



## **Morphometry of eggs and its development in Brahminy Starling in Kapoori, Saharanpur, U.P., India**

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### **Abstract**

Brahminy myna also named as Brahminy Starling. The body colour is pale reddish – fawn plumage. The beak is yellow with a bluish base. In both the sexes black crest is present on head. In male the crest are more prominent than female crest. It is a resident breeder in eastern Afghanistan, Nepal, Srilanka and India. This passerine bird is typically found in dry forest and scrub jungle and also near human residence. This species built nest in cavity or holes in tree or boughs, in wall or roof of house, railway station and wells. The brahminy starling is a single breeding bird in a breeding season. In this study it was observed that construction of nests were completed from March to the end of the April of 2020 and average height for nesting was 12.5 feet. Generally eggs were observed from mid April to mid May of 2020. It was also concluded that generally brahminy myna laid 4 to 5 eggs in one clutch and average weight of an egg was 5.43 gm. Percentage of reproductive success are as follows, hatching of eggs were observed 83.3% and Fledging of birds were observed 61.1% from mid May to mid July of 2020 and mortality rate was recorded 38.9%.

**Key words:** Brahminy myna, eggs, morphometry, nest, reproductive success

### **INTRODUCTION**

The genus *Sturnus* belongs to the family Sturnidae (a family of starling and mynas) of order Passeriformes (class - Aves). It is widely distributed throughout the oriental region, with its representatives in central and South East Asia. In Indian subcontinent, this genus is represented by as many as 9 species and 19 subspecies (Ali and Ripley, 1983, 1987). *Sturnus pagodarum* is widely distributed throughout India (but not in arid, semidesert and desert tracts or humid evergreen biotope) (Bolger et. al., 2005). It was also recorded in Pakistan, Cylon, Nepal and Thailand (Kazmierczak, 2008) and mainly resident. Their habitat are open areas, farmland, dry deciduous forest etc. It is locally common but capricious and subject to seasonal movements in monsoons visiting northern cold-winter parts (as high as 1400-1600 m) in summers. Birds are the most important ecological indicator of the environment (Bibby et. al., 1992). The brahminy myna measures about 19 - 22 cm in length. The body has beautiful garb, which is combination of reddish, brown and black colours with a distinguished black crest. The bill and the legs are bright yellow and there are yellow wattles (loose folds of skin) on the gape. Both sexes are similarly garbed, but crest is slightly smaller in females. Juveniles have dull coloration and no distinct crest, but with black patch of feathers on head. Brahminy mynas are generally found in grasslands, fields and gardens i.e. in wild as well as near to human habitation.

Brahminy mynas are omnivorous and they feed chiefly on fruits, berries and insects, but in captivity are easily maintainable on soft and proteinaceous diets and thus suitable for laboratory



investigations. They also visit flowers for nectar. They are sociable species and move in company of 4 to 7 members and have communal roosts. Communal roosting means it roosts together with other species of Myna as well as with other avian species, also known as heterogeneous roosting (Mahabal, A. 1997). Usually, brahminy myna is noticed in company of other species of myna, although they do not belong to the same genus like Parakeets. The breeding season extends from March to September, but the main reproductive period varies with the locality (earlier in south and later in north India) (Ali and Ripley, 1987). Common myna commonly breeds between March to September of every year and lay three clutches of eggs in one season (Pell and Tidemann, 1997). Both sexes share the responsibilities of nest building, incubation and caring of young (Ali and Ripley, 1987). Nest is made from a collection of grass, dead leaves, feathers and rubbish stuffed in a hole or tree-trunk or artificial cavities, railway station and wells (Dhandhukia et. al, 2012), sometime has colonial nesting and nesting in steal anchor pipe also been reported by Sharma 1996. The normal clutch is 3 to 6 eggs are laid which are pale bluish green in colour. The eggs hatch in about 11 to 15 days.

### **Materials and Methods**

The study was carried out from March to July 2020 in the campus of Govt. Modal Degree College, Kapoori, Saharanpur, U.P., India in natural condition. Which latitude is  $29.785258^\circ$  and longitude is  $77.7373396^\circ$  and 269 meters above the sea level. Brahminy myna were visually observed by binoculars (GOR Standard 10x50). Data was collected from the nest by the help of 12 feet wood leader. Eggs weights were measured with the help of electric weighing scale. Data of egg length and width were calculated by the help of Vernier caliper. Eggs volume and egg shape index were recorded with the help of mathematical equation as per given by Bored (1999).

Formula of egg volume ( $V$ ) =  $0.52 \times L \times B^2$

Where  $V$  = Volume of egg,  $L$  = Maximum length,  $B$  = Maximum breadth and 0.52 is a constant for external ellipsoidal volume.

Formula of egg shape index ( $ESI$ ) =  $B/L \times 100$

Where  $ESI$  = Egg shape index,  $L$  = Maximum length,  $B$  = Maximum breadth.

The clutch size, hatching of eggs, fledging of bird and mortality rate were recorded. The observations were recorded in the early morning and evening hours. In this study, the nesting sites, nests, eggs, chicks, juvenile of the bird, and adult birds, were not harmed in any way.

