

Chapter 1

Kans Grass (*Saccharum spontaneum* L.) and associated small birds: a conservation aspect

Parminder Singh Dehar¹, Kaushal Tripathi², Subhalakshmi Rout³ and Sanjeet Kumar^{3*}

¹Department of School Education, Government of Punjab, GHS Kamalpur Sangrur, Punjab, India

²Genetics and Tree Improvement Division, ICFRE- Tropical Forest Research Institute, Jabalpur, Madhya Pradesh, India

³Ambika Prasad Research Foundation, Odisha, India

*Email Id: sanjeetaprf@gmail.com

ABSTRACT

Grasses are a crucial group of plant life that provides services to all organisms from minor fauna to megafauna and humans. *Saccharum spontaneum* is one such native grass that provides seeds as food to birds, shelter, and nesting habitat to waterbirds, etc. In turn, birds aid in the pollination, seed dispersal, and pest management of the grass. This mutual interrelationship between birds and grasses is essential for the ecological balance of an ecosystem. Nowadays, animal-plant interactions are disrupted by several anthropogenic activities like urbanization, pollution, and population rise pushing small bird populations to the brink of extinction. This will severely affect the environment in turn causing negative impacts on the human population. Keeping the importance of bird-grass interactions in mind, field surveys were carried out in the Rourkela Forest Division and Mahanadi River areas of Cuttack, Odisha to document the birds associated with *S. spontaneum*. The survey documented 14 bird species visiting *S. spontaneum* for various purposes and the authors recommended more plantation of grass meadows to conserve the bird population.

Keywords: Grass, small birds, river, conservation, urbanisation

INTRODUCTION

Grasses are the most important type of vegetation on the earth's surface. They are often grazed upon by livestock, hold the soil tightly preventing soil erosion, and are made into ropes, mats, etc. (Chandra *et al.*, 2024).

Saccharum spontaneum is a wild variety of sugarcane that is used as a beverage base in beverage production, animal fodder, and gives sugar and wax for human use. It is a perennial tall grass belonging to the family Poaceae locally known as “Tandi” or “Kasatandi” in Odisha state. It is usually found throughout the warmer parts of India, common in wastelands, along roadsides, along streams and rivers, wetlands, etc. (Pandey *et al.*, 2015). The flowers emerge just before rain and are often linked with the arrival of the Dusshera festival in India (Dalasingh *et al.*, 2018). The inflorescence always attracts small birds. Most of the small birds feed on the seeds of this grass while some use the inflorescence to make nests. Eggs of some aquatic birds are also found in the depressions near the roots of the grass. The intricate root systems of this grass capture several small fishes and insects providing food to the waterbirds like Indian skimmers, terns, etc. (Bebarta *et al.*, 2023). Grasses also act as safe breeding grounds for waterbirds. Thus, *S. spontaneum* plays an essential role in the survival of small birds like munias, sparrows, some waterbirds, etc. Apart from the wind pollination of *S. spontaneum*, birds also help in their pollination and seed dispersal thereby maintaining the gene pool of the grass. Insectivorous birds also help in controlling pests on the grass by feeding on them keeping the grasses healthy (Das *et al.*, 2023). The interaction between this grass and birds is vital for the smooth functioning of the ecosystem. In the current scenario, urbanization and population hikes present hindrances in the birds-grass interaction and threaten their survival (Mahanti and Kumar, 2016). Rivers and streams are drying up quickly diminishing the *S. spontaneum* population thereby causing a decline in the bird’s population. Therefore, there is a need to conserve the grasses through more plantations of grass meadows in the urban and semi-urban areas so that the birds can be protected. Major actions should be taken to protect rivers and wetlands and if possible, to rejuvenate the polluted water systems. Keeping this situation in mind, field surveys were conducted in the Rourkela Forest Division and Mahanadi River areas in Cuttack, Odisha to document the relationship between birds and *S. spontaneum* for food, nesting, or other purposes.

