



TAXONOMIC STUDY OF GENUS *SCIRPUS* Linn. FROM BEED DISTRICT OF MAHARASHTRA

Solanke Sudhir

Dept. of Botany, Shri Muktanand College, Gangapur, Dist. Aurangabad.

Abstract

The genus is comparatively large, comprising more than 200 species distributed throughout the world and represented by over 25 species in India (Clarke, 1893, W. Khan, 2015). In the present study morphological characters, illustrations and key for identification of 8 species of genus *Scirpus* from Beed District of Maharashtra have been provided.

Key words: *Scirpus* Taxonomic study, Beed district, Maharashtra.

INTRODUCTION

The genus *Scirpus* Linn. in broad sense appears to be a heterogeneous assemblage of ill-defined species. It includes all the scirpoid species left out from inclusion in other genera (Kern 1974, W. Khan 2015).

The characteristic features of the genus are spirally arranged glumes and style which is continuous with the ovary. These features, however, are not diagnostic or exclusive of the genus but are shared by other genera as well. Spirally arranged glumes for in stans are characteristic for genera such as *Bulbostylis*, *Fimbristylis*, *Eleocharis*, *Fuirena*, *Eriophorum* and *Lipocarpha*. It is therefore necessary to employ other features such as involucral bracts, position and nature of inflorescence on the culms, presence and absence of hypogynous structures, habit etc. in the circumscription of different species. Thus, it can be said that there is no satisfactory set of characters that can be employed for characterization of any one species. It is an overall assessment of certain prominent features and field experience that help to distinguish different species of the genus. (W. Khan, 2000, 2015)

Besides, external morphology, the genus appears to be heterogeneous from anatomical as well as embryological point of view. These features are variable even within the smaller groups of species. Thus, there is no correlation of characters at any level of the genus and this has posed the existing problems in the taxonomy of the genus. Obviously, there are diverse opinions regarding the delimitation of the genus as well as its Subgenera and Sections. Some cyperologists treat the genus in a broad sense with different species groups under sections, others split the genus into several distinct genera (W. Khan, 2000, 2015).

Various genera of small size have been recognized by employing chiefly anatomical features (Palla, 1888-89) or their distinctiveness at present is supported by the embryological differences. These genera such as *Bulboschoenus* Palla, *Schoenoplectus* Palla, *Blysmus* Panz. ex Schult. *Hemicarpha* Nees, *Isolepis* R. Br. *Kylligiella* R. Haines & Ley, *Rikliella* J. Raynal, *Baethryon* A. Dietr. *Actinoscirpus* Ohwi. *Eleogiton* Link, *Websteria* S. N. Wright and a few others.

The narrow generic limit has been accepted by Hooper, (1976), Koyama (1957, 1958, 1985), Goetghebeur & Simpson, 1991, J. Bruhl (1995), Eisuki Hayasaka (2000) and a few others.

The genus *Rikliella* has been now merged in to *Lipocarpha* by Goetghebeur and Van den Borre (1989). The new concept of this genus is based on the interpretation of reduction in inflorescence and floral structures. On the basis of SEM studies, Pandey et.al. (1995) and Secondary metabolites, Ragan (1994) supported the merging as above. Kunth (1837), Boeckeler (1869-70), Pax (1887), Clarke (1893,1908), Chermezon (1937), Kern (1974), Rao and Verma (1982), W. Khan (2000), are in favor of taking the genus in broad sense including various small sections with more or less closely related species. This course has been followed in the present text as it appears to be more convenient, less problematic. Further, even within the narrow limits of various genera the included species do not appear interrelated. *Scirpus grossus* and *S. kysoor*, for instance lodged between *Schoenoplectus* and *Actinoscirpus*, *S. maritimus* and *S. affinis* between *Bulboschoenus* and *Schoenoplectus*, *S. squarrosus*, *S. squarrosus* between *Rikliella* and *Lipocarpha*. The position of these and other species under these genera appears to be doubtful. Most of these genera are also recognized on the basis of leaf anatomy and interpretation of floral reduction are not morphologically distinct from *Scirpus* s.l. (W. Khan,2000). The present study gives report of 8 taxa from the study regions. Frequent visits were made during October to January in the study region and specimens were collected and processed. The specimens were identified with the help of Floras and available literature.

Sr. No. 1	Name of Flora	No. of Species
1.	Flora of British India.	26
2.	Aquatic & Wetland of Plants India.	13
3.	Flora of Karnataka	09
4.	Flora of Maharashtra	05
5.	Flora of Marathwada	13

6.	Flora of the Presidency of Bombay.	11
7.	Flora of the Presidency of Madras	13
8.	Botany of Bihar and Orissa	08
9.	Flora of the Tamil-Nadu Carnatic	08
10	Flora of Andhra Pradesh	14
11	Beed region (Present account)	08

The *Scirpus* are Key to the species and characterized in general as under:

KEY TO THE SPECIES

- 1a. Leaves well-developed; involucre bracts 2-5, foliaceous, dorsiventrally flat.....2
- 1b. Leaves reduced to sheaths, rarely shortly laminate sometimes stems are leafy in *S. lateriflorus* or up to 2 cm long mucronate blade.4
- 2a. Hypogynous bristles or scales absent **S. squarrosus**
- 2b. Hypogynous bristles or scales present.3
- 3a. Involucre bracts with broad, hyaline wing on margins near the base; inflorescence often terminal; spikelets broadly ellipsoid, flat or subturgid, stramineous; glumes 7-9 x 3-4 mm; nuts reticulate, style mostly 2-fid **S. affinis**
- 3b. Involucre bracts without or rarely with a narrow hyaline wing on margins at base; in florescence often pseudolateral; spikelets terete, cylindrical ultimately blackened; glumes 5.5-6 x 2.5-3 mm, nuts smooth; styles mostly 3-fid **S. maritimus**
- 4a. Hypogynous bristles or scales present; amphicarp absent. 5
- 4b. Hypogynous bristles or scales absent; amphicarp (female flower with very long style within the basal sheaths) often present.6
- 5a. Spikelets all sessile, often clustered in globose heads on primary and secondary rays; hypogynous scales like the small reduced glumes, ciliate on margins; nuts trigonous, styles 3-fid. Stems spongy, 8-15 mm broad **S. brachycerus**
- 5b. Spikelets all solitary, on ray like peduncles; hypogynous scales narrow, densely plumose from the moniliform hairs; nuts biconvex, styles 2-fid. Stems not spongy, 2-8 mm broad **S. littoralis**
- 6a. Stem solid, terete or angular, not septate; spikelets atleast partly peduncled and on short rays; nuts with strong transverse wavy ridges extending beyond angles giving muricate appearance**S. lateriflorus**
- 6b. Stems hollow, terete, faintly to strongly septate (when dry); spikelets all sessile in Capitulate heads; rays absent; nuts smooth or faintly to strongly undulated but never appearing muricate on angles. 7

