

NESTING BIOLOGY OF THE INDIAN SPARROW (*PASSER INDICUS*) IN THE FLATLANDS OF TASHKENT REGION

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Summary

Observations on the nesting biology of the Indian sparrow were conducted in Boka district of Tashkent region. 392 nesting pairs of birds were found in a colony formed on the wall of a ravine on the bank of a waste water canal. All processes in 12 nests were monitored in order to study the nesting biology of the Indian sparrow. Egg-laying of birds in the colony began on May 10 and continued until May 18. A total of 72 eggs were laid in reference nests. Hatching of chicks is completed by the second half of June. Both sexes fed 3, 8, and 10-day-old chicks 148, 183, and 189 times during the day, respectively. The average mass of 11-day-old young birds (n=11) was 22.96 g, with the beak length 6.58 mm, wing length 53.5 mm, tarsus length 19.77 mm and tail length 28.26 mm. It was observed that the chicks left the nest when they are 12-13 days old. By the end of the breeding season, 54 chicks had hatched from the reference nests.

Keywords: *Indian sparrow, egg measurements, feeding intensity, growth intensity, nesting biology.*

Introduction. The distribution area of the Indian sparrow *Passer indicus* [domesticus] Jardine et Selby, 1831 extends from the Nile Valley to Jungria, the southern slopes of the Himalayas and the southern tip of Tibet 1. Species range covers our entire research area. This bird is a nesting species in Uzbekistan. The Indian sparrow often nests away from humans, but when there is no suitable place to build a nest, it enters human settlements. *P. indicus* forms a colony

independently, as well as together with Spanish or field sparrows. It makes spherical nests in acacias, Lombardy poplars, fruit trees, boulevards, villages and roadside shrubberies. Also, it widely uses holes in sandy walls along rivers and highways, rock fissures in mountains, the abandoned nests of large birds of prey and storks [2,3,4]. The Indian sparrow is considered a nesting species in the territory of Uzbekistan, and a number of studies have been conducted on its economic importance, but there are not enough studies on the nesting biology of the species.

Materials and methods. Research was conducted from April to June 2022 on the bank of the Chilisoy stream (40°38'1.49"S 69°8'21.83W) flowing through Boka district of Tashkent region (Figure 1). The researches were carried out on the edge of natural vertical slopes 12-14 meters high and 20-50 meters long. In the course of the work, binoculars (Swarovski SLC 15x56) and rangefinder (Helia RFM 7x25) were used for remote observation of birds, sliding calipers (accuracy of 0.1 mm) and electronic scale (accuracy of 0.01 g) were used to specify the size of eggs and morphometric sizes of chicks. Observations to study the nesting biology of the Indian sparrow were carried out in 12 nests. The intensity of food transport in the birds' feeding process was studied through

continuous observation from 05:00 to 20:00. Morphometric measurements were always made at 19:00 in order to determine the intensity of growth of chicks. The form

index of eggs was calculated using the A. L. Romanova formula: $IF=100xd/D$. Here d is the transverse size of the egg, D is the longitudinal size of the egg.