MORPHOLOGY

It is a coarse grass of about 150-200 cm in height, tufted, stoloniferous, usually glaucous with erect and solid culms of 2.5-15 mm in diameter. Leaves 30-120 cm long and very narrow with incurved margins, usually 5-18 mm

wide. Panicle is 30-60 cm long, white-silvery, and narrow. Branches 7.5-10 cm long, whorled on the silky rachis and articulated to it. Peduncle hairy below the panicle, rachis very fragile. Spikelets are variable in size, 2-5 mm long, callus is hairy and much longer than the small spikelets. Glumes are membranous, at least at the upper part, glabrous at the back, 3.5-4 mm long, coriaceous, and brown polished below, sub-hyaline, and white in the upper two-thirds part. Lower glume lanceolate, 2-keeled, entire, or minutely 2-toothed, margins smooth or ciliate, glabrous on the back. Upper glume broad-lanceolate, subequal, 1-keeled with inflexed long ciliate margin, sometimes mucronated. Lower lemma shorter, ovate-lanceolate, long-ciliate, minutely pubescent above on back. Upper lemma minute, hyaline, linear, and ciliate. Palea small about the size of the lodicules, ovate, and ciliate. Lodicules ciliate on the margins, often with one long hair. The flowering and fruiting period is from August to February (Saxena and Brahmam, 1996).

METHODOLOGY

Keeping the dependence of some small birds on grasses, field surveys were conducted in the Rourkela Forest Division (RFD), Sundargarh and Mahanadi River areas of the Cuttack district of Odisha state from November 2023 to February 2024 to document the birds associated with *Saccharum spontaneum*. Surveys were done specifically in the morning time (6 AM-9 AM) and evening time (3.30 PM- 5 PM) to record the birds visiting the grass. The birds were identified using the published literature (Grimmett *et al.*, 2011) and the grass was identified by the authors.

RESULTS AND DISCUSSION

The conducted surveys revealed that 14 bird species belonging to 12 genera and 9 families visited *S. spontaneum* on different occasions (Table 1). From the documented 14 bird species, 3 bird species each belonged to the families Estrilididae and Laridae, 2 species belonged to the family Muscicapidae, and 1 species each belonged to the families Cuculidae, Laniidae, Paradoxornithidae, Passeridae, Ploceidae, and Pycnonotidae. It was seen that 6 bird species preferred to perch on the grass while resting or looking for insects, 5 species visited *S. spontaneum* for food, 4 species namely Baya weaver, Red munia, Scaly-breasted munia, and Tricoloured munia used the inflorescence of the grass to make nests (Figure 2), and 3 water birds namely Black-bellied tern, Indian skimmer, and River tern preferred to lay eggs near

the roots of the grass (Figure 1). Out of the 14 enumerated bird species, 11 species were on the list of least concern (LC) and 3 species in the different threatened categories. Black-bellied terns were found to be in the endangered category (EN), Indian skimmers were in the vulnerable category (VU), and River terns were in the near-threatened category (NT). It was also found that the populations of black-bellied tern, Indian skimmer, and river tern in the Mahanadi River were decreasing due to sand mining, climate change, and unavailability of grasses for food and egg-laying purposes.

Table 1: Birds visiting on *S. spontaneum*

Common name	Scientific name	Family	Visiting purpose
Baya weaver	<i>Ploceus philippinus</i> Linnaeus, 1766	Ploceidae	Perch and use the inflorescence of grass to make nests
Black-bellied tern	<i>Sterna acuticauda</i> Gray JE, 1831	Laridae	Lay eggs near the roots
Greater coucal	<i>Centropus sinensis</i> Stephens, 1815	Cuculidae	Search for food near the roots
House sparrow	<i>Passer domesticus</i> Linnaeus, 1758	Passeridae	Food
Indian robin	<i>Copsychus fulicatus</i> Linnaeus, 1766	Muscicapidae	Perch on the grass in search of insects
Indian skimmer	<i>Rynchops albigollis</i> Swainson, 1838	Laridae	Lay eggs near the roots
Long-tailed shrike	<i>Lanius schach</i> Linnaeus, 1758	Laniidae	Perch
Pied bushchat	<i>Saxicola caprata</i> Linnaeus, 1766	Muscicapidae	Perch on the grass in search of insects
Red munia	<i>Amandava amandava</i> Linnaeus, 1758	Estrildidae	Food and use the inflorescence of grass to make nests
Red-whiskered bulbul	<i>Pycnonotus jocosus</i> Linnaeus, 1758	Pycnonotidae	Perch
River tern	<i>Sterna aurantia</i> Gray JE, 1831	Laridae	Lay eggs near the roots
Scaly-breasted munia	<i>Lonchura punctulata</i> Linnaeus, 1758	Estrildidae	Food and use the inflorescence of grass to make nests

