

## A Systematic Census on the Sedges of Koch Bihar District, West Bengal

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### Abstract

The present study reveals that the sedges of the district of Koch Bihar are represented by 43 species under 13 genera. The maximum number of species has been recorded in *Cyperus* (14 species) followed by *Fimbristylis* (10 species). The other common genera are *Eleocharis* (04 species), *Kyllinga* (03 species), *Pycneus* (03 species) and *Schoenoplectus* (02 species). On the other hand there are seven genera having single species each viz. *Bulbostylis*, *Carex*, *Fuirena*, *Juncellus*, *Rikliella*., *Rhynchospora* and *Scleria*. It has been observed during study that only two species namely *Cyperus rotundus* L. and *Kyllinga brevifolia* Rottb. are used by the local peoples for treatment.

The members of the family Cyperaceae commonly known as sedges are the grass like herbs, distributed almost throughout the world and often become an important component of many habitats ranging from marshes to mountains. The sedge family is the third largest family among Monocots comprising of 106 genera and 5,387 species<sup>11</sup>. Beside their economic importance as the source of food, fodder, medicines etc. the sedges have a significant ecological value. They are not only the predominant plants of stable wetlands but also play a vital role in ecological succession. Apart from that sedges provide food and shelter to the birds and aquatic animals, control soil erosion and improve water quality by acting as filters to remove pollutants and sediments.

Many workers<sup>3,6,7,9,10,13-16,18-20</sup> have

made valuable contribution on the systematic of sedges. But no endeavour has been undertaken to enumerate the sedges growing in the district of Koch Bihar, West Bengal though a few stray publication<sup>1,2,4,5,8</sup> exist on the flora of the district. Therefore, the present work has been undertaken.

### Study area :

The district of Koch Bihar is situated in the north eastern part of the state of West Bengal under Jalpaiguri division in between 26° 32' 46" to 25° 57' 57" N latitude and 89° 52' 00" to 88° 45' 02" E longitude and covering an area of 3,386 sq km. The rivers of the district include Tista, Torsha, Jaldhaka, Kaljani, Raidak, Gadadhar and their tributaries. The soil is alluvial type. The climate of the district is characterized by highly humid atmosphere with

the temperature being seldom excessive during summer. The average rainfall of the district is 320.1cm.

The present work is the outcome of extensive survey conducted in different parts of the district for the consecutive five years. Collection and preservation of plant specimens were done following the guidelines of Lawrence<sup>17</sup> and Jain & Rao<sup>12</sup> with some minor changes wherever required. Vernacular names and local uses of sedges (if any) were recorded from the elderly knowledgeable persons of the villages. In the laboratory dissections of the spikelets were done under binocular dissecting microscope. Correct identity and updated nomenclature of the collected plant specimens were established with the help of published literature and also comparing with the authentic herbarium specimens of Central National Herbarium (CAL).

Sedges collected during the present study are enumerated below. The name of the genera and species are arranged alphabetically. Scientific name of each species is followed by field notes, flowering and fruiting periods, places of collection and field no. Vernacular names (in parenthesis) and local uses are also provided wherever available.

### 1. *Bulbostylis* Kunth.

*Bulbostylis barbata* (Rottb.) Clarke in Hook. f., Fl. Brit. India 6: 651.1893. *Scirpus barbatus* Rottb., Prodr. 27. 1772 and Descr. Icon Pl. 52, t. 17, f. 4: 1773. *Stenophyllus barbata* (Rottb.) T. Cooke, Fl. Pres. Bombay 2: 887.1908. *Fimbristylis barbata* Rottb. Benth., Fl. Australia 7 : 321.1878.

A densely tufted annual of 4-20 cm height. Spikelets sessile in dense clusters at the top of stem, linear to oblong. Less common, in damp places of forest edges, margins of ponds and ditches and on sandy river beds. July – October. Jamalda forest, SB- 2972.

### 2. *Carex* Linn.

*Carex wallichiana* Spreng., Syst. Veg. 3: 812.1826. *Carex foliosa* D. Don ex Tilloch and Taylor in Phil. Mag. 62: 455.1823. *Carex muricata* Linn. var. *foliosa* (D. Don ex Tilloch and Taylor) Clarke in Hook. f., Fl. Brit. India 6: 703.1894.

