



DEPREDATORY BIRDS AND THEIR MANAGEMENT IN OPEN GRAIN STORAGE FACILITIES OF PUNJAB

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ABSTRACT

This study evaluates the relative abundance of depredatory birds and their management in open grain storage facilities of Punjab. Maximum relative abundance of blue rock pigeon observed. This is due to food availability and it is the major depredatory bird in open grain storage facility and cause severe damage to stored grains. Different management methods like reflective ribbon, hawk eye balloon, jute rope net and bioacoustic device were evaluated and bioacoustic device was observed to be efficient.

Key words: Grainivore birds, blue rock pigeon, bioacoustic, reflective ribbon, jute rope net, hawk eye balloon, open grain storage facilities, stack, stored grains, damage

A bird is a warm blooded animal, which means their temperature remains more or less constant and independent of the surrounding temperature whereas reptiles, amphibians and fishes are cold blooded animal whose temperature changes with the hotness or coldness of their surroundings (Ali, 2002). Birds are present all over the world and they are distributed various areas depending upon their feeding behavior and the availability of food which they likes the most. In a survey of 207 villages of Punjab between 2011-2013, 189 species of birds enlisted which belongs to 17 orders, 56 families and 117 genera (Kler and Kumar, 2015). Birds serve as an important part of Agricultural-economics (Dhindsa and Saini, 1994) and play dual role (Jambagi and Kambrekar, 2021). Depredatory birds can affect grain, food, and grain storage facilities and processing in several ways. These include physical damage to grains, grain contamination, occupational health and safety risks to humans such as spread of disease, respiratory problems, and other illness, and also damage building, machines, and vehicles (McCarthy, 2003).

According to Sridhara (2006) the most common depredatory birds are House Crow, Rose ringed-Parakeet, Rock pigeon, Red vented-Bulbul, House Sparrow, Small green barbet, Spottedmunia, Baya weaver in agriculture field. Grainivorous birds are usually depredatory birds they feed very vigorously causing severe damage. In open grain storage facilities mostly wheat grains are stored in sacks. Open grain

storage facilities are just like agriculture field serving as an open bowl of grains to grainivorous birds. Grainivorous birds are depredatory in open grain storage facilities they come in flocks and feed vigorously on grains stored in sacks. There is a demand to establish methods for the reduction of damage and for the aim of scientific research to examine the loss done by diverse bird species (Saxton, 2006).

MATERIALS AND METHODS

Point count method was used to study and record the bird diversity from August 2021 to July 2022 in and around the open grain storage facilities. All the birds that could be seen were counted. About 20-30 minutes were spent on each vantage point of site in order to avoid the repeated individual bird counted and identified as described by Ali (2003). Different management methods i.e. jute rope, reflective ribbon, bioacoustic, hawk eye balloons were evaluated for their efficacy following Lukas et al. (2020). Jute rope was used in the form of small squares block (20x20 cm) about 15 cm above the stacking bags of stored grains. Reflecting ribbons of polyester strips were installed above the stack (Khan and Shahbaz, 2008). Bioacoustic equipment and hawk eye balloons were installed near the experimental areas. Hawk eye balloons were installed near the stacks of stored grain bags with the help of bamboo sticks. Kruskal-Wallis test was conducted to check statistical difference in relative abundance of bird species using SPSS software 29.

RESULTS AND DISCUSSION

In the present study total of 25 bird species were observed at open grain storage facility. Blue rock pigeon was observed as the most abundant species (49.09%) and is the major depredatory bird collared-dove. The greater coucal was least abundant (0.19%) (Table 1). In open grain storage facility grainivorous birds are depredatory and cause severe damage (Sridhara, 2006). Grainivorous birds cause direct physical and quality loss which reduces the economic value (Kumar and Kalita, 2017). According to Rao and Dubey (2006) the depredation may be done by single or by several species. Among the techniques evaluated viz., reflective ribbon, hawk-eyed balloons, jute rope nets, and bioacoustic devices, bio-acoustic device was successful in reducing the number of depredatory birds, specifically blue

rock pigeon followed by reflective ribbon, jute rope net and very little difference was observed with hawk eye balloon (Table 1). Statistical analysis significant difference in relative abundance of birds at management methods.

