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Nest composition of Himalayan bulbul *Pycnonotus leucogenys*: A study in Chamba district of Himachal Pradesh

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Abstract
The nest composition of Himalayan Bulbul *Pycnonotus leucogenys* was studied in a village of Chamba district in Himachal Pradesh. The observations were carried out during the month of July 2024. The various parameters of the naturally dried nest such as shape, size and weight along with number, weight and types of constituents formed the nest were studied. The photographic evidence was recorded with the help of a digital camera (Nikon Coolpix A900) and measurements were done with the help of a measuring tape and an electronic weighing balance. The observations were as follows: height of the nest above the ground: 3.2 meters; weight: 4.78 g; size: outer dimensions L 11 cm x W 10 cm x H 6.0 cm; inner dimensions L 7.6 cm x W 7.6 cm x D 4.0 cm. The nest structure consisted of dwarf shoots/branches of Indian Gooseberry *Emblica officinalis* (87), sticky fruit bearing shoots/branches of Barbed Forget-Me-Not *Cynoglossum wallichii* (44), inflorescence bearing shoots/branches of Congress grass *Parthenium hysterophorus* (4) and another grass (5), plant stem fibers (30), plant root / rootlet fibers (25) and thin plastic fibers (5). The length of constituents forming the nest varied from 6.3 cm to 27.9 cm and the average length of most of the constituents was 14.2 cm to 16.7 cm. Out of 3 eggs laid in the nest, only one hatchling could develop up to fledgling stage. The present study reveals that the nest composition of Himalayan Bulbul consisted of 7 different types of constituents out of which higher percentage was contributed by shoots/branches of plants followed by stem fibers & root/ rootlet fibers of plants, lesser number of inflorescences bearing shoots/branches of grasses and a few plastic fibers.

Keywords: Nest composition, Himalayan bulbul, pycnonotus leucogenys, Chamba, Himachal Pradesh, nesting, breeding

Introduction

The distribution of Himalayan Bulbul *Pycnonotus leucogenys* varies in altitude from 300 m to 2400 m amsl and is distributed throughout the Himalayas from Afghanistan to Punjab hills, Himachal Pradesh, Uttar Pradesh hills, Nepal, Bhutan and Arunachal Pradesh. The bird occurs in almost all kinds of habitats ranging from open scrubs, gardens, forests, agricultural lands, towns and villages. The bird is resident with some local movements at higher elevations in winter. The breeding season varies from April to August (Whistler, 1941; Ali and Ripley, 1996) [11, 1]. The nest is cup shaped, shallow, loosely built and made up of plant stems, fibers lined with rootlets, finer grass, down feathers, cotton fibers and nylon fibers (Hume, 1889; Baker, 1932; Fazili *et al*., 2013) [6, 2, 5]. The nest is built on low branches of trees, shrubs, bushes, ceilings of buildings, garden creepers and tucked into the thatch of a dwelling. The nest is built at a height of 30 cm to 3 meters and rarely 5 meters (Baker, 1932; Ali and Ripley, 1996) [2, 1]. The eggs are pinkish white, thickly speckled, streaked or blotched with various shades of red, tiny spots and clouds of underlying pale inky purple. The clutch size varies from 2-4, usually 3 and occasionally 5. The eggs are laid at 24-hour intervals and the incubation period is about 12 days. The overall period of incubation, nestling and fledgling is about 25-26 days and from nest building to fledging is about 4 weeks (Baker, 1932; Bates and Lowther, 1952; Ali and Ripley, 1996; Fazili *et al*., 2013; Kumar and Kumar, 2021) [2, 3, 1, 5, 7].

