



To Study Diversity and Taxonomy of Family- Cyperaceae Around Aurangabad District of Maharashtra State

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Abstract

The present investigation gives report on the sedges of the rural areas around Aurangabad district during the year 2012 for the first time. Total 5 genera and 25 species of sedges were growing around rural areas of Aurangabad district which were collected and identified and presented in the form of genera and species key and checklist shown in Table-1 with their phenology and status. Genus *Cyperus* found dominant having 9 species followed by *Fimbristylis* 7 species, *Pycurus* 3 species while *Fuirena* and *Kyllinga* have 3 species each. Species were distributed widely in marshy places, pond and in wetlands. The species were used as crop for animal food, medicine and as ornamental purposes.

Keywords- *Cyperaceae, Taxonomy, Aurangabad District, Diversity*

Introduction

The Cyperaceae are a family of graminoid, monocotyledonous flowering plants known as sedges. The family is large, with some 5,500 known species described in about 90 genera, [1,2] the largest being the "true sedges" genus *Carex* [3,4] with over 2,000 species[5]. These species are widely distributed, with the centers of diversity for the group occurring in tropical Asia and tropical South America. While sedges may be found growing in almost all environments, many are associated with wetlands, or with poor soils. Ecological communities dominated by sedges are known as sedge lands or sedge meadows. Some species superficially resemble the closely related rushes and the more distantly related grasses. In comparison, grasses have alternate leaves, forming two ranks [7]. Some well-known sedges include the water chestnut (*Eleocharis dulcis*) and the papyrus sedge (*Cyperus papyrus*), from which the writing material papyrus was made. This family also includes cotton-grass (*Eriophorum*), spike-rush (*Eleocharis*), sawgrass (*Cladium*), nutsedge or nutgrass (*Cyperus rotundus*, a common lawn weed), and white star sedge (*Rhynchospora colorata*).

Aurangabad district is known as a major production center of cotton fabric, artistic silk fabrics and bulbous educational institutions. The district has an area of 10,100 km², of which 37.55% is urban and the rest is rural. Aurangabad District is the foremost region in Marathwada. Aurangabad district, Gautala is a well-known sanctuary, Jayakwadi is also well-known for bird sanctuary. The district is situated mainly in Godavari Basin and its some part towards North West of Tapi River Basin. This District general down level is towards South and East and North West part comes in Purna-Godavari River basin. The Aurangabad district's North Longitude (Degree) is 19 and 20 and East Longitude (Degree) is 74 to 76. The average annual rainfall in Aurangabad is 725.8 mm. Annual temperatures in Aurangabad is range from 17 to 33°C. The Cyperaceae is the third largest monocot family, globally it consisting of an estimated 5000 species in 104 genera. They have a worldwide distribution, especially in the tropics [6, 7]. The family has significant economic importance; many members are serious agricultural weeds, whereas others provide animal food, and medicines. Nearly 10% of the family is place to use by humans with the focus of use in the tropics [8]. Cyperaceae also have protection and environmental importance. They are major or even main components of marshland habitats. The weakening of sedge species within different types of habitats is a useful indicator of potential habitat injury. [12]. In terms of ecosystem services, they can play a specific role in water quality. Created wetlands, artificial marshes, or swamps created for anthropogenic releases such as wastewater, storm-water, runoff or sewage treatment in various parts of the world have included Cyperaceae species [14]. Work on family Cyperaceae in different parts of India were carried out by several workers like Rao and Verma [15], M. A. Wadoodkhan [12, 13], Singh [13], Kumar and Saxena [11].

Material and Method

Survey of sampling sites was selected as rural areas around Aurangabad district has been done using geographical distribution and vegetation. The collection of Sedges samples was collected during 2012. Critical morphological studies have been completed and different floras and largest monographs have been checked to identify the sedge species. [9, 10] The plants were treated into voucher specimen following standard methods [10]. After the work specimens were deposited in Herbarium of Cyperaceae, Department of Botany, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

Observation and Results

The present study revealed that 5 genera and 25 species of sedges growing around rural areas of Aurangabad district which are presented in the form of genera and species key and checklist shown in Table-1 with their phenology and status. Genus *Cyperus* found dominant having 9 species followed by *Fimbristylis* 7 species, *Pycneus* 3 species while *Fuirena* and *Kyllinga* have 3 species each. Species were distributed widely in muddy soil, marshy places, grass fields, pond side, moist waste soil. The species are used economically as fodders, medicinal and ornamental.

Acknowledgements

Author is expressing their gratitude to Head, Department of Botany, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad for provided herbarium and laboratory facility.

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Key to the genus

- 1a Glumes atleast lower ones distichous.....2
 1b Glumes spirally arranged.....5
 2a Plant leafless.....Cyperus
 2b Plant leafy.....3
 3a Rhachilla articulated.....Kyllinga
 3b Rhachilla not articulated.....4
 4a Style 2-fid.....Pycneus
 4b Style 3-fid.....Cyperus
 5a Hypogynous scales or bristles absent.....Fimbristylis
 5b Hypogynous scales or bristles present.....Fuirena

