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RESEARCH ARTICLE

PRELIMINARY OBSERVATIONS ON THE FOOD PREFERENCE OF BIRD'S INHIBITING IN VARIOUS CROPLAND SYSTEM OF TANDOJAM

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ABSTRACT

Passeriformes bird's are generally regarded as insectivorous bird's. These avian predators play paramount role to control the insect pest population form different cropland and forest ecosystem. Bird population occurring in the croplands of Tandojam during the year 2015 was pertaining to order Passeriformes including Common Babbler, Common Myna, House Sparrow, Indian Wren Warbler, Jungle Babbler, Rosy Pastor, Yellow throated Sparrow, Common Wood Shrike, Gray Wagtail and Crow were mainly insectivorous, whereas, Pigeon and Parrot belong to Columbiformes and Psittaciformes found occasional insectivorous. Beside this, status of 9 bird species were resident and only 3 species i.e Rosy Pastor, Grey wagtail and Yellow throated Sparrow were migrant in nature. Among the most dominant bird species, the Jungle Babbler and Common Myna were of significantly important, they exclusively derived their food from insect source. It was observed that insect based food was dominated by the order Hymenoptera compose on ants and thin larvae and wasps and their larvae, Hemiptera comprise on bugs, scale insects, aphids and lice. This study support to implement conservation tactics to increase the bird populations in different cropland ecosystems where they could function as a biological control agent of insect pests.

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INTRODUCTION

Food is a factor of considerable economic importance in bird's life to maintain their higher metabolic rate. They may confine to specific or different food types. Passeriformes bird's are generally regarded as insectivorous bird's. Avian predators play paramount role to control the insect's pest population form grassland, sandy and forest ecosystem. They are aerial acrobats and consumed thousands of insects in their life, many of which were consider pests of rice, sugarcane, wheat, maize, fruits and vegetable. Notorious insects pest of these cropland are grasshoppers, locusts, mosquitoes, beetles, and moths. Bird's also feed on juvenile stages of many insets species. In a single meal they can eat huge quantities of adults and larvae of insects, which are believe to be enriched in protein contents necessary for their growth. Insectivorous bird's are important for reducing population density and community organization of insect pest through different ways viz. decrementing insect population size and regulating transmutations in population structure, species diversity and taxonomic composition (Joren, 1986). Insectivorous bird's filled their stomach five to six times daily (Baily, 1905). Passerine bird's species empty their gizzard after each repast in about one and one moiety hour to two and one moiety hour (Stevenson, 1933). Unfortunately, in Pakistan introducing bird's as predator to control insect pest population is quite new technique. Recently, (Hussain and Afzal, 2005) recorded a total of 32 bird's species including 31 Passeriformes and one coraciiform from the agro-ecosystem of Multan. Most of them were found residential and few were migratory in nature. They were chiefly alimenting on the insects belonging to the orders Hymenoptera and Hemiptera. Hopefully this fundamental study will be fruitful to enlist insectivorous bird's and their preferable prey in the cropland of Tandojam. Present study highlights that many insect's pest species occurring in different agriculture field where bird's feed on them.

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MATERIALS AND METHOD

Bird's Sampling: Samples of bird's were obtained from wheat, sugarcane, sunflower, vegetables, and fruits occurring

in Haji MS Baloch, SAU Horticulture, S.A.U, L.A Farm, Malir Farm were visited time to time during the year 2015. Collected bird's were mostly resident. The collection of bird's samples were made during January to December 2015 and alive bird's captured through trapping with mist nets from various cropland and purchased bird's were provided live insects stock. For the collection methodology given by (Hussain and Afzal, 2005) was applied.

Identification of Bird's

Bird's are in dimorphic in nature. They show visible differences between male and female. In most cases, male bird's sport brighter and bolder colors to attract mates during the breeding season. Female are usually duller, with less distinctive markings that make it easier to blend in to the surroundings while they mind a nest or protect young bird's. For the identification of resident and migratory birds identification keys of Ali and Ripley 1983 and Roberts, 1992 were used.

