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BEYOND THE BRANCHES: THE URBAN PIGEON NESTING IN THE AGE OF ASPHALT

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Abstract:
Urbanisation has a variety of effects on bird populations due to habitat fragmentation and the availability of nest building materials. This study tracked *Columba livia*'s nest building behaviour from nest site selection to laying egg. Urbanisation alters the native ecosystem, reducing available areas for breeding and other related behaviours such as nest site selection and nest construction material choice. This leads to the usage of atypical nest material, which increases nestling mortality.

Keywords: Urbanisation, Habitat, Nest building, Nest site, Nestling

Introduction:

Urbanisation has put the pressure on the creatures that live there. To some extent, the urban landscape has a positive impact by providing greater supplies of primary requirements such as water, food, and shelter for some species [1,2]. Birds are highly adapted to the urban ecology both physically (changes in stress hormones) and behaviorally (e.g., changes in usual feeding activities, extension of the breeding season, nest building). Nests are constructed using a range of materials, although twigs, sticks, grasses, leaves, and, on occasion, soft wings and fibres are preferred. The blue rock pigeon nests on platforms and builds its nests out of little sticks and fibres [3]. Breeding season, the availability of appropriate nest sites, readily available nesting materials, the local food and water supply, and predators all influence where and how nests are built [4]. Foraging and avoiding the prolongation of the breeding season are two examples of behavioural adaptations to urbanisation that have been examined [5-9]. Bird populations and communities are significantly impacted by urbanization [10-12]. *Columba livia domestica* prefer to make their coarse nests on platforms found in construction sites and ancient structures [13]. Although it is generally known that some starlings use fibrous materials to build their nests, there is no information on how urbanisation has affected the choice of nest building materials in *Columba livia*. Thus, the study was conducted to determine how urbanisation affected *Columba livia domestica's* nest-building behaviour in an urban location that was densely populated and had all the hallmarks of an urban landscape.

Materials and Methods:

The study was conducted in Rajasthan's sun city of Jodhpur. The centre region of Rajasthan, a state in northwest India, is where this is situated. The districts of Bikaner, Ngaur, Pali, Barmer, and Jaisalmer are all adjacent to the district area. Its latitude and longitude are 26°.00' to 27°.37' North and 72°.55' to 73°.52' East, respectively, and its elevation is 250 to 300 meters above sea level. Nesting at Jai Narain Vyas University, old campus, Commerce department, Jodhpur was the study site.

Using a Samsung mobile camera (Galaxy S20 FE 5G) and binocular, the study was conducted in April 2025 to examine nesting behaviour in *Columba livia* at Jodhpur. The various behaviours were periodically recorded.

Results and Discussion:

A couple of blue rock pigeon was attempting to make a nest on the outside of the commerce department. There were just few inches between the window and the balconi,

which was insufficient for nest formation. The pair began nest building at the platform on April 22, 2025, using standard nest materials such as sticks and twigs, but failed to lay any material for three days. The pair attempted to place a range of materials from April 22 to May 3, 2025, including thorny *Acacia nilotica* and *Prosopis juliflora* twigs, safety pins, aluminium wires, some steel, and old metallic bangles. Ultimately, they attempted to construct the nest using wires; they were able to place anything on the chosen site.

On May 5, the couple placed several neem twigs and *cassia fistula* plants. The next day, they placed some green neem (*Azadirachta indica*) leaves and laid the first egg before 7.14 a.m., and then began incubation. Natural floristic composition and spatial distribution of plants are being affected by anthropogenic pressure in urban areas, as evidenced by an increase in *Prosopis juliflora.* The effect of these changes on bird species is determined by the nature of the vegetation. Urbanisation benefits bird species that are related with human activity [14]. The problems that the bird faces in the urban environment, as well as the habitat in the urban region, may lead the bird to choose nesting sites that are practically unsuitable.

Natural areas have been damaged and fragmented due to urbanisation pressure, resulting in an edge effect. Increased edge ratios in compared to core habitats lead to increased nesting of birds in edge habitats, which are soft targets for predators, resulting in increased nest predation and high nestling mortality [15,16]. In this example, the pair chose a spot that was unsuitable for nest building yet continued the process. When this pair failed to place standard nesting material, they began collecting unique nesting material in order to deposit it.

They constructed their nest using odd materials, most likely as a result of the prior experience, but wind dislodged the nest again when they attempted to build the nest there. The antibacterial qualities of neem (*Azadirachta indica*) leaves may be linked to their placement. The selection of green leaves for the uppermost portion of the nest serves the dual purposes of giving the freshly formed nestlings a comfortable cushion and possibly adding moisture, which may help to somewhat lower the temperature. Although *Azadirachta indica* leaves are well known for their insecticidal capabilities, their use in this circumstance cannot be justified [17]. Although it has been found that house sparrows prefer to utilise neem leaves to repel some insect pests from their nests [18]. Many bird species use nesting materials recognized for their antipathogenic and insecticidal properties [19,20]. This pair gathered several uncommon materials, such as plastic spoons, plastic cables, and wires, at the base of the nest. Some atypical nesting behaviour was reported in a moderately developed urban habitat [21-24]. I collected nesting materials from pieces that had fallen to the ground; a list is provided in the Table 1.

Table:1 Nesting material used by Columba livia domestica

S.No.	Name of the nesting material	Specification
1.	*Azadirachta indica*	Twigs, leaves
2.	*Acacia nilotica*	Twig, throne
3.	*Cassia fistula*	Rachis
4.	*Prosopis juliflora*	Twigs
5.	Galvanized Wires	Pieces
6.	Aluminum wire	Pieces
7.	Safty pin	Complete
8.	Metallic Bangles	Complete
9.	Plastic electrical wire	Pieces

Figure-1: Different stages of *Columba livia domestica* nesting behavior

1 to 2 Nesting site with pigeon couple, 3 Complete Nest building stages, 4 Nest with one egg, 5 Nest with one egg and pigeon 6 Hatchling

Conclusion:

Urbanisation is a necessary evil in today's globalised world. The percentage of wild habitat land is fast diminishing, and human settlements are thought to be a difficult task for the living biotic ecosystems. Urbanisation is an ongoing process to suit the requirements of a growing population, thus we should focus on planning cities that incorporate biotic community friendly methods so that numerous bird species can thrive in this transformed habitat. Urban environments are widely known for their high density and poor species diversity. Avifauna requires some green patches in between concrete-built areas with adequate wetland. Only a few bird species can thrive in concrete-built environments.

While variety, distribution, and temporal distribution are the focus of general urban bird studies, the behavioural and general elements are not. In urban areas devoid of natural spaces and wetland areas, birds either avoid or adapt to survive.

This fact is only demonstrated by the current investigation. The pair in question initially attempted to utilise standard nesting materials, but when they were unable to create a viable nest, they turned to some unconventional materials that were readily available nearby. Therefore, urban planning needs to be innovative enough to recognise and meet the demands of both dominant and subdominant species while ensuring the latter's survival.

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