Perennial, 15-60 cm long; upper 2-3 spikes male, linear; lower spikes female, cylindrical. Less common, found in forest floor. March – May. Patlakhawa forest. SB – 3872.

### 3. *Cyperus* Linn.

Clarke<sup>6</sup> considered *Cyperus* in a wide sense and recognized *Pycreus*, *Juncellus*, *Mariscus*, *Kyllinga*, etc. as subgenera under *Cyperus*. This view was followed by the later workers like Kukenthal<sup>15</sup>, Koyama<sup>14</sup> and Kern<sup>13</sup>. But Clarke<sup>7</sup> in his later publication considered *Pycreus*, *Kyllinga*, *Juncellus*, *Mariscus*, *Courtoisia* as distinct genera apart from *Cyperus*. Goetghebeur<sup>10</sup> in his work of generic delimitation of *Cyperus* included *Mariscus* and *Courtoisia* within *Cyperus* but not the genera with two stigma and biconvex nuts i.e. *Pycreus*, *Kyllinga* and *Juncellus*. This view is followed in the present work.

1. *Cyperus compactus* Retz., Obs. Bot. 5: 10.1789. *Cyperus dilutus* Vahl, Enum. Pl. 2: 357.1806. *Mariscus compactus* (Retz.) Boldingh, Zakfl. Landb. Java. 77. 1916. *Mariscus microcephalus* Presl, Reliq. Haenk.

1: 182.1828.

Perennial, 0.2-1 m high; Anthela compound to decomposed. Common, occurs along the side of rivers, ponds, ditches and in low land area, flooded during monsoon. June – November. Jamalda, SB – 2960.

**2. *Cyperus cuspidatus*** Kunth, in H.B. and K., Nov. Gen. Sp. 1: 204:1815. Tufted annual, 2.5-15 cm long. Anthela simple or compound. Common, in damp places, mostly along with grass patches. August – November. Rasikbil, SB – 3155.

**3. *Cyperus cyperoides*** (Linn.) Kuntze, Rev. Gen. Pl. 3: 333.1898. *Scirpus cyperoides* Linn., Mant. Pl. 2: 181.1771. *Mariscus sieberianus* Nees ex Clarke in Hook. f., Fl. Brit. India 6: 622.1893. Perennial, 15-70 cm high. Anthela simple, usually evolute. Common, in moist wastelands, cultivated fields and along forest edges. July – November. Atiamochar, SB – 3143.

**4. *Cyperus difformis*** Linn., Sp. Pl. ed. 1, 67.1753. Tufted annual, up to 45 cm high. Anthela simple, evolute or almost capitately contracted. Common, in marshes, ditches and in paddy fields. August – January. Kochbihar, SB – AICRPE 3248.

**5. *Cyperus digitatus*** Roxb., Fl. Ind. (eds. Carey and Wall.) 1: 209.1820. Perennial, up to 1.5 m high; rhizomes stout, woody. Anthela compound to decomposed. Less common, at the edge of ponds, canals and in ditches and marshes. July – November. Folimari, SB – 3746.

**6. *Cyperus distans*** Linn., Suppl. 103. 1781. Perennial, 0.3-1 m high. Anthela decomposed, lax. Less common, in the edges of ditches, ponds and other water bodies sometimes in other moist places also. April – October.

Haldibari, SB – 3657.

**7. *Cyperus exaltatus*** Retz., Obs. Bot. 5: 11.1789.

Robust perennial, up to 1.5 m high; rhizome short, woody. Anthela compound or Govt. D.B. Girls College, Raipur [C.G.] - 492001 (India) compound, lax. Less common, found along the sides of canals, ponds, ditches and marshes. July – October. Saulmari, SB – 3780.

**8. *Cyperus halpan*** Linn., Sp. Pl. ed. 1, 45.1753, ('haspan'). Perennial or annual, tufted, up to 60 cm long. Anthela compound or decomposed, lax. Common, mostly found along the margin of ponds, ditches, water courses and also in paddy fields. May – October. Atiamochar, SB – 3362.

