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NEW RECORDS OF CYPERACEAE FOR KHANDESH REGION OF MAHARASHTRA, INDIA

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Abstract

The present paper deals with addition of six species, which are reported for the first time for Khandesh region from different parts of the Satpuda ranges. The herbarium specimens have been lodged in the herbarium of P. G. Department of Botany, M. J. College, Jalgaon (Maharashtra), India. Detailed description and images are provided.

Key words : Cyperaceae, Khandesh, Maharashtra State.

Introduction

Khandesh consist of three districts Jalgaon, Dhule and Nandurbar. It lies at the Northwestern corner of the Deccan plateau, in the valley of the Tapti river, and is bound to the north by the Satpuda ranges, to the east by the Berar (Vidarbha) region, to the south by the hills of Ajanta, belonging to the Marathwada region of Maharashtra, and to the west by the Northern most ranges of the Western Ghats, and beyond that the coastal plain of Gujarat. Khandesh region lies between 20^0 8' and 22^0 7' North latitude and 73^0 42' and 76^0 28' East longitude. The forest of the Khandesh region is of dry deciduous type. Khandesh region though botanically rich in biodiversity have not been explored extensively except a few sporadic reports on floristic of Karnik (1959), Salunkhe (1995), Mathew (1988), Garud (1999), Yadav (2003), Kshirsagar (2008) and Patil (2003).

During botanical explorations of Khandesh region of Maharashtra state, 06 interesting specimens belonging to Cyperaceae were collected from wet open grasslands on hill slope and margins of water courses. Close examination with the help of literature and herbarium specimens reveal that they were not recorded earlier from Khandesh region. All of them have been identified as *Carex caricina* D. Don, *Cyperus cyperinus* (Retz.) Valck-Sur., *Kyllinga melanosperma* Nees, *Lipocarpa chinensis* (Osb.) Kern, *Pycreus sanguinolentus* (Vahl) Nees, *Scleria levis* Retz., which proved to be new records for Khandesh region. Identification of all these taxa is confirmed by Dr. M. A. Wadood Khan. (Department of Botany, Majalgaon College, Majalgaon Dist., Beed), who confirmed the identity of the species and also comparing the specimens with those of by BSI western circle, Pune. Detailed descriptions are given below:

Carex caricina (D. Don) Karthik. *et al.* Fl. Ind. Enum. Monocot: 34 (1989). *Carex caricina* var. *caricina.* Lakshmin. in Sharma *et al.*, Fl. Maharashtra State, Monocot. 275. (1996). *Cyperus caricinus* D. Don, Prodr. Fl. Nepal. 39. (1825). *Carex filicina* Nees in Wight, Contr. Bot. India 123. (1835); Clarke in Hook. f., Fl. Brit. India. 6: 717. (1894) (plate 1).

Perennial, with short, woody rhizome, 40-100 cm tall. Stems erect, prominently trigonous, with 3-6 nodes, smooth, 2-4 mm thick. Leaves: sheaths of cauline leaves 2-8 cm long, with membranous mouth; basal sheaths short, reddish brown, disintegrating into fiburs; blades basal and 2-5 cauline, shorter than stems, linear, 6-7 mm wide, narrowed to a long acute apex. Inflorescence brownish, tinged with yellow or chest-nut, compound, 15-50 x 3-5 cm, paniculate; secondary panicles 3-7, single or binate, pyramidal in outline, 4-15 x 2-6 cm; rhachis smooth below, hispidulous above; bracts foliaceous, longer than secondary panicles; sheaths as in upper leaves. Spikelets sessile, androgynous, narrow, cylindrical, 5-15 x 2-4 mm, loosely to subdensely flowered, male part slender, usually shorter than female part, 2-3 mm long. Cladoprophylls sterile, glumiform, broadly ovate, 1-1.5 x 0.8-1 mm, with awn 1-4 mm long, hispidulous; male glumes upto 3.5 mm

long. Stamens 3; Female glumes ovate to oblong-ovate, 1.5-2.5 × 1-1.5 mm, obtuse or acute at apex, pale brown to reddish brown or chest-nut, glabrous or hispid above, much shorter than the utricles, ending in a short, hispid awn, narrowly hyaline margined. Utricle trigonous, ellipsoid, 2.5-3.5 × 0.8-1 mm (including upto 1.5 mm long, slender beak), slightly to strongly recurved, greenish to stramineous, spreading, glabrous, with 2-4 nerves on each face, orifice of beak very oblique, 0.5-0.6 mm long. Nuts trigonous, ellipsoid, 2-2.5 × 0.8-1 mm, shortly beaked.