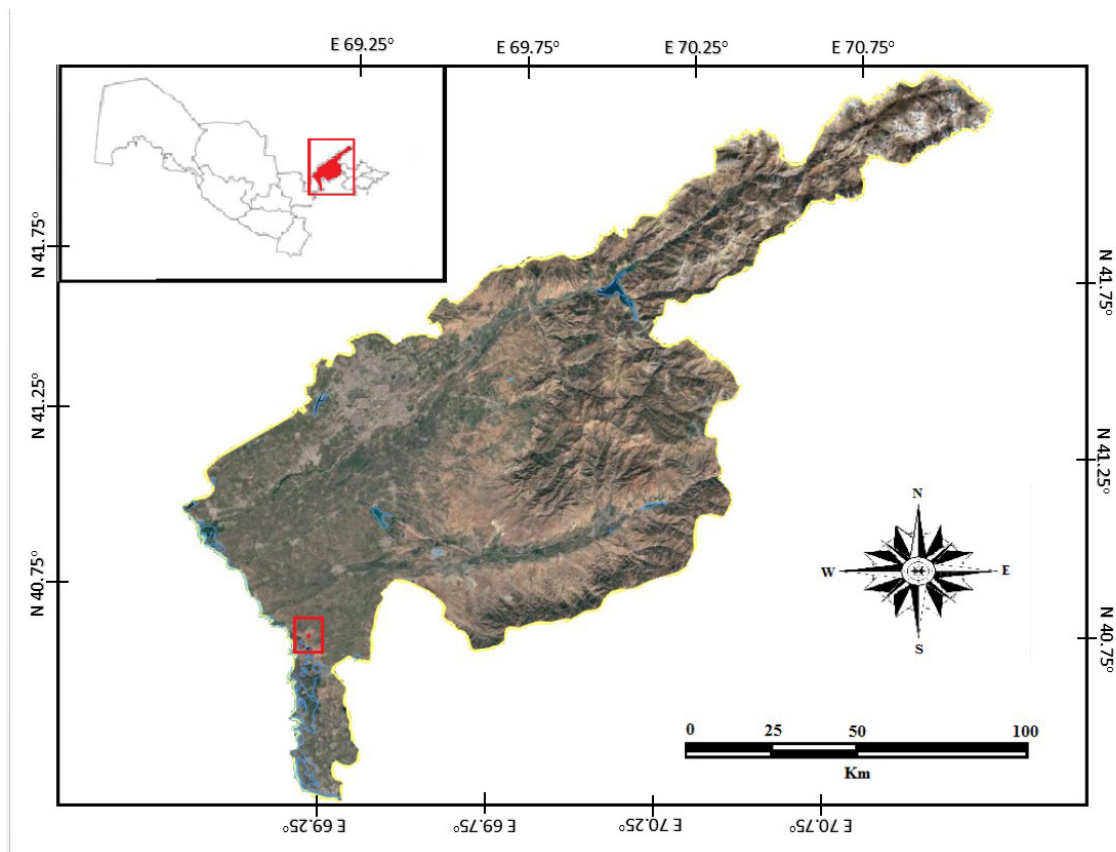


Figure 1. The colony of the Indian sparrow in Chilisoys is located in the red dot

Results and discussion. In the first half of the 20th century, the spring migration of the Indian sparrow in Tashkent region was recorded in the second decade of April. As a result of our observations, the first recorded date of the bird in Boka and Bekobod districts, located in the south of Tashkent region, was on April 14. On April 16, birds were seen entering holes in concrete slabs on the roofs of buildings. At that time, it was observed that they were forming pairs.

Nesting: First, on April 24, it was noted that sparrows started nesting between the walls of white stork (*Ciconia ciconia*) nests on the pylons of electric lines that passed through the edge of the

Bekobod desert area. Stork nests have different heights, so depending on the height of the nest, it was found that 25 to 50 Indian sparrows nested in each stork nest. During this period, it was observed that Indian sparrows and Eurasian tree sparrow were bringing nesting materials into cracks and holes in the wall of an abandoned barn building located in the desert area. In the same days, Indian sparrows occupied some of the available holes for nesting in the vertical slopes of the Chilisoys canal, but it was found that the birds started bringing nesting materials from April 29. It was noted that sparrows chose holes for nesting, which are located mainly on the north side of the substrate, that is, in a shady place where the sun's

rays do not fall directly (Figure 2). Both the male and female participate in nest building. The Indian sparrow uses the thin twigs and leaves of conifers, the wool of sheep and goats, horse wool, cotton fibers, and synthetic fibers in the form of yarn as nesting material. The intensive nesting of sparrows continued until May 13-14. In the next period, the amount of transported necessary nest material for nest construction would be significantly reduced. However, on June 6, it was noted that some birds were carrying construction material for building nests in the colony. In addition to the Indian

sparrow, it was observed that the holes on the natural wall were occupied by birds such as the European roller (*Coracias garrulus*), Blue-cheeked Bee-eater (*Merops persicus*), Eurasian Jackdaw (*Corvus monedula*), and Common Myna (*Acridotheres tristis*). Of all the nests, 91% (392) were occupied by the Indian sparrow 5.1% (22) by the Common Myna, 2.1% (9) by the European roller and 1.8% (8) by the Eurasian Jackdaw. It was noted that most (85-96%) of the nests were placed on a level higher than the middle part of the wall.



