

## Study on the response of common Myna (*Acridotheres tristis*) towards artificial nests in selected sites of Peshawar city

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### Abstract

The objective of this paper is to analyze the response of common myna to artificial nest boxes placed at different sites in Peshawar city i.e. University Town, Rahat Abad, Qadir Abad, and Palosi Road Peshawar respectively. Where a large increase in the population of common myna was noticed. The artificial nests were designed with dimensions of 56 x 22 cm and 21 x 16 cm with respective openings of 8 cm and 7 cm. A total of 28 artificial nests were installed in the breeding season of common myna. Therein 18 nest boxes were found attempted by common myna. 45 eggs were found in the attempted nest boxes. Early hatching of eggs was observed at Site-C. The success percentage of the installed nests was about 64.28 %. Competition and disturbances viz kite, crow, and woodpecker were observed. It is impossible to get a complete picture of the reproductive success of common myna in artificial nests in urban and suburban areas. However, nest box replacement may be one of the solutions to enhance the population of birds in spite of all disturbances.

**Keywords:** Artificial nests, common Myna, reproductive success, breeding season

### Introduction

Urban areas might play an essential role in addressing biological diversity conservation challenges. The majority of study into the habitat requirements of diverse bird species has focused on natural

habitats, while urban ecosystems have largely been disregarded (Jokimaki & Huhta, 2000). With the fast increase in urban and suburban development, as well as the resulting habitat change, it is clear that understanding the interaction between birdlife and urban ecosystems is critical (Niemelä, 1999). Artificial nests are often used to investigate factors that determine forest bird reproductive success. Artificial nests provide the effect of providing the researcher to measure the number and distribution of nests in the study. It also takes less time to build artificial nests than it does to find natural nests. When using artificial nests, the implicit assumption is that they may serve as a good substitute for actual bird nests, and some researchers have observed that disturbance rates on artificial nests are comparable to disturbed rates on actual nests (Wilson et al., 1998). However, there have been numerous issues raised about the use of artificial nests and the interpretation of study results (Wilson et al., 1998). Researchers require a better knowledge of how rates of predation on artificial nests compare to rates of predation on natural nests for artificial nests to be a helpful tool of natural nest predation (Major, 1991). Artificial nests differ from natural nests in several key aspects that could affect predation rates. A predator's ability to detect nests may be hampered if there is no incubating adult connected with manufactured nests. Predation rates on manufactured nests may be higher if adults can either hide the natural nest or actively defend it from predators. If predators are drawn to natural nests by the behaviour of the adults, the absence of adults may result in decreased rates of predation on manufactured nests (Martin, 1987)

Mynas can be found in large numbers in all climate zones where they can live. Mynas belong to the Passeriformes order and the Sturnidae family.(Ali et al., 1983). The common myna is an Asian small bird that has spread throughout the world as a result of accidental or deliberate human introductions common myna were identified in location with higher human population numbers and land transformation values more frequently than expected by chance (Peacock et al., 2007)

### **Material and methods**

Nest boxes were installed at selective sites in Peshawar city. The four sites are labeled as site-A (University town), site-B (Rahat Abad), site-C (Qadir Abad) and site-D (Pelosi road) respectively. The nests installed at each site were numbered accordingly as A-1, B-1, C-1, D-1 and so on. Total number of 28 nest box were installed at selective sites in Peshawar city. All artificial nest boxes were installed on random selected old trees. Direct observation was made Using Watch techniques. Size of nest boxes were small, medium and large respectively. Installed nest boxes were visited

after every (02) two weeks. Sign, symptoms and eggs of birds were observed through direct observation. Nests were installed in breeding season (March to September, 2022). Nest boxes were constructed as per the guidelines made by the Royal Society for the Protection of Birds (RSPB) (Fig 1, 2).



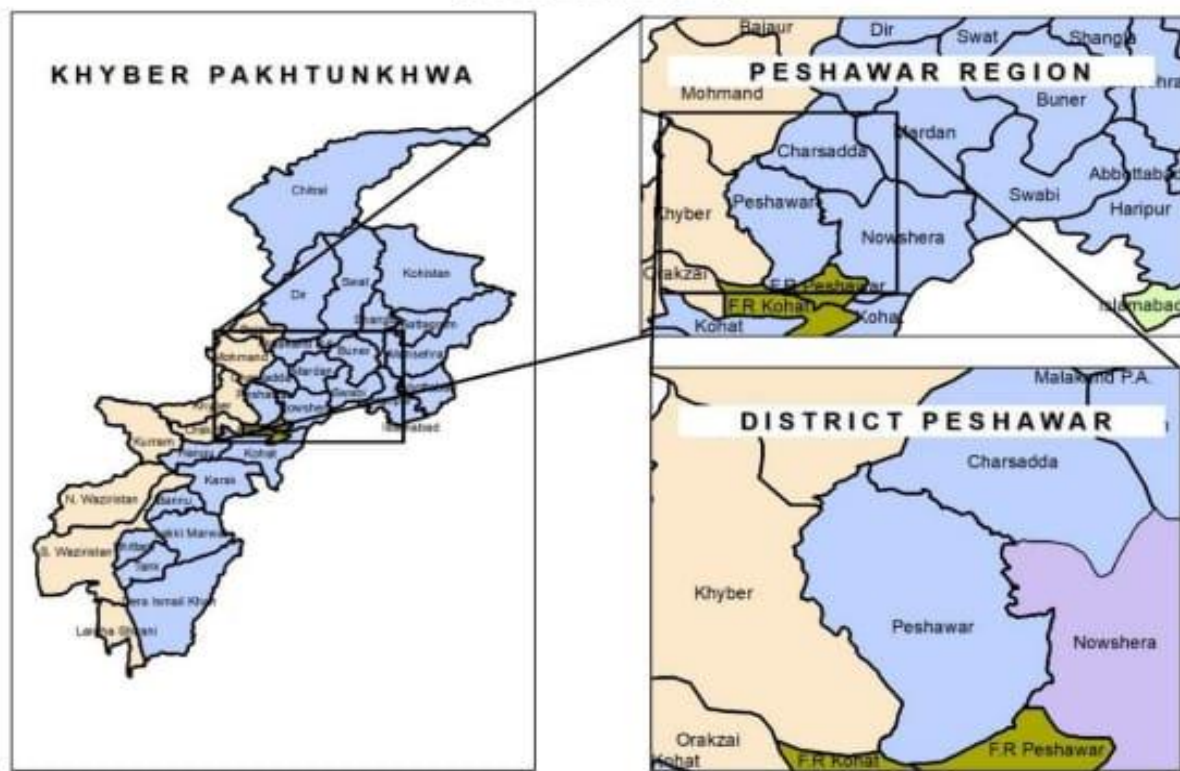
Figure 1. Hatching of eggs at different sites of Peshawar city



