

## MORPHOMETRIC STUDY OF BIRDS' NESTS

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**Abstract-** Birds vary a great deal from one another in most of their life pattern like habitat, food, colorations, beaks, feet, size, plumage pattern, distribution and so on, likewise nests of birds are also having huge variations in their size, shape, structure, construction material used, construction pattern, selection of site for nest, nest architecture etc. Nest building in birds require extreme skills of engineering. In this regard birds have proved themselves expert engineers. Nest construction skills can be considered as a part of parental care or instincts. Birds provide care to their young ones before birth by constructing nests. Here it should be mentioned that some birds are not building nests and some provide very less parental care to their young. Following could be the needs of nest construction: (1) providing site for egg laying and incubating (2) Shelter for the young and the parents (3) Protection against enemies (4) escape from predators (5) A means of Courtship e.g. the male weaver bird builds nest for getting mate. In this study nests of birds were studied which are found on Christ college campus (CCC), Rajkot. Christ College is situated beside Saurashtra University in the Munjaka village. The area is full of vegetation, and has two streams and a water body. There was a great degree of variation amongst their nests. Many birds had selected leaf and twigs of neem tree (*Azadiracta Indica*) for making their nest. A variety of materials like Leaves, Grasses, threads, plastic bags, plastic rope, hairs, cloths, twigs, Papers, Spider web, thin branches, feathers, cotton, roots, etc were used for nest creation. The bird and their Site for nests are given below: (1) Robin- in holes near Canteen Hill, (2) Red vented bulbul- bushes of *Duranta* Near biology laboratory, (3) common Myna-window of Biotechnology laboratory, (4) Common Tailorbird-on *Tecoma* plants and Phalsa (*Grewia subinequailis*) plant near chemistry laboratory, (5) Indian Silver bill-Top of *Zizyphus mauritiana* plant, (6) Shikra- on a neem tree (*Azadiracta indica*) near water body in the botanical garden, (7) Grater coucal- on a Neem tree (*Azadiracta indica*) and Bamboo (*Dendrocalamus strictus*) in Botanical garden (8) Plain prinia-In *Pendula pendula* Near Canteen, (9) Eurasian Golden Oriole and (10) Black Drongo -Near Student parking in Gulmahor (*Delonics regia*), (11) Pond heron-on tree of Pardesi papal (*Ficus benjamina*) Opposite to reception, (12) Red-wattled lapwing-Down the hill near sports ground, (13) Rock pigeon- On Lintel near window 3<sup>rd</sup> floor, (14) Baya weaver bird- A colony hanging over water on neem tree (*Azadiracta indica*) behind botanical garden and on *Acacia nilotica* plant, (15) Black winged kite-*Prosopis cineraria* (16) Dusky crag martin-On wall near reception Cart (17) Green bee-eater-Holes in hill near canteen, (18) house sparrow-In water outlet pipe. (19) House swift-In Building ceilings, (20) Eurasian Collared Dove-On an *Acacia* tree, (21) Purple sunbird-In Botanical garden on *Ficus glomerata* and *Mimusops eleangi*

**Keywords-** Nest, Morphometry

### Introduction

Gujarat, the westernmost state of India, owes its rich avifauna to its diverse range of habitats, geographical location along the Indus flyway, and tradition of conservation [7,14]. However urban biodiversity has received very little attention from conservation biologists as compared to natural and protected ecosystems [6, 15]. Although educational premises occupy less than 5% of the total urban area, such areas may harbor up to half the biodiversity of the urban biota [9,4]. Work on bird is desirable for environmental protection because (1) Birds are widely recognized as good bio-indicators of the quality of the ecosystems and health of the environment [3] (2) Birds are responsive to change; their diversity and abundance can reflect ecological trends in other biodiversity [2] (3) Because of their highly specific habitat requirements, birds become increasingly intolerant of