**9. *Cyperus iria*** Linn., Sp. Pl. ed. 1, 45.1753. Annual, 15-45 cm tall. Anthela simple to compound, lax. Common, in paddy and jute fields, marshes and along the margins of ditches and ponds. July – November. Jamalda, SB – 2961.

**10. *Cyperus nutans*** Vahl, Enum. Pl. 2: 363.1806; Perennial, 30-90 cm high. Anthela compound to decomposed, lax. Spikes dense. Less Common, in marshes, ditches and at the margin of ponds also found in agricultural fields. May – October. Atiamochar, SB – 3436.

**11. *Cyperus pilosus*** Vahl, Enum. Pl. 2: 354.1806. *Cyperus obliquus* Nees in Wight, Contrib. Bot. 86. 1830. Perennial, 60-90 high; rhizomes stoloniferous. Anthela compound, lax. Common, in marshy places, also in paddy fields. June – November. Dewanhat, SB – 3758.

**12. *Cyperus rotundus*** Linn., Sp. Pl. ed. 1, 45.1753. (*Kasla* – Rj.; *Mutha* - Beng.) Perennial, 5-40 cm high; stolons long, slender, bearing ellipsoid aromatic tuber. Anthela

usually simple, sometimes compound. Very common, weed of waste places, rice fields and roadsides. July – December. Atiamochar, SB- 3115.

*Local Uses:*

- Aqueous extract of underground part of the plant is given to the children one teaspoon full thrice daily in dysentery till cured.
- Inflorescence is tied in the mammary gland of cow when suppression of milk takes places after delivery.

**13. *Cyperus squarrosus*** Linn. in Torner, Cent. Pl. 2: 6.1756. *Cyperus aristatus* Rottb., Deser. Pl. Rar. Progr. 22: 1772. *Mariscus squarrosus* (Linn.) Clarke in Hook. f., Fl. Brit. India 6: 623.1893.

Tufted annual, 3-10 cm high. Anthela simple. Common, in moist waste places, along with grasses. August – November. Megipur, SB – AICRPE 3052; Kochbihar, SB – 3242.

**14. *Cyperus tenuispica*** Steud., Syn. Cyp. 11.1854. *Cyperus flavidus* sensu Clarke in Hook. f., Fl. Brit. India 6: 600.1893, *non* Retz. 1789.

Annual, tufted, 5-25 cm long. Anthela compound or decompound, lax. Common in marshes and mostly as weed in paddy fields. July – November. Atiamochar, SB – 3408.

**4. *Eleocharis* R. Br.**

**1. *Eleocharis acutangula*** (Roxb.) Schult. in Roem. and Schult. Mant. 2: 91.1824. *Scirpus acutangulus* Roxb., Fl. Ind. (eds. Carey and Wall.) 1: 216. 1820. *Eleocharis fistulosa* Schult. in Roem. and Schult., Mant. 2: 89.1824.

A rhizomatous perennial, up to 60 cm high; Spikelets terete, as thick as or slightly thicker than stem, Common, in ditches, margin of ponds and in paddy fields as weed. July –

November. Bamanhat, SB – 3753.

**2. *Eleocharis dulcis*** (Burm. f.) Trim. ex Henschel, Vita Rumph 186.1833. *Andropogon dulce* Burm. f., Fl. Ind. 219.1768. *Scirpus plantagineus* Retz., Obs. Bot. 5: 14.1789. *Eleocharis plantaginea* (Retz.) Roem. and Schult., Syst. Veg. 2: 150.1817.

A stoloniferous perennial, up to 60 cm high. Spikelets terete, Common, in swamps and as weeds in paddy fields. July – October. Gitaldaha, SB – 3737.

**3. *Eleocharis geniculata*** (Linn.) Roem. and Schult., Syst. Veg. 2: 150.1817. *Scirpus geniculatus* Linn., Sp. Pl. ed. 1, 48.1753. *Eleocharis capitata* R. Br., Prodr. 225. 1810, *non*. *Scirpus capitatus* Linn. 1753. Annual, 5-30 cm high; Spikelets subglobose to oblong. Common, in marshy lands and drying paddy fields. September – January. Baneswar, SB – 3520.

