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MORPHOMETRIC STUDY OF NESTS OF BAYA WEAVER BIRD *PLOCEUS PHILIPPINUS* IN DIFFERENT ZONES OF SHIVAMOGGA DISTRICT, KARNATAKA

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ABSTRACT

The baya weaver bird is one of the common weaver birds which occur across the Indian subcontinent. The nest of the weaver bird is distinctive for the delicate craftsmanship of constructing complex pendent nests. This paper describes a morphometric study of nest of bayaweaver birds hanging on natural and man-made habitats of shivamogga district. A total of 30 nests (20 complete and 10 incomplete) were collected for morphometric measurements. Ten parameters namely total length, Total width, Stalk length, Nest length, Entrance tube length, Stalk width, Entrance tube width, Egg chamber circumference, Entrance tube circumference, Threshold taken and weight were measured of both complete and incomplete nest. One-way analysis of variance (ANOVA) inferred that Total width (0.0026), Stalk length (0.0185) and Egg chamber circumference (0.00082) significantly in the complete and incomplete nests. But in the parameters like weight, total length, nest length, entrance tube length, stalk width, entrance tube width, entrance tube circumference, threshold is insignificantly in the complete and incomplete nests.

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INTRODUCTION

The baya weaver bird *Ploceus philippinus* (Linn.) is a sexually dimorphic, colonial- nesting bird that occurs throughout the Indian subcontinent. The adult male has brown streaks, thick bill and short rounded tail. During breeding season, it acquires golden yellow plumage on the breast and head whereas female is more drab. The weaver bird's nest is unique for delicate craftsmanship of building intricate pendent nests. Baya weaver bird is called 'king of nest building birds'. It takes about, 18 days to construct a complete nest. The male practices successive polygamy. He alone builds the nest; the female takes no part in the work except in lining the egg chamber after she accepts the nest. In the early stages of a nesting colony the female are completely absent. When some of the nests have reached the helmet stages (half-build), female visit the colony to prospect for suitable nest. The birds hop from one 'helmet' to another perching on the initial ring or chin strap. The nests are pendulous, hanging from the leaf tips.

There are five stages in the construction of a nest: initial attachment, roof and egg or brood chamber, ante- chamber, entrance and entrance tube (Solomon Raju, 2009). Each colony consists of 5-24 nests. The bird prefers building nest on plant that overhang a water body are believed to be protected from rats and similar terrestrial animal. Ali (2010) reported that, mean length, width and depth of the nest were 27.5 ± 9.31 cm,

19.3 ± 1.93 cm, 19.9 ± 2.71 cm respectively. Dhande *et al.* (2015) worked on the 'Morphometric study of baya weaver (*Ploceus philippinus* passeriformes) in Chakiston Tehsil of Jalgaon district. In their study, the statistical analysis by one-way ANOVA showed that complete nest differed insignificantly [$p < 0.05$] from that of incomplete ones. Naik (2007) studied on 5502 nests and observed 504 abnormal nests belonging to 17 different types in Shimoga district, Karnataka. They assessed the nest construction pattern at different stages of nest of baya weaver bird. The present study is focused on detail of post morphometry of nests and find out the present status and conserve suitable site for birds and nature conservation.

MATERIALS AND METHODS

Study Area

The study was carried out mainly in 4 different zones of Shivamogga districts, namely Ayanur (Zone-I), Shivamogga (Zone-II), B.R. Project (Zone-III) and Bhadravathi (Zone-IV). The study area is in agricultural lands along the canals of river Bhadra and Tunga. The prominent plant species found in these areas are *Butea monosperma*, *Pongamea pinnata*, *Tamarandus indica*, *Acacia leucopyrus*, *Prosopis juliflora*, *Tectona grandis*, *Cocos nucifera*, *Terminalia tomentosa*, *Areca catechu* and *Delonix regia*. Also there are agricultural cultivation of Paddy, Sugarcane, Cotton, Banana, pulses and other cereals. Nesting colonies were found in a variety of situation. Some colony trees

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were located on the edges of open ponds or on the steep embankments of storm water ditches, irrigation canal, areca trees and electric power lines in agriculture fields.

