

Chapter 3

Grasses and sedges of green urban space: a floristic survey

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Abstract: Urban parks serve as important ecological and social refuges within rapidly expanding cities, yet their ground-layer plant diversity often remains understudied. Present study documented the diversity and composition of grasses (Poaceae) and sedges (Cyperaceae) in Biju Pattanaik Park of Cuttack, Odisha, India. A total of 31 species were recorded, comprising 15 grass species across 12 genera and 16 sedge species across 3 genera. The grass flora exhibited high generic diversity, with *Digitaria* and *Eragrostis* being the most species-rich genera, while the sedges were dominated by the genus *Cyperus*. Species showed clear microhabitat preferences, with grasses largely occupying open lawns as well as disturbed grounds and sedges occurring in moist depressions, drainage channels and seasonally waterlogged areas. Several disturbance-tolerant species, including *Cynodon dactylon* and *Cyperus rotundus*, were widespread across the park, reflecting adaptation to urban management regimes. The present study highlights the ecological significance of urban parks as reservoirs of low-stature plant diversity and the importance of recognizing grasses and sedges as functional components of urban biodiversity and ecosystem service provision.

Keywords: Cyperaceae, Poaceae, urban parks

Introduction

Urban parks have functioned as vital interfaces between nature and the built environment, offering much-needed respite from the fast-forwarding pace of urban life (Zhang et al., 2025). Rapid urbanization, expanding infrastructure, deforestation, pollution and increasingly demanding work cultures have distanced urbanites from direct interactions with nature (Sen and Guchhait, 2021). In this context, urban green spaces emerge as carefully constructed yet essential substitutes for lost natural landscapes, providing moments of quiet, reflection and reconnection within the dense and hectic urban settings (Sen and Guchhait, 2021). Historically, parks have been shaped not merely as recreational grounds but as deliberate interventions

to improve urban health and quality of life. From ancient gardens to colonial botanical gardens to contemporary urban parks, these spaces reflect changing societal attitudes toward nature, well-being and public life (Sharma et al., 2021). While designed and managed, urban parks retain ecological relevance by hosting diverse plant communities that persist amidst anthropogenic pressures. They function as compact biodiversity reservoirs within concrete-dominated landscapes, often supporting taxa that would otherwise be excluded from urban matrices (Nagendra and Gopal, 2011). Ecologically, urban parks deliver a suite of critical ecosystem services (Singkran, 2023). Vegetation within these spaces contributes to air purification, pollutant absorption, microclimate regulation, carbon sequestration and mitigation of surface runoff and water-logging. Grasses and sedges, in particular, play a foundational role in these processes by stabilizing soil, supporting trophic interactions and maintaining habitat continuity at the ground layer (Tobias, 2013). Beyond ecological functions, urban green spaces foster social cohesion and cultural engagement, serving as sites for leisure, community interaction and cultural expression. Increasing evidence also highlights the role of everyday contact with urban nature in enhancing mental well-being and strengthening nature connectedness among urban populations (Jabbar et al., 2022). Thus, urban parks represent not only ecological assets but also socio-cultural and psychological lifelines within modern cities. Therefore, a survey was conducted in the Biju Pattnaik Park situated at CDA Sector 11, located in the Cuttack district of Odisha, India. It is one of the well-maintained urban green spaces of Cuttack, named after the aviator and former chief minister of Odisha, Shri Biju Patnaik. The survey aimed to document the species diversity of grasses and sedges found in the park, thereby highlighting the importance of urban parks in city life.

Methodology

Field surveys were conducted during November and December 2025 at the Biju Pattnaik Park situated in the Cuttack district of Odisha, India. The park represents a typical urban green space within a densely populated city, surrounded by the Mahanadi River, influenced by seasonal changes and anthropogenic activities. The species identification was done using standard regional flora (Saxena and Brahmam, 1996). Common names were searched from different online databases (Kumar, 2025). The field data were compiled into a checklist with botanical names and common names.

Results

The floristic survey of the Biju Pattnaik Park situated in the Cuttack district of Odisha, India recorded a diverse assemblage of grasses and sedges,

comprising 15 grass species (Table 2) across 12 genera and 16 sedge species (Table 1) across 3 genera.