Fls. & Frts. : November to December.

Distribution: Occasional. In marshy places in forest at high elevations. In Maharashtra reported only from Ahmednagar and Nagpur.

Specimens examined: Nandurbar Dist., Toranmal, *Tanveer A. Khan* 1094; Legapani, *Tanveer A. Khan* 1405; Akkrani, *Tanveer A. Khan* 1559.

Cyperus cyperinus (Retz.) Valck-Sur. Gesl. Cyp. Mal. Archip. 154, t. 6. f. 10. 1898. *Kyllinga cyperina* Retz. Obs. Bot. 6:21.1791. *Mariscus cyperinus* (Retz.) Vahl Enum. Pl. 2: 377. 1806; Lakshmin. in Sharma *et al.*, Fl. Maharashtra State, Monocot. 335. 1996. *M. cyperinus* (Retz.) var. *cyperinus* Prasad & Singh, Sedges of Karnataka 255. (2002). (Plate-I)

Perennial, 10-50 cm tall with short, woody rhizome, clothed with brown fibres; stolons absent. Stems tufted, rigid, triquetrous, 1-3 mm wide, smooth. Leaves: sheaths reddish to dark brown; blades shorter than stem, flat or canaliculated, linear, 3-6 mm wide, scabrid on the margins, long-attenuate at apex. Inflorescence simple, usually contracted and head-like, at times with short rays; involucral bracts 4-10, obliquely patent to patent, much overtopping the inflorescence, the longest up to 30 cm; rays 5-10, spreading, usually less than 1cm, rarely longer than 2 cm. Spikes broadly cylindrical to obovoid, usually attenuate towards the base, 10-25 × 7-10 mm, densely bearing numerous spikelets. Spikelets obliquely erect to horizontally divergent, oblong-linear, subterete, 4-7 × 1-1.2 mm, usually 2 flowered; rhachilla winged. Glumes 4, lower 2 ovate, 1-1.3 mm long; remaining glumes elliptic to oblong-elliptic, 3-4 × 1.5-2 mm, membranous to thinly chartaceous, glaucous green to tinged straw-brown; keel green with 3-4 nerved on both sides, acute at apex. Stamens 3; anthers linear, upto 1.5 mm long. Nuts trigonous, oblong to narrowly elliptic, 2-2.5 × 0.6-0.9 mm, brownish, slightly curved, minutely granulate, brown, shortly apiculate. Style 3-fid, short.

Fls. & Frts : July-October.

Distribution : Occasional. Along the banks of rivers, streams, canals and moist hill slopes. In Maharashtra reported at Bombay, Satara and Sindhudurg.

Specimens examined : Jalgaon Dist., Manudevi forest, *Tanveer A. Khan* 519. Nandurbar Dist., Kalapani, *Tanveer A. Khan* 1561; Bhagdhari, *Tanveer A. Khan* 1418; Sablapani, *Tanveer A. Khan* 2432.

Note : Fruiting specimens can be distinguished from the closely related *C. cyperoides* by the stiff leaves, the contracted inflorescence, the shorter and denser spikes, the obliquely erect, darker. Broader spikelets, more obtuse glumes and the ellipsoid nuts all these characters are very variable.