Figure 2. Vertical slope with bird nest (Photo by B.N. Ganiev)

Egg laying. During the survey it was found that eggs were laid in only one of 12 nests on May 10. After that, nests were inspected once every two days (table 1). It was recorded on May 18 that the birds had laid eggs in the monitored nests. According to Kashkarov and Puzankova, in the Fergana Valley *P. indicus* lays 4-7 eggs in most cases, in some cases up to 3 or 9, and Gavrilov mentioned that in Kazakhstan, 5 to 10 eggs were laid. According to the results of our observation, the recorded number of eggs was from 4 to 9, with an average of 6 per nest.

During the research, the dimensions of 38 eggs in 7 nests were taken. Weight of eggs – min = 2.19 g, max = 2.75 g, mean = 2.45 g; height – min = 19.7 mm; max = 22.2 mm, mean = 20.93 mm; width – min = 14.1 mm, max = 15.8 mm, mean = 14.79 mm (table 2). It was found that the egg weight decreased from 0.02 to 0.04 grams during incubation. After 12-13 days, hatchlings emerged from the eggs. During the observations at 19:00 on the evening of May 28, it was noted that eggs hatched in 6 nests. According to sources 5 and our observations, it was found that chicks

emerged for 1-2 days. It was noted that in 5 out of 12 observed nests, all eggs hatched in one day, in 6 nests in two days. It was observed that most of the chicks hatched on the first day and then one or two chicks emerged on the second day. It was noted that one nest was damaged by other birds and the eggs died.

On May 29, 30% of sparrows (out of 392 nests) began to search for food, and on May 30, their number increased to 60%. It was noted that male and female birds alternately carried food to the nests where part of their eggs had hatched, and in those

nests where all the eggs had hatched, both birds began to bring food.

On May 30 hatchlings were recorded in 10 nests, on June 1, in all nests. It was observed that the eggs in some nests remained in the lining. 7 out of 72 eggs in the reference nests (9.7%) decayed; that is, in 4 nests where 9, 7, 7 and 6 eggs had been laid, 3, 2, 1 and 1 eggs, respectively, proved decayed. In addition, it was noted that one nest with 6 eggs was damaged by other birds and the eggs died during the incubation period.

Table 1. Number of eggs in Indian sparrow nests, the hatching of eggs and the number

Nests	Number of eggs						Hatching chicks			Number of chicks leaving the nest
	10 May	12 May	14 May	16 May	18 May	20 May	28 May	30 May	01 June	
No.1	0	2	4	6	7	7	+	+	+	7
No.2	0	1	3	5	5	5	+	+	+	5
No.3	0	1	3	5	6	6	+	+	+	5
No.4	0	0	0	2	4	4	+	+	+	4
No.5	0	0	1	3	5	5	+	+	+	5
No.6	0	1	0	2	4	4	-	+	+	4
No.7	0	2	4	6	8	9	-	+	+	6
No.8	1	3	5	7	7	7	+	+	+	6
No.9	0	0	1	3	5	5	-	+	+	0
No.10	0	1	3	5	7	7	-	+	+	7
No.11	0	1	3	5	6	6	-	-	-	0
No.12	0	2	4	6	7	7	-	+	+	5

Table 2. Biometric parameters of Indian sparrow eggs (n = 38)

Indicators	Lim	M±m	CV, %
Weight (g)	2.19-2.75	2.45	6.94
Length (mm)	19.7-22.2	20.93	19.8
Width (mm)	14.1-15.8	14.79	3.8
Volume (cm ³)	16.8-22.5	19.17	7.93
Form index (%)	65.76-78.8	70.7	4.76