- 7a. Stems 1.5-2.5(3) mm wide; spikelets always basal, 1.5-2.5 mm wide; glumes *ca* 3 mm long not or indistinctly striated; nuts 1-1.2 mm long with 8-10, thick conspicuously spaced horizontal wavy ridges on each face, one face broad and flat, strongly brown ribbed on angles..... **S. jacobii**
- 7b. Stems 6-10 mm wide (sometimes narrow to *ca* 3 mm wide in *S. roylei*); spikelets not always basal, 3.5-6 mm wide; glumes 3.5-6 mm long, distinctly striate on sides; nuts 1.5-1.8 mm long, smooth or with numerous, slender, closely arranged undulations equally trigonous or triquetrous, not ribbed on angles **S. praelongatus**

Scirpus affinis Roth in Roem. & Schult. Syst.2:140.1817 et Nov. Pl. Sp. 30.1821; Maheshwari Fl. Delhi 362.1963; Shah Fl. Gujrat State, 754.1978; L'narsimhn in Sharma et al Fl. Maharashtra 2:367.1996; W. Khan in Naik Fl. Marathwada 2:965.1998. et in J. Rheede . 10 (1): 24. 2000. *Scirpus maritimus* L. var. *affinis* (Roth.) Clarke in Hook f. Fl. Brit. India 6: 659. 1893; Cooke Fl. Pres. Bombay 2: 893. 1908. *Bulboschoenus maritimus* (L) Palla subsp. *affinis* (Roth) Koyama. Brittonia 31:284.1979; Simpson & Koyama in Fl. Thailand 6(4):271. f. 7. 1998. *Bulboschoenus affinis* (Roth.) Drobow. Trav. Mus. Bot. Acad. St. Petersburg. 16:139. 1916; Roshev. in Komarv, Fl. URSS 3:57. t. 3. f. 11.1935.

Dwarf perennial, 5-40 cm tall; stolons, 1-1.5 mm wide, often ending in very short, ovoid, non-aromatic tubers 8-10 mm in diam., stems triquetrous, 1-3 mm wide, often arising from a short tuber, strongly striated, smooth (not scaberulous) below the inflorescence. Leaves: sheaths, glabrous striated; cotraligule membranous, tongue, like, 2-3 mm long, truncate; blades linear, 2-6 mm wide basal and cauline, coriaceous, sometimes the middle ones closely distichous and crowded. Inflorescence: simple terminal, sessile or subsessile, capitate head with 1-7 spikelets; involucre bracts 2-3 foliaceous, distinctly with 1-15 mm wide hyaline wings on margins near the base, often erect, the longest 5-10 cm long. Spikelets broadly ellipsoid, 1.5-2 x 0.8-1 cm, more or less turgid, sessile, echinulate, glistening straw white, obtuse or subacute, rarely 1-2 with 0.5-1.5 cm long peduncles; rachilla wingless. Glumes oblong- elliptic, 7.9 x 3.4 mm; keel with a strong mid-rib, shortly silky pubescent on the back; sides nerveless, thinly membranous, stramineous or brown linate, broadly hyaline on margins, ciliate, lacerate or notched at apex with *ca* 1.5 mm long, recurved awns. Stamens 3; anthers linear, *ca* 2.5 mm long, with hairy- membranous appendage at the tips. Hypogynous bristles 4-5, unequal, white retrorsely barbellate, longer than the nuts. Styles 2-fid, shorter or equalling the nuts. Nuts biconvex, broadly obovoid, 2.5-2.7 x 1.5-1.8 mm, stramineous; shining distinctly reticulate from the isodiametric cells, shortly but distinctly beaked at rounded apex.

Rare in marshes and wet grass lands

Fls & Frts :- December to March.

Specimens examined :- MH. State, Beed District, Moreswar Temple near the Godavari river bed, *Solanke S.N.* 1979, Dhalegaon near the Godavari river bed, *Solanke S.N.* 1980, Godavari river bed, *W. Khan* 1539, Majalgaon, Shindphana reiver, *W. Khan* 94,

Scirpus brachycerus Hochst. ex. A. Rich, Tont. Fl. Abyss. 2:496.1851; Verma et Chandra. Cypr. M. P. Records BSI. 212. 264.1981; W. Khan in J. Rheede 10 (1): 25. 2000. *S. corymbosus* Heyne ex. Roth Nov. Pl. Sp. 1821; Clarke in Hook. f. Fl. Brit. India 6:657.1893; Cooke Fl. Pres. Bombay 2:892.1908; Fischer in Gamble Fl. Pres. Madras (1931) 3:1665(repr.ed.)1994; W. Khan in Naik Fl. Marathwada 2:967.1998. auct. non. Linn. 1753; nec Forsk. 1775. *Isolepis corymbosus* Roth. ex R. & S. Syst. Veg. 2:110.1817; *Schoenoplectus corymbosus* (Roth ex. R. & S.) J. Raynal in J. B. Lebrun et al Cat. Niger. Pl. 343.1976; L'narsimhn in Sharma et al Fl. Maharashtra 2:359. 1996.

Robust perennial, 90-150 cm tall; rhizomes stout, 2.5-4 mm thick shortly creeping; stems terete, 0.8-1 cm wide, spongy, faintly striated, gradually narrowed upwards, obtusangular below the inflorescence. Leaves: reduced to membranous, 10-20 cm long sheaths; blades, if present, very short. Inflorescence: simple or compound, pseudolateral below the apex, corymbose and pendulous, sometimes contracted; involucre bracts stem like, solitary, appearing like the continuation of stems, shorter than the inflorescence; primary rays 8-10, 4-6 cm long; secondary ones, if present, filiform, with capitate heads with 3-many spikelets. Spikelets elliptic oblong, 5-8 x 3-3.5 mm, sessile, stramineous, tinged with brown, acute or subacute; rachilla wingless. Glumes ovate-oblong, 3.5-4 x 2 mm, boat-shaped, loosely imbricated, chartaceous; keel faintly nerved with a strong distinct mid-nerve; sides faintly nerved and brown linate, with hyaline margins, mucronate at acute apex. Stamens 3; anthers linear, ca 2 mm long, with distinct hairy appendage at the tips. Hypogynous scales 2-4, linear, small, glume-like, brownish, thinly silky hairy, densely so on margins, the longest often overtopping the nuts. Styles 3-fid, thinly hairy, longer than the nuts. Nuts trigonous, ellipsoid 1.8-2 x 1-1.2 mm, smooth, shortly beaked, yellowish to black.

Occasional in marshes.

Fls & Frts: - December to March.