### **Result and discussion**

This species also have a single annual breeding season of about six month from March to August (Ali and Ripley 1972). In early breeding season, both male and female brahminy myna bird were responsible for the selection of nesting site. Both birds take 15 to 25 days in the selection of nesting site (Lamba, 1963g). Distance between breeding and feeding sites (abiotic and biotic components) also played an important role in the selection of breeding sites, along with safety from predators and inter-specific competition (Dhandhukia and Patel, 2012). Selection of nesting site is considered to be one of the most important factors in reproductive success in many species of birds (Li and martin, 1991) and it has been recorded that in some species, reproductive success has been reduced due to poor nest site selection (Frederick, 1986). Any physical measurement of nests (size or nesting materials used) should be done after the nestlings have fledged from the nest (Brave et al., 2020). Artificial wooden nest boxes, a hole in a tree trunk or in a wall is the usual nesting site for the brahminy myna. Male brahminy myna bird appears to

select a possible nesting site but the final selection is done by the female brahminy myna bird. Both male and female bird completes its nest with in 12-25 days (Lamba, 1963f).

It was observed that the nesting materials are stem of small plants and creepers, thin twigs, small piece of cloth and papers or rag, feather of birds, leaves of neem, pepal and other local plants, threads etc.. Maximum nest material act as insulator that is help in decreasing heat exchange result play an important role in eggs incubation (Panicker 1980). Green leaves in nest play an important role to provide soft bed for the nestlings and also maintain humidity in the nest (Sengupta, 1982). When the nest construction activity completed then egg laying process start. Generally in one clutch brahminy myna laid four to five eggs at regular intervals of 24 hours. Average length and breadth or width of eggs are (L × W) 2.45 × 1.93 cm and average weight was 5.43 g and they were fairly glossy, pale blue and oval in shape (Lamba, 1963c, Dhandhukia and Patel, 2016). Average egg volume of an egg was 4.74 cm<sup>3</sup>. and average egg shape index (ESI) was 78.53 (Table 1).

**Table 1.** Morphometric Parameter of eggs of brahminy myna, during study-

S.N.	Length (cm)	Breadth (cm)	Egg Volume (cm <sup>3</sup> )	Egg shape index (ESI)	Weight (gm)
1.	2.46	1.88	4.52	76.42	4.96
2.	2.44	1.94	4.76	79.51	5.40
3.	2.45	1.92	4.70	78.37	5.64
4.	2.45	1.96	4.89	80.00	4.90
5.	2.48	1.94	4.85	78.22	4.88
6.	2.46	1.92	4.71	78.04	4.96
7.	2.44	1.94	4.76	79.51	5.88
8.	2.46	1.90	4.61	77.23	5.90
9.	2.45	1.92	4.70	78.36	5.90
10.	2.46	1.96	4.91	79.67	5.88
<b>Range</b>	<b>2.44-2.48</b>	<b>1.88-1.96</b>	<b>4.52-4.91</b>	<b>76.42-80.00</b>	<b>4.90-5.90</b>
<b>Average</b>	<b>2.45</b>	<b>1.93</b>	<b>4.74</b>	<b>78.53</b>	<b>5.43</b>

Female Brahminy myna starts incubation process by sitting on the eggs in the day time after the laying of the second egg. The incubation period of brahminy myna (*Sturnus pagodarum*) was found to 11 – 12 days and 13 – 14 days incubation period was found in common myna (*Acridotheres tristis*) (Lamba and Tyagi, 1975). In this study it was observed that they usually made their nests at height range of 11 -14 feet, also same result were found by Kaur and Khera, 2014. The total number of eggs laid were eighteen (18) in breeding month from mid April to mid May of 2020. In which 15 young ones hatched so hatching success was 88.3%. The newly hatched young are fleshy pink in colour. Their eyes are closed, the traces of grayish white filoplumes on head, back, wing, thighs and sides of abdomen are present. The eyes of nestling is open between 5 to 8 days. The feathers break out of the skin on 4<sup>th</sup> to 6<sup>th</sup> day in the nestling and they are fully fledged in next 14 to 16 days. The nestling period of Brahminy myna is 18 to 22 days (Lamba and Tyagi, 1977). After hatching 11 chicks were modified in to fledge of birds from out of 15 young ones, so fledge of birds success was 61.1% (Table 2). Chudasama and



Dodia (2017) observed that fledging success in common myna and bank myna was observed 67.30% and 50.09%. The mortality rate was observed to be 38.9%. Nestling mortality was due to shortage of food especially during first week and predation were the main factors of nestling mortality in Brahminy myna (Tyagi and Lamba, 1984).

**Table 2.** Clutch size, hatching of eggs and fledging of bird in brahminy myna, during study-

S.No.	Height of nest	Clutch size	Hatching of eggs	Fledging of bird	Total mortality
01	14 Feet	05	04	03	02
02	11 Feet	05	05	03	02
03	13 Feet	04	03	02	02
04	12 Feet	04	03	03	01
<b>Range</b>	<b>11-14 Feet</b>	<b>04-05</b>	<b>03-05</b>	<b>02-03</b>	<b>01-02</b>
<b>Total</b>	<b>----</b>	<b>18</b>	<b>15</b>	<b>11</b>	<b>07</b>
<b>Percentage</b>	<b>----</b>	<b>100%</b>	<b>83.3%</b>	<b>61.1%</b>	<b>38.9%</b>

### Conclusion

In this study it was concluded that generally brahminy myna laid 4 to 5 eggs in one clutch. Brahminy myna preferred those areas for selection of nesting site which having range 11 to 14 feet height from the ground level. In this study the hatching success of brahminy myna, was 83.3% and fledge of birds success was 61.1% . Percentage of mortality rate was 38.9%.

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