**4. *Eleocharis retroflexa*** (Poir.) Urb., Symb. Antill. 2: 165.1900. *Scirpus retroflexus* Poir. in Lam., Encycl. 6: 753.1804. *Eleocharis chaetaria* Roem. and Schult., Syst. Veg. 2: 154.1817.

Annual, usually 3-10 cm long. Spikelets ovoid-ellipsoid. Common, grows in moist land, along river banks and in drying paddy fields. October – December. Atiamochar, SB – 3339.

**5. *Fimbristylis* Vahl**

**1. *Fimbristylis acuminata*** Vahl, Enum. Pl. 2: 285.1806.

Perennial, 5-20 cm high. Anthela reduced to a solitary terminal spikelets, rarely up to three. Common, in wet places, waste lands and fallow paddy fields. June – October. Megipur, SB – 3025.

**2. *Fimbristylis aestivalis*** (Retz.) Vahl, Enum. Pl. 2: 288.1806. *Scirpus aestivalis*

Retz. Obs. Bot. 4: 12.1786.

Annual, upto 30 cm high. Anthela compound or decomposed, lax, bearing numerous spikelets. Common, in open wet places, along ponds, ditches and in paddy fields. September – December. Patlakhawa, SB – 3789.

**3. *Fimbristylis albo-viridis*** Clarke in Hook. f., Fl. Brit. India 6: 638.1893. Annual, 15-40 cm high. Anthela compound or decomposed, lax. Less common, grows in moist shady waste lands. August – October. Atiamochar, SB – 3811.

**4. *Fimbristylis bisumbellata*** (Forssk.) Bubani, Dodec. 30. 1850. *Scirpus bisumbellatus* Forssk., Fl. Aeg. Arb. 1: 15. 1775. *Fimbristylis dichotoma* sensu Clarke in Hook. f., Fl. Brit. India 6: 635.1893, non Vahl, 1806. Annual, 10-20 cm long. Anthela compound to decomposed, lax or dense. Less common, in moist places, side of ponds, ditches, in drying marshy lands and harvested paddy fields. April – September. Dewangunj, SB – 3668.

**5. *Fimbristylis dichotoma*** (Linn.) Vahl, Enum. Pl. 2: 287.1806. *Scirpus dichotomus* Linn., Sp. Pl. ed. 1, 50.1753. *Fimbristylis diphylla* Vahl, Enum. Pl. 2: 289.1806.

Annual or perennial, 20-45 cm high. Anthela compound to decomposed, lax or dense. Very common, along the sides of water courses, waste places, roadside and in paddy fields. April – October. Lalbazar, SB – 3697.

**6. *Fimbristylis miliacea*** (Linn.) Vahl, Enum. Pl. 2: 287.1806. *Scirpus miliaceus* Linn., Syst. Veg. ed. 10, 868.1759.

Tufted annual or perennial, up to 70 cm high. Anthela decomposed. Common, in marshes, edge of ponds, ditches and other water bodies, paddy field, bundhs and also in moist waste places along with grasses. July – November. Jamalda, SB – 2962.

**7. *Fimbristylis ovata*** (Burm. f.)

Kern in Blumea 15: 126.1967. *Carex ovata* Burm. f., Fl. India 194. 1768. *Fimbristylis monostachyos* (Linn.) Hassk., Pl. Jav. Rar. 61.1848. ('monostachya'). *Cyperus monostachyos* Linn., Mant. Plant. 2: 180. 1771.

Perennial, usually 10-30 cm high. Anthela reduced to a solitary spikelet. Common, grows in wet places like banks of ponds, ditches, paddy fields and moist waste places along with grasses. July – October. Kochbihar, SB – 3241.

**8. *Fimbristylis schoenoides*** (Retz.)

Vahl, Enum. Pl. 2: 286.1806. *Scirpus schoenoides* Retz., Obs. Bot. 5: 14.1789. Perennial, 10-30 cm high. Anthela reduced to a solitary spikelet, rarely of 2-3 spikelets. Common, in moist waste lands and in paddy fields. August – October. Atiamochar, SB – 3423.

