

Clutch Size, Egg Dimensions, Weight and Breeding Success of Black Drongo (*Dicrurus macrocercus*) at Tehsil Mansehra, Pakistan

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ABSTRACT

This study was attended in Tehsil Mansehra of District Mansehra during the breeding period April-July 2012. The mean clutch size documented was 3.3 with eggs range 2-4. Mean egg length and breadth was 24.5 ± 2.6 mm and 20.3 ± 1.7 mm, mean egg volume was 5.24 ± 1.2 cm³ and egg shape index calculated to be 1.20 ± 0.02 . Mean weight of the egg recorded was 4.5 ± 1.09 g. There is no substantial correlation exists between egg length and breadth ($P > 0.05$) and likewise between weight and volume of Black Drongo eggs there was no meaningful statistical difference exists ($P > 0.05$). Hatchling success was 71.1% and fledgling success was 64.7%.

Key words: Breeding, Clutch, *Dicrurus macrocercus*, Fledgling, Hatchling

1. Introduction

Black Drongo (*Dicrurus macrocercus*) also known as king Crow is a small Asian Passerine Bird belongs to the Drongo family Dicruridae. In the Tropical Asia it is one of the resident breeders from Southwest Iran over Pakistan, India and Srilanka, in the east including southern China and Indonesia. It is purely black bird with a unique forked tail. In the range of species it is mainly found in cultivated areas and in light forests and predate on insects and glean on ground

level vegetation. There are two separate species of Drongo, Fork-tailed Drongo restricted to Africa and Asian range of the Black Drongo [1, 2]. It plays an important role in controlling agricultural insect pests in its native range [3, 4]. All Dicruridae species are insectivores [5]. Black Drongo is one of the common birds in Pakistan [6]. Very few notes are present related clutch size and egg dimensions of Black Drongo [7, 8]. There is lack of such data in Pakistan. The purpose of the paper is to present clutch size, egg dimensions including egg length, breadth,

volume, egg shape index, egg weight and breeding success of Black Drongo. The relationships amongst different egg dimensions and egg weight were also analyzed.

2. Materials and Methods

Study was conducted in Tehsil Mansehra 34°14'35"10' N and 72°55'74"6' E with an area of 1,486 square miles and is located at an altitude of 1088m and is 3 hours' drive from Capital Islamabad. Tehsil Mansehra is bordered in the east with Tehsil Balakot and in the west with Tehsil Oghi of District Mansehra, in the north with Battagram and in the south with Abbottabad Districts (Figure 1). Tehsil Mansehra is populated as well as agricultural rich area. Climate of the area is severe i.e. hot in summer up to 40 °C and 5 °C in winter [9]. Temperature variation during the study period that affects breeding of Black Drongo is given in (Figure 2). Main vegetation of the study area consists of *Populus euphratica*, *Platanus orientalis*, *Pinus roxburgii*, *Morus alba*, *Melia azedarach*, *Eucalyptus camaldulensis*, *Prunus armeniaca*, *Broussonetia paperfera*, *Acacia nilotica* and *Acacia nilotica*.

Study cover the time period of 4 months from April-July 2012. During nest search,

71 of the clutches were found with 239 eggs. All the found nests were inspected directly to see the anterior of the nest. Egg length and breadth was measured by Vernier Calliper with Least Count 0.1 mm. Egg volume was calculated from the length and breadth using the formula Hoyt [16], $V = 0.51 \times L \times B^2 / 1000$, where V is volume in cm^3 , L is length and B is breadth in mm. An egg shape index was calculated by dividing L/B. Egg weight was taken on electronic weighing bar.

The hatching success and fledgling success was measured to know breeding success of Black Drongo by using the following formulae:

Hatching Success (%) = No of eggs hatched/
Total no. of eggs laid $\times 100$

Fledgling Success (%) = No of nestlings
fledged/ Total no. of eggs hatched $\times 100$

2.1. Statistical analysis

Mean descriptive statistics are followed by Standard Deviation (SD). Difference between mean variables of egg characteristics was done by (ANOVA) Analysis of Variance. Significance of test was accessed at $P=0.05$. Graphs were made by using Microsoft Excel (2010).