Kyllinga melanosperma Nees in Wight, Contr. Bot. India 91. 1834; Clarke in Hook. f., Fl. Brit. India 6: 588. 1893; Lakshmin. in Sharma *et al.* Fl. Maharashtra State, Monocot. 329. 1996. *Cyperus melanospermus* (Nees) Valck. Sur. Gesl. Cyp. Mal. Archip. 50 t. 2, f. 8. 1898; Kern in Van Steenis, Fl. Malesiana. 1, 7: 655. 1974. (Plate--I)

Perennial, 40-170 cm tall, with 2-4 mm thick, creeping rhizome, somewhat knotty, clothed with lanceolate to ovate, brownish to blackish scales, very aromatic. Stems close together in a single row along the rhizome, erect, triquetrous, almost winged, 2-5 mm wide, smooth. Leaves: sheaths membranous, transversely corrugate on the anterior side, purplish to reddish-brown tinged; blades reduced to bladeless sheaths or the upper most 1 or 2 short-bladed; blades if present, flat, up to 3 cm long, much shorter than the stem. Inflorescence a single, globose head, 8-14 × 7-9 mm, pale green, becoming straw-coloured or golden brown at maturity; involucral bracts 3, spreading to reflexed, up to 20 cm long. Spikelets numerous, densely arranged, strongly compressed, elliptic-oblong to lanceolate-elliptic, 3-4.5 × 1-1.2 mm, 1 rarely 2, flowered. Glumes mostly 4, the lower two ovate-elliptic, 2.5-3 mm long, 7 or 9-nerved, remaining glumes lanceolate-ovate, 3-4.2 mm long, 5-nerved, mucronulate, with a smooth or spinulose keel. Stamens 3; anthers linear, upto 1 mm long. Nuts elliptic-oblong or oblong, laterally compressed, 1.5-2 × 0.6-0.7 mm, apiculate, brown to black. Style 2-fid, upto 1.5 mm long.

Fls. & Frts : August to December.

Distribution : Rare. In satpuda ranges, Wet slippery rocks near waterfalls, along the margins of streams, rice fields, and in marshes of wet grasslands at high elevations. In Maharashtra reported only from Nagpur.

Specimens examined : Nandurbar Dist., Legapani Tanveer A. Khan 671; Kalapani Tanveer A. Khan 1096; Yashwant lake, Tanveer A. Khan 678.

Note: Relatively thick leafless culms and large heads are the distinguishing characters. It can be easily recongnised in the field by its strong odour of essential oil, emitted by the thick rhizome.

Lipocarpa chinensis (Osb.) Kern in Blumea Suppl. 4: 167. 1958 and Steenis, Fl. Malesiana 1, 7: 521. f. 33. (1974); Lakshmin. in Sharma *et. al.*, Fl. Maharashtra State, Monocot. 332. 1996. *Scirpus chinensis* Osb. Dagb. Ostind. Resa. 220. 1757. *Lipocarpha argentea* (Vahl) R. Br. ex Nees in Linnaea 9: 287. 1835; Clarke in Hook. f., Fl. Brit. India 6: 667. 1893 (plate 1).

Annual or short lived perennials, 15-50 cm tall with or without a short rhizome. Stems tufted, 1-2 mm wide, obtusely trigonous, smooth. Leaves: sheaths sub-loosely surrounding the stem, reddish-purplish; blades shorter than stem, linear-filiform, 2-4 mm wide, gradually tapering above to subobtuse at apex. Inflorescence terminal, with 4-10, subequal spikes; involucral bracts 2-4, unequal, spreading or reflexed, up to 9 cm long. Spikes ovoid to oblong-ovoid, 5-8 × 4-5 mm, obtuse at apex, whitish, densely many flowered. Glumes thinly membranous, spathulate to obovate-oblong, 2-3 × 0.7-1 mm, with a strong midnerve and purplish-lineolate sides, triangular at apex, cuneate towards base. Hypogynous scales oblong-lanceolate or oblong, 1.7-2 × 0.4-0.5 mm, 5-7 nerved, much shorter than the nut. Stamens 1 or 2; anthers linear, upto 1 mm long. Nuts trigonous, oblong or oblong-obovate, at times weakly curved, with a short, discoid stipe at base, 1-1.4 × 0.3-0.4 mm, apiculate at apex, light to dark brown bearing a mosaic of fine granules, alternating with still finer pits. Style 3-fid, upto 0.7 mm long.