Specimens examined: - MH. State, Beed District, Majalgaon, Shindphana river, Solanke S.N.1994, Telgaon to Kille-Dharur along road side, *Solanke S.N.* 1990, Wadvani to Kille-Dharur, Solanke S.N. 2001.

Notes: - The stems are not septate in all the specimens of this region. The hypogynous barellate bristles are totally absent. However, 2-3 very narrow glume-like scale are present which are ciliate on margins and apex. These sometimes (in the same plant) reduced and much smaller than the nuts, sometimes reduced to only one subulate ciliate scale or even totally absent. The earlier worker must have seen the latter case to mention the hypogynous structure are totally absent. A series of plants from other parts have also been studied.

Scirpus jacobii Fischer, Kew Bull. 1931:103.1931 et in Gamble Fl. Pres. Madras (1931) 3:1166 (repr. ed.) 1994; W. Khan in J. Rheede 10 (1): 26. 2000. *Schoenoplectus jacobii* (Fischer) Lye in Bot. Notis

124:290.1971. *Schoenoplectus senegalensis* sensu Hooper in Sald. & Nicol. Fl. Hassan Dt. 699.1976; Karthikeyan et al in Indic. En. Monocots :70.1989; L'narsimhn in Sharma et al Fl. Maharashtra 366.1996. non Hochst. ex. Steud. 1855; Hayasak, E. in J. Jap. Bot. 78(2): 69. 2003. *Isolepis senegalensis* Hochst. ex Steud, Syn Pl. Glum. 2:96.1855. *Scirpus senegalensis* (Hochst ex Steud.) W. Khan in Naik Fl. Marathwada 2:971.1998. non. Lamk. 1791. *Scirpus praelongatus* sensu Clarke in Th. Dyer Fl. Trop. Afr. 7:454.1902. non Poir.1804.

Densely tufted annuals, 10-35cm tall. Stems angular, terere, glabrous, soft, fleshy, septed, erect, many, 1-2 mm wide, ending brown tips. Leaves sheaths glabrous, membranous, basal, blade very short. Umbels simple, psedolateral, sessile, 10-15 spikelets, near the base including sheaths or obove sheaths. involucre bract, stem - like, continous of the stem. Spikelets sessile, ovoid or oblong - ovoid, 5 x 2.5-3 mm, whitish, rhachilla wingless. Glumes ovate, suborbicular, spirally arranged, 2.5-3 mm across, white hyaline, apiculate apex. Stamens 2, anther elliptic, 0.6-0.8 mm long, cuticous, bristles absents. Styles 3-fid, linear, longer than the nuts. Nuts trigonous, obovoid, 1-1.2 x 1 mm.

Occasional in moist lands, ditches, and ponds.

Fls. & Frts. : - September to January.

Specimens examined: - MH. State, Beed District, Sautada, *Solanke S.N.* 2010, Sautada to Jamkhed road side 1930.

Notes: - Although Fsicher (l.c.) has recorded this species from Bade Talab (Andhra Pradesh) However, I have recorded and studied this species from Nizamabad District of Andhra Pradesh where it is common and rare in Maharashtra (W. Khan 2000) It is a distinct taxon on account of the features shown in the key, but has been treated variously by the different taxonomists.