Methodology

The present study was carried out in four different zones of Shivamogga district from August 2019 to July 2020. When the breeding activity stops, and then the parent bird, along with the juvenile, leaves their nests (after the breeding season, the nests were abandoned by the birds), the numbers of abandoned nests with stalks attached to the host plant were collected from the fields and measurements were taken in the laboratory.

The nests were divided into two categories namely the complete and the incomplete nest. The complete nests referred to as nests with entrance tube and incomplete nests referred as nests without entrance tube. The length, width, circumference and depth of the nests were measured by using centimeter scale and total weight of each nest was weighed by an electronic balance (Kohinoor millennium) with ± 0.01g accuracy. Photographs of complete and incomplete nests were made on the spot using camera (Canon EOS, 700D & Nikon Coolpix L810).

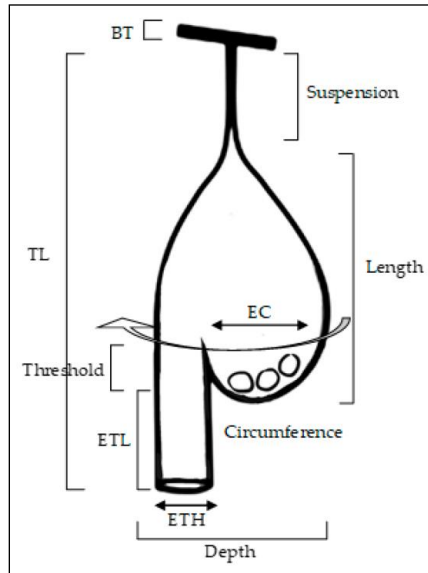


Fig. 1 Complete nest structure of baya weaver bird (*Ploceus philippinus*). TL: Total length, ETH: Entrance tube hole, EC: Egg chamber, ETL: Entrance tube length, BT: Brach thickness.

Results and Discussion

Baya weaver (*Ploceus philippinus*) build typical type of ovoid or kidney shaped nest with entrance tube on total 18 species of host plants and 1 electric power line in the selected study area. A total of 468 nests were sited from four different zones (Zone-I, Zone-II, Zone-III & Zone-IV) during breeding season among them 284 complete and 185 incomplete nests. In the present study, a total of 30 nests (20 complete and 10 incomplete) nests were collected for morphometric measurements (n=30) (Table 1 and Fig 2 & 3). The average weight of complete nest was 60.5±16.6 gm and incomplete nest was 18±3.4 gm. Total length, total width, stalk length, nest length, stalk width, egg chamber circumference, entrance tube circumference and threshold was 54.5±10.8, 15.65±0.8, 22.3±6.4, 17.95±2.6, 4.3±1.12, 38.65±8.7, 19.1±4.9 and 2.15±0.5 cm respectively in complete nest. But 34.1±5.9, 14±1.9, 16.6±4.5, 17.8±2.09, 5.2±1.47, 34.5±3.8 and 2.1±0.21 cm in incomplete nest respectively.

The average entrance tube length, entrance tube width and entrance tube circumference of the complete nests was 14±6.5 cm, 8.8±1.6 cm and 19.1±4.9 cm respectively, whereas incomplete nests did not have an entrance tube. The size and shape of the complete and incomplete nests was determined by various factors such as availability of nesting materials, nesting season, habitat of nest construction and experience of male bird.