3. Results

3.1. Clutch size, egg dimensions and egg weight

Clutch size of the Black Drongo in the study area was 3.3 with eggs range from 2-4. Among this range 37 of the clutches contained 4 eggs 52.1%, clutches that contained 3 eggs were 23 and is 32.3% of the total and 11 of the clutches contained 2 eggs 15.4% (Figure 3). Mean egg length measured was 24.5 ± 2.6 mm (range= 22.0-

27.3mm) and mean breadth was 20.3 ± 1.7 mm (range= 18.1-23.5mm) (Table 1). There is no significant statistical correlation exists between egg length and breadth ($P > 0.05$). Mean egg shape index ESI was 1.20 ± 0.02 (range= 1.16-1.22). Mean volume calculated was 5.24 ± 1.2 cm³ (range= 3.67-7.68cm³) and mean egg weight of the Black Drongo was 4.5 ± 1.09 g (range= 3.4-7.2g) (Table 1). Similarly between egg volume and egg weight there is no statistical correlation exists ($P > 0.05$).

Table 1. Mean egg characteristics of Black Drongo in Tehsil Mansehra, 2012.

Egg Characteristics	N	n	Mean	SD	Range
Egg Length (mm)	40	110	24.5	2.6	22.0-27.3
Egg Breadth (mm)	40	110	20.3	1.7	18.1-23.5
Egg Volume (cm ³)	40	110	5.24	1.2	3.67-7.68
Egg Shape Index	40	110	1.20	0.02	1.20±0.02
Egg Weight (g)	40	110	4.5	1.09	3.4-7.2

N= Number of clutches, n= number of eggs

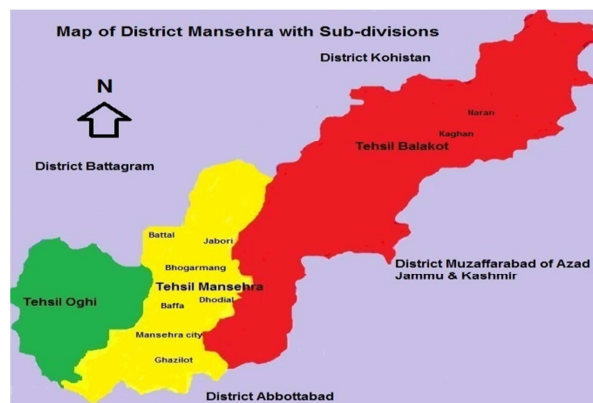


Figure 1- Map of District Mansehra with its Sub-divisions showing study area Tehsil Mansehra in Between Tehsil Balakot and Oghi.

3.2. Breeding success

Breeding success is defined as measure of hatching and fledgling success. Total of 71 clutches were found with 239 eggs. Of

these 239 eggs 170 hatched so hatching success was 71.1%. From these 170 nestlings 110 fledged from their nests so fledgling success was 64.7% (Table 2).

Table 2. Breeding Success in Black Drongo population in Tehsil Mansehra, 2012

List	Breeding Success
No. of clutches	71
No. of eggs	239
Clutch size	3.3
No. of hatchling	170
No. of fledglings	110
Hatchling success	71.1%
Fledgling success	64.7%

4. Discussion

In the study area clutch size and egg dimensions were studied during the breeding season April-July. In contrast to other studies in the range of species breeding season of Black Drongo in Cauvery Delta, Southern India started from March and ends in June reported by Ali et al [7]. Breeding season was from April-June in Calicut University Campus, Kerala reported by

Shukkur et al [8]. Breeding of Black Drongo is directly related to insect's abundance because nestlings need much quantity of proteins in their diet and insects are more in number during the time period March-August [10]. However other factors like rainfall, temperature, suitable mate, nesting material, nest site selection, predation and observer disturbance also affects breeding of Black Drongo.

