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ANALYSIS OF NESTS OF TEN SPECIES OF PASSERINE BIRDS FROM THE COLLECTION OF THE BANGABANDHU JAMUNA MULTIPURPOSE BRIDGE REGIONAL MUSEUM IN TANGAIL, BANGLADESH

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ABSTRACT

Analysis of nests of ten species of passerine birds from the collection of the Bangabandhu Jamuna Multipurpose Bridge Regional Museum, Tangail, Bangladesh was conducted during February to April 2010. In total 77 nests of the species studied were measured from outer surface of the sealed glass-boxes and the nest materials were identified. The nesting plants and nesting heights were analyzed from the records of the museum.

Keywords: Bird nest, nesting materials, nest measurement, Bangabandhu Jamuna Multipurpose Bridge Regional Museum, Tangail, Bangladesh.

INTRODUCTION

Birds build nests for survival and continuity of generations. Therefore, it is important to know about the nests of birds to conserve them. A nest is a place of refuge to hold an animal's eggs or provides a place to live or raise offspring. Nests are usually made up of some organic materials such as twigs, grasses and leaves or may simply be a depression in the ground or a hole in a tree, rock or building. Man made materials, such as string, plastic, cloth, hair or paper may also be used as nest material. Generally, each species has a distinctive style of nest. Nests are found in many different habitats. The preparation of a place for the building of nest is referred to the nesting instinct and may occur in both mammals and birds (Hansell 2005).

Most birds build some sort of nests, though some lay their eggs directly onto rock ledges or bare soil without modifying the area. Nest types vary from very simple scrape, which is merely a shallow depression on soil or vegetation, to

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the elaborately woven pendant or sphere. Some birds build nests in trees, some on rocky ledges, and others nest on the ground or in the holes.

Hannan and Ahsan (2002) studied nests of 25 species of birds at the Karnaphuli river mouth and adjacent areas in Chittagong but none of the nests of those birds are included in the present work. Ali (1996) mentioned the nesting materials of most of the birds of the Indian subcontinent. Robert (1992) recorded the shape and nesting materials of most of the birds of Pakistan. No published report is on record on the nests of birds from the BJMBRM (Bangabandhu Jamuna Multipurpose Bridge Regional Museum), Tangail area, so an attempt was made to do so.

STUDY AREA

BJMBRM is situated at Bhuapur Upazilla ($24^{\circ}27.5' N$ and $89^{\circ}52' E$) in Tangail District. The Museum is 1 km south-west from the Bangabandhu Setu East Station.

History of the Bangabandhu Jamuna Multipurpose Bridge

A question was raised during feasibility study for the construction of Bangabandhu Jamuna Multipurpose Bridge (BJMB) that what would be the adverse condition of biodiversity (mainly wildlife) of the concerned area (Tangail - Sirajganj), if the Bridge is built. So, an attempt was taken