

TAXONOMIC STUDY OF GENUS *ELEOCHARIS* R. BR. FROM VIDARBHA REGION OF MAHARASHTRA

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Abstract

The genus *Eleocharis* is comparatively small genus with 120 species distributed throughout the world and represented by about 16 species in India (Clarke 1893). In the present study morphological characters and key for identification of 8 species of genus *Eleocharis* from Vidarbha region of Maharashtra.

Key words: *Eleocharis*, Taxonomic study, Vidarbha region.

INTRODUCTION

The genus *Eleocharis* appears to be natural. Based on some anatomical criteria Rikli (1895) divided the genus *Chlorocharis* and *Eleocharis*. However, Riklis cleavage has not been confirmed by anatomical studies of Metcalfe (1971). As regard to its subdivision into infrageneric grouping for the natural arrangement of related species, there appears to be uniformity of opinions among the modern Cyperologists viz Clarke (1893, 1902); Kern (1974); Rao and Verma (1982); Koyama (1957,1985); Simpson and Koyama (1998) and few others.

The genus is comparatively small with over 120 species distributed throughout the world and represented by about 16 species in India (Clarke 1893). C. B. Clarke also provide a critical and comprehensive account of the genus. The different recent flora associated with regions provide a merge account (Table 1). However, recently W. Khan (1999) provides a detail critical account of 11 taxa of *Eleocharis* from Maharashtra alone. 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.	Name of Flora	No. Of Species
1	The Flora of Sawantwadi	4
2	Flora Marathwada	3
3	Flora of Maharashtra	6
4	Flora of British India	16
5	Flora of Kolhapur	5
6	Flora of Nasik District	2
7	Flora of Raigad District	2
8	Flora of Mahabaleshwar	2
9	Flora of Karanataka	7

The *Eleocharis* are characterised in general as under:

Annual or perennial, if perennial often stoloniferous. Stems usually tufted, erect or arcuate, terete to acutely angled. Leaves : reduced to bladeless tubular sheaths often bearing a short erect mucro at the

apex. Inflorescence: terminal, ebracteate, single spikelet, sometimes proliferous. Spikelet terete or angular, rarely compressed, few to many flowered. Rhachilla persistent. Glumes spirally imbricate, sometimes subdistichous, the lowest 1-2 usually empty and more persistent than the fertile ones. Flowers hermaphrodite. Perianth normally consisting of 6-10 bristles, not rarely reduced, very rarely wanting. Stamens 1-3; anthers ovate to linear, the connective produced into a small, rarely subulate appendage. Style usually glabrous, articulated with the nut, the dilated base persistent on the nut, stigmas 2-3. Nut 3 or 2 sided, obovate, orbicular, or pyriform, crowned by the enlarged style base; epidermal cells hexagonal, transversely oblong to linear, or vertically oblong.

- 1a. Spikelets cylindrically elongated, 2.5-5 cm long, almost as wide as stems; glumes striated, coriaceous leathery. Usually rhizomatous perennials; stolons if present with or without tubers; stems rather robust upto 6 mm thick2
- 1b. Spikelets globose, subglobose or ovoid-oblong, up to 8 mm long, usually much wider than the stems; glumes not striated, thinly membranous. Annuals; stems filiform to rather slender, upto 2.5 mm thick4
- 2a. Stems terete, usually striated3
- 2a. Stems triquetrous or trigonous, not distinctly striated6
- 3a. Bristles linear, rigid, stiff; shorter than to equalling the nuts, almost reaching top of the style base (never overtopping) subdensely barbellate in upper half, smooth and glabrous in lower half; glumes loosely imbricated, nuts large, 2-2.3 mm long *E. lankana*
- 3b. Bristles weakly slender, soft, twice as long as the nuts; often overtopping the style base, almost reaching 1/2-3/4 the length of styles, densely barbellate from top to base 5
- 4a. Stems 4-6 mm wide, strongly compressed (when dry), greenish chartaceous *E. dulcis*
- 4b. Stems 1.5-2 mm wide, not compressed, pale yellowish to stramineous, rather rigid and stiff; spikelets slightly but distinctly wider than the stem; glumes 3.5-4.2 mm wide, stramineous coriaceous*E. equisetina*
- 5a. Spikelets terete, distinctly wider than the stem, rounded at apex; glumes almost quadrate, tightly imbricated, truncate at apex, their exposed parts broader than long, faintly many nerved; nuts not constricted below the style base; style base confluent on the body of nuts*E. spiralis*
- 5b. Spikelets more or less angular, acute at apex, not wider; glumes ovate-oblong; loosely imbricated, obtuse, their exposed parts much longer than broad, distinctly many nerved; nuts constricted into a neck below the apex *E. acutangula*
- 6a. Styles 2-fid; nuts biconvex, shining smooth; glumes 0.9-2 mm long. Style base very slender and much narrower than the nuts 7
- 6b. Styles 3-fid; nuts trigonous pitted, faintly striated or if smooth not shining; glumes 2-4 mm long; style base almost as wide as the nuts or slightly narrower *E. geniculata*
- 7a. Lowest empty glumes 3-4; bristles ferruginous brown, or if whitish then longer than the nuts.....*E. geniculata*
- 7b. Lowest empty glumes 1-2; bristles white to translucent, shorter than the nuts *E. atropurpurea*

