

Insectivorous Birds of Paddy Ecosystem at Cuttack, India

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SUMMARY

Intensive research on insectivorous birds and their conservation, on the other hand, could revolutionise integrated pest management. Insectivorous birds can assist reduction in production costs by devouring a large number of insect pests in the paddy fields. These insectivorous birds are important bio-control agents of insect pests of paddy ecosystems. Provision of diversified habitats which include tall shrubs and trees can help in the conservation of insectivorous birds like Black drongo, House sparrow, and common myna etc. Some of the important bird conservation techniques to protect birds in paddy ecosystems include erection of bird perches in the field till the milky stage of the crop, planting of trees and shrubs, maintenance of water bodies, organic farming etc. for foraging of insectivorous birds.

INTRODUCTION

India is the world's 2nd largest rice producing and largest rice exporting (37.5%) country of the world (India Today, 2021; World top export, 2020). Rice production is influenced by several yield limiting abiotic and biotic factors. Among the biotic factors insect pests are constant threats for rice production in most Asian countries. This crop ecosystem is home to nearly 1,300 species of birds (Sundar *et al.*, 2010). Birds are homeothermic, belonging to Phylum Chordata and class Aves. Birds are beneficial in the crop fields due to their insectivorous guilds. Bird survey methods like line transects were conducted to identify the predatory birds in the fields of ICAR-National Rice Research Institute (NRRI), Cuttack. During transect walk in the morning and evening hours several bird species were noticed feeding in the unploughed land with rice stubbles and some were also noticed during the cropping season. Some of the bird species were noticed in flocks while some wandered singly. These birds construct their shelters near paddy agro-ecosystems for their primary requirements of food, shelter, roosting, resting and nesting sites for their survival. The availability of a various kinds of food sources for both adults and nestlings, safe habitat for their roosting/nesting in and around the paddy fields are essential for the abundance of insectivorous bird populations. During the observations at different crop developmental stages *viz.* transplantation stage, tillering stage, boot leaf stage, harvesting stage and post-harvest stage in the fallow land with rice stubbles the presence of certain bird species were noticed. Adjacent to NRRI rice fields, forests trees of National Bureau of Plant Genetic Resources (NBPGR)-base centre also provided a good cover for nesting as well as foraging sites for insectivorous birds in the paddy fields. The presence of diversified insects *viz.* yellow stem borer, pink stem borer, rice leaf folder etc. in the paddy fields attracted the insectivorous birds. These insectivorous birds are important bio-control agents of insect pests of paddy ecosystems. At ICAR-NRRI field white egret was seen at ploughing and land preparation stage of the crop. Other birds associated with paddy ecosystem were *viz.*, Great egret, House sparrow, Paddy field Pipit, Paddy field Warbler, Common myna, House Crow, Common Weaver Bird and Fork-tailed drongo during the cropping season. This article documents the insectivorous avifauna associated with paddy ecosystem along with eco-friendly management practices for their conservation.

Great egret: *Ardea alba* (Family: Ardeidae)



The great egret or the large egret or common egret is widely distributed throughout India. This bird walks with its extended neck and wings held in close position and forages in fallow rice land with stubbles in search of insects. It can also be seen in ploughed paddy land where they search for the hibernating stages of the exposed insects. The male builds a nest close to water with long sticks and twigs. Female lays six bluish green eggs at one time and both the sexes share the duties associated with incubation and feeding of the young ones.

House sparrow: *Passer domesticus* (Linn.)(Family: Passeridae)



This bird is common in plains & mountains. It is an opportunistic eater, omnivorous, feeding on all kinds of food grains, fruit-buds, flower nectar, insects and kitchen scraps. They visit the ripening paddy fields in search of food. They construct their nests in house roofs and medium sized trees with dried grass and feathers and breed throughout the year. A female bird generally lays 3-5 eggs. All the duties for raising the young ones are shared by both the sexes.

Paddy field Pipit: *Anthusru fulus* (Family: Motacillidae)



The paddy field pipit is a small passerine non-migratory bird, resident breeder in open scrubs, and grasslands. They run rapidly on the ground and breeds throughout the year but mainly during dry season. The nests are woven with leaves and grass normally cup shaped. Nests are lined with finer roots or grass. It feeds principally on different species of insects, tiny snails, worms *etc.* While walking on the ground they chase insects like mosquitoes or termites in the air. They breed throughout the year, but mostly in the dry season. Paddy field pipit generally lays 3-7 eggs. Both the sexes are involved in raising the young ones.