even slight ecosystem disturbance [13]. In present study nests of birds were studied which are found on Christ college campus (+22° 17' 29.17" & +70° 43' 31, 22"), Rajkot. Christ College is situated beside Saurashtra University in the Munjaka village. The area is full of vegetation, and has two streams and a water body. There was a great degree of variation amongst birds' nests. The whole area under study is referred to as Christ College Campus (CCC) which covers 20 Acres and include main College building, Canteen, Saint Poul's School campus, Botanical garden, Sports ground, Open auditorium, Parking, Chemistry Building, Polytechnic building, MBA Section and Ladies hostel. The area has variations in temperature, which ranges from 46°C in summer to a minimum of 8°C in winter. The minimum relative humidity has been recorded during the late winter months and ranges from 5% to 12% and

maximum during the monsoon in July and ranges from 90% to 95%. The present study is based on the author's observations performed from 2008 to 2010 and published data. Natural landscapes of the study region have been partially affected by processes related to agricultural land development and irrigation. Recent climatic changes (more than average raining and increasing humidity) resulting from an increase in the extent and intensity of vegetation [8]. There is always a correlation between the vegetation pattern of the area and occurrence and distribution of Nests. A huge amount of pesticides are used annually in the agricultural fields [1], that also affect the non-target components along with eradicating unwanted insects and controlling disease vectors [10]. Birds are also one of none targeted but affected creatures. The study area supports a huge variety of native as well as exotic plant species. 250 plant Species are found in CCC. The CCC has eye-catching botanical garden. A number of tall trees and indigenous fruiting trees attract many birds [16]. The diverse flora of CCC is selected by near about 42 bird species as their nest sites. The present study is focused not only on sighting the nests, but also to find out birds occurrence, present status in the campus, particular bird's Suitable sites for nesting, Conserve the suitable sites as well as to generate responsiveness for avifaunal and nature conservation. The study provides the basic information about bird's nests which can be helpful as references for such studies in other areas. CCC is a large green spot near University, where birds get Cover and a variety of vegetation at a place. We are encouraging more number of bird species by protecting their habitat, Nests and inviting additional birds by planting bird friendly trees [5] like *Butea monosperma*, *Ficus glomerata*, *Ficus virens*, *Ficus religiosa*, *Erythrina indica*, *Acacia nilotica*, *Madhuca indica*, *Salvadora persica*, *Cordia gharaf*, *Morus alba*, *Syzygium cumini* and many more. The CCC is utilized since birds find the Campus more suitable and undisturbed.

### Materials and Method

The area of Christ college campus is under routine observation since July 2008 till the date. The work was carried out for a period of March 2010 to September 2010. The birds and nests were observed during the most active period in the day, morning 06:30 to 8:30, during 11:30 to 12:00 daily and 1:15 to 02:15 thrice a week. Approximately 300 man hours were spent. Sighting were carried out for the entire week except Sunday throughout the study the period. To encounter maximum knowledge about nesting behavior of birds and their nests morphometry, Details of bird and Nests were noted and photographs were taken as documentary proof. Whenever a bird was sighted, it was identified up to species and details like name of plant if nest is on a plant, nest construction, material used, period of nesting, place selected for nesting, nest morphometry, number of birds, and habitat type were recorded. Morphometry of nest includes nest length, nest width, nest position (Feet up from ground), nest depth, Materials used for nest

construction, and observation period for that particular bird. Birds were identified using binocular (8×40) and with the help of field guide. Photographs and some Videos were taken with the help of 12 mega pixel Camera. Birds are sensitive to the local landscape and change in vegetation patterns can affect the population of birds in the area [11,12]. After locating nest site it is regularly observed, with the precaution that the bird and the nest should not be disturbed. It is observed that birds like red vented Bulbul, Common Myna, Common tailor bird and dusky crag martin have built their nest in human activity area and they are much habituated with Men.

### Result and Discussion

Out of 52 Bird species found in Saurashtra University campus the CCC and nearby area has nests of 41 birds. The CCC provides unique habitat. The area supports a large number of birds and their nests as it has a rich and varied vegetation pattern and possesses two running water bodies (One runs throughout the year and other runs and provide water for 8 months) and a man made permanent water body which is all the time full with water (Water body is of 55feet Diameter and depth of 5.5 feet). The CCC (20 acres) comprises Botanical garden with 110 species of plants, Open auditorium with tall Trees, Shrubs and Grasses, Parking in the midst of rows of mixed vegetation, Canteen with Varied vegetations, A hill about 50 feet with Grasses, bushes and 15 tall plants on it, Saint poul's school with growing vegetations, A large sports ground full with grass during monsoon, and educational buildings. The area is having vegetation patterns like Scrubland, dense shrub, vegetation with scattered and intense trees, open garden vegetations with spares trees, wetlands, and open degraded grounds and buildings. Mere over the whole area is surrounded by agricultural lands, hills and open fields. All above conditions may provide suitable habitat for the birds. This could be one of the reasons that the birds (21 included in study and 20 others) have selected CCC as their home (Nest). Nearby area of CCC is full with cropland and pesticides and chemical fertilizers are constantly used. Birds may also select this site (CCC) so as to overcome such and similar circumstances.

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Table 1- Morphometric Details of Nests of Some Birds in Christ College Campus Rajkot

Bird's Common Name	L	W	D	Up	E	On	In B	NHA	Rep	SRep
(1) Robin	10	8	3	8	3	N	Y	Y	N	Y
(2) Red vented bulbul	11	11	3	4	3	Y	N	Y	N	N
(3) Common Myna	45	30	3	45	4	N	Y	Y	Y	Y
(4) Common Tailorbird	10	3	9	2	3	Y	N	Y	N	Y
(5) Indian Silver bill	25	17	15	10	4	Y	N	N	N	Y
(6) Shikra	50	40	4	25	3	Y	N	N	Y	Y
(7) Grater coucal	40	30	4	20	3	Y	N	N	Y	Y
(8) Plain prinia	8	5	7	2	3	Y	N	Y	N	Y
(9) Eurasian Golden Oriole	20	15	8	18	2	Y	N	Y	N	N
(10) Black Drongo	9	9	2.5	14	3	Y	N	Y	N	N
(11) Pond heron	40	35	5	45	4	Y	N	Y	Y	Y
(12) Red wattled lapwing	10	10	1	00	3	N	N	N	N	Y
(13) Rock pigeon	30	25	3	40	2	N	Y	Y	Y	Y
(14) Baya weaver bird	70	10	12	15	4	Y	N	N	Y	Y
(15) Black winged kite	18	12	3	12	3	Y	N	N	Y	Y
(16) Dusky crag martin	13	13	2	15	3	N	Y	Y	N	N
(17) Green bee	35	6	30	8	4	N	N	N	Y	Y
(18) house sparrow	18	7	2	15	4	N	Y	Y	Y	Y
(19) House swift	45	15	2	12	4	N	Y	Y	Y	Y
(20) Eurasian Collared Dove	12	10	2	12	2	Y	N	N	N	N
(21) Purple sunbird	18	8	5	18	2	Y	N	N	N	N

**L:** Length cm **W:** Width cm **D:** Depth cm **Up:** Feet Up from Ground **E:** No of Eggs **On:** Is the nest on a Tree? (Yes or No) **In B:** Is Nest In Buildings? **NHA:** Is nest constructed Near Human Activity? **Rep:** Is the nest reused for egg Laing? **SRep:** Is the site repeated for Nesting?



Fig. 1- Two red Vented Bulbul



Fig. 2- Fourteen Baya Weaver Bird





Fig. 3- Eight plain Prinia



Fig. 4- Black Winged Kite



Fig. 5- Common Tailorbird



Fig. 7- Common Myna