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Diversity of birds at crop fields of Mondouri, West Bengal

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ABSTRACT

The study was carried out in Teaching Farm, Mondouri (22.941842N, 88.513064E) under Bidhan Chandra Krishi Viswavidyalaya, Nadia and West Bengal during June 2015 to April 2016. Landscapes of the area can be classified into two major categories: agricultural fields and non-agricultural areas. Observations on birds were taken twice a week, at early morning, starting from just after the sunrise around 7a.m and till before sunset up to 5.30 pm. Data were collected by using the line transect method. Total 74 number of bird species were recorded which belonged to 18 orders. Out of 74 bird species 23 species (31.08%) were recorded as insectivorous, 16 species (21.62%) as omnivorous, 13 species (17.57%) as granivorous, 11 species (14.86%) as carnivorous, 7 species (9.45%) as frugivorous, 2 species were piscivorous (2.70%) and nectarivorous (2.70%). During the study, total fifteen species (20.27%) were recorded as local migratory, nine species (12.16%) were recorded to be winter migratory and rest of the 50 species (67.57%) were recorded as resident.

Keywords: Birds, Crop field, West Bengal, Agricultural fields, Non-agricultural areas

Introduction

Without having a clear understanding of the ecological principles and possible benefits out of ecosystem services suitable growth in crop production is not possible. Amongst all other organisms interacting within agro ecosystems the role of the birds possibly are least understood. It has been observed that species richness of birds, its density and frequency has decreased due to intensive agricultural practices (Fischera et al. 2011). Birds fulfil many ecological functions in their habitats. For instance, they are bioindicators of healthy ecosystems (Mistry et al. 2008; Slabbekoorn & Ripmeester, 2008). In addition, insectivorous species and raptors regulate disease vectors, including mosquitoes and rodents. Birds consume large numbers of harmful insects, as well as their eggs and larvae, which serves as a biological control agent of insect pests. They play an important role in controlling population of different insects and pests. Scavenger birds contribute to biomass recycling and to some degree reduce levels of disposable wastes. Frugivorous birds play an important role in seed dispersal of fleshy fruit-producing plants (Stevenson & Fanshawe 2002). Birds are also important in plant pollination as demonstrated by sunbirds, which participate in crossbreeding of flowering plants, especially those with bird-pollination syndrome (Judd et al. 2008).They are helpful and help to provide rich food for mankind and are known to man since ages (Chittampalli & Bhatkhande 1993). Very few information is available on the species diversity of the pests and beneficial birds from agricultural field in West Bengal. The present study was conducted with a view to find out different species of birds, their habits and habitats. The special focus was given on finding of crop pests and beneficial birds.

Materials and methods

Study Area

The present study area is situated in the Teaching

Farm, Mondouri (22.9418420 N, 88.5130640E) of Bidhan Chandra Krishi Viswavidyalaya, West Bengal (India). The study area was of cropped and non-cropped lands of 225 acres and observations were taken in June-April of 2015-16.

Landscape Stratification

Landscapes of the area were classified into two major categories: agricultural fields and non-agricultural areas. Agricultural fields included cultivated land where different types of cereals, vegetables, flowers and fruit crops were predominant. In non-agricultural areas, stream banks, roads and built-up areas included institutional buildings were located.

Data Collection

Birds were identified either visually (based on the size and shape of the bird's body, wings, head, feet, beak, flying characteristics, acts and colours of feathers) or by their calls. The observations were taken twice a week, at early morning, starting from just after the sunrise around 7am and till before sunset up to 5.30 pm. Data were collected by using the line transect method (Bibby et al. 2000) during June-April of 2015-16. The detailed bird species observed by using binoculars (8 X 40, Make: Pentax) and field guidebook (Ali 2002). The status of individual bird was enlisted as: migratory; resident; common; rare; winter migrant; and summer migrant.