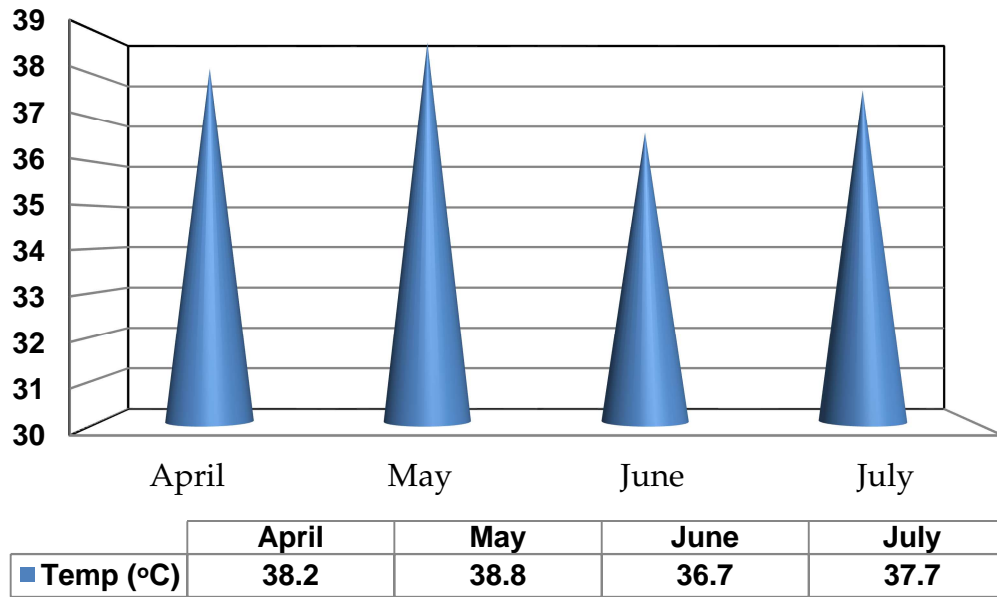


Figure 2- Temperature variation during the study period that affects breeding of Black Drongo from April- July 2012.

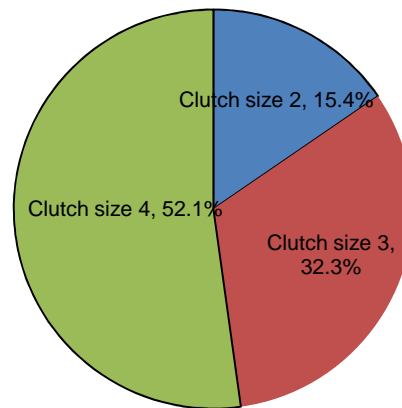


Figure 3- Percentage of egg range in relation to clutch size of Black Drongo in Tehsil Mansehra.

Mean clutch size observed was 3.3 with eggs range 2-4, this value is more or less in contrast with other authors in the range of

species [7, 8-11-12]. Somewhat how clutch size of birds depends upon parent's age, parents with young age laid smaller clutch

contrasted to elder ones [13, 14-15]. Clutch size also dependent upon diet and territory quality [17]. Mean length and breadth measured was 24.5 ± 2.6 mm and 20.3 ± 1.7 mm in the study area while other authors; Ali et al [7] measured egg length and breadth of 26.0 ± 0.14 mm and 20.0 ± 0.07 mm at Cauvery Delta, South India. Similar measurements were taken by Ali and Ripley [11] and Shukkur and Joseph [8] in the range of species. Mean egg weight was 4.5 ± 1.09 g similar to recorded by earlier authors [7, 8-11] in the range of species.

Hatching success was 71.1% in the study area and is similar to Ali et al [7] while fledgling success was 64.7% relatively bit low as compared to Ali et al [7].

Due to potential role as a biological pest control, Black Drongo is considered as

agriculturally beneficial bird [3, 4]. So breeding records of this species needs to be monitored to check their population status from time to time because due to rapid deforestation and urbanization species is declining in number because of loss of its natural habitat. Such kind of primary data will be helpful in investigating their population decline.

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