Dissection of bird's and organ examination

Captured bird's were dissected immediately after collection and gizzard were removed and packed in polythene bags and tagged properly. Gizzards were frozen within 2 hours. Purchased bird's were dissected within 2 hour after providing insect meal. Selected bird's from the entire group were fully anesthetized or killed and transferred in a dissecting tray. The bird's were kept such way that ventral side exposed clearly. The feathers from abdominal and cloacal side removed and cleaned several times with spirit after that a longitudinal cut was given from anus to anterior part of the body to remove the abdominal wall. Later on, another cut was given through large scissor to cut the hard Sternum bone. After that, Sternum was lifted consciously and visceral organ were removed from body cavity one by one and kept in normal saline or distil water. Moreover, an internal content of gizzard was observed carefully under stereoscopic binocular dissecting microscope (4 X) for the separation of plants and insect contents following (Hussain and Afzal, 2005).

Statistical Examination

Experimental data was subject to one way analysis of variance (ANOVA) version (SPSS 16.0) with significant and non-significant lettering applying (LSD) values.

RESULTS

Passeriformes bird's occurring in the cropland system of Tandojam mainly feeding on insects including Common Babbler, Common Myna, House sparrow, Indian Wren Warbler, Jungle Babbler, Rosy Pastor, Yellow throated Sparrow, Common Wood Shrike, Grey Wagtail and Crow. Whereas, Pigeon and Parrot belongs to Columbiformes and Psittaciformes were also feeding different insects when their density in the field rose and easily available to them (Table I). House sparrow and common Myna were more common in fields as compare to Grey wagtail and Pigeon. Beside this, status of the bird's were also noted carefully in study area and found that 9 species were resident and only 3 species i.e Rosy Pastor, Grey wagtail and Yellow throated Sparrow were found migrant in nature.

Resident bird's were captured for dissection and examination of gut content. (Table II-III) showing that body weight was in favor of male except common Myna. More than one third of the bird species captured had exclusively feed on insect food. Among the most dominant bird's species, the Jungle Babbler and Common Myna were of significantly important because they exclusively derived their food from insect source. Beside this, Pigeon and Parrot ratio of plant based food was dominant during the vegetables and fruit season while its proportion was almost balanced with insect's contents in other croplands seasons. It was noticed the food derived from plant sources was based on the grains and seeds (Table III). It was observed that insect based food was dominated by the order Hymenoptera compose on ants and thin larvae and wasps and their larvae, Hemiptera comprise on Bugs, Scale insects, Aphids and Lice. Common Aphids and Thrips were major component in the food of Indian Wren Warbler found dominated in the field (Table IV).

Table 1. Status of bird's species observed from different croplands ecosystem of Tandojam

S.No.	Common Name	Scientific Name	Family	Status
1	Common Babbler	*Turdoides caudate* *	Timaliidae	Resident
2	House Sparrow	*Passer domesticus* *	Passeridae	Resident
3	Common Myna	*Acridotheres tristis* *	Sturnidae	Resident
4	Indian Wren Warbler	*Prinia familiaris* *	Sylviidae	Resident
5	Jungle Babbler	*Turdoides striatus* *	Timaliidae	Resident
6	Rosy Pastor	*Sturnus roseus* ^{o}	Sturnidae	Migrant
7	Yellow Throated Sparrow	*Petronia xanthocollis* ^{o}	Passeridae	Migrant
8	Common Wood Shrike	*Tenphro dornis* *	Laniidae	Resident
9	Grey Wagtail	*Motacilla cinerea* ^{o}	Motacillidae	Migrant
10	Crow	*Corvus splendens* *	Corvidae	Resident
11	Pigeon	*Columba albitorques* *	Columbidae	Resident
12	Parrot	*Psittacula krameri* *	Psittaculidae	Resident