Results

Altogether 74 number of bird species were recorded (Table 1) which belonged to 18 orders and the results showed that there was a difference in bird richness and diversity among the habitats of the area of study. Out of 74 bird species 23 species (31.08%) were recorded as insectivorous, 16 species (21.62%) omnivorous, 13 species (17.57%) as granivorous, 11 species (14.86%) as carnivorous, 7 species (9.45%) as frugivorous, and the 2 species were piscivorous (2.70%) and nectarivorous (2.70%). During the study, fifteen species (20.27%) were recorded as local migratory (LM) *viz*., Little egret (*Egretta garzetta*), Grey heron (*Ardea cinerea*), Cinnamon bittern (*Ixobrychus cinnamomeus*), Median egret (*Mesophoyx intermedia),* Crested serpent eagle (*Spilornis cheela*), Pied kingfisher (*Ceryle rudis*), Tricoloured munia (*Lonchura Malacca*), Indian silverbill (*Lonchura malabarica*), Baya weaver (*Ploceus philippinus*), Little grebe (*Tachybaptus ruficollis*), Alexandrine parakeet (*Psittacula eupatria*), Plum headed parakeet (*Psittacula cyanocephala*), Chestnut tailed starling (*Sturnus malabaricus) and* Brahminey starling (*Sturnus pagodarum*). Nine species (12.16%) were recorded to be winter migratory *viz*., Brown shrike (*Lanius cristatus*), Longtailed shrike (*Lanius schach*), White wagtail (*Motacilla alba*), Citrine wagtail (*Motacilla citreola*), Yellow wagtail (*Motacilla flava*), Grey wagtail (*Motacilla cinerea*), Paddyfield pipit (*Anthus rufulus*), Green bee-eater (*Merops orientalis)* and rest of the 50 species (67.57%) were recorded as resident (Table 1). Pied kingfisher (*Ceryle rudis*), Tri-coloured munia (*Lonchura Malacca*) were found to be uncommon birds belong to the order Coraciiformes and Passeriformes. Little egret (*Egretta garzetta*) and Median egret (*Mesophoyx intermedia*) were found as rare species in this particular farm.

Discussion

Bird's species richness, density and their frequency of visits are dependent on the land-use pattern and seasons (Bolwig et al. 2006). The food availability and habitats may be the main factors of variation in the birds' populations (Ali et al. 2011). There were 74 species of birds recorded in the different habitats (agricultural field and non agricultural areas) during the study in the year 2015-16. It indicated the diversity and richness of birds' species because of continuous availability of food, suitable place for nesting and breeding. During the study it had been found that bird diversity in agricultural land was less than non-agricultural habitats, whereas birds used non-agricultural habitats due to food availability in the vicinity good nesting and breeding. In the study, it was found that at the time of cropping they were found to visit the field frequently for food. Otherwise they preferred non-agricultural areas for their nesting in large tree, fallow land, herbs, shrubs etc. Birds are normally found foraging in open cultivated tracks and grasslands intermixed with scrub forests (Grimmett et al. 2008). During June to April due to the intensive cultivation of cereals, vegetables and fruits abundance of