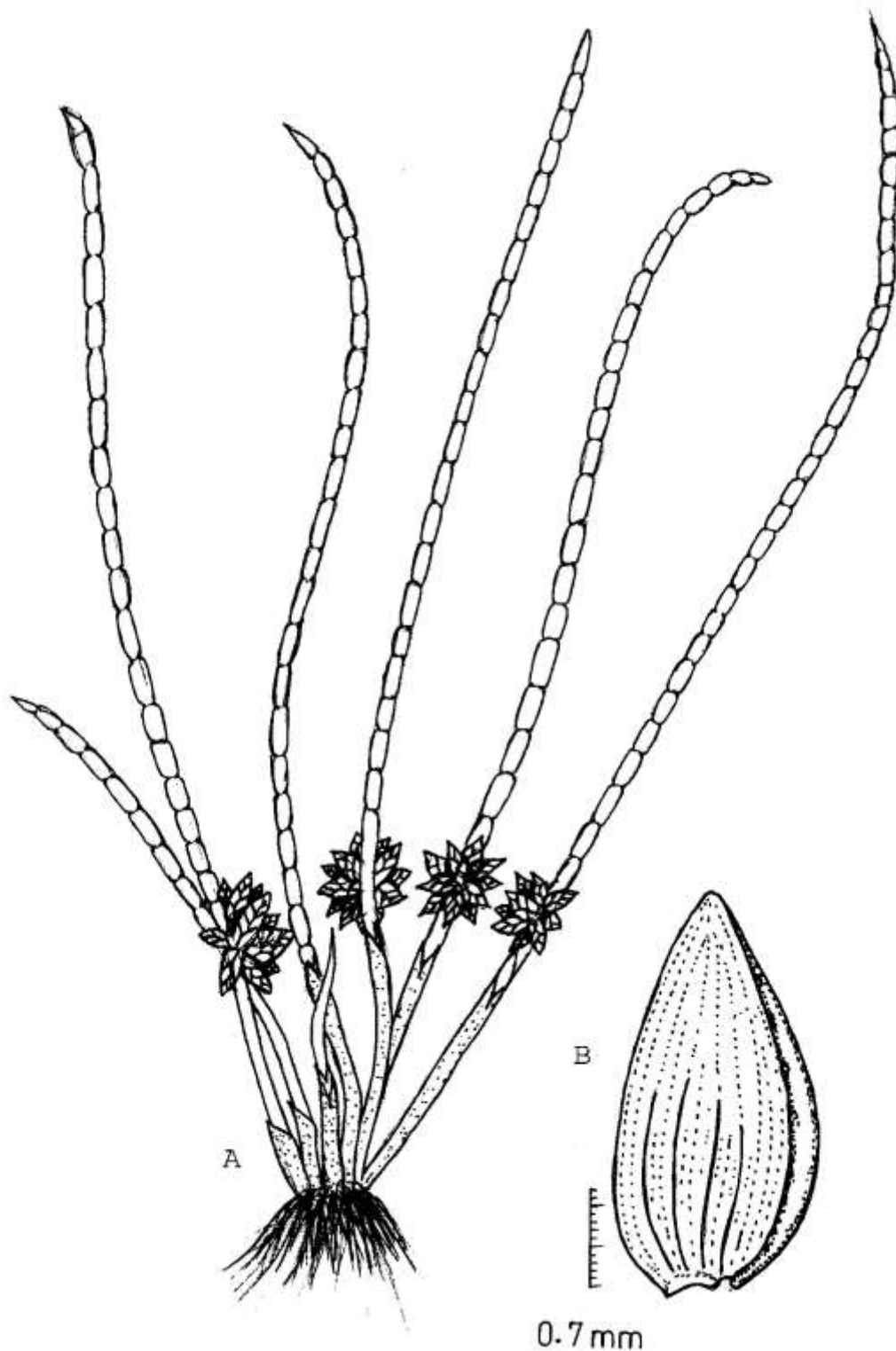


Fig. - *Scirpus jacobii* Fischer
A - Habit, B - Glume

Scirpus squarrosus Raymond, Nat. Canad. 86:230.1959; J. Raynal, Adansonia, ser. 2.13:155.1973; *Isolepis squarrosus* (Raymond) Lye, Bot. Notiser 124:479.1971. *Rikliella squarrosus* (Raymond) J. Raynal, Adansonia ser. 2.13:155.1973; L'narsimhn in Sharma et al Fl. Maharashtra 356. 1996; W. Khan in Naik Fl. Marathwada 2:963.1998. et in J. Rheedia 10 (1): 25. 2000. *Lipocarpha squarrosus* (Raymond) Goetghebeur, Wageningen Agri. Univ. papers, 89-1:42.1989.

Tufted, dwarf annual, 5-20 cm tall; stems filiform angular or nearly so, 0.3-0.5 mm wide, often flexuous. Leaves : sheaths glabrous, reddish-brown; blades linear, filiform, 0.2-0.3 mm wide, often basal, shorter than the stems, acuminate. Inflorescence : reduced to solitary, terminal sessile cluster of 1-4 spikelets; involucre bracts 2, setiform, patent, much overtopping than the inflorescence, the longest ones often 1.5-3 cm long. Spikelets subglobose, 4-5 x 2.5-3 mm, terete, squarrose, greenish, tinged with brown, obtuse; rhachilla wingless. Glumes, obovate oblong, 1-1.1 x 0.5-0.6 mm, with 3-nerved keel; sides nerveless, hyaline, tinged with red in the upper half, contracted into *ca* 1 mm long recurved, glabrous awns almost as long as the body of glumes. Stamen 1; anther elliptic, minute. Hypogynous scales or bristles absent. Nuts biconvex, obovoid, 0.5-0.7 x 0.2 mm, with a raised, median ridge in dorsal side, dotted, apiculate. Styles 2-fid, obscure or very short, glabrous.

Occasional in moist open grass lands.

Fls & Frts : - September to December

Specimens examined :- MH. State, Beed District, way Telgaon to Beed road, Solanke S.N. 2019, Majalgaon, Near to the dam, Solanke S.N. 2030, Ambajogai, Near Ambadevi Temple, Solanke S.N. 2033. Bansarola, Manjara river, Solanke S.N. 1922.

Notes :- Apparently very similar and deceptively grow together with *S. squarrosus* in the same locality. Usually the terminal spikelets and spreading or deflexed involucre bract distinguish it in field from the latter.

Scirpus lateriflorus Gmel. Syst. Veg. 1:127.1791; Kern in Steenis Fl. Malesiana 1.7(3): 514.1974; W. Khan Fl. Marathwada 2:968.1998 et in J. Rheede 10 (1):27.2000. *Scirpus lateralis* Retz. Obs. 4:12.1786 et ibid 5:16.1789 non Forsk. 1775. *Isolepis uninodis* (non Delile) Miq. Fl. Ind. Bot. 3:308.1856. *Scirpus supinus* L. var. *uninodis* Clarke in Hook. f. Fl. Brit. India 6:656.1893 non. *Isolepis uninodis* Delile *S. supinus* Clarke (l.c. 656.) Cooke Fl. Presd. Bombay 2:892.1908; Fischer in Gamble Fl. Pres. Madras (1931) 3:1166 (repr. ed.) 1994. auct non Linn. 1753. *Schoenoplectus lateriflorus* (J.F.Gmel.) Lye in Bot. Notis. 124: 290.1971. Koyama in Hara, Stearn & Williams En. Fl. Pl. Nepal 1:119.1978 et in Dassan. & Fosb. Rev. Handb. Fl. Ceylon 5:158.1985. L'narsimhn in Sharma et al Fl. Maharashtra 361. 1996.

Tufted slender annuals, 10-30 cm tall. Stems terete, 1-2 mm wide, filiforms, leaves sheaths glabrous, blade very short or absent. Umbels of simple, pseudolateral, sessile, capitate, involucre bract, stems like 10-15 cm long, continuation of the stems, rays 3-4, 1-2 cm long, spikelets ellipsoid, sessile, or solitary, greenish, 7x 2 mm, rhachilla wingless. Glumes ovate, 1.6-2 x 1.5 mm, boat shaped. white hyaline margins, mucronate. Stamens 3, anther elliptic, bristles absent, Style 3 fid, longer than the nuts. Nuts trigonous ellipsoid, 1-1.1 x 1-1.2 mm, as long as broad, flat on one face, horizontal wavy lines, white or blackish mucous.

Very common, in marshes of tanks, rice-fields, along banks of water courses.

Fls. & Frts. : - October to february.

Specimens examined :- MH. State, Beed District, Moreswar Temple near the Godavari river bed, Solanke S.N. 2038, Dhalegaon near the Godavari river bed, Solanke S.N. 1982, Gangamsla, near the Godavari river bed, Solanke S.N. 2003, Pimpalagaon, near the Godavari river bed, Solanke S.N.1975, Kille-Dharur, Near to Ambadivi Temple, Solanke S.N. 2035, W. Khan 1428.

Notes :- Rarely basal or subbasal single long bladed leaf develops on stems.