Table 1: Diversity of sedges in the urban park

Sedge name	Common name
<i>Abildgaardia ovata</i>	Flatspike sedge
<i>Cyperus brevifolius</i>	Greenhead sedge
<i>Cyperus compressus</i>	Poorland flat sedge, Summer sedge
<i>Cyperus cuspidatus</i>	Coastal plain flatsedge
<i>Cyperus cyperoides</i> (Figure 5)	Pacific island flat sedge, Common flat sedge
<i>Cyperus distans</i>	Slender sedge, Piedmont flatsedge
<i>Cyperus dubius</i> var. <i>dubius</i>	Soft sedge, Dubious flatsedge
<i>Cyperus flavescens</i> (Figure 6)	Yellow flatsedge
<i>Cyperus haspan</i>	Dwarf sedge, Dwarf paper reed
<i>Cyperus iria</i>	Ricefield flatsedge, Umbrella sedge
<i>Cyperus neochinensis</i> (Figure 7)	Chinese flatsedge
<i>Cyperus polystachyos</i>	Bunchy flat sedge, Many-spiked flatsedge
<i>Cyperus rotundus</i>	Nutgrass, Purple nutsedge
<i>Cyperus squarrosus</i> (Figure 9)	Bearded flatsedge
<i>Fimbristylis dichotoma</i> (Figure 10)	Annual fringe rush
<i>Fimbristylis schoenoides</i> (Figure 8)	Ditch fimbry

Table 2: Diversity of grasses in the urban park

Grass name	Common name
<i>Bothriochloa pertusa</i> (Figure 2)	Indian bluegrass, Hurricane grass
<i>Chloris barbata</i> (Figure 4)	Swollen fingergrass
<i>Chrysopogon aciculatus</i>	Golden beardgrass, Love grass
<i>Cynodon dactylon</i>	Bermuda grass
<i>Dactyloctenium aegyptium</i>	Crowfoot grass
<i>Digitaria bicornis</i>	Asian crabgrass
<i>Digitaria ciliaris</i> (Figure 1)	Southern crabgrass
<i>Digitaria longiflora</i> (Figure 3)	Indian crabgrass
<i>Echinochloa colona</i>	Jungle rice

<i>Eragrostis ciliaris</i>	Gophertail lovegrass
<i>Eragrostis tenella</i>	Japanese lovegrass
<i>Eragrostis unioloides</i>	Chinese lovegrass
<i>Setaria pumila</i>	Yellow foxtail
<i>Sporobolus diandrus</i>	Indian dropseed
<i>Zoysia matrella</i>	Manila grass, Japanese carpetgrass