Table 1.
Details of species recorded during the study

Order	Family	Common Name	Scientific Name	Abun-dance	Status	Feed-ing guild
Accripitriformes	Accipitridae	Black kite	*Milvus migrans*	C	R	O
		Crested serpent eagle	*Spilornis cheela*	C	LM	O
		Shikra	*Accipiter badius*	C	R	O
		Oriental honey buzzard	*Pernis ptilorhynchus*	C	R	O
Alcedinidae	Halcyonidae	White breasted kingfisher	*Halcyon smyrnensis*	C	R	C
Anseriformes	Anatidae	Lesser Whistling Duck	*Dendrocygna javanica*	C	LM	C
Apodiformes	Apotidae	Asian Palm Swift	*Cypsiurus balasiensis*	C	R	I
Bucerotiformes	Upupidae	Hoopoe	*Upupa epops*	C	R	I
Charadriformes	Charadridae	Red wattled lapwing	*Vanellus indicus*	C	R	I
Columbiformes	Columbidae	Spotted dove	*Spilopelia chinensis*	C	R	G
		Red collared dove	*Streptopelia tranquebar-ica*	C	R	G
		Eurassian collared dove	*Streptopelia decaocto*	C	R	G
		Rock pigeon	*Columba livia*	C	R	G
		Yellow footed green pigeon	*Treron phoenicoptera*	C	R	F
Coraciiformes	Alcedinidae	Common kingfisher	*Alcedo atthis*	C	R	C
	Cerylidae	Pied kingfisher	*Ceryle rudis*	UC	LM	P
	Meropidae	Green bee eater	*Merops orientalis*	C	WM	I
	Colacidae	Indian roller	*Coracias benghalensis*	C	R	I
Ciconeformes	Ciconidae	Asian openbilled stork	*Anastomus oscitans*	C	R	C
Cuculiforme	Cuculidae	Asian koel	*Eudynamys scolopaceus*	C	R	F
		Greater coucal	*Centropus sinensis*	C	R	O
		Common hawk cuckoo	*Hierococcyx varius*	C	R	I
Gruiformes	Rallidae	White breasted waterhen	*Amaurornis phoenicurus*	C	R	O
Peleceniformes	Ardeidae	Cattle egret	*Bubulcus ibis*	C	R	C
		Little egret	*Egretta garzetta*	R	LM	C
		Indian pond heron	*Ardeola grayii*	C	R	C
		Grey heron	*Ardea cinerea*	C	LM	C
		Cinnamon bittern	*Ixobrychus cinnamomeus*	O	LM	O
		Median egret	*Mesophoyx intermedia*	R	LM	C
Passeriformes	Aegithinidae	Common iora	*Aegithina tiphia*	C	R	I
	Alaudidae	Bengal bushlark	*Mirafra assamica*	C	R	G
	Cisticolidae	Common tailor bird	*Orthotomus sutorius*	C	R	I
		Plain prinia	*Prinia inornata*	C	R	I
		Zitting cisticola	*Cisticola juncidis*	C	R	I
	Pycnonotidae	Red vented bulbul	*Pycnonotus cafer*	C	R	F
		Red whiskered bulbul	*Pycnonotus jacosus*	C	R	F
	Sturnidae	Common myna	*Acridotheres tristis*	C	R	O
		Jungle myna	*Acridotheres fuscus*	C	R	O
		Chestnut tailed starling	*Sturnus malabaricus*	C	LM	O

