

ADDITIONS TO THE SEDGES OF GOA

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ABSTRACT

The Goa state is rich in wetland habitats which are relatively underexplored. As a result of floristic study of wetlands, 11 species of sedges are being reported in the present paper as additions to the family Cyperaceae of Goa. They belong to the genera *Bolboschoenus* (1 sp.), *Cyperus* (3 spp.), *Fimbristylis* (3 spp.), *Kyllinga* (1 sp.), *Mariscus* (1 sp.), *Pycneus* (1 sp.) and *Sorostachys* (1 sp.).

INTRODUCTION

The family Cyperaceae or the sedge family has a wide range of distribution and habitat adaptability. Because of its economic insignificance and complicated morphology, the family was neglected by workers prior to Clarke (Vartak & Ghate 1983). The major work on Indian Cyperaceae was carried out by Clarke (1893, 1909). After almost a century Karthikeyan *et al.* (1989) enumerated Cyperaceae for India along with other monocotyledones. Chok (1996) provided an account of Cyperaceae with keys, descriptions and illustrations in his Aquatic and Wetland plants of India. At regional level, Rao & Verma (1982) published an account on Cyperaceae of North East India. Most of the works on the family, published subsequent to Clarke (*l.c.*), are in regional / state level Floras. In Western India, the accounts in Cooke (1908), Blatter and McCann (1934-35), Lakshminarasimhan (1996) and enumeration by Vartak and Ghate (*l.c.*) are significant. For the state of Goa, Vartak (1966) reported 22 species of

Cyperaceae and Rao (1986) dealt 51 species of the same. The number of species reported in earlier works could be easily categorised as an underestimate for the group as the rainfall in this region is in excess of 3000 mm per annum with abundant wetlands around. The recent additions to the flora of Goa (Kulkarni & Janarthanam 1995; Joshi *et al.* 1997; Rajkumar *et al.* 1998 (in press)) supports this observation. In the present work, with the addition of 11 more species to the family Cyperaceae in Goa, the aforesaid view has been confirmed.

The specimens collected and studied have been deposited in the Goa University Herbarium. The identity of the specimens was confirmed at BSI and MH.

Bolboschoenus maritimus (L.) Palla in Koch. Syn. Deutsch. Schweiz. Fl. Ed. 3. 3: 2532. 1904. *Scirpus maritimus* L. Sp. Pl. 51. 1753; Clarke in Hook. f. Fl. Brit. India 6: 658. 1893; Cooke, Fl. Bombay 3: 407. 1967 (reprint. ed.). *Schoenoplectus maritimus* (L.) Lye in Blyttia 29: 145. 1971; Lakshminarasimhan

in Sharma *et al.*, Fl. Maharashtra Monocot 365. 1996.

Rhizomatous herbs; culms up to 1 m long; leaf sheath swollen; inflorescence umbellate; spikelets solitary on each ray, cylindrical; glumes awned; nuts obovoid, brown, with perianth scales.

Exsiccata: Chora, 18.7.97, 758.

Note: Common in brackish water (Khazan land).

Cyperus nutans Vahl, Enum. Pl. 2: 363. 1806; Clarke in Hook. f. Fl. Brit. India 6: 607. 1893; Vartak, Enum. Pl. Gomantak 110. 1966; Cooke, Fl. Bombay 3: 381. 1967 (reprint. ed.); Rao, Fl. Goa 2: 468. 1986; Almeida, Fl. Savantwadi 2: 75. 1990; Lakshminarasimhan in Sharma *et al.*, Fl. Maharashtra Monocot. 289. 1996.

Culms up to 1.5 m long; inflorescence an umbel, lax; spikelets few flowered, dark brown; nuts narrowly obovoid, apiculate.

Exsiccata: Colem, 11.10.97, 1076

Note: Found in marshy area.

Cyperus pangorei Rottb. Descr. Ic. Rar. Nov. Pl. 31, t.7, f.3. 1773; Lakshminarasimhan in Sharma *et al.*, Fl. Maharashtra Monocot. 291. 1996. *C. corymbosus* var. *pangorei* (Rottb.) Clarke in J. Linn. Soc. 21: 292. 1884 & in Hook. f. Fl. Brit. India 6: 612. 1893. *C. taquetum* Roxb. Fl. Ind. 1: 208. 1832; Clarke in Hook. f. Fl. Brit. India 6: 613. 1893.

Rhizomatous herbs, rhizomes spreading; culms tufted; leaves reduced to bladeless sheaths; sheaths scale like, brown in color; inflorescence compound; spikes arranged in corymbs; glumes mucronate at tip with hyaline margin; nuts 3-sided, dark brown in colour.

Exsiccata: Codal. 29.9.97, 989.

Note: Found along the stream.

Cyperus pilosus Vahl, Enum. Pl. 2: 354. 1806; Clarke in Hook. f. Fl. Brit. India 6: 609. 1893; Almeida, Fl. Savantwadi 2: 76. 1990; Lakshminarasimhan in Sharma *et al.*, Fl. Maharashtra Monocot. 293. 1996.

Rhizomatous herb; culms up to 50 cm long; leaf sheath spongy; lower involucrel bract overtopping the inflorescence; inflorescence compound, rachis hirsute; spikelets dense, terminal; glumes ovoid with mucronate

apex; nuts 3-sided, stipitate, dark brown in colour.