Fls. & Frts : August to December.

Distribution : Occasional. Along the streams, canals and ponds. In open water logged areas, marshes and in moist paddy fields after harvest. Elsewhere in Maharastra reported from Bhandara, Chandrapur, Kolhapur, Raigad and Sindhudurg.

Specimens examined : Nandurbar Dist., Toranmal, *Tanveer A. Khan* 1072; Tinasmal, *Tanveer A. Khan* 1105; Jamli, *Tanveer A. Khan* 1510.

Note : A distinct species on account of its terminal white head of 5-8 ovoid spikes and two hypogynous scales.

Pycreus sanguinolentus (Vahl) Nees in Linnaea 9: 283. 1834; Lakshmin. in Sharma *et. al.*, Fl. Maharashtra State, Monocot. 352. 1996. *Cyperus sanguinolentus* Vahl, Enum. Pl. 2: 351. 1806; Cooke, Fl. Pres. Bombay 3: 369. 1958 (Repr. ed.). *C. sanguinolentus* subsp. *sanguinolentus* Kern in van steenis Fl, Malesiana, 1, 7: 646. 1974; Naik, Fl. Marathwada 2: 939. 1998. (Plate-I)

Annual or short lived perennial, 10-30 cm tall, with short rhizome, without stolons. Stems tufted, slender, obtusely trigonous, decumbent or rooting at 1-4 nodes above the base. Leaves: sheaths glabrous, reddish brown; blades shorter than the stem, flat or canaliculate, 2-4 mm wide, linear, gradually acuminate, scabrid on the upper part. Inflorescence simple, sub-compound or contracted to 2-3 dense sessile heads or reduced to a single terminal head; involucral bracts 3, foliaceous, lower ones overtopping the inflorescence; rays if present, 1-3 cm long. Spikes ovoidal, bearing 5 to 18 spikelets on short rhachis. Spikelets strongly compressed, stellately spreading, narrowly ovate or oblong-lanceolate, 8-15 × 2-3 mm, sanguineous-brown, subacute at apex; rhachilla wingless; Glumes chartaceous, ovate to broadly ovate, boat-shaped, carinate, 2-2.5 × 1.7-2 mm; keel 3-5 nerved, arcuate, with a strong dark-brown, lateral nerve; sides nerveless, with a pale or hyaline, elliptic depression either side with sanguineous band around it. Stamens 2; anthers elliptic-oblong, appendiculate at tip. Nuts biconvex, laterally compressed, broadly obovate or orbicular, 0.9-1.3 × 0.8-1mm, shortly stipitate, brownish to black when mature, minutely puncticulate with isodiametrical epidermal cells. Style 2-fid, as long as the nuts.

Fls & Frts : September to November

Distribution : Frequent. Along the margins of rice fields, streams. In Maharashtra reported at Ahmednagar, Kolhapur, Pune, Raigad, Ratnagiri, Satara, Sindhudurg, Nasik, Yavatmal and Thane.

Specimens examined : Nandurbar Dist., Toranmal, Tanveer A. Khan 1513; Dhadgaon, Tanveer A. Khan 1646; Kukurmunda, Tanveer A. Khan 2020; Bhagadari, Tanveer A. Khan 1838.

Note : Glumes with acute keels with groove-like depression on each side; culms swollen and decumbent at base, rooting at nodes, the lower third to half leafy are the diagnosing characters.

Scleria levis Retz., Obs. Bot. 4: 13. 1786; Lakshmin. in sharma *et. al.*, Fl. Maharashtra State, Monocot, 372. 1996; Yadav & Sardesai, Fl. Kolhapur. Dist. 551. 2002. *S. hebecarpa* Nees in wight, Contrib. 117. 1834; Cooke, Fl. Pres. Bombay 3: 419.1958 (Repr.ed.) *S. hebecarpa* var. *pubescens* (Steud.) Clarke in Hook. f., op.cit. (plate 1).