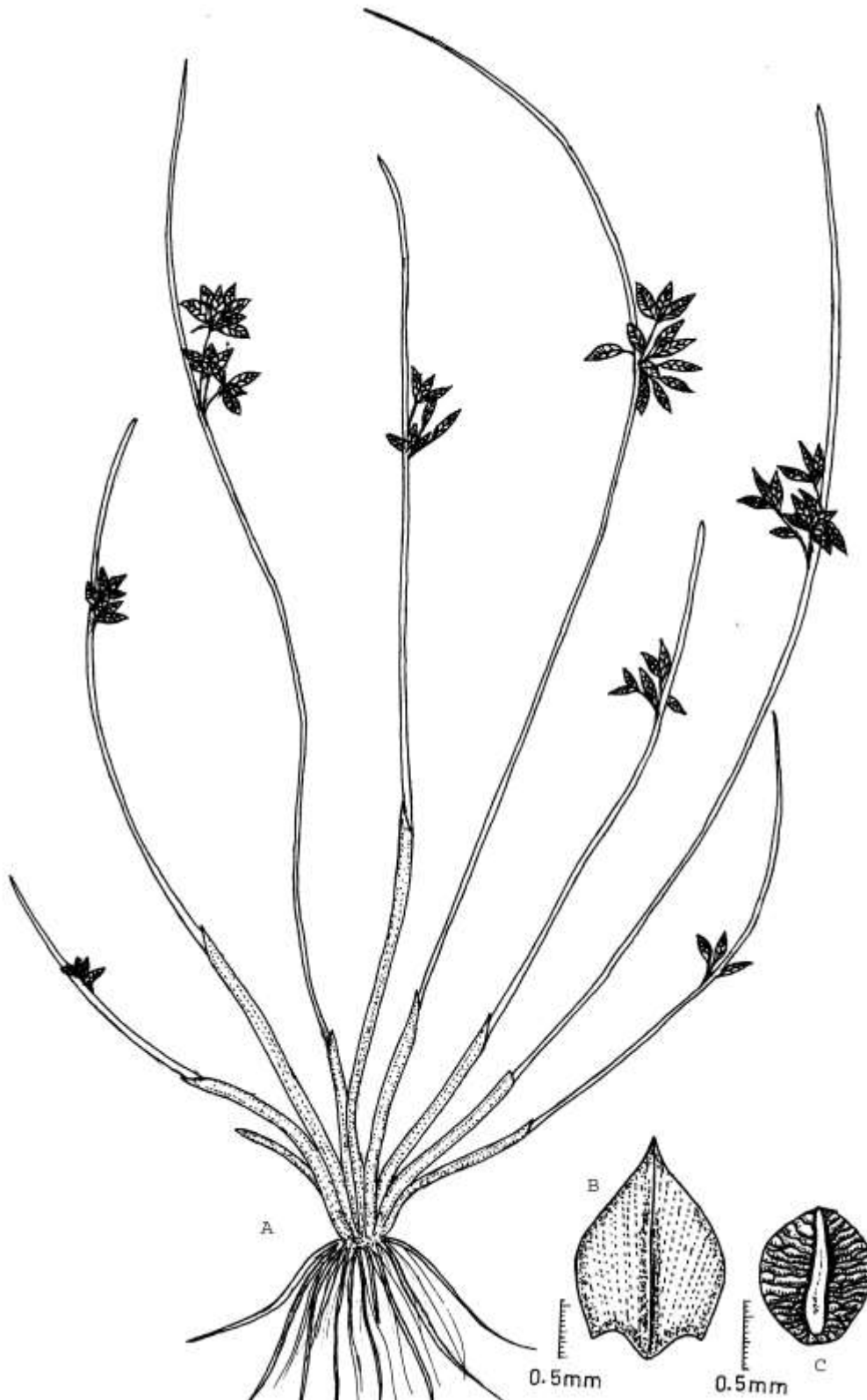


Fig. - *Scirpus lateriflorus* Gmel.
A - Habit, B - Glume, C - Nut.

Scirpus littoralis Schrad. Fl. Germ. 1:42: t. 5. f. 7.1806; Clarke in Hook. f. Fl. Brit. India 6:659.1893; Cooke in Fl. Pres. Bombay 2:894.1908; W. Khan Fl. Marathwada 2:969.1998. *Schoenoplectus littoralis* (Schrad.) Palla, Sitzber. Zool. Bot. Ges. Wien 38: 49.1888; W. Khan in J. Rheede 10 (1):28. 2000.

Scirpus subulatus Vahl En. Pl. 2:268.1806. *S. littoralis* Schr. var. *subulatus* (Vahl) Chiovenda Istit. Bot. Catania 1:15.1928. *Schoenoplectus littoralis* (Schr.) Palla subsp. *subulatus* (Vahl) Koyama in Dassan. & Fosb. Rev. Handb. Fl. Ceylon 5:157.1985; L'narsimhn in Sharma et al Fl. Maharashtra 2:363.1996.

Robust perennials, 40-120 cm tall. Stems terete, 3-7 mm wide, angular, glabrous. Leaves sheaths glabrous, basal, blade short, 15 cm long, 5-7 mm wide. Umbels simple or subcompound, solitary, involucre bracts, stem - like 5-10 cm long, continuation of a stems, primary 2-4 with few to many spikelets, the longest rays 3-4 cm long. Spikelets ovoid, oblong, 10 x 3-4 cm, solitary, brownish in the upper half, acute, rachilla wingless. Glumes elliptic - oblong 3.5-4 x 1.6-2 mm spirally arranged, white hyaline, mid nerve very strong and prominent. Stamens 3, anther linear, 2 mm long, hypogynous scales 3-5, bright - red, longer than the nuts. Styles 2 fid, longer than the nuts. Nuts biconvex, obovate, suborbicular, 1.8-2 x 1.5 mm, pale - yellow to brownish, smooth, apiculate.

Common, along banks of rivers, margins of tank, and lake.

Fls & Frts. : - December to March.

Specimens examined :- MH. State, Beed District, Gangamsla, Moreshwar Temple near the Godavari river bed, Solanke S.N. 2048, Gangamsla, near the Godavari river bed, Solanke S.N. 2007, Pimpalagaon, near the Godavari river bed, Solanke S.N.1985, Kille-Dharur, Near to Ambadivi Temple, Solanke S.N. 2038, Rakshsbhuvan, Godavari river, Solanke S.N. 1935, Chaosala, Manjara river bed, Solanke S.N. 1945, Majalgaon, Godavari river bed, W. Khan 1539.

Notes :- To be distinguished from the typical var. *littoralis* by the terete stems as against trigonous in the latter.