Figure 1: Inflorescence of *Digitaria ciliaris*

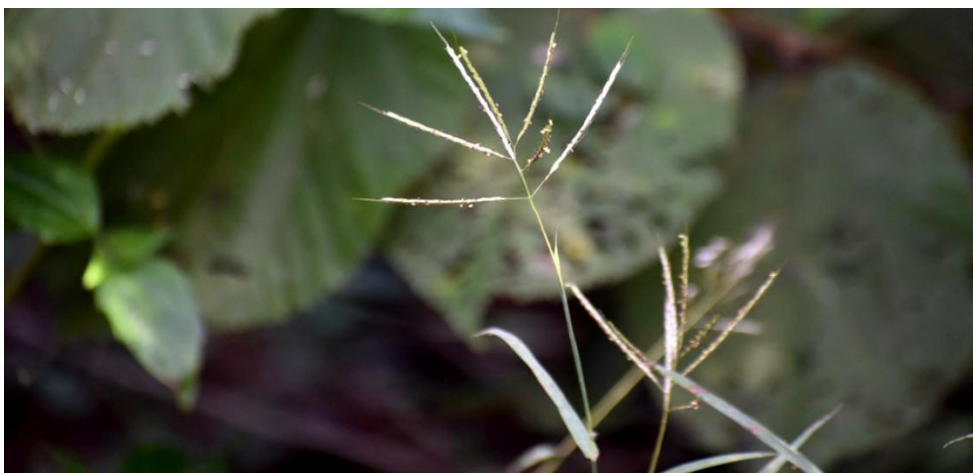


Figure 2: Inflorescence of *Bothriochloa pertusa*



Figure 3: Inflorescence of *Digitaria longiflora*



Figure 4: Inflorescence of *Chloris barbata*



Figure 5: Inflorescence of *Cyperus cyperoides*



Figure 6: Habitat of *Cyperus flavescentis*



Figure 7: *Cyperus neochinensis* in its habitat

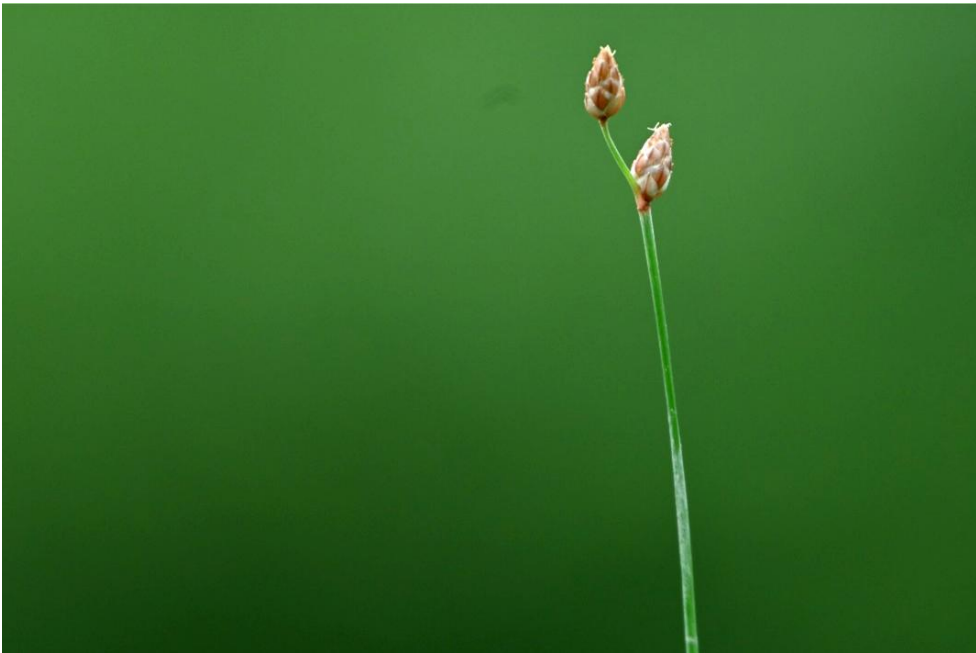


Figure 8: Inflorescence of *Fimbristylis schoenoides*



Figure 9: Inflorescences of *Cyperus squarrosus*



Figure 10: Aerial parts of *Fimbristylis dichotoma*

Grasses exhibited high generic diversity, with *Digitaria* and *Eragrostis* being the most species-rich genera, while sedges had a predominance of genus *Cyperus*, which contained the majority of the recorded Cyperaceae species. Both groups showed clear habitat partitioning within the park landscape; grasses primarily dominated open lawns, trampled grounds and managed recreational areas, whereas sedges were more frequent in moist depressions, drainage lines and seasonally waterlogged patches. Disturbance-tolerant and fast-growing species such as *Cynodon dactylon* and *Cyperus rotundus* were widely distributed and abundant. It shows their high adaptability to urban management regimes. Collectively, grasses and sedges contributed substantially to ground-layer vegetation, which enhances soil stabilization, moisture regulation and microhabitat diversity (Roy and Devi, 2025), reinforcing the role of urban parks as compact yet functionally significant biodiversity hotspots within the densely built concrete environments.

Conclusion

The floristic survey demonstrated that urban parks, despite intensive management and anthropogenic pressures, support a considerable diversity of grasses and sedges. The coexistence of multiple genera and species with varied ecological preferences indicates strong habitat heterogeneity within the urban landscape. Grasses contribute predominantly to lawn structure, soil stabilization and recreational functionality, while sedges occupy ecologically sensitive niches associated with moisture retention and drainage, enhancing ecosystem resilience. The dominance of adaptable and disturbance-tolerant species like *C. rotundus*, *C. compressus* and *D. aegyptium* reflects the selective pressures imposed by urban environments, yet the persistence of habitat-specific taxa suggests conservation potential within managed green spaces. Recognizing and documenting such ground-layer diversity in Biju Pattnaik Park was essential for informed urban biodiversity planning and sustainable park management of the city. Future studies integrating seasonal variation, functional traits and ecosystem service assessments would further strengthen understanding of the role of grasses and sedges in urban ecological networks.

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