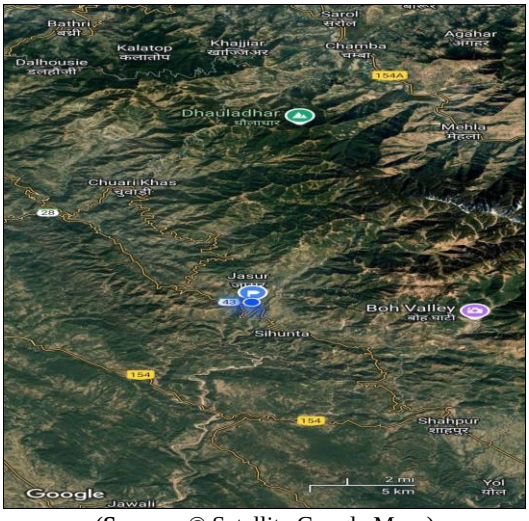
The range of distribution of Himalayan Bulbul in Himachal Pradesh as recorded by the author varies from 350 m to 2750 m from subtropical to temperate regions in a variety of habitats (Singh, 2015) [9]. As per BirdLife International IUCN Red List, the status of bird is Least Concern (BirdLife International, 2024) [4].

Despite the number of studies carried out about breeding of Himalayan Bulbul since the last many years, the information regarding constituents of the nest composition was found insufficient. Therefore, a present study was undertaken to investigate the composition of a naturally dried nest of Himalayan Bulbul.

Materials and methods

Study Area

The present study was carried out in a village (Samote) located in Sihunta tehsil of district Chamba in Himachal Pradesh (Figure I). The study area is located at an altitude of about 1020 m amsl with coordinates 32.3288^0 N and 76.0732^0 E. The three main seasons of the area are summer, monsoon & winter along with transitional periods of autumn & spring, the climate of the area is subtropical.



(**Source:** © Satellite Google Maps)

Fig 1: Location of Study Area (blue dot)

The nest was observed with naked eyes built on the outdoor wall of the house from a distance of about 1-2 feet. The observations were carried out during the month of July 2024 (07-07-2024 to 31-07-2024) about the nesting and its composition. The behaviour and activities of birds were observed during the day time in sufficient sunlight at a distance and care was taken not to disturb the birds. The size, weight and composition of the naturally dried nest was studied after it was abandoned/ left by parent birds along with the fledgling. The nest was removed from its location and various parameters such as weight, size and constituents were studied in detail. These were identified, counted and weighed to get complete information about the nest composition. The photographic evidence was recorded with the help of a digital camera (Nikon Coolpix A900). The measurements of length, width, height and depth were taken near to the central axis of the nest. The measurements of dimensions were done with the help of a measuring tape. The weight of the nest and its constituents was measured with the help of an electronic weighing balance.

Results

Observations of the nest and its composition

The nest was found built over a light cover fixed on the outdoor wall of the house 3.2 meters above the ground (Figure 1). A pair of birds were seen moving around the area of the nest construction and one bird at a time with nesting material in its beak was found adding material to the nest (before 7th of July 2024). In total, 3 oval shaped eggs of pinkish white colour speckled with dark pinkish red spots and an average size of L 22 mm x W 16 mm were found laid inside the nest on 7th July 2024 (Figure 1) and were seen up to 18th July 2024 as an incubation period. The parent bird was seen leaving the nest during the daytime hours occasionally in search of food and sitting again inside the nest during dim light (morning & evening) and night. The protection of eggs during incubation, hatchling, nestling and fledgling was carried out by one parent bird at a time by sitting over them inside the nest. Out of 3 eggs, only one hatchling could develop up to the fledgling stage. The feeding material to fledgling was seen as an insect captured in the beak of the parent bird. The fledgling seen inside the nest on 29th July 2024 was found to have attained a size of about 6.5 cm in length with greyish brown body colour. The fledgling was seen sitting over the edge of the nest on 30th July 2024 ready to take flight (Figure 2). Both male and female parent birds along with this fledgling/ young bird left the nest on 31st July 2024. The incubation period was about 12 days (07-07-2024 to 18-07-2024) and the total period from egg laying to fledging stage was about 24 days (07-07-2024 to 30-07-2024). The total period of breeding i.e. nesting, incubation, nestling, fledgling was about 4 weeks (Early July 2024 to end of July 2024). The abandoned/ empty nest on 31st July 2024 was then removed from its location and studied for its shape, size, weight and composition.