Passeriformes		Brahminey starling	*Sturnus pagodarum*	O	LM	O
	Plocidae	Baya weaver	*Ploceus philippinus*	O	LM	G
	Picidae	Black rumped flameback	*Dinopium benghalense*	C	R	I
		Fulvous breasted woodpecker	*Dendrocopos macei*	C	R	I
	Oriolidae	Black hooded oriole	*Oriolus xanthornus*	C	R	I
	Passeridae	House sparrow	*Passer domesticus*	C	R	I
	Nectarinidae	Purple sunbird	*Nectarinia asiatica*	C	R	N
		Purple rumped sunbird	*Nectarinia zeylonica*	C	R	N
	Muscicapidae	Oriental magpie robin	*Copsychus saularis*	C	R	I
		Bluethroat	*Luscinia svecica*	C	WM	I
	Lanidae	Brown shrike	*Lanius cristatus*	C	WM	I
		Longtailed shrike	*Lanius schach*	C	WM	I
	Leiothrichidae	Jungle babbler	*Turdoides striata*	C	R	O
	Motacillidae	White wagtail	*Motacilla alba*	C	WM	I
		Citrine wagtail	*Motacilla citreola*	O	WM	I
		Yellow wagtail	*Motacilla flava*	O	WM	I
		Grey wagtail	*Motacilla cinerea*	C	WM	I
		Paddyfield pipit	*Anthus rufulus*	C	WM	I
	Dicruridae	Black drongo	*Dicrurus macrocercus*	C	R	C
	Estrilidae	Indian silverbill	*Lonchura malabarica*	O	LM	G
		Scaly breasted munia	*Lonchura punctulata*	C	R	G
		Tricoloured munia	*Lonchura malacca*	UC	LM	G
		White rumped munia	*Lonchura striata*	C	R	G
	Corvidae	House crow	*Corvus splendens*	C	R	O
		Roufous tree -pie	*Dendrocritta vagabanda*	C	R	O
		Jungle crow	*Corvus macrorhynchus*	C	R	O
Piciformes	Megalaimidae	Lineated barbet	*Megalaima lineata*	C	R	F
		Blue throated barbet	*Megalaima asiatica*	C	R	F
		Coppersmith barbet	*Megalaima haemacephala*	C	R	F
Podicipediformes	Podicipedidae	Little grebe	*Tachybaptus ruficollis*	O	LM	O
Psittaciformes	Psittacidae	Rose ringed parakeet	*Psittacula krameri*	C	R	G
		Alexandrine parakeet	*Psittacula eupatria*	O	LM	G
		Plum headed parakeet	*Psittacula cyanocephala*	O	LM	G
Strigiformes	Strigidae	Spotted owlet	*Athena brama*	C	R	C
Suliformes	Phalacrocracidae	Little cormorant	*Phalacrocoras niger*	C	R	P

bird species in huge number particularly scaly breasted munia (*Lonchura punctulata*), tri-coloured munia (*Lonchura malacca*), Common myna (*Acridotheres tristis*), Coppersmith barbet (*Megalaima haemacephala*), Spotted dove (*Streptopelia chinensis*) and rose ringed parakeet (*Psittacula krameri*) was noticeable. However, seasonal variations also influence the bird species and diversity within the region (Natarajan et al. 2013). In this study, house crow (*Corvus splendens*), copper smith barbet, scaly breasted munia,

tri-coloured munia, jungle myna, cattle egret, lineated barbet, bulbuls, house sparrow, rose ringed parakeet and common mynas were found as resident birds. Rose ringed parakeet, house crow, house sparrow, mynas, and bulbuls were common among the resident birds (Awan et al. 2004). The bird species common myna, Indian roller, common iora, house sparrow, paddy field pipit, brown shrike, and small green bee-eater played an important role in predation on insects. It was observed that rose ringed parakeet, Indian silver bill, tri-coloured munia, scaly breasted munia, spotted dove, red collared dove and rock pigeon fed on grain. Lineated barbet, copper smith barbet, blue throated barbet, red vented bulbul and Asian koel was found to be frugivorous. House sparrow fed on grain, insects, weed seeds, fruit buds, nectar (Bhattacharya et al. 2011). Little cormorant, *P. niger* was found as fish eating, migratory cum resident bird and commonly found in water bodies (Muhammad et al. 2016). Similarly, in the resent study, little cormorant and pied kingfisher were found as fish eating birds.

As a sum up this can be spelt out that this is a unique study, conducted for the first time in the crop fields of lower Gangetic alluvium of West Bengal. Altogether 74 numbers of bird species were recorded; of these 31.08% were insectivorous, 21.62% omnivorous, 17.57% granivorous, 14.86% carnivorous, 9.45% frugivorous, 2.70% piscivorous and 2.70% nectarivorous. However, amongst the insects used as bords food what was the share of the crop pests could not be determined in the present study. But this can clearly be spelt out that the majority of the birds frequenting in crop fields are not damaging the crops, conversely help in managing insect pests and also help in pollination. Hence in the intensified crop production technology, majority of the birds need not be treated as pests. Specific bird-pest may warrant management on certain crop fields or orchards but not universally. However, poor understanding of the ecological services has impacted bird populations negatively which in turn makes crop production technology costlier.

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