Key to the species of Cyperus

- 1a Spikelets digitate, stellately radiating on much shortened or condensed rhachis of spikes forming clusters, sometimes solitary ones often added C. **difformis**
 1b Spikelets spicately arranged at some distant from one another upon a more or less elongated rhachis.....2
 2a Spikes oblong or cylindrically oblong, several times longer than broad. Spikelets many to numerous (more than 25);rhachis visible or invisible.....C. **exaltatus**
 2b Spikes ovate, as long as broad; spikelets 3-15 on visible rhachis.....3
 3a Rhachilla distinctly winged; sides of glumes nerved or nerveless 4
 3b Rhachilla of spikelets wingless; sides of glumes often nerved.....C. **iria**
 4a Plants leafless or leaves reduced to bladeless sheaths, rarely with short 5-7 cm long solitary blade.....C. **scariosus**
 4b Plants leafy.....5
 5a Glumes distinctly 7-11 nerved, equally spreading over the whole breadth near to the margins; inflorescence simple, small or reduced to a spike or imperfect with short, 2-3 cm long rays.....6
 5b Glumes distinctly or indistinctly 5-7 nerved, sides at most with 2-3 nerves close to or much less prominent from the keel; inflorescence simple to subcompound, large with 10-15 cm or small, 5-6 cm long rays/.....7
 6a Inflorescence reduced with rays 2-3 cm long, glumes 9-11 nerved. Stolons blackish, capillary, soon disappearing.....C. **bulbosus**
 6b Inflorescence well developed, dense with up to 15 cm long rays; glumes 7-9 nerved. Stolons yellowish long persistent.....C. **esculentus**
 7a Spikelets turgid, subterete or subangular.....C. **stoloniferous**
 7b Spikelets strongly compressed.....8
 8a Stems subterete in lower half, trigonous just below the inflorescence; the lower involucrel bract erect, pushing aside the small inflorescence; spikelets pale brownish or stramineous tinged with brown.....C. **scariosus**
 8b Stems acutely trigonous throughout, involucrel bracts spreading inflorescence large with 10-15 cm long rays; spikelets brown to yellowish-brown, usually bright.....C. **rotundus**

Key to the species of Fimbristylis

- 1a Styles 2-fid; nuts biconvex.....2
- 1b Styles 3-fids'; nuts trigonous or triquetrous.....4
- 2a Glumes wholly or partly (in upper half) densely brown or greyish tomentose on the back; nuts usually smoother or finely striated.....**F. ferruginea**
- 2b Glumes glabrous, rarely minutely ciliolate on apex margins; nuts trabeculate or Reticulate.....3
- 3a Nuts copiously tuberculate or verruculose.....**F. albovididis**
- 3b Nuts etuberculate or few scattered tubercles.....**F. dichotoma**
- 4a Annual.....**F. microcarya**
- 4b Perennials.....**F. complanata**

Key to the species of Fuirena

- 1a Perennials with long creeping rhizome; stems usually acutely 3-angled, hypogynous scales or bristles absent or rarely bristles reduced.....**F. cuspidata**
- 1b Perennials or annuals, hypogynous structures consist of scales and bristles or only bristles.....**F. ciliaris**

Key to the species of Killinga

- 1a Keel of glumes distinctly winged.....**K. nemoralis**
- 1b Keel of glumes wingless.....**K. brevifolia**

Key to the species of Pycerus

- 1a Glumes awned or distinctly mucronate.....2
- 1b Glumes muticous or inconspicuously apiculate.....**P. flavidus**
- 2a Spikes globose; rhachilla straight mucro erect; spikelets white, silvery white, rusty Brown.....**P. pumilus**
- 2b Spikes rectangular or ovoid, rhachilla flexuous, mucro usually recurved spikelets pale to bright brown or reddish brown.....**P. nervulosus**

Table – 1) Checklist of cyperaceae family species found in study sites

Sr. No.	Plant name	Remark	Flowers and Fruits
1.	<i>Cyperus stoloniferus</i>	Occasional, in marshes along the roadside, wet agricultural fields	September to November
2.	<i>Cyperus squarrosus</i>	Common, banks of water courses	October to February
3.	<i>Cyperus sanguinolentus</i>	Common, banks of water courses	September to December
4.	<i>Cyperus difformis</i>	Commonly, in marshes of ditches, margins of tanks	October to November
5.	<i>Cyperus esculentus</i>	Margin of tanks, ditches	September to November
6.	<i>Cyperus exaltatus</i>	Common, banks of water courses	October to February
7.	<i>Cyperus iria</i>	Common, banks of water courses	September to December
8.	<i>Cyperus rotundus</i>	Common weed of agricultural fields	September to December

9.	<i>Cyperus scariosus</i>	Occasional, in tanks, ditches	September to December
10.	<i>Fimbristylis polytrichoides</i>	Occasional in wet open grasslands, on margins of water courses	October to November
11.	<i>Fimbristylis alboviridis</i>	Occasional, in open grassland	September to November
12.	<i>Fimbristylis complanata</i>	Common, along banks of water courses	September to December
13.	<i>Fimbristylis schoenoides</i>	Occasional in wet open grasslands, on margins of water courses	October to November
14.	<i>Fimbristylis dichotoma</i>	Occasional in wet open grasslands, on margins of water courses	October to November
15.	<i>Fimbristylis ferruginea</i>	Common, in tanks, along margins of streams, rivers, marshes of lakes	Major part of the year
16.	<i>Fimbristylis microcarya</i>	Common, along banks of water courses, marshes of open grasslands	September to December
17.	<i>Fuirena wallichiana</i>	Occasional, in marshes and margins of water	October to August
18.	<i>Fuirena ciliaris</i>	Occasional, in marshes and margins of water	September to December
19.	<i>Fuirena trilobites</i>	Occasional, in marshes and margins of water	October to August
20.	<i>Kyllinga melanosperma</i>	Occasional, in marshes of tanks, wet grasslands	September to November
21.	<i>Kyllinga bulbosa</i>	Common, along banks of water courses, marshes of open grasslands	September to December
22.	<i>Kyllinga nemoralis</i>	Rare, margins of tank	September to November
23.	<i>Pycreus flavidus</i>	Common, along banks of water courses, marshes along road sides	December to March
24.	<i>Pycreus nervulosus</i>	Open grassland	August to October
25.	<i>Pycreus pumilus</i>	Open grassland	August to October