One-way analysis of variance (ANOVA) inferred that total width (0.0026), stalk length (0.0185) and egg chamber circumference (0.00082) significantly (P < 0.05) in the complete and incomplete nests. But in the parameters like Weight, Total length, Nest length, Entrance tube length, Stalk width, Entrance tube width, Entrance tube circumference, Threshold is non-significantly in the complete and incomplete nests (Table 1). Wood (1926) and Quader (2003) stated that nests with short entrance tube had a lower hazard than those with long suspensions, prevent nests from being tossed about violently in strong winds and thereby losing their eggs or nestlings. Another advantage of short length of entrance was larger number feeding trips to keep pace with requirement of food for rapidly growing chicks. The variation in the nest entrance tube could also be associated with the presence of potential predators such as snakes and rodents (Ali, 2010).

CONCLUSION

The morphometric character of the baya weaver bird nests gave some significant and insignificant values and could not predict particular size of the nest which may helps in the success rate. The size of the nests was determined by various factors viz., availability of nests materials, nesting season, habitat and nest construction experience of male baya weaver bird. So, further studies are needed to compare the complete and incomplete nests of baya weaver bird hanging from natural and manmade platform.

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Table 1 Morphometric measurement of baya weaver bird nests (Average ± SD).

Sl. No.	Parameter	Complete nest	Incomplete nest	P-value
		(n=20)	(n=10)	
1	Weight (gm)	60.5±16.6	18±3.4	1.33 ^{NS}
2	Total length (cm)	54.5±10.8	34.1±5.9	6.84 ^{NS}
3	Total width (cm)	15.65±0.8	14±1.9	0.0026**
4	Stalk length (cm)	22.3±6.4	16.6±4.5	0.0185**
5	Nest length (cm)	17.95±2.6	17.8±2.09	0.8771 ^{NS}
6	Entrance tube length (cm)	14±6.5	-	1 ^{NS}
7	Stalk width (cm)	4.3±1.12	5.2±1.47	0.0737 ^{NS}
8	Entrance tube width (cm)	8.8±1.6	-	1 ^{NS}
9	Egg chamber circumference (cm)	38.65±8.7	34.5±3.8	0.00082**

10	Entrance tube circumference (cm)	19.1±4.9	-	1 ^{NS}
11	Threshold (cm)	2.15±0.5	2.1±0.21	0.5750 ^{NS}

**=Significant (P<0.05), NS=Non Significant, SD=Standard deviation.

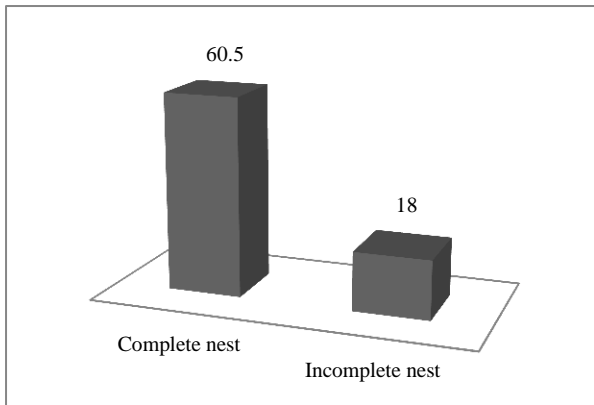


Fig. 2 Average weight of baya weaver bird nest (in gms).

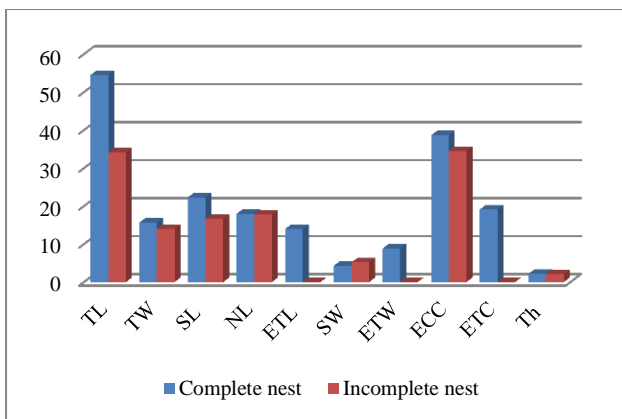


Fig. 3 Average morphometric value of baya weaver bird nest (in cm).

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