**9. *Fimbristylis tomentosa*** Vahl,

Enum. Pl. 2: 290.1806. *Fimbristylis podocarpa* Nees and Meyen in Wight, Contrib. Bot. 98.1834 p.p. *Fimbristylis diphylla* var. *pluristriata* Clarke in Hook. f., Fl. Brit. India 6: 638.1893.

Annual, 15-50 cm high. Anthela compound, lax. Less common, in moist shady places. July – October. Gitaldaha, SB – 3729.

**10. *Fimbristylis umbellaris*** (Lam.)

Vahl, Enum. Pl. 2: 291.1806. *Scirpus umbellaris* Lam., Illus. 1: 141.1791. *Fimbristylis globulosa* (Retz.) Kunth, Enum. Pl. 2: 231.1873. *Scirpus globulosus* Retz., Obs. Bot. 6: 19.1791. *Fimbristylis assamica* Clarke ex Guhabakshi in Bull. Bot. Soc. Beng. 24: 111.1970.

Perennial, 10-40 cm high. Anthela lax, bearing 2-many spikelets. Less common, in marshy places. July – October. Dewanhat, SB – 3765.

**6. *Fuirena* Rottb.**

*Fuirena ciliaris* (Linn.) Roxb., Fl. Ind. (eds. Carey and Wall.) 1: 184.1820. *Scirpus ciliaris* Linn., Mant. Pl. 2: 182.1771. *Fuirena glomerata* Lam., Illus 1: 150.1791. Annual, commonly 15-30 cm high. Spikelets in cluster of 3-8, ovoid to oblong. Less common, in rice fields, marshy lands and in waste places. October – January. Sonapur, SB – 3543.

**7. *Juncellus* Clarke**

*Juncellus pygmaeus* (Rottb.) Clarke in Hook.f., Fl. Brit. India 6: 596.1893. *Cyperus pygmaeus* Rottb., Descr. Icon. Pl. 20. t. 14, f. 5. 1773. *Cyperus michelianus* (Linn.) Link ssp. *pygmaeus* (Rottb.) Aschers and Graebn., Syn. Mitteleur. Fl. 2 : 273.1904. Densely tufted diffuse to erect annual, up to 20 cm long. Inflorescence capitate, subglobose. Common, in harvested paddy fields and near water courses, often in moist waste places. Almost throughout the year but mostly in monsoon. Sitalkuchi SB –3692.

**8. *Kyllinga* Rottb.**

**1. *Kyllinga brevifolia*** Rottb., Descr. and Icon. 13, t. 4, f. 3. 1773. *Cyperus brevifolius* (Rottb.) Hassk., Cat. Hort. Bogor. 24, 1844. (*Biskala* – Ra.). Perennial, 5-25 cm high; rhizomes stoloniferous, creeping. Head solitary, globose, to oblong green. Very common, in wastelands, along the sides of the water courses and on paddy fields. Almost throughout the year, mainly from June to November. Atiamochar, SB – 3113.

*Local Use:*

- Paste of the plant is applied externally in headache .

**2. *Kyllinga nemoralis*** (J. R. and G.

Forst.) Dandy ex. Hutch. and Dalz. Fl. West Trop. Africa 2: 487.1936. *Thryocephalon nemorale* J. R. Forst. and G. Forst., Charact. Gen. Pl. 129, t. 65. 1776. *Kyllinga monocephala* Rottb., Descr. Icon. Nov. Pl. 13, f. 4.1773. *Cyperus kyllingia* Endl. Cat. Hort. Vindob. 1: 94.1842.

Perennial, 5-30 cm high; rhizome creeping. Heads spiciform, globose to broadly oblong. Very common, in waste lands, roadsides and often in forest floors, prefers damp places. Almost throughout the year, but mainly in May – October. Jamalda, SB – 2907.

**3. *Kyllinga tenuifolia*** Steud., Syn. Pl.

Glum. 2: 69.1855. *Kyllinga triceps* Rottb., Descr. Ic. 14, t. 4, f. 6. (excl. lit. Rheede) 1773 *nom. superfl.*

Perennial, up to 20 cm long; rhizome very short without stolons. Heads usually in a cluster of three, rarely five, globose to ovate-oblong, spiciform. Common, in grassy waste places. Almost throughout the year, but mainly in June – December. Jamalda, SB – 2935; Atiamochar, SB – 3409.