Tricoloured munia	<i>Lonchura malacca</i> Linnaeus, 1766	Estrildidae	Food and use the inflorescence of grass to make nests
Yellow-eyed babbler	<i>Chrysomma sinense</i> Gmelin JF, 1789	Paradoxornithidae	Perch



Figure 1: Relation of waterbirds with *Saccharum spontaneum*



Figure 2: Interaction of Scaly-breasted munia with *Saccharum spontaneum*

There is very little documentation of the interactions between birds and *Saccharum spontaneum*. Akash *et al.*, (2018) reported 10 native birds directly associated with *Saccharum-Imperata* grasslands in a northwestern tea estate in Bangladesh between November 2015 and May 2016. In 2022, Pandian reported the nesting habits of tricoloured munia in the wetlands of Veedur Reservoir in Viluppuram district, Tamil Nadu where the nests were lined with dried spikelets of *S. spontaneum*.

CONCLUSION

From the conducted study, it was concluded that every component in the ecosystem is essential for its proper functioning and balance. The interaction between small birds and the grass is mutually beneficial and is essential for their survival. Due to the anthropogenic issues of urbanization and population rise, there are drastic changes in the present climatic conditions. Day by day rivers are drying up and wetlands are lost threatening the bird population because of the loss of plants on which they depend for food, nesting, breeding, and other requirements. The study shows the interdependence of birds and grasses and recommends the protection of these associations by conservation and plantation of native grass meadows especially in the urban and semi-urban areas.

ACKNOWLEDGEMENT

Authors are thankful to the DFO, Rourkela Forest Division, Odisha, India.

REFERENCES

- Akash M, Khan T and Chowdhury SU. (2018). Association of grassland birds with *Saccharum-Imperata* patch in a northeastern tea estate of Bangladesh. *Journal of Threatened Taxa*. 10(7): 11831–11843.
- Bebarta L, Majhi S, Subhadarshini A, Mohanty A and Kumar S. (2023). Establishment of the relationship between Indian Skimmer and their foods. *Zoo's Print* 38(8): 22–24.
- Chandra S, Kumar M, Bala A, Kaur H, Mishra S and Kumar S. (2024). *Saccharum spontaneum*: a medicinally important grass of India. In: Das A, Das K, Mishra S and Kumar S. (2024). *Medicinal Poaceae of India Vol. I*. APRF Publishers, Odisha, India. pp 1-9.
- Dalasingh BK, Mahalik G and Parida S. (2018). Study on the use of plants and plant parts in Durga Puja for worshipping of the Goddess Durga in Odisha, India. *International Journal of Management, Technology and Engineering*. 8(12): 2911-2918.
- Das A, Tallur PN, Bhat SS, Topno SC, Creado R, Rout S and Kumar S. (2023). Birds and their associated medicinal plants: a conservation aspect. In: Dimri R, Sharma BP, Kumar A, Behera B and Kumar S. (2023). *Medico Biowealth of India-VIII*. APRF Publishers, Odisha, India. pp 108-115.
- Grimmett R, Inskipp C and Inskipp T. (2011). *Birds of the Indian Subcontinent*. Bloomsbury Publishing India Pvt. Ltd. pp 1-528.

- Mahanti P and Kumar S. (2016). A check list of avifaunal diversity in semi-urban areas of Cuttack, India: implication on conservation and environmental studies. *International Research Journal of Environmental Sciences*. 5(7): 24-32.
- Pandey VC, Bajpai O, Pandey DN and Singh N. (2015). *Saccharum spontaneum*: an underutilized tall grass for revegetation and restoration programs. *Genetic Resources and Crop Evolution*. 62: 443-450.
- Pandian M. (2022). Nesting habits of the Tricoloured Munia *Lonchura malacca* in Veedur Reservoir in Viluppuram District, Tamil Nadu, India. *Indian BIRDS*. 18 (5): 135–141.
- Saxena HO and Brahmam M. (1996). *The Flora of Orissa*. Regional Research Laboratory, Bhubaneswar. Orissa Forest Development Corporation Ltd., Bhubaneswar, Odisha. 4: 2474-2475.