1. *Eleocharis acutangula* Roxb.

Perennial with short rhizome; stolons long; Stems triquetrous solid not transversely septate. Leaves; sheaths membranous, oblique at mouth, purplish towards base. Spikelets cylindrical, acute at apex, as broad as stem, many flowered. Glumes broadly oblong, obtuse acute at apex not keeled, scarious towards margins; midvein prominent with many faint veins on both sides. Hypogynous bristles 6, linear, slightly broader towards apex, as long as or slightly exceeding the nut. Stamens 3; anthers linear-oblong. Nut obovoid, slightly compressed, yellowish-brown, with persistent style base dark brown

Common in shallow stagnant water in ponds, tanks rice fields, ditches, marshes and margins of ponds and tanks, often forming large patches.

Fls. & Frts. : July-May

2. *Eleocharis atropurpurea* (Retz.) J. & K. Persl. Rel. Haenk. 1: 196. 1828. *Scirpus atropurpureus* Retz. Obs. Bot. 5: 14. 1789; Lakshmin & B. D. Sharma Fl. Nashik Dt. 503, 1991; Lakshmin. in Sharma *et al.* Fl. Maharashtra st. Monocot. 298. 1996.

Densely tufted, glabrous annual; stems angular, erect, striate. Leaves sheaths glabrous, often basal, purplish; blades small. Inflorescence : reduced to a single, terminal ebracteate spikelet subglobose or ovoid greenish tinged with brown, acute or subacute; involucre bracts replaced by 1-2 empty glumes at the base with 3-nerved keel; rachilla wingless. Glumes narrowly elliptical-oblong, thinly membranous with a uninerved keel, ending below the hyaline apex; sides nerveless, hyaline, red brown, banded in the upper half, obtuse at apex, muticous. Stamen 1; anther linear, muticous. Hypogynous bristles 3-5, shorter than or as long as the nuts; tightly appressed to the nuts, retrorsely barbellate. Nuts biconvex, obovate, smooth, shining, purplish to chest-nut brown, shortly stipitate, timorous at apex. Styles 2-fid, shorter than the stigmas, hairy.

Common in marshes of tanks, ditches, rice-fields, river banks.

Fls. & Frts. : July- May

3. *Eleocharis dulcis* Burm. F.

Perennial; rhizomes short; stolon slender ending in subglobose tubers. Stems terete, fistular, faintly striate, distinctly transversely septate, glabrous. Leaves; sheaths glabrous, often purplish; blades reduced or absent. Inflorescence; reduced to a single, terminal elongated spikelet; involucre bracts absent or replaced by 2, glumes like lobes of bifurcated stem tips. Spikelet cylindric, almost as broad as to slightly wider or narrower than the stems, sessile, terete, greenish or stramineous, often tinged with red, many flowered; rachilla wingless. Glumes oblong with almost parallel margins, much longer than broad, strongly keeled; keel ending below the hyaline obtuse apex; sides nerveless linear. Hypogynous bristles 6-8 slender, retrorsely spinulose from base to top, flat near base longer than nuts or reaching the top or little exceeding the conical apex of the nuts. Styles bifid, much longer than the stigmas, glabrous. Nuts biconvex, elliptic, suburgid on faces, smooth with costate angles and ring on the top but at the base long conical beak.

Common, along margins of tank and lakes.

Fls. & Frts. : October-December

4. *Eleocharis equisetina* Pres.