Postembryonic development of chicks. In order to specify the intensity of growth, morphometric measurements of 3, 4, 7, 8-11-day-old Indian sparrow chicks were carried out (table 3). The body of a hatchling is covered with a reddish-pink bare skin, and the ear holes and eyes are unopened. At the age of 3 days, a crack appears between the eyelids, at the age of 4 days, the crack between the eyelids becomes larger, but the eyes are not yet fully opened. The skin of the wings, head and back of the body along the spine to the tail turns dark gray, and it is felt that feather shafts have started to form under the skin. After 5 days, feathers begin to grow, eyes and ears are fully opened. By the age of 7 days, the body of the chick is completely covered with feathers. Starting from the 8th day, the tips of the quills begin to burst and cover the body with feathers, while the quills and feathers continue to grow. In 9-10 days, the feather quills are fully opened and the body is completely covered with feathers. After

12 days, when the chicks can't fly well yet, they try to escape by flying short distances from the nest when there is danger. From 10 out of 12 reference nests, chicks left the nest successfully. In the study area, birds of prey such as the Western marsh harrier (*Circus aeruginosus*) and Shikra (*Accipiter badius*) were identified as threats to the nests and chicks of the Indian Sparrow. According to the results of our research, the average weight of 3-day-old nestlings of *P. indicus* (n=17) was 5.21 g, and 11-day-old (n=11) was 22.96 g. At the same time, the length of the beak measured from the nostril increased from (n=17) 2.8 mm to (n=11) 6.58 mm. At the age of 3 days, there were no feathers on the body, and the length of the wings (n=17) was 7.37 mm, but at the age of 11 days (n=11) it grew to 53.5 mm, and the length of the tarsus was observed to reach from 8.27 mm to 19.77 mm. The tail of the chicks begins to grow at the age of 5 days, it was noted that its length is 26, 28 mm by the

Table 3. Age morphometric parameters of Indian sparrow chicks

Nestlings age	Mass, g	Beak, mm	Wing, mm	Tarsus, mm	Tail, mm
3 days (n=17)	$\frac{3.76-6.0}{5.21}$	$\frac{2.6-3.0}{2.8}$	$\frac{7.0-7.8}{7.37}$	$\frac{7.8-8.8}{8.27}$	-
4 days (n=16)	$\frac{10.14-10.56}{10.51}$	$\frac{3.6-4.3}{3.91}$	$\frac{10.1-12.0}{11.36}$	$\frac{10.8-11.6}{11.4}$	-
7 days (n=16)	$\frac{19.56-22.36}{20.4}$	$\frac{5.9-6.4}{6.1}$	$\frac{39.5-43.3}{41.24}$	$\frac{18.6-19.2}{18.93}$	$\frac{12.2-16.5}{15.7}$
8 days (n=15)	$\frac{20.06-23.61}{22.07}$	$\frac{6.0-6.8}{6.24}$	$\frac{37.5-47.0}{43.28}$	$\frac{18.5-20.0}{19.18}$	$\frac{14.0-19.4}{17.78}$
9 days (n=16)	$\frac{19.71-23.38}{21.47}$	$\frac{6.3-7.0}{6.55}$	$\frac{41.0-49.0}{46.42}$	$\frac{18.7-20.2}{19.5}$	$\frac{17.3-22.6}{20.65}$
10 days (n=17)	$\frac{19.4-25.13}{23.56}$	$\frac{5.9-6.4}{6.12}$	$\frac{44.2-48.5}{46.1}$	$\frac{19.0-20.2}{19.45}$	$\frac{18.6-23.6}{21.7}$
11 days (n=11)	$\frac{20.6-25.96}{22.96}$	$\frac{6.0-6.9}{6.58}$	$\frac{50.0-56.3}{53.5}$	$\frac{19.0-20.3}{19.77}$	$\frac{24.0-31.0}{28.26}$

11th day (Table 3, Figure 3).