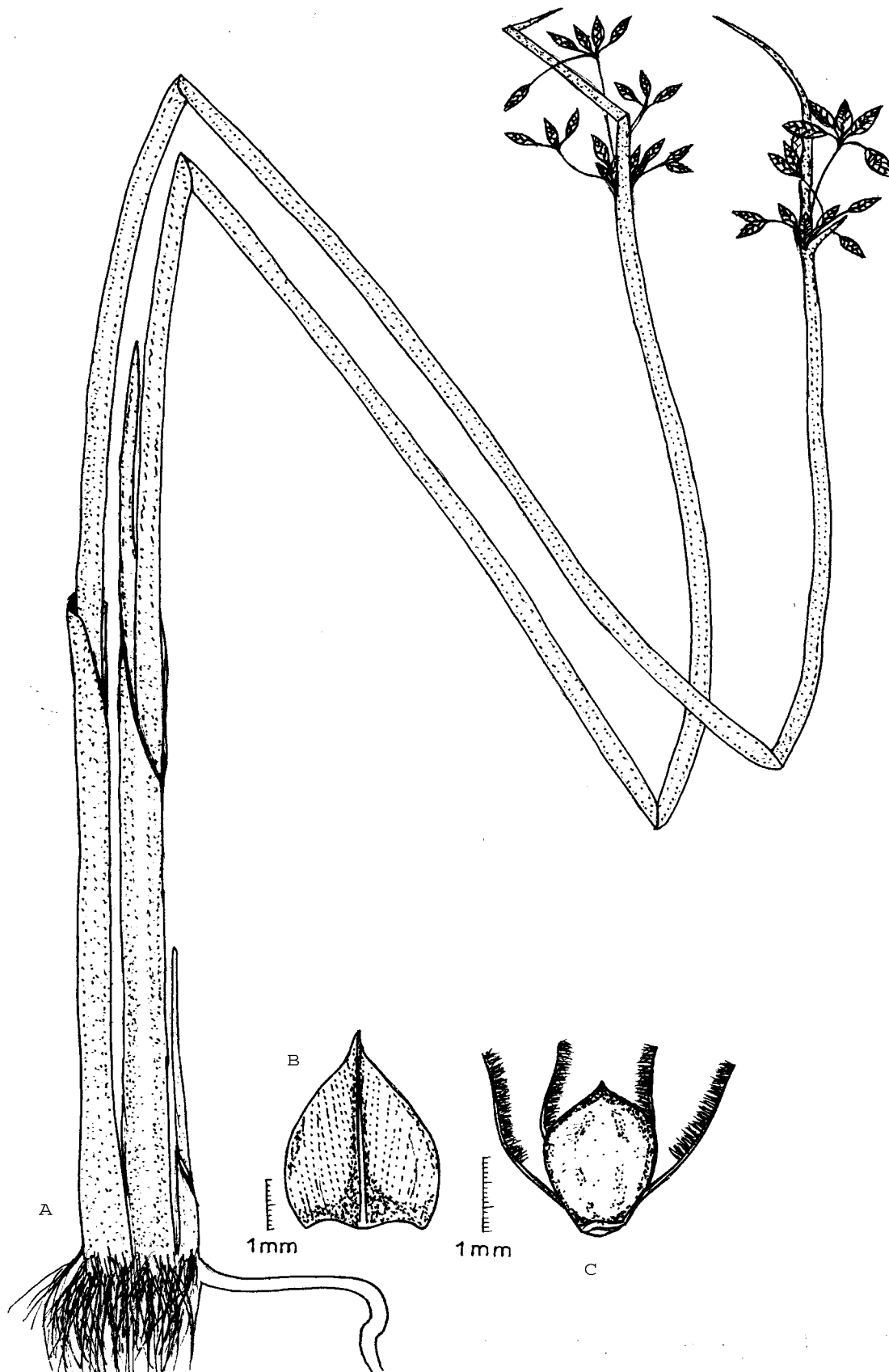


Fig. - *Scirpus littoralis* Schrad.
A - Habit, B - Glume, C - Nut.

Scirpus maritimus L. Sp. Pl. 51.1753; Clarke in Hook. f. Fl. Brit. India 6:658.1893; Kern in Steenis, Fl. Malesiana 1.7(3): 479.1974; Cooke in Fl. Pres. Bombay 2:893.1908; Fischer in Gamble Fl. Pres. Madras (1931) 3:1666 (repr. ed.) 1994; W. Khan in Naik Fl. Marathwada 2:967:1998. *Bulboschoenus*

maritimus Palla in Koch Syn. Deutsch. Fl. ed. 3: 2532.1904; Hooper in Sald. & Nicol. Fl. Hassan Dt. 658.1976; Simpson & Koyama in Fl. Thailand 6 (4): 271.1998; Cook CDK Aq. & Welt. Pl. India :96.1998. *Schoenoplectus maritimus* (L.) Lye in Blyttia 29:145.1971.

Perennial, 30-150 cm tall; stolons rather thick, 3.5-4 mm wide, ending in subglobose, yellowish to brown, non aromatic tubers 1.5-3 cm in diam.; stems triquetrous, 2-4 mm wide, very rigid, gradually narrowed upwards, often scaberulous below the inflorescence, faintly striated or smooth. Leaves : sheaths glabrous, rather thick, spongy; blades linear, 3-8 mm wide, cauline and basal, sometimes crowded near the base, with strong mid-rib beneath and grooved on upper surface, long acuminate or caudate. Inflorescence : simple, pseudolateral, usually pendulous fascicle; involucre bracts 2-3, foliaceous, the lowest the longest, equalling or slightly overtopping the umbels, erect, as though continuation of the stems; primary rays 3-5, 2-5 cm long, with solitary peduncled or 2-5 digitately arranged sessile spikelets on top of the rays. Spikelets cylindric, 2-3 cm by 3-5 mm, spreading, echinulate, yellowish to pale brown, ultimately blackish, obtuse or subacute; rhachilla wingless. Glumes oblong-elliptic, 5.5-6 x 2.5-3 mm, not keeled, with a strong mid-rib extending up to *ca* 1.5 mm long, erect or recurved awns, shortly pubescent on the back; sides nerveless, thinly membranous, ciliolate on broad hyaline margins, lacerate or notched at apex. Stamens 3; anthers linear, *ca* 2.5 mm long with hairy, membranous appendage at the tips. Hypogynous bristles 5-6, very unequal, white, retrorsely barbellate, often shorter than the nuts. Styles 3-fid, linear, glabrous, shorter than the nuts. Nuts trigonous or planoconvex, ellipsoid-oblong, 2-2.5 x 1.5 mm, stramineous to dark brown apiculate.

Occasional, in marshes of tanks, ditches along the road sides.

Fls and Frts - September to December.

Specimens examined :- MH. State, Beed District, Moreswar Temple near the Godavari river bed, Solanke S.N. 2050, Dhalegaon near the Godavari river bed, Solanke S.N. 2070, Gangamsla, near the Godavari river bed, Solanke S.N. 2053, Pimpalagaon, near the Godavari river bed, Solanke S.N.2068, Kille-Dharur, Near to Ambachondi Temple, Solanke S.N. 2080.Savargaon, Solanke S.N. 1948, Majalgaon, Patrud canal, W. Khan 4013.

Notes : - The Indian *S. maritimus* has been sometimes regarded as *S.tuberosus*. There is hardly any difference between the two as seen from the diagnostic description of the latter.

Scirpus roylei (Nees) Parker in Duthie, Fl. Upp. Gang. Pl. 3:361.1929; Maheshwari in Sc. & Cult 31 (4):195.1965; W. Khan in Naik Fl. Marathwada 2:971.1998 et in J. Rheede 10 (1):30. 2000. *Isolepis roylei* Nees in Wt. Contr. 107.1834. *Scirpus quinquefarius* Buch. Ham. ex. Boeck. in Linnaea 36:701.1869-70; Clarke in Hook. f. Fl. Brit. India 6:657.1893; Cooke in Fl. Pres. Bombay 2:892.1908. *Schoenoplectus roylei* (Nees) Ovezinn & Czukav. Fl. Tadjikist. 2.16.150.1976; L'narsimhn in Sharma et al Fl. Maharashtra 2:365.1996; Hayasaka E. in J. Japan Bot. 78(2):69.2003.