**9. *Pycneus* P. Beauv.**

**1. *Pycneus pumilus*** (Linn.) Nees ex Clarke in Hook.f., Fl. Brit. India 6: 591. 1893. *Cyperus pumilus* Linn. Cent. Pl. 2: 6. 1756. *Cyperus nitens* Retz., Obs. Bot. 5: 13. 1789. *Pycneus nitens* (Retz.) Nees in Nov. Acta Nat. Cur. 19. Suppl. 1: 53. 1843.

Caespitose annual of 3.5-10 cm high, rarely up to 20 cm long. Anthela simple or subcompound. Common, in moist places and sometimes in paddy fields. August – November. Jamalda, SB – 2946 and 2959.

**2. *Pycneus sanguinolentus*** (Vahl)

Nees ex Clarke in Hook.f., Fl. Brit. India 6: 590.1893. *Cyperus sanguinolentus* Vahl, Enum. Pl. 2: 351.1806.

Annual or perennial, usually 40 cm high. Anthela capitately contracted. Less common, grows on moist places along with grassy patches. August – January. Kochbihar, SB – 3235.

**3. *Pyereus stramineus* Clarke** in Hook. f., Fl. Brit. India 6: 589.1893. *Cyperus stramineus* Nees in Wight, Contrib. Bot. 74.1834, non Desf. ex Link. 1820. *Cyperus substramineus* Kuekenth in Engler, Pflanzenr.101: 398.1936.

Annual, tufted, 7-30 cm high. Anthela simple. Common, in moist waste places, along the margin of ponds, ditches, water courses and at the sides of paddy field bunds. August – November. Jamalda, SB – 2965.

### **10. *Rhynchospora* Vahl**

***Rhynchospora hookeri* Boeck** in Linnaea 37: 621.1873.

Perennial, rhizomatous herb, commonly 30-80 cm high. Panicles consisting of 1-4, distant, corymbiform anthelas. Less common, along pools and ditches and in wet waste places. August – October. Atiamochar, SB – 3141.

### **11. *Rikliella* J. Raynal**

***Rikliella squarrosa* (Linn.) J. Raynal** in Adansonia Ser. 2, 13: 154.1973. *Scirpus squarrosa* Linn. Mant. Pl. 2: 181.1771. A dwarf, tufted annual herb, usually 3-10 cm high. Inflorescence of 2-4, pseudolateral, squarrose spikelets. Common, in wet and shady places and also in harvested paddy fields with grassy patches. September – December. Gitaldaha, SB – 3735.

### **12. *Schoenoplectus* (Rehb.) Palla.**

**1. *Schoenoplectus articulatus* (Linn.) Palla** in Bot. Jahrb. Syst. 10: 299.1888. *Scirpus articulatus* Linn., Sp. Pl.

ed. 1, 47.1753.

Annual or rhizomatous perennial, 20-50 cm high or even more. Inflorescence pseudolateral, capitates. Common, in marshy lands, at the margin of ponds, and ditches also in drying paddy fields. November – January. Pundibari, SB – 3532.

**2. *Schoenoplectus juncooides* (Roxb.) Palla** in Bot. Jahrb. Syst. 10: 299.1888. *Scirpus juncooides* Roxb., Fl. Ind. (eds. Carey and Wall.) 1: 218.1820. *Scirpus erectus* sensu Clarke in Hook. f., Fl. Brit. India 6: 656.1893, non Poir. 1804.

An annual tufted herb, commonly 30 cm high. Inflorescence pseudolateral, capitates. Common, in marshy places, along ponds and ditches and also in paddy fields. March – January. Atiamochar, SB – 3433.

### **13. *Scleria* Berg.**

***Scleria biflora* Roxb.**, Fl. Ind. (ed. Carey) 3: 573.1832. *Scleria tessellata* Nees in Wight, Contr. Bot. 118.1834, non Willd. 1805.

A tufted annual of 15-45 cm high. Inflorescence narrow, elongate, consisting of 2-4 panicles.

Less common, in moist waste places and the edges of water bodies. July – October. Atiamochar, SB – 3422.

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