, linear. Capsules not exceeding the perianth, oblong-trigonus or somewhat obclavate, $\pm$ very short mucronate, unilocular; seeds very small, 0.3-0.4 mm long, not tailed, subfusiform to obovoid-oblong, finely striated.

Type: Described from Paris.

A-6 Dayas, W. of Barce (El Merj), *Maire & Weiller* (vide Maire, l.c.)

Distribution: Europe & N.Africa (Atlantic-Medit. element).

Easily distinguished from *J. bufonius* by its knotty leaves.

Vern. Dees.

6. **Juncus punctorius** L. f., Suppl. 208.1781; Corti, Fl. Fezzan. 69.1942; Maire, l.c. 286, fig. 717; Keith, l.c. 580.

J. exallatus Decne. in Ann. Sc. Nat. Ser. 2.2:16.1834; *J. schimperi* Hochst in Rich., Tent. Fl. Abyss. 2:338.1850.

Rhizomatous perennial, 50-100 cm tall (rarely up to 2 m), with septate, cylindrical culms and leaves; basal sheaths usually 3, and only 1 cauline leaf, nearly as long as the culm, multitubulose with complete or incomplete septa. Inflorescence paniced with many, hemispherical, 8-30-flowered glomerules. Flowers 2.5-3 mm long; tepals almost equal, ovate, acute or apiculate. Stamens 6, up to c. 2/3 of the tepals; anthers less than 1 mm long, linear; style c. 1 mm long with 1-1.5 mm long