Tufted annual, 20-50 cm tall; stems more or less flat, 1-2 mm wide, septate when dry, with acuminate apex ending in to callous tips. Leaves : sheaths glabrous, striated with keel ending below the obtuse apex; blades, if present, very short. Inflorescence : simple, sessile, capitate, pseudolateral heads with 6-10 spikelets, clustered below the apex of stems. Involucral bract solitary, stem-like often shorter than the stems. Spikelets broadly linear-oblong, 7-12 x 3.5-5 mm, sessile, orange-yellow, bright-shining, subacute; rhachilla wingless. Glumes narrowly elliptic-oblong, 3.8-4 x 1.5-2 mm, thinly membranous, loosely imbricated; mid-nerve prominent; sides striated with many nerves spreading near to the margins, acute, shortly but distinctly mucronate. Stamens 3; anthers oblong, *ca* 0.5 mm long, mucicous or nearly so. Bristles or scales absent. Nuts triquetrous, broadly obovoid, 1-1.3 x 0.5-0.8 mm, with distinct, horizontal wavy ridges, except the smooth, thick angles, shortly stipitate, apiculate. Styles 3-fid almost equalling the nuts.

Occasional in marshes,

Fls. & Frts :- November - December.

Specimens examined :- Mah. State, Beed District along road sides, W. Khan, 37, Sautada, Ahemadnagar road sides, *Solanke S.N.5442 & Rafeeque*, 1106.

Scirpus praelongatus Poir. Ency. Meth. Bot. 6:764.1804; W. Khan in J. Eco. Tax. Bot. 27 (suppl.) 1222. 2003 et in J. Bioinfolet 5(3):303.2008. *Isolepis praelongatus* (Poir.) Nees in Wt. Contr. Bot. Ind. 108.1834. *Scirpus articulatus* auct. non L. Clarke in Hook. f. Fl. Brit. India 6:656.1893; Kern l. c. 513. *Schoenoplectus praelongatus* (Poir.) J. Raynal Adansonia 2(16);148.1976. K. L.Wilson, Telopea 2:161.1981 S. K.Uniyal et al Cypr. Uttar Pradesh 62.1997. E. Hayasaka J. Jap. Bot. 78(2):67.69.2003.

Densely tufted perennials, 80-110 cm tall. Stems spongy, terete, fleshy, many, 0.9-1.5 mm wide, fistular, septate. Leaves sheaths glabrous, membranous, 10-24 cm long, mouth oblique, blade linear, reduced to sheaths. Umbels simple, pseudolateral, sessile, capitate heads, below the middle or above the mouth of sheath, with often 15-35 spikelets, involucral bract stem like, longer, fleshy, fistular, continuous of the stems, erect. Spikelets ellipsoid, 4-8 x 3-3.5 cm, sessile, greenish, rhachilla wingless, slender. Glumes broadly ovate, 3-3.5 x 2.5-3 mm, deeply boat shaped, keel margins, mucronate, subacute at apex. Stamens 3, anthers, elliptic, oblong, 1 mm long. Styles 3-fid, glabrous, longer than the nuts. Nuts trigonous, obovoid, as long as broad, 1.1-1.5 x 1.5 mm, horizontal wavy lines on nuts, yellowish brown, apiculate.

Common in marshes and old water bodies.

Fls. & Frts.: - November - December.

Specimens examined: - Mah. State, Beed District, Pimpalagaon, *Solanke S.N.* 2088, Kille-Dharur, Near Ambachondi Temple, *Solanke S.N.* 2099. Majalgaon, Kesapuri kamp, *Solanke S.N.* 2097. Kaij, along road sides, *Solanke S.N.* 2102. Shirpur to Kada, *Solanke S.N.* 1987.

Notes: - To be distinguished from the *Scirpus articulatus* on account of nut which is with undulated ridges, while in the latter the nut is completely smooth. Most of the authors in literature provide mixed description of both the taxa. *S. praelongatus* is common in the study region. I have seen specimens of *S. articulatus* collected from Karnataka. Hence our herbaria need to be check for the separation of these taxa on the characters mentioned in the key. I have followed W. Khan, 2000, 2015 treating it distinct specifically.