Note: * = Resident, ^{O} = Migrant

Table 2. Body weight of the different bird's species occurring in different fields of Tandojam

Bird's Species	Body weight of Male (gm) (Mean±SD)	Body weight of Female (gm) (Mean±SD)
Jungle Babbler	78.08±10.39	74± 8.91
House Sparrow	31.38 ±4.82	27.28 ±2.00
Common Myna	100.5±54.58	106.28± 19.56
Crow	480.14±114.19	337.18±43.83
Parrot	129.98± 10.28	116.82±4.19
Pigeon	503.42 ±130.71	348.46±76.50
Yellow throated Sparrow	33.38 ±6.12	26.46±3.94

Table 3. Food preference of bird's species inhabiting in various cropland system of Tandojam

Species	No. of samples dissected (n=64)	Crop	Proportion %of food in gizzard contents	
			Plant %	Insect%
Indian Wren Warbler	03	Wheat	45.9	54.1
Common Myna	12	Sunflower	29.3	70.8
House Sparrow	10	Cotton	59.7	40.3
Jungle Babbler	10	Wheat	21.0	79.0
Yellow throated Sparrow	02	Vegetables	48.0	52.0
Crow	14	Sugarcane	36.0	64.0
Pigeon	09	Vegetables	68.2	31.8
Parrot	04	Fruit farm	74.0	26.0

Table 4. The orders of different insects preferable by Bird's

S.No.	Order	Insect
1.	Hymenoptera	Ant larvae, Leaf cutter, Ants, Wasps and their larvae
2.	Diptera	Mosquitoes, Fruit flies, Haver flies, Black flies
3.	Thysanoptera	Thrips
4.	Hemiptera	Bugs, Aphids, Scale insects
5.	Isoptera	Subterranean termites
6.	Lepidoptera	Army worm, American boll worm, Citrus butterfly
7.	Coleoptera	Beetles
8.	Orthoptera	Locust, Grasshoppers
9.	Dictoptera	Praying mantis

DISCUSSION

During present survey, we have recorded 12 species of bird's among them 09 resident and 03 were migrant. Moreover, Common Myna and Jungle Babbler are special significance as they were feeding directly on insect populations. It was thoroughly observed that these species have higher thread from the prevailing risk of pesticides similar observation was also reported by (Jabber *et al.,* 1993; Hasnain, 1999). Common Myna was usually found near human dwellings, mango and citrus orchards and livestock. However, Jungle Babblers were seen in mango and citrus orchards and under trees and on the boundaries of the crop fields. Indian wren warbler was the most important small bird's that have normal distribution in the open crop lands. (Hussain and Afzal, 2005) reported 32 bird's species including 31 Passeriformes and one Coraciiform were recorded from the cropland of Multan of while 23 were resident while the remaining was migrant. Beside this, large numbers of insects belonging to Hymenoptera, Diptera, Thysanoptera, Hemiptera and Isoptera were came in collection overall it was noticed that bird's prefer to eat these insects. (Irshad and Mirza, 2011) reported 04 insectivorous bird species from Ravi riverine habitats. Black Mynas and Black Drongos exclusively feeding on insect source for about one sixth of their body weight while, Cattle Egret and Crested Lark devoted one third of their body weight daily. (Smith and Popov, 1953) observed thousands of eagles and falcons feeding for days on a swarm containing tens of millions of locusts. This study support to implement conservational tactics to increase the bird's populations in the vegetables, fruit field, sunflower field, wheat field, and sugarcane field so that they could function as biological control agent of insect pests, an essential component of IPM strategies. (Risser *et al.,* 1981) reported that insect population significantly decrease in forest system, it was necessary to demonstrate similar results in grasslands. This is the first attempt of such comparative examination of co-existing population of bird's and insects in this permissive. Present study, recommends that resources of bird species should be saved and hunting of bird's at local level must be banned.

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