JUNCACEAE

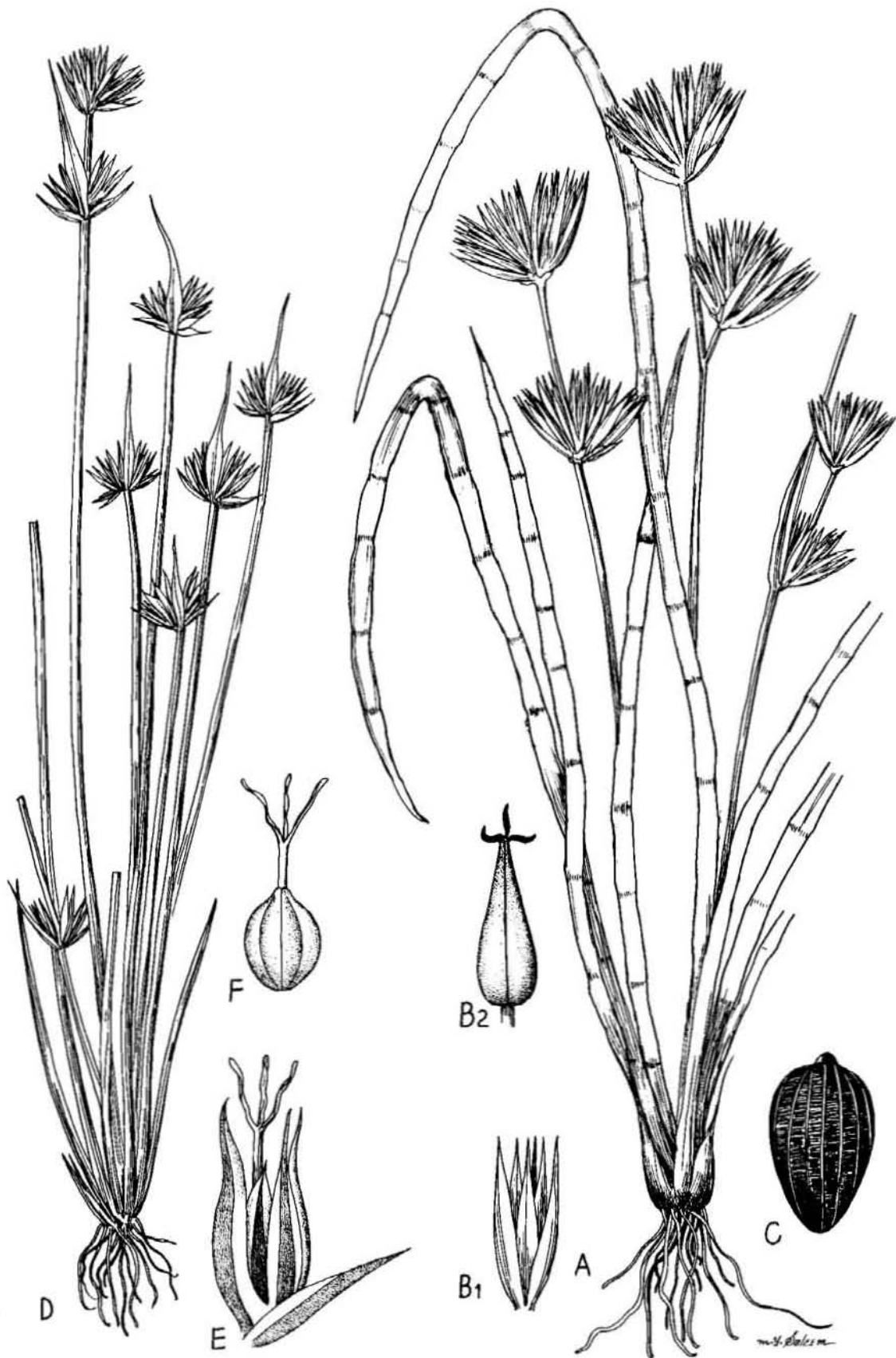


Fig. 5, *Juncus mutabilis*: A, habit x 5; B₁ tepals x 5; B₂, capsule x 7; C, seed x 60; *J. capitatus*: D, habit x 1.5; E, flower x 10; F, capsule x 10.

JUNCACEAE

stigmas. Capsules usually about as long as the tepals, ovoid-oblong subspherical, beaked, 3-locular, brownish; seeds c. 0.5 mm long, ovoid, biapiculate, suboblique, striated.

Type: e Caput bonae spei.

Reported from Fezzan (Oasis de Serdeles; now called Aweinat) by Corti (l.c.) and Maire (l.c.).

Distribution: N. to S.Africa, eastward to Arabia petrea, to Pakistan (Saharo-Sindian element).

7. ***Juncus fontanesii*** J.Gay in La harpe, Monogr. Junc. in Mem. Soc. Hist. Nat. Paris 3:130.1827; Maire, l.c. 293., fig. 722; Keith, l.c. 579. (Fig. 6).

J. articulatus auct. non L.: Desf., Fl. Atl. 1:313.1798; *J. duvalii* Loret, Rev. Sc. Nat. 4:56.1875.

Perennial, usually with spreading rhizome, giving out 1 or more leafy clumps at the nodes, sterile and fertile both present, 10-50 cm tall, 1-2 mm thick, herbaceous. Leaves cylindrical septate, cauline 2-4. Inflorescence terminal, usually paniced with short branches ending into 6-20-flowered glomerules. Lower bract leaf-like; floral bracteoles ovate, hyaline. Flowers 3-4 mm long. Tepals $\pm$ lanceolate, acute or acuminate, inner ones $\pm$ longer. Stamens 6; anthers linear-oblong, c. 1 mm long; style c. 1 mm long with 1-1.5 mm long stigmas. Capsules exceeding the tepals, trigonal-ovoid, usually narrowed into a short beak, (2-) 2.5-4.5 mm long; seeds c. 0.5 mm long, pyriform, without appendages.

Type: « Barbarie », Herb. Desfontanes.

Reported from Ain Mara (Cyrenaica) by Pampanini (vide Maire, l.c.).

Distribution: N.Africa, Egypt, Ethiopia, Iraq, Iran & Pakistan.

Distinguished from *J. articulatus* L. by the presence of stolons and apiculate perianth segments.