There were found seven different types of constituents that contributed to the structure of the nest. The higher percentage was contributed by two types of shoots/ branches of plants which mainly formed the walls and base of the nest i.e. Indian Gooseberry/ Amla *Emblica officinalis* and Barbed-Forget-Me-Not *Cynoglossum wallichii* followed by thin stem and root/ rootlet fibers of plants which formed the soft lining of the nest along with lesser number of inflorescences bearing shoots/ branches of grasses and a few thin plastic fibers also.

The shape of the nest was cup-like with an outer oval circumference. The total weight of the naturally dried nest was 4.78 g. The size of the nest was: outer dimensions L 11 cm x W 10 cm x H 6.0 cm and inner dimensions L 7.6 cm x W 7.6 cm x D 4.0 cm. The following constituents were studied in detail for identification, number, weight and length variation. (L-length, W-width, H-height, D-depth, g: gram, cm: centimeter).

The length of constituents forming the nest varied from 6.3 cm to 27.9 cm and the average length of most of the constituents was 14.2 cm to 16.7 cm.

1. **Indian Gooseberry/ Amla *Emblica officinalis* dwarf shoots/branches:** (Figure 3). In total, 87 unbranched dwarf shoots of *Emblica officinalis* with a total weight of 2.10 g constituted the major part of the base and inner wall of the nest. The length of shoots varied from 7.6 cm to 15.2 cm. The average length of most of the shoots/ branches was 15.2 cm.

2. **Barbed-Forget-Me-Not *Cynoglossum wallichii* shoots/branches:** (Figure 4). In total, 44 sticky fruit bearing branched shoots/ branches of *cynoglossum wallichii* with a total weight of 1.55 g constituted the base and outer part of the wall of the nest. The length of shoots varied from 7.6 cm to 17.7 cm. The average length of most of the shoots/branches was 13.9 cm.

3. **Plant stem fibers:** (Figure 5). In total, 30 thin stem fibers of plants with a total weight of 0.68 g constituted the soft inner lining of the nest. The length of these stem fibers varied from 7.6 cm to 25.4 cm. The average length of most of the stem fibers was 17.7 cm.

4. **Plant roots/rootlets:** (Figure 6). In total, 25 thin roots/rootlets of plants with a total weight of 0.19 g constituted the soft lining of the wall and base of the nest. The length of these root /rootlet fibers varied from 7.6 cm to 19.0 cm. The average length of most of the root fibers was 15.2 cm.

5. **Grass shoots/branches:** (Figure 7). In total, 5 inflorescence bearing shoots/branches of a grass with a total weight of 0.15 g constituted the soft lining of the wall of the nest. The length of shoots/branches varied from 15.2 cm to 27.9 cm. The average length of shoots/branches was 22 cm.

6. **Congress Grass *Parthenium hysterophorus* shoots/branches:** (Figure 8). In total, 4 inflorescence bearing shoots/branches of congress grass with a total weight of 0.06 g constituted the soft lining of the nest. The length of shoots/branches varied from 6.3 cm to 10.1 cm. The average length of shoots/branches was 7.6 cm.

7. **Plastic fibers:** (Figure 9). In total, 5 thin white coloured plastic fibers (probably removed from a woven plastic bag) with a total weight of 0.05 g were incorporated on the outer side of the wall of the nest. The length of these fibers varied from 6.3 cm to 19.0 cm. The average length of plastic fibers was 13.9 cm.

Despite the above constituents which actually formed a part of the nest composition, 1-2 soft down feathers of an adult bird were also seen to have fallen on the wall of the nest.

1. Eggs in the Nest

2. Fledgling outside the Nest

3. *Emblica officinalis* shoots

4. *Cynoglossum wallichii* shoots

5. Plant Stem fibers

6. Plant roots/ rootlets

7. Grass shoots/ branches

8. Congress Grass shoots/branches

9. Plastic fibers

Discussion

The results of the present study are compared with the previous studies for following discussions:

The height of the nest from the ground was 3.2 meters which is in confirmation with earlier studies of height variation from 30 cm to 3 meters and rarely above 5 meters (Baker, 1932; Ali and Ripley, 1996) [2, 1].