Nutrition. Information on feeding and nutritional composition of *P.indicus* is provided by *E. I.Gavrilov* [5]; it is cited in the works of *Kashkarov et al.* [6]. Both birds in a pair take part in feeding their chicks, and the proportion of male to

female birds is different in different nests. For example, on May 30, parents brought food 148 times during the day to five 3-day-old chicks. The percentage of female and male birds was 52% and 48%, respectively. It was found intensity

and quantity of food delivery depended on the age of chicks, their number and climatic conditions. When the external temperature was 33-34 °C, the intensity of feeding of birds varied during the day. For example, at 9-10 a.m. it reached a maximum level of 17-18, and in the remaining hours from 7 to 12. In another nest with five 8-day-old chicks, the birds brought food 182 times. There the percentage of female and male birds was 46% and 54%, respectively. It was observed

that the birds fed their chicks mainly with insects (orthopterans, hymenopterans, coleopterans, lepidopterans and their larvae) and partly with plant seeds. The chart below shows that the chicks were fed 127 times at the age of 3 days, 183 times at 8 days and 179 times at 10 days (Figure 4). Accordingly, the share of each chick was 29.6, 36.6 and 35.8, respectively. Birds with 6 nestlings in another nest were observed to feed 108, 121, 164 times on days 3, 5 and 6, respectively.