Paddy field Warbler: *Acrocephalus agricola* (Family: Acrocephalidae)



The paddy field warbler is migratory bird, wintering in India, Bangladesh and Pakistan. This bird is found in low vegetation such as long grass and rice fields. The adult is insectivorous. They breed in summer from May to August. During the breeding season, males and females will build its nest with grass in the reed beds.

Female lays generally a clutch of four to six eggs. They found during the crop season at various developmental stages in search of diversified insects.

Common myna: *Acridotheres tristis* (Linn.)(Family: Saturnidae)



This is one of the most common birds visits the fields of paddy during all the developmental stages. This is found in all paddy growing areas of India. These birds live in pairs or in groups and also feed on the grasshoppers, fruits, earthworms etc. Nests are built in the vicinity of paddy fields on tree holes and breeding is from April to August with two broods in succession. Female lays 4-5 glossy blue eggs which incubate at a time. Domestic

duties will be shared by both the sexes for raising the young ones.

House Crow: *Corvus splendens* (Vieillot) (Family: Corvidae)



This is common bird is distributed throughout the plains of Indian Subcontinent. The bird is intelligent and lookout for stealing titbits. The house-crow no doubt is omnivorous, but also eats the invertebrates like insects of the paddy ecosystem. The bird abounds in the, vicinity of towns and villages, living in close association with human beings and make nests on tree branches with a small depression in the centre for raising the young ones. Female lays 3-5 eggs. The breeding season is from April to June. Domestic duties will be shared by both the sexes for raising the young ones.

Common Weaver Bird: *Ploceus philippinus* (Linn.)(Family: Ploceidae)



Distributed all over India. The breeding season of the baya weavers is during the monsoons. The bird roosts in a large number as governed by seasonal behaviour. Both males and females are polygamous. Male birds build

intricately and compactly woven, retort shaped nest having a long vertical entrance tube, using paddy/palm leaves and in clusters hanging from the palm trees near ponds or water bodies. Female lays 2-4 pure white eggs. They feed on insects including butterflies, sometimes carrying them specially to feed their young ones.

Fork-tailed drongo, *Dicrurus adsimilis* (Family: Dicruridae)



These insectivorous birds are usually found in paddy fields of Indian subcontinent. They are mostly carnivorous and can go for flycatch or obtain prey from the ground. Drongos are mostly black with forked tails and some are having tail decorations. They are short-legged birds, with an upright stance when perched. These birds are known to be associated with paddy at tillering and flagleaf stage and feed on insects which they catch in flight or on the ground. The females lay 2 to 5 eggs in a season. Both parents look after the eggs and protect them. Even after hatching both parents feed their young ones and share the domestic duties.

Bird Conservation Techniques

Some of the following measures to protect birds in paddy ecosystems include

- Bird perches erected in the field till the milky stage of the crop helps for foraging of these insectivorous birds.
- Hedges and shrubs plantation around fields for birds nesting and shelter sites.
- Maintaining water bodies at local level to protect wetland birds and providing nesting and roosting sites near the paddy ecosystems.
- Electric poles and wires in the paddy ecosystem are useful as bird perching sites
- Placing of water-troughs to attract ground predatory birds like wagtails.
- Organic farming with biofertilizers and biopesticides should be promoted
- Maintain forest cover near villages. Additionally, multicropping or mixed cropping and ecological engineering favours specific diversity of insects which will indirectly enhance the bio-control activity of insect pests of paddy -ecosystems. All these invertebrates are important food sources for cuckoo-shrikes, honeyeaters, hornbills, passerines and whistlers.
- Provision of diversified habitats which include tall shrubs and trees can help in the conservation of insectivorous birds like Blackdrongo, House sparrow, and common myna etc. which will help in the management of harmful insects in agricultural fields.

CONCLUSION

Paddy agro-ecosystem, supports a diverse range of invertebrates and vertebrates with a variety of feeding habits. Insect pests cause damage the crops and resulting in vast economic losses to the farmers. Insectivorous birds can assist reduction in production costs by devouring a large number of insect pests. Bird sheltering in the paddy agro-ecosystem is a long-standing tradition. Intensive research on insectivorous birds and their conservation, on the other hand, could revolutionise integrated pest management.

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