Perennial, 30-90 cm tall, with stout, horizontally short-creeping rhizome, covered with purple-brown scales. Stems slender, trigonous, glabrous or minutely puberulous on concave faces, at times retrorsely scabrous on angles,

Carex caricina D. Don

Cyperus cyperinus (Retz.) Valck-Sur.

Lipocarpa chinensis (Osb.) Kern

Kyllinga melanosperma Nees

Scleria levis Retz.

Pycreus sanguinolentus (Vahl) Nees

Plate 1 : New records of Cyperaceae for Khandesh.

2-3 mm thick in the middle portion. Leaves: upper sheaths 5-8 cm long, 3-sided, with narrow or broad scabrous wings; the lower sheaths tinged with reddish or purplish-brown; contra-ligule, suborbicular, 1-2 mm long, pubescent and hirsute in uppper part; blades linear, 15-35 × 0.2-0.8 cm, 3- costa, scabrous on margins and along costats, densely pubescent to glabrous, gradually tapering to acute apex. Inflorescence consisting of a terminal panicle and 1 or 2 smaller axillary ones; terminal panicle 7-13 cm long, with loose branches; lateral panicles usually not branched, Spike like, on exserted peduncles. leaf like bracts slightly overtopping the inflorescence; bracteoles setaceous, elongate, longer than their branches. Pistillate spikelets and staminate spikelets in groups of 2 to 4 intermingled. Staminate spikelets peduncled, lanceolate-oblong, 3-5 mm long, sanguineous. Glumes lanceolate, acute to mucronate at apex, 2.5-3.5 mm long. Stamens 3; anthers linear, apiculate. Pistillate spikelets sessile, borne towards the base of branchlets, obovoid, 4-6 mm long. Glumes broadly ovate, 3-4.5 mm long, sanguineous-brown, acute to mucronate at apex. Nuts globose, nearly terete, 1.7-2.5 mm long and as broad, rounded to apiculate at apex, smooth, pubescent, later becoming glabrescent, whitish. Disk deeply 3-lobed; lobes ovate-lanceolate appressed to nut, almost half as long as the nut, acute at apex.

Fls & Frts: September to January

Distribution: Occasional. In open moist grasslands and along the margins of the hill slopes. In Maharashtra reported only from Kolhapur, Nagpur, Sindhudurg and Thane.

Specimens examined: Nandurbar Dist., Toranmal, Tanveer A. Khan 1103; Dhadgaon, Tanveer A. Khan 1466; Surgas Tanveer A. Khan 1619.

Materials and Methods

While working on Sedges of Khandesh region of Maharashtra State, we undertook frequent collection tours in every season to collect plants. The outcome of the collection tour was the 06 new taxa that are *Carex caricina* D. Don, *Cyperus cyperinus* (Retz.) Valck-Sur., *Kyllinga melanosperma* Nees, *Lipocarpa chinensis* (Osb.) Kern, *Pycreus sanguinolentus* (Vahl) Nees, *Scleria levis* Retz. All taxa have been identified with the help of available literature. The voucher specimens are deposited at the herbarium of Department of Botany, M. J. College, Jalgaon, Maharashtra. The plants have been described with their Latin names, followed by authors citations. Detailed descriptions of the taxa, flowering and fruiting period and distributions, precise locations and exsiccate numbers are appended at the end.

Results and Discussion

We have gone through all pertinent literature (Kshirsagar, 2008; Patil, 2003; Clarke, 1893; Cook 1996; Lakshminarsimhan, 1996; Yadav and Sardesai 2002; Prasad 2002; Shah 1978; Rao 1982) and by consulting the BSI Herbarium Pune. To find out the occurrence, distribution and habitat of species. We found that, these species were not reported in any of the Khandesh floras. This clearly reveals that, these species are rare to flora of Maharashtra State, even India as a whole. These species are new record to the flora of Khandesh region of Maharashtra State. The voucher specimen is deposited in the herbarium of P. G. Dept. of Botany, M. J. College, Jalgaon.

On close examination of herbarium specimens and detailed scrutiny of literature published till today on these taxa, it can be claimed that these are new records for Khandesh region from Maharashtra.

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