Exsiccata: Dodamarg, 13.9.96, 150.

Note: Found in flooded paddy fields.

Fimbristylis polytrichoides (Retz.) Vahl, Enum. Pl. 2:248. 1806; Clarke in Hook. f. Fl. Brit. India 6: 632. 1893; Vartak, Enum. Pl. Gomantak 111. 1966; Cooke, Fl. Bombay 3: 393. 1967 (reprint. ed.); Rao, Fl. Goa 2: 473. 1986; Almeida, Fl. Savantwadi 2: 83. 1990; Lakshminarasimhan in Sharma *et al.*, Fl. Maharashtra Monocot. 316. 1996. *Scirpus polytrichoides* Retz. Obs. Bot. 4: 11. 1786.

Tufted herbs; leaves longer than culm; spikelets in solitary heads; nut compressed, yellow, dotted with white spot.

Exsiccata: St. Cruz, 18.8.98, 1616.

Note: Found in brackish water (Khazan land).

Fimbristylis pubisquama Kern in Blumea 8: 131. 1955; Almeida, Fl. Savantwadi 2: 84. 1990; Lakshminarasimhan in Sharma *et al.*, Fl. Maharashtra Monocot. 317. 1996; *F. compressa* Boeck. in Linnaea 38: 387. 1874; Clarke in Hook. f. Fl. Brit. India 6: 639. 1893.

Tufted herbs; leaf sheath hairy; inflorescence compound; spikelets ovoid; glumes rusty brown, pubescent; nuts obovoid, brown.

Exsiccata: Chora, 21.9.97, 1006.

Note: Found in brackish water (Khazan land).

Fimbristylis tomentosa Vahl, Enum. Pl. 2: 290. 1806; Lakshminarasimhan in Sharma *et al.*, Fl. Maharashtra Monocot. 321. 1996; *F. podocarpa* Nees et Mey. in Wight, Contrib. Bot. Ind. 98. 1834 p.p.; Clarke in Hook. f. Fl. Brit. India 6: 638. 1893.

Tufted herbs; inflorescence a simple umbel; glumes shortly pointed; nuts flattened, smooth.

Exsiccata: Keri, 16.10.96, 247.

Note: Found in flooded paddy fields.

Kyllinga tenuifolia Steud. Syn. Pl. Glum 2: 69. 1855; Lakshminarasimhan in Sharma *et al.*, Fl. Maharashtra Monocot 330. 1996. *Kyllinga triceps* Rottb. Descr. & Ic. 14, t.4, f. 6. 1773; Clarke in Hook. f. Fl. Brit. India 6: 587. 1893; Cooke, Fl. Bombay 3: 391. 1967; Almeida, Fl. Savantwadi 2: 88. 1990.

Tufted herbs; leaves linear; inflorescence 3,

sessile; spikelets globose, greyish white.

Exsiccata: Nirankarichi Rai, 14.11.97, 1180.

Note: Found in flooded paddy fields.

Mariscus maderaspatanus (Willd.) Napper in J.E. Afr. Nat. Hist. Soc. 28: 124; 10: 1971; Almeida, Fl. Savantwadi 2: 89. 1990; Lakshminarasimhan in Sharma *et al.*, Fl. Maharashtra Monocot. 339. 1996. *Cyperus maderaspatanus* Willd. Sp. Pl. 1: 278. 1798. *Mariscus squarrosus* sensu Clarke in Hook. f. Fl. Brit. India 6: 623. 1893, p.p. (non L. 1753).

Tufted herbs; inflorescence digitate with few rays; glumes narrowly oblong, straw coloured; nuts oblong.

Exsiccata: Goa University campus, 10.7.97, 732.

Note: Found in marshy areas of plateau.

Pycurus polystachyos (Rottb.) P. Beauv. Fl. Oware 2: 48. T. 86. F.2. 1807; Clarke in Hook. f. Fl. Brit. India 6: 592. 1893; Almeida, Fl. Savantwadi 2: 94. 1990; Lakshminarasimhan in Sharma *et al.*, Fl. Maharashtra Monocot 351. 1996. *Cyperus polystachyos* Rottb. Descr. & Ic. 39. t.11. f.1. 1773.

Tufted herbs; leaves few, shorter than culm; inflorescence clustered; involucre bracts overtopping inflorescence; glumes keeled; nut compressed, stipitate.

Exsiccata: St. Cruz, 21.8.97, 888.

Note: Found in flooded paddy fields.

Sorostachys pulchellus (R. Br.) Lye in Nord. J. Bot. 1: 189. f.4. 1981; Clarke in Hook. f. Fl. Brit. India 6: 592. 1893; Lakshminarasimhan in Sharma *et al.*, Fl. Maharashtra Monocot. 377. 1996. *Cyperus pulchellus* R. Br. Prodr. 213. 1810; Almeida, Fl. Savantwadi 2: 76. 1990. *Cyperus leucocephalus* Nees in Hook. J. Bot. Kew 6: 28. 1854 (non Retz. 1789).

Culms solitary; leaf sheath darker at base; inflorescence a sessile, congested, globose head; glumes obtuse; nuts cylindrical, papillose.

Exsiccata: Lolium, 24.8.96, 60; Verna, 7.8.97, 825.

Note: Found near puddles on rocky plateaus.

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