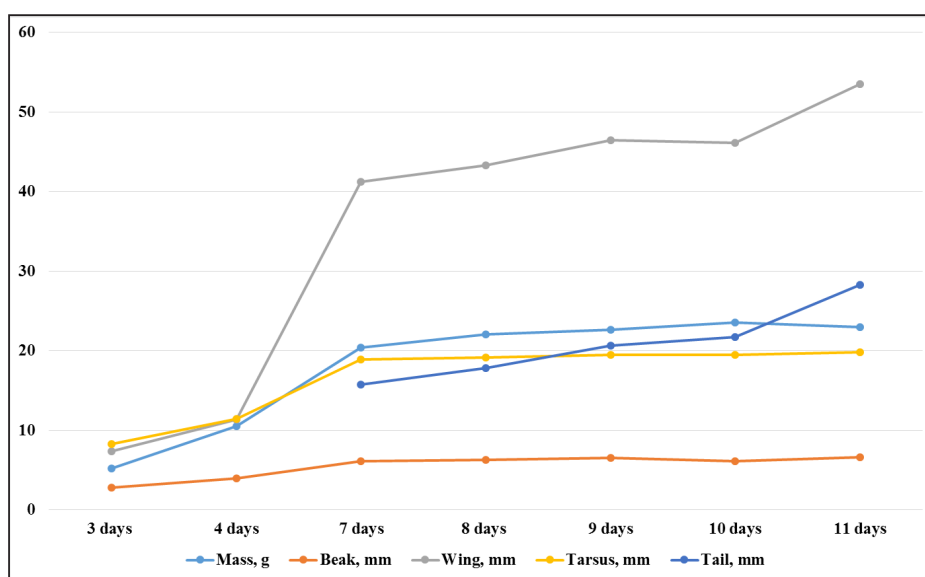


Figure 3. Growth intensity of *P.indicus* nestlings

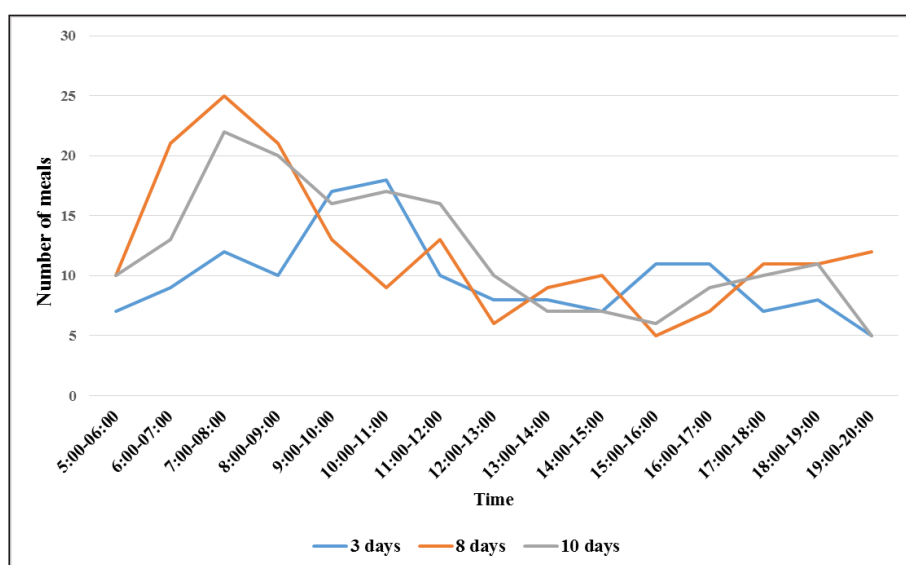


Figure 4. Age-dependent food delivery for Indian sparrows

Conclusion. In the southern parts of Tashkent region, Indian sparrows start migrating from the second half of April. Nesting starts from the last weeks of April, when the nests of birds of prey and white storks are used as a substrate, and from the beginning of May in ravines. 1-2% of the birds in the colony continue to build nests even in early June. Egg laying starts on May 10 and ends on May 18 in most nests. Hatching begins on April 29, and by early June, 60% of nests in the colony have all their eggs hatched. 12-13-day-old chicks begin to leave the nest. In reference nests (n=12), the average number of eggs was 6, the embryonic mortality rate was 18%, post-embryonic mortality was 8.47%, and 4.5 chicks flew out of the nests. Both birds participated in feeding their chicks. The intensity of feeding the chicks of the Indian sparrow directly depended on the chicks' age, their number and climatic conditions.

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Ташкент облысы, бөке ауданында кездесетін қылаң торғайының (*Passer indicus*) ұя салу биологиясы

Аңдатпа

Ташкент облысы, Бөке ауданындағы қылаң торғайының ұя салу биологиясы зерттелді. Қашыртқы каналының бойындағы құламалы жарларда орналасқан колонияда 392 ұялаушы құстар жұбы табылды. Зерттеу мақсатына сәйкес 12 жұп ұялаған құстар бақылауға алынды. Колониядағы зерттеуге алынған құстардың жұмыртқалау мерзімі 10 ма-

мыр мен 18 мамыр аралығына дейін созылды. Бақылауға алынған ұяларға баржоғы 72 жұмыртқа салынды. Инкубация кезеңі маусымның екінші жартысында аяқталды. Екі құс 3 және 8 әрі 10 күндік балапандарын тәулігіне - 148, 183, 189 рет қоректендірді.

11	22,96	(n=11),	
	6,58	,	
53,5	,		19,77
			28,26
		54	
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Материал баспаға 10.08.23 түсті

(Passer indicus)

Проводились исследования по гнездовой биологии индийского воробья в Букинском районе Ташкентской области. В колонии, находящейся на стене обрыва у берега сбросного канала, обнаружено 392 гнездящиеся пары птиц. С целью изучения гнездовой биологии индийского воробья отслеживались 12 гнезд. Откладка яиц в изучаемой колонии началась 10 мая и продолжалась до 18 мая. В контрольных гнездах было отмечено всего 72 яйца. Период инкубации завершился во второй половине июня. Оба родителя кормили 3, 8 и 10 дневных птенцов, соответственно 148, 183 и 189 раз в сутки. Средняя масса 11 дневных птенцов (n=11) составила 22,96 г при длине клюва 6,58 мм, длине крыла 53,5 мм, длине лапки 19,77 мм и длине хвоста 28,26 мм. Было замечено, что птенцы индийского воробья покидали гнездо в возрасте 12-13 суток. К концу сезона размножения из контрольных гнезд вылетело 54 птенца.

К ю е е : индийский воробей, промеры яиц, интенсивность питания, интенсивность роста, гнездовая биология.

М е р у р е д ц ю
10.08.2023