The nest was built over the light cover fixed on the outdoor wall of the house which is also in confirmation with earlier studies about the locations of the nest construction on the walls and ceilings of the houses (Baker, 1932; Bates and Lowther, 1952; Fazili *et al*., 2013) [2, 3, 5].

The nest shape was cup like and constituted of different types of plant and non-plant material shows some similarities with previous studies regarding the shape and types of nest constituents such as cup like nest formed of stem fibers, grasses, roots and nylon fibers (Hume, 1889; Baker, 1932; Ali and Ripley, 1996; Fazili *et al*., 2013) [6, 2, 1,

[5]. However, presence of white coloured thin plastic fibers in the nest was a different observation in comparison to previous studies.

The number and identification of constituents of the nest consisted of 6 different types of plant material i.e. 87 dwarf shoots/ branches of Indian Gooseberry/Amla *Emblica officinalis* of total weight 2.10 g and average length 15.2 cm; 44 shoots/ branches of Barbed-Forget-Me-Not *Cynoglossum wallichii* of total weight 1.55 g and average length 13.9 cm; 30 plant stem fibers of total weight 0.68 g and average length 17.7 cm; 25 plant roots/ rootlets fibers of total weight 0.19 g and average length 15.2 cm; 5 grass shoots/ branches of a grass of total weight 0.15 g and average length 22cm; 4 shoots/ branches of Congress Grass *Parthenium hysterophorus* of total weight 0.06 g and average length 7.6 cm; and 1 non-plant material as 5 thin plastic fibers of total weight 0.05 g and average length 13.9 cm. These constituents were studied in detail and provided extra information in comparison to previous studies.

The nesting and breeding time was July month of the year in which nest construction started during the early days of July month followed by egg laying near 7th of July and completion of development to fledgling stage up to 30th of July. This observation in comparison to previous studies shows close similarities for nesting and breeding time: from March to August (Hume, 1889; Whistler, 1926; Ali and Ripley, 1996) [6, 10, 1] and April-May in Kangra (Whistler, 1926) [10].

The various observations about the average size of egg 22 mm x 16 mm, clutch size 3, oval shape and pinkish white colour speckled with dark pinkish red spots are found in close similarities with previous studies: average size of eggs 21.6 mm x 16.1 mm (Baker, 1932) [2]; 22.8 mm x 16.7 mm (Osmaston, 1927) [8]; clutch size 2-5 (Ali and Ripley, 1996) [1]; oval shaped (Hume, 1889; Baker, 1932) [6, 2]; pinkish white colour speckled with reddish spots (Baker, 1932; Bates and Lowther, 1952) [2, 3].

The incubation period of about 12 days and development from egg laying to fledging of about 24 days and complete breeding period of nesting, incubation, nestling and fledgling about 4 weeks also found in close comparison with previous studies: incubation period 11-13 days (Ali and Ripley, 1996; Fazili *et al*., 2013; Kumar and Kumar, 2021) [1, 5, 7] and total period from egg laying to fledging 25-26 days (Fazili *et al*., 2013) [5] and nesting to fledging about 4 weeks (Kumar and Kumar, 2021) [7].

Conclusion

- The nest composition consisted of 7 different types of constituents out of which the highest percentage was contributed by shoots/ branches of Indian Gooseberry/Amla *Emblica officinalis* (87) followed by shoots/ branches of Barbed-Forget-Me-Not *Cynoglossum wallichii* (44) and both of which formed the major part of the walls and base of the nest. Then, a lesser number of thin stem fibers (30) and plant root/ rootlet fibers (25) formed the soft lining of the nest. The least number of inflorescences bearing shoots/ branches of a grass (5) and Congress Grass *Parthenium hysterophorus* (4) and thin plastic fibers (5) formed a part of the nest walls.
- The length of constituents forming the nest varied from 6.3 cm to 27.9 cm and the average length of most of the constituents was 14.2 cm to 16.7 cm.
- The total weight of the naturally dried nest was 4.78 g including all the constituents of the nest.
- The total period of breeding i.e. nesting, incubation, nestling and fledgling extended for nearly 4 weeks.

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