JUNCACEAE

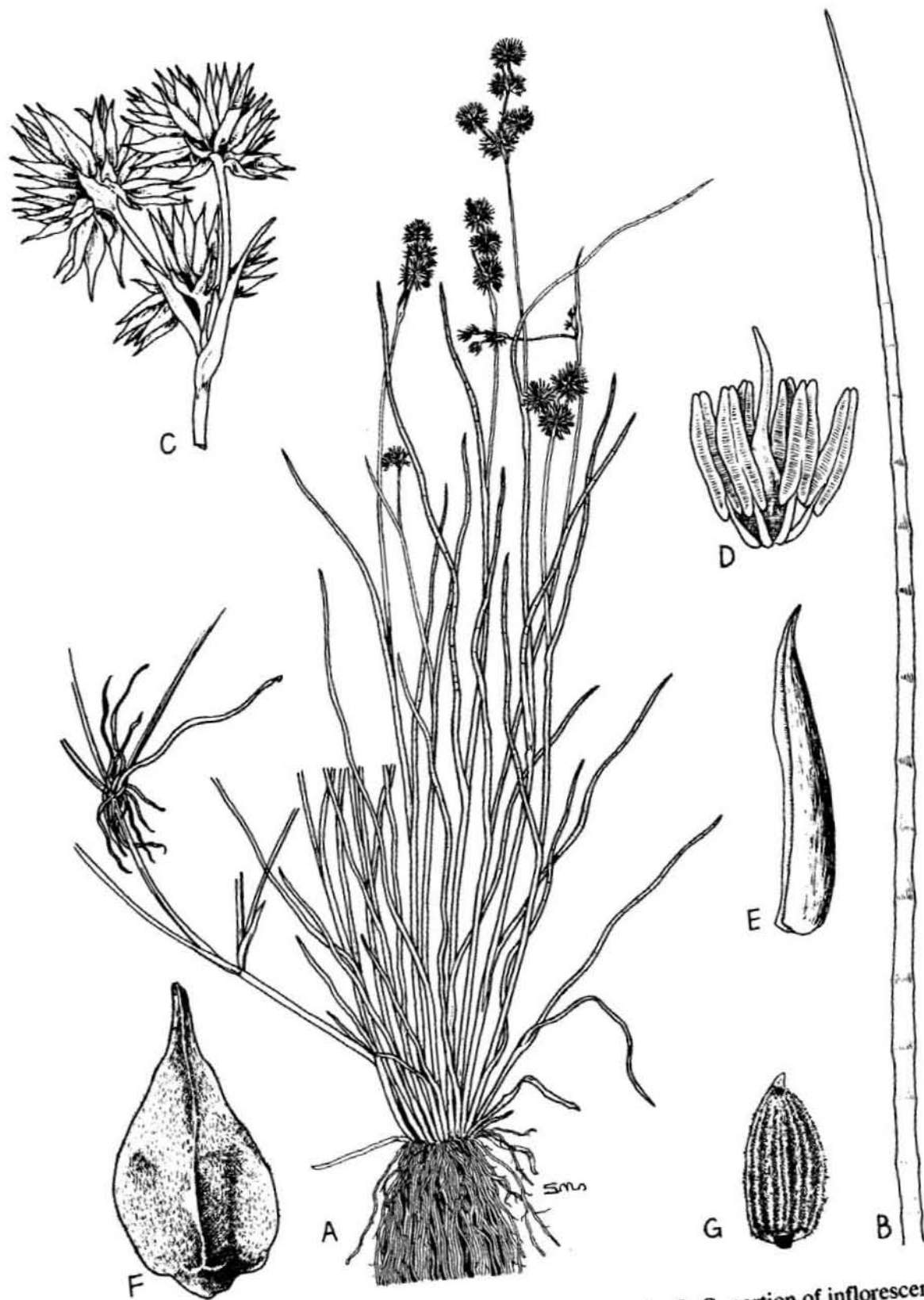


Fig. 6, *Juncus fontanesii*: A, habit x 0.5; B, leaf x 3; C, portion of inflorescence x 3; D, stamens and ovary x 15; E, tepal x 15; F, capsule x 15; G, seed x 50.

JUNCACEAE

8. **Juncus capitatus** Weig, Obs. Bot. 28, tab. 2, fig. 5.1772; Maire, l.c. 303, fig. 727. (Fig. 5-D-F).

Annual, up to 12 cm tall, with filiform, culms and small, linear, non-septate, $\pm$ plane cauline leaf-blades. Inflorescence usually a terminal, 3-8-flowered, 5-9 mm diam. glomerule; lower bract leaf-like, exceeding the glomerule. Flowers c. 3.5 mm long, bracteolate, usually cleistogamous; tepals lanceolate, subequal; outer acuminate-subulate, keeled, inner c. 2/3 of the outer ones, scarious-hyaline, with subobtus apices. Stamens 3, c. half as long as the tepals; anthers c. 1 mm long; style with longer stigmas, exceeding the tepals. Capsules ovate-subglobose, subtrigonal, 3-locular, shortly mucronate, brownish. Seeds c. 0.3 mm long, ellipsoid-ovate, without appendages, brownish.

Type: Pomerania, *Wilke*.

Reported from Barce (El Merj) by Maire (l.c.) - collected by Sandwith & Simpson.

Distribution: Europe, N.W.Africa, Libya, Ethiopia; introduced elsewhere,

Vern. Dees.

JUNCACEAE

INDEX TO JUNCACEAE

- Juncus** L. 1
J. acutus L. 6
J. arabicus (Asch. & Buch.) Adam. 9
J. articulatus auct. non L. 13
J. broteri Steud. 8
J. bufonius L. 4
J. bufonius var. *congestus* Wahlb. 4
J. bufonius var. *hybridus* (Brot.) Coss & Dr. 4
J. caffer Bert. 9
J. capitatus Weig. 15
J. duvalii Loret 13
J. exallatus Decne. 11
J. fontanesii J. Gay 13
J. hybridus Brot. 4
J. karelini Steud. 6
J. maritimus Lam. 8
J. maritimus f. *rigidus* (Desf.) Maire 9
J. maritimus var. *arabicus* Asch. & Buch. 9
J. maritimus var. *rigidus* (Desf.) Keith 9
J. multiflorus Desf. 4
J. mutabilis Lam. 11
J. neveskii Krecz. & Gontsch. 9
J. ponticus Stey. 8
J. punctorius L.f. 11
J. pygmaeus Rich. 11
J. rigidus Desf. 9
J. schimperii Hochst. 11
J. sicularis Tin. 4
J. spinosus Forsk. 6
J. subulatus Forsk. 4