Figure 2. Nest boxes installed at different sites in Peshawar city.

### Study area

The research work was carried out in Peshawar city, located in the wide valley, surrounded by four districts; Kohat, Charsadda, Khyber Agency and Nowshera. The total area of Peshawar city is 125 Km.sq and is positioned at (34.0150° N, 71.5805° E) (Fig. 3). It features a warm semi-arid weather, long summers and short, cool Winters. The winter season starts from mid-November to the end of March and summer starts from May to September. The mean temperature in summer ranges from 25°C to over 40°C.



**Figure 3.** The geographic location of the study area

### Results and discussions

Out of the total 28 artificial nests installed during breeding season of common myna at four different sites the no of total eggs found were 45 in which 36 were hatched successfully showing reproductive success percentage of 80% and about 20% wastage of eggs was observed. The mortality of chicks at all the four sites A, B, C and site-D were 02, 03, 01 and 01 respectively which is about 19% of the total mortality rate. All the Artificial nests installed at road side were

left unattempted due to anthropogenic disturbances therein 03 nests at site-A University town, 02 nests at site-B Rahat Abad and 01 nest at site-D Palosi Road. Polythene debris were observed during our visit at Site-C Qadir Abad, so it is assumed that the presence of polythene debris may have caused early hatching of eggs over there. Observations were made through lenses and binoculars. Interspecific competition and various threats were faced by birds' species table.3. It was assumed that the scarcity of nesting material at suitable places in the disturbed area reflected in favor to the occupation of artificial nest. Hence it is recommended that the nest box replacement maybe considered in urban and sub-urban areas

**Table 1.** Productivity of artificial nests

Site	no of nest boxes	no of eggs	no of chicks	mortality of chicks
SITE-A University Town	08	15	13	02
SITE-B Rahat Abad	08	10	07	03
SITE-C Qadir Abad	06	08	06	01
SITE-D Palosi Road	06	12	10	01
TOTAL	28	45	36 (80%)	07 (19%)

**Table 2.** Attempted / unattempted nests at different sites of Peshawar city.

Sites	Attempted	Unattempted
Sites A	05	03
Sites B	06	02
Sites C	06	NIL
Sites D	05	01

**Table 3.** Threats / competition observed at different sites of Peshawar city.

Sites	Threats observed	Competition
Site -A	Common squirrels, termites	Crows and Black kites
Site -B	Ants and predators	Wood peckers and pariah kites
Site -C	Noise, debris, residual wastes and Anthropogenic activities	Parrots and kites
Site -D	Predators, heavy rain	Wood pecker and crows

**Table 4.** Difference in incubation period of eggs

Sites	Early hatching	Reason of early hatching
Site-A	-	-
Site-B	-	-
Site-C	02 days	Debris (plastic)
Site-D	-	-

**Table 5.** Contingency table results

Sites	no of nest boxes	no of eggs	no of hatched eggs	total
Site-A	8 (9.24)	15 (14.9)	13 (11.9)	36
Site-B	8 (6.42)	10 (10.32)	7 (8.25)	25
Site-C	6 (5.13)	8 (8.25)	6 (6.60)	20
Site-D	6 (7.19)	12 (11.55)	10 (9.24)	28
<b>Total</b>	28	45	36	109

$$\chi^2 \text{ cal} = 1.3425; \quad \chi^2 \text{ table} = 12.59 \text{ at } df = 6, LS = 0.05$$

**Table 6.** Multiple regression model

Site	no of nest boxes	no of eggs X <sub>1</sub>	no of hatched eggs X <sub>2</sub>	X <sub>1</sub> Y	X <sub>2</sub> Y	X <sub>1</sub> X <sub>2</sub>	X <sub>1</sub> <sup>2</sup>	X <sub>2</sub> <sup>2</sup>
Site-A	8	15	13	120	104	195	225	169
Site-B	8	10	7	80	56	70	100	49
Site-C	6	8	6	48	36	48	64	36
Site-D	6	12	10	72	60	120	144	100
	$\bar{Y} = 7$	$\bar{X}_1 = 11.25$	$\bar{X}_2 = 9$	320	256	433	533	354

$$\hat{\beta}_1 = 2.039, \hat{\beta}_2 = -177.03, \hat{\beta}_0 = 0.006$$

$$Y = \hat{\beta}_0 + \hat{\beta}_1 X_1 + \hat{\beta}_2 X_2$$

$$Y = 0.006 + 2.039 X_1 - 177.03 X_2$$

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