According to Avery and Werner (2017) use of bioacoustic devices with biological calls is an effective way to scare birds. Nets, overhead lines, cages to exclude birds from the protected area are also efficient (Moerman et al., 2016). It has been reported that there is no perfect method to prevent damage caused by birds and there are many techniques which works well with integration and there is a need of regular alteration (Rivadeneira et al., 2018). Bird diversity can also be reduced by providing an alternative food to the birds so that our important commodity may be saved. It has been

Table 1. Relative abundance (%) of bird species

Annual relative abundance									
Species	(%)	Species	(%)	Species	(%)	Species	(%)	Species	(%)
Asian Koel	0.66	Black Shoulder Kite	1.43	Eurasian Collared-Dove	4.78	Jungle Babbler	4.29	Red-vented Bulbul	1.70
Asian Pied Starling	1.64	Blue Rock Pigeon	49.09	Greater Coucal	0.19	Little Brown Dove	2.60	Red-wattled Lapwing	3.74
Bank Myna	2.06	Cattle Egret	4.10	House Crow	2.81	Paddyfield Pipit	0.80	Rose-ringed Parakeet	4.71
Black Drongo	1.41	Common Myna	3.64	Indian Robin	2.88	Purple Sunbird	1.15	Small Bee Eater	1.90
Black Kite	1.03	Common Tailor bird	1.81	Indian treepie	0.72	Red-naped Ibis	0.66	White-breasted Kingfisher	0.22
Relative abundance in management methods									
Bird species	T1	C1	T2	C2	T3	C3	T4	C4	
Bank Myna	3.94	4.26	2.15	4.38	4.56	5.00	7.44	6.76	
Blue Rock Pigeon	14.32	23.26	22.23	23.12	14.49	31.77	8.30	20.4	
Common Myna	10.19	4.87	7.79	6.12	6.96	4.37	10.56	5.43	
Eurasian Collared-Dove	10.09	9.97	9.20	8.50	6.82	8.07	7.03	5.22	
House Crow	5.67	5.14	6.12	5.05	8.13	4.95	12.84	7.03	
Jungle Babbler	4.01	4.66	5.50	6.29	6.29	5.00	13.43	7.01	
Little brown Dove	8.21	8.22	5.86	7.30	6.44	7.81	7.03	6.62	
Rose-ringed Parakeet	6.93	3.86	4.99	5.58	7.45	5.55	11.03	7.89	

%- annual relative abundance; T1- Treatment Reflective ribbon and C1- Control; T2-Treatment Hawk eye balloon and C2- Control; T3- Treatment Jute rope net and C3- Control; T4- Treatment Bio-acoustic device and C4- Control

observed that Eurasian collared-dove and little brown dove feed upon spilled grains on ground for most of the time. Birds are attracted by spilled grains in open grain storage facility and they cause direct damage (Kumar et al., 2021).

ACKNOWLEDGEMENTS

Authors are grateful to Principal Zoologist (Rodents) and Head, Department of Zoology, Punjab Agricultural University, Ludhiana for providing necessary facilities and support for the study.

FINANCIAL SUPPORT

Not applicable

AUTHOR CONTRIBUTION STATEMENT

The designing of the research problem was done by M K and the observations were made by R K. Both the authors interpreted the data. R K wrote the manuscript and M K approved the manuscript.

CONFLICT OF INTEREST

No conflict of interest.

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(Manuscript Received: July, 2023; Revised: July, 2023;
Accepted: July, 2023; Online Published: July, 2023)

Online First in www.entosocindia.org and indianentomology.org Ref. No. e23058