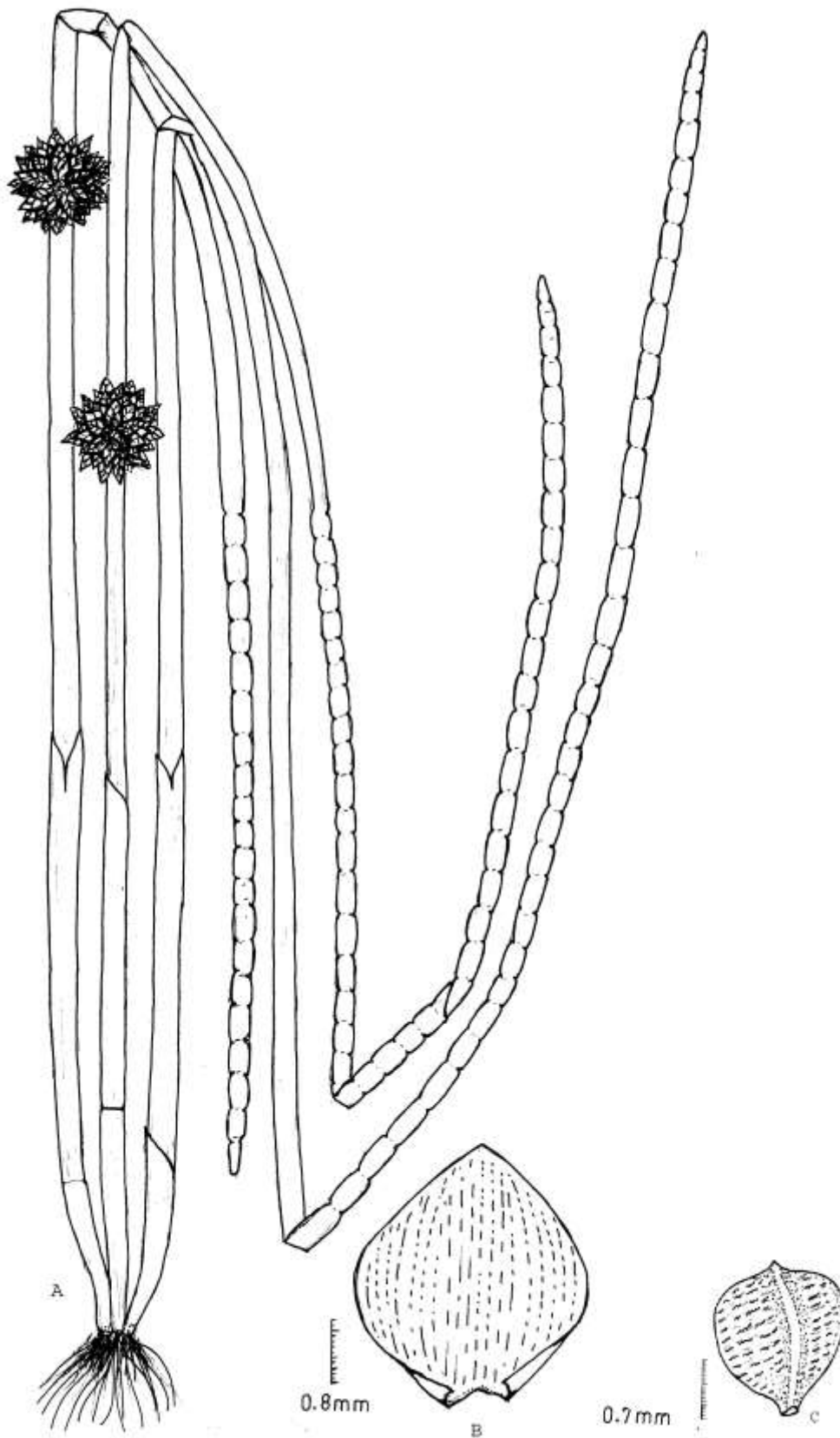


Fig. - *Scirpus praelongatus* Poir.
A - Habit, B - Glume, C - Nut.



Scirpus jacobii Fischer



Scirpus squarrosus Raymond



Scirpus brachycerus Hochst.



Scirpus maritimus L.



Scirpus praelongatus Poir.



Scirpus littoralis Schrad.

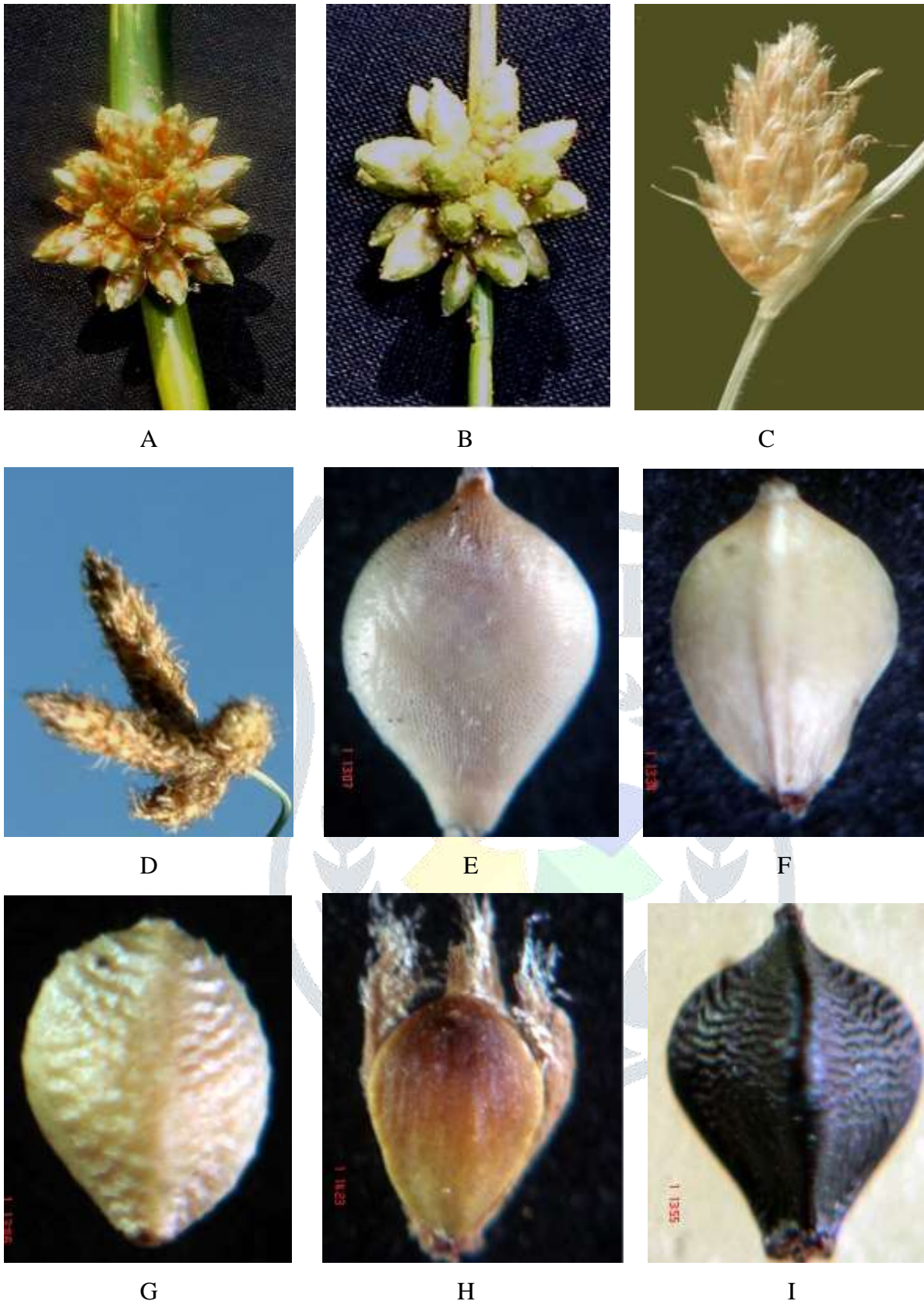


Fig. A - Spikelets of *Scirpus jacobii* Fischer. B - Spikelets of *S. praelongatus* Poir. C - Spikelets of *S. affinis* Roth. D - Spikelets of *S. maritimus* L. E- Nut of *S. affinis* Roth. F - Nut of *S. brachycerus* Hochst. G- Nut of *S. lateriflorus* Gmel. H - Nut of *S. littoralis* Schrad. I- Nut of *S. praelongatus* Poir. J- Nut of *S. jacobii* Fischer.



J

ACKNOWLEDGEMENTS

The authors wish to acknowledge their grateful thanks to Dr. M. A. Wadood Khan for his valuable guidance, constant encouragement, and Principal Dr. M. N. Sarnaik, Shri Muktanand College, Gangapur, Dist. Aurangabad for library and laboratory facilities.

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