Perennial; Stems terete, not compressed; sheaths very dark purple with a triangular teeth on oblique moth; spikelet terete; glumes tightly imbricated, broadly scarious at rounded or subtruncate apex; nuts small bristles weakly slender; often soft, twice as long as the nuts, overtopping the style densely barbellate from top to base. Stamens 3; anthers linear. Hypogynous bristles 5-6 slender, retrorsely spinulose from base to top, flat near base longer than nuts or reaching the top or little exceeding the conical apex of the nuts. Styles bifid, much longer than the stigmas, glabrous. Nuts biconvex, elliptic, suburgid on faces, smooth with costate angles and a ring on the top but at the base long conical beak.

Occasional, along margins of tank and lakes

Fls. & Frts. : October to December

5. *Eleocharis geniculata* (L.) Roem. & Schult. Syst. Veg. 2: 150. 1817. Lakshmin & B. D. Sharma Fl. Nashik Dt. 504. 1991; Lakshmin in Sharma *et al.* Fl. Maharashtra St. Monocot. 299. 1996.

Densely tufted annual; stems angular, striate. Leaves; Sheaths glabrous, purplish near the base; and blades absent or reduced. Inflorescence : with a single terminal, ebracteate spikelet. Involucral bracts replaced by 3-6 empty glumes at the base, the lowest one often with nerved keel. Spikelet ovoid, or subglobose, wider than the stems, greenish or stramineous, tinged with brown or purple, obtuse; rachilla wingless. Glumes broadly obovate or almost suborbicular, keel uninerved, ending below the hyaline apex; sides nerveless, with narrow hyaline margins, tinged with brown-purple near rounded apex, muticous. Stamens 3; anthers linear, muticous. Hypogynous bristles 7-9, purplish brown, erect, exceeding the nuts, retrorsely barbellate. Nuts-biconvex, obovate, smooth, shining, purplish to chest nut brown, shortly stipitate, with tumor at apex. Styles 2-fid, shorter than or as long as the stigma hairy.

Common in marshes or river-bank, lakes and ditches.

Fls. & Frts. : October to February

6. *Eleocharis lankana* Koyama

Densely tufted perennial; rhizome decumbent, red brown. Stems erect, terete, subrigid, deeply green, shiny, striate when dry, indistinctly transversely septate, the intersepta hallow. Leaves : basal sheaths 2 or 3, membranous above, herbaceous below, pale or yellowish-green, stained with red-brown or purple towards base, obliquely truncate at hyaline orifice, subobtusate at apex. Inflorescence : spikelets cylindrical, contracted to subacute apex, pale green, subdensely many flowered; bract broadly ovate to semicircular, herbaceous, green. Glumes suberect, ovate-oval to elliptical, subacute, herbaceous, whitish-green, tinged with brown inside the hyaline margin, wholly cosely and finely striate, obtusely keeled, broadly white-hyaline on margins. Stamens 3. Nuts obovate, thickly biconvex with obtuse edges, the sides olive coloured, slightly shiny, smooth. Hypogynous bristles 6-8, shorter than to equalling the nut pale brownish.

Common in low land marshes

Fls. & Frts. : September to November

7. *Eleocharis retroflexa* subsp. *Chaetaria* (Roem. & Schult.) Koyama

Annual with very slender hair like stems; stems minutely angular, often curved; sheaths membranous, purplish towards the base, whitish-scarious towards apex. Spikelets ovoid, slightly flattened 4-8 flowered, greenish. Glumes membranous, loosely imbricate, oblong –ovate, obtuse at apex, not keeled, hyaline and thinly membranous towards margin. Hypogynous bristles 6, unequal, whitish. Stamens 2 anthers muticous, style conical at base, Nut obovoid, trigynous with 3 acute angles projecting from the apex, yellowish, epidermal cells very prominent, pitted. Persistent style base pyramidal, extending to the three acute projections of the nut, brownish; persistent pranth, bristles smaller to longer than nut.

Common in wet grasslands and swampy areas

Fls. & Frts. : September to December.

8. *Eleocharis spiralis* (Rottb.) Roem. & Schult.

Perennial with short rhizome; stolon slender; stems triquerous, gradually narrowed to an acute apex, not septate; sheaths membranous, oblique at mouth, appendage at apex. Spikelets cylindrical, wider than the stems, densely many flowered, whitish. Glumes tightly and spirally arranged, broadly obovate, as long as broad or broader than long, truncate at apex, distinctly brown spotted towards the centre and scarious towards margins. Hypogynous bristles 5-6, linear, unequal in length, retrorsely scabulous, as long as or shorter than nuts stamens 3, anthers muticous; Styles 3-fid, smooth, conical at base. Nuts obovate, narrowed at apex without neck below the conical style base, straw coloured, shiny

Occasional, along margins of tanks and lakes.

Fls. & Frts. : October to December

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