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A Study of Passer Domesticus and Pycnonotus Barbatus Nesting Behavior in an Urban Microhabitat in Raebareli, Uttar Pradesh

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ABSTRACT

The nesting biology of a bird species is likely the most important component of its life history and is affected by several ecological and environmental factors. Various components of avian nesting biology have proved to be important traits for testing fundamental ecological and evolutionary hypotheses, and for monitoring the efficacy of biological conservation programs. Although there is a great need for research, there are several biological, legal, and ethical aspects to consider before studying bird nests through direct observation or by using new technological and digital monitoring techniques. Here, we outline the merits and needs for studying the nesting biology of birds in India but also suggest best practices specific to the Indian context, which will help ensure that the research is conducted legally, ethically, and in a way that can provide important new information to advance Indian ornithology without compromising the welfare of birds.

Keywords: - Breeding Biology, Incubation, Nestling, Parental Role.

INTRODUCTION

A bird's nest functions as a site and structure utilized by birds to lay their eggs, incubate them, and raising the nestlings. These nests can be constructed and tended to by a pair of birds or by multiple individuals working collaboratively within a cooperative breeding system. The design of a bird's nest may range from a simple depression on the ground to an elaborate hanging dome, all serving the purpose of safeguarding the eggs and young from adverse weather conditions and predators. It is noteworthy that nest designs exhibit specificity according to taxonomic groups. Nevertheless, birds exhibit intricate courtship displays to attract mates, demonstrate skill in constructing and positioning their nests, and demonstrate great care in tending to their offspring. The selection of a nesting site and its construction are crucial as they determine the place for egg-laying, incubation, and nurturing of the offspring. The nest is typically a structure either built or altered by the parents. However, in some instances, they may utilize a pre-existing natural cavity for the nest. Depending on the specific location of the nest, parents may employ techniques like camouflaging the nest or covering the eggs with twigs and foliage to protect them from potential predators.

Nesting cycle:-

- Finding a place to breed.
- Choosing a mate.
- Nest building.
- Copulation and egg formation.
- Egg laying.
- Incubation.

- Hatching.
- Feeding the young.
- Leaving the nest.

MATERIAL AND METHODS

I have observed two birds, *Pycnonotus barbatus* (Bulbul) and *Passer domesticus* (Gauraiya). I observed Bulbul from 26th March to 21 April 2024, about 22 days. I also observed from 1st May to 23rd May 2024, about 23 days. Bulbul has made its nest on the Araucaria pine plant, which is quite large and located inside my house. The nest is small and situated among the thorny branches of the Araucaria pine plant, making it difficult to touch without getting pricked.

The house sparrow has built its nest in my garden, deep within the branches of a plant slightly above the ground.

I used a digital camera - Canon to observe these instances.



Bulbul Nest



House Sparrow Nest

RESULT

The nesting cycle period of *Pycnonotus barbatus* was from 26 March to 21 April, lasting about 22 days.

The nesting cycle period of *Passer domesticus* was from 1 May to 23 May, lasting about 23 days.

Pycnonotus barbatus

• Bulbul are a familiar bird in My Location

First of all, the male and female birds come in pairs and survey the area to see which tree is there, whether there is a plantation, and if food and water are available for them. Then they finalize the place. Bulbul has made her nest on the Araucaria pine plant. She has made her nest 3 times before on the same plant and at the same place. The Araucaria plant is inside my house. Even though the tree was inside the house, she made her nest there because she felt safe in that place. It is a familiar bird that makes its nest in houses as well. It took 2 days for the bulbul to build its nest. Araucaria is a thorny plant which prevents the food thrown by the bulbul from falling. She always sits around her nest because their nest is very small, so she does not sit on it; at night, she sits on only one nest because the nest is very small and it will break.



Bulbul nest

• **The Hidden Nest**

Bulbul builds its nest secretly so that no one can easily see it or disturb it. Bulbul has built a nest deep inside the Araucaria plant so that no one can disturb its nest, break its eggs, and so that its children may remain safe.

• **The parent bird**

The mother bird is not sitting on its nest because its nest is very small. Therefore, it always keeps a watch by sitting a little away from its nest and ensures that its children are safe. At night, only one bird sits inside the nest with the egg or chicks.

• **Egg laying**

The photo underneath was taken on 26th Walk 2024. By the way, all the photographs were taken when the parent feathered creatures were absent. So, I did not aggravate or panic the guardians. I checked the settle each day to see whether the mother fowl had laid its eggs. So, on this day, I saw 3 eggs in the nest.



Bulbul Eggs

• **Hatchling on day 1**

Egg after around 14 days (8 April, 2024) they brought forth, and the chick came out from them. I took this underneath in the early morning of 8 April, 2024. It was a captivating small thing without any quills, just dull skin covering the delicate frame.



Hatchling day -Two

• **Hatchling on day 2 to day 6**

Day five Astonishing - hatchling from day 2 to day 6 (9 April, 2024 to 14 April, 2024). I did not exasperate the hatchling for the following 5 days. At that point on day five, I took this photo underneath. It's astounding! Just five days old, and you can see the feathers projecting from the wings! The small one was still too delicate to use its legs. The proportionately large head was completely formed by then. The body was covered with bare skin.



Hatching Day - Five

• Day 7, Getting Stronger

On April 15, 2024, Day 7 was marked by the photo below. It is possible to discern the little feathers surrounding the neck, which were robust enough to raise the head when feeding.



Hatchling day - Seven

• Day 8, Increasing in Size

I shot the pictures below on day eight, which is April 16, 2024. With eyes wide open, the head was completely formed. Except for the feathers, every quill on the wings was fully stretched. The back and sides of the head began to get little fluffy feathers.



Hatchling day – Eight

• Day 9 , Filling The Whole Nest

On April 17, 2024, the chicks have completed the entire nest as they have grown rapidly. They are now huddling together, consuming food and water quickly, and small feathers have started to emerge from their quills.



Hatchling Day - Nine

• Day 10 , Developing Fast

(April 18, 2024) Day ten photo underneath appears a placated singular settling holding up to fly off in a few days' time. The quills were developing quick, covering nearly the entirety body.



Hatchling day - Ten

• The last days

I took the photographs below on days 11 and 12. The nestlings had full quills covering their bodies. I assume both of their wings were well-formed and prepared to take their first flight. Noting that the nestlings are more aware of my presence, I tried not to interfere with their protection further.



Hatchling day - Eleven (Final days)



Day - Twelve

• **A surprise on day thirteen**

Upon separating the leaves on the morning of day thirteen, April 21, 2024, I saw only an empty nest. In only 12 days, a small blob of tissue had developed into a full-fledged bird. I did not see the bird flying off. After all, it was the thirteenth day!



A Surprise On a thirteen day (No more nestlings)

Passer domesticus

From May 1, 2024 to May 23, 2024 is the nesting cycle period.

Breeding period

• **The look of the house sparrow's nest**

The location of the nest affects how the nest appears. It takes on a spherical or domed shape that is about 8 inches wide when constructed outside a hollow or enclosure. Roofed nests outside enclosures or cavities feature a side entrance leading to an egg-holding cup. Coarse materials like dried grasses, twigs, plastic fragments, paper, and strings are used for the external portion of the nest. The inside cup of the dome is lined with delicate materials such as feathers, fur from mammals, hair, and other fine fibers. House sparrows can construct nearby nests in my garden.

• **Nesting habits**

House sparrows do not excavate cavities nor enhance existing structures to fit their needs. They can build their nests inside or outside cavities. They prefer cavities or any enclosure for nesting. When these are not available, they can build a nest in trees with dense and intertwined branches, in vines, ledges of houses, or buildings.



House Sparrow Nest

• **Nest building**

The initiation of nest building depends on whether males are still unmated or the pair is already formed. Unmated males find a nesting site and build a nest or start one. The male advertises his presence and the nest site by calling persistently while perched next to the nest site. Prospective females inspect the nest site and stay or move on. Once a pair is formed, the female takes over mainly to make the interior cup and lining. Mated pairs build the nest jointly or repair the nest they used the year before or the one they used for an earlier brood.



Parent Bird

- **The look of the egg**

Oval-shaped eggs are laid by house sparrows. Within the same clutch, as well as between nests, there might be variations in color and patterns. The egg has brown dots on a white background.

- **Egg laying**

As soon as the nest is completed, the female house sparrow starts to lay eggs. Every day, generally in the early morning, eggs are laid. The same nest is frequently used by house sparrows for the next generation. According to field observations, females can begin laying eggs for the following brood as soon as eight days after the prior brood's chicks have fled the nest. But sometimes, after the previous brood departed the nest, it took a lot longer for a female sparrow to begin laying eggs.



House Sparrow Egg

- **Size of clutch**

The female house sparrow has laid three eggs.



Clutch

- **The eggs' incubation process**

The next-to-last egg is laid by the female house sparrow, who then starts the incubation process. When she begins to lay eggs, she stays inside the nest to roost, but she does not incubate the eggs. Males and females alternate when incubation begins. In the early days, the male just spends a few hours incubating the eggs; however, over time, he increases the amount of time he spends doing so to as much as 50% of the total. Towards the end of the incubation cycle, the female settles for roughly 50% of the time after doing the majority of the incubation initially.

• **Incubation period**

The incubation period for house sparrow eggs is around 12 days. During this time, the male house sparrow will take turns with the female house sparrow to incubate the eggs. It's important to ensure that the birdhouse for sparrows is in a safe and secure location during their incubation period. This will help protect the eggs from predators and other dangers.

• **Hatchling and Nesting stage**

Once the eggs have hatched 8 days later, the nestling stage begins. During this stage, the parent sparrows will spend their time feeding and caring for their young. It's important to make sure that the birdhouse has enough space for the parent sparrows to move around and care for their young. It's also important to make sure that the birdhouse for sparrows is clean and free of any debris that could harm the young sparrows.



Hatchlings

• **Fledgling and Learning how to fly**

Young birds, also called fledglings, start to develop their wings and strengthen their muscles as they get closer to being ready for their first flight. When sparrow fledglings hatch, they are completely dependent on their parents for food. During this time, sparrows can be seen in flocks or groups with adult sparrows teaching them how to fly and searching for food. As sparrow fledglings begin to leave the nest, they learn how to fly by fluttering their wings and hopping from branch to branch. At this stage of the process, it is essential to check that the birdhouse for sparrows is indeed situated in a secure and risk-free environment. When the young sparrows are getting ready to leave the birdhouse, it is very essential that they have plenty of food and water to support them.





Fledglings

• Caring for young Sparrows

It is essential to continue providing for the young sparrows even after they have departed the nest. This includes supplying them with an adequate amount of food and water, as well as shielding them from any potential threats, such as predators. It is essential to keep an eye on the baby sparrows to ensure that they are maturing properly and that they are being monitored. In the event that there are any problems, it is essential to seek veterinarian assistance as quickly as possible.

DISCUSSION

Observed the nesting cycle of two birds, *Pycnonotus barbatus* (Bulbul) and *Passer domesticus* (House sparrow). I observed that the bulbul completed its nesting cycle in 22 days, and the House sparrow completed its nesting cycle in 23 days. First of all, I saw that bulbul birds come in pairs and observe the place for 2 days to decide if it is safe for them and their chicks. They consider whether there are trees and plants, adequate food and water available. Only after considering these factors, the bulbul decides to make its nest at that place. The bulbul made its nest on the Araucaria pine plant, a large plant inside my house. The nest is small and located inside the Araucaria plant, which is thorny, making it difficult to touch without getting pricked. The bulbul had made its nest three times before on the same plant and at the same place. Bulbul builds its nest secretly so that no one can easily see it or disturb it. Bulbul has built a nest deep inside a plant so that no one can disturb its nest, break its eggs, and keep their chicks safe. The bulbul bird is not bothered or affected by people coming near its nest because before building the nest, it surveys the area to check if the plant is safe for them or not. The mother bird does not sit on its nest because the bulbul nest is very small. So it sits a little away from the nest, keeps a permanent watch, and an eye on whether its children are safe or not. At night, only the mother bird sits near the egg, and the father bird sits away from the nest. 2 days after the nest was built, the mother bird laid 3 eggs. The chicks emerge from the eggs during a roughly 14-day period of incubation. This procedure happens early in the morning. With just dark skin covering its frail frame, it was an intriguing small creature devoid of feathers. Day 5: Amazing - I did not disturb the hatchling for the next five days, from day two to day six. It is incredible! The quills are peeking out from the wings, and it's just been five days! The young one's legs were still too frail for it to use. By then, the large head was proportionately formed. The skin was all that covered the body. Seventh day: The little feathers around the neck that were strong enough to raise the head upward for feeding are visible. On the eighth day, the eyes were open and the head was fully formed. Except for the feathers, every quill on the wings was fully stretched. Tiny, hairy feathers began to sprout on the head and back. 9th day - The chicks have completed the whole nest as they have grown very fast, so they are lying on each other, and they have started consuming food and water very fast, and small feathers have started coming out of their quills. On day ten, a happy lone nestling anticipated taking departure in a few days. The feathers were quickly spreading to nearly cover the entire body. The nestling's body was fully covered in feathers on the eleventh and twelfth (final) days. That would have been when both of its wings were fully developed and prepared for their first flight. I tried not to bother the fledgling anymore as I realized how conscious it was of my presence. An unexpected event occurred on the morning of the thirteenth day. Planning to capture another image of the developing nestling, I prepared my Canon digital camera. Upon opening the leaves to view the nest, I discovered it was empty. This transformation from a small lump of flesh to a fully formed bird had occurred rapidly in just 12 days. The sudden disappearance took me by surprise, leading me to speculate that the fledglings had taken flight to freedom. However, in my perception, the fledgling had not yet flown away entirely. House sparrows also survey the area for two or three days before making their nest to check whether the area is safe for them and their chicks, and whether food and water are available in adequate quantity in the area. Then they decide to make a nest. A house sparrow has made a nest in my garden. The house sparrow has made its nest inside the branches of the plant. House sparrows make their nests on the walls of houses, poles, and traffic lights. Male house sparrows find a place to build their nest and make the nest, while female house sparrows repair and provide shelter to the nest. It takes about 4 days for the female bird to build the nest. After 3 days, the female bird lays eggs. She lays only one egg in a day. The female house sparrow starts the process of egg incubation when she lays the next-to-last egg. When she begins to lay eggs, she stays inside the nest to roost, but she does not incubate the eggs. The male and female share the role once incubation begins. In the early days of the incubation period, the male only spends a few hours incubate the eggs;

However, as time goes on, he increases the amount of time he spends incubating the eggs, up to 50% of the total time near the conclusion of the incubation period. The incubation period for house sparrow eggs is around 12 days, during which time the male house sparrow will take turns with the female house sparrow to incubate the eggs. It's important to make sure that the house for house sparrows is in a safe and secure location during their incubation time. This will help to protect the eggs from predators and other dangers. Once the eggs have hatched 8 days later, the nestlings stage begins. During this stage, the parent house sparrows will spend their time feeding and caring for the young. It's important to make sure that the birdhouse has enough space for the parent house sparrows to move around and care for their young. It's also important to make sure that the birdhouse for sparrows is clean and free of any debris that could harm the young sparrows. Young birds, also called fledglings, start to develop their wings and strengthen their muscles as they get closer to being ready for their first flight. When sparrow fledglings hatch. They are completely dependent on their parents for food. During this time, sparrows can be seen in flocks or groups of adult sparrows teaching them how to fly and searching for food. As sparrow fledglings begin to leave the nest, they learn how to fly by fluttering their wings and hopping from branch to branch. At this stage, it is essential to check that the birdhouse for sparrows is indeed situated in a secure and risk-free environment. When the young sparrows are getting ready to leave the birdhouse, it is very essential that they have plenty of food and water to support them.

CONCLUSION

I have completely observed the nesting cycle of Bulbul and House Sparrow, and I have 3 days. Bulbul has made its small nest on an Araucaria pine plant, the birds were not scared of the people's presence. Bulbul made its nest in 2 days, laid eggs after 2 days, and about 14 days later, the eggs hatched and the chicks came out of the eggs. On the 13th day, they developed completely and flew out of the nest.

The house sparrow also decided to make a nest only after surveying its area completely. In about 4 days, its nest was completed. The nest is made by the male bird, which was built deep inside the branches of the garden tree. After 3 days, it laid a single egg, and its chicks hatched after three days, they developed wings and left their nest after 12 days and flew out of the nest. Thus this study emphasized that both bulbul and sparrows can be conserved in an urban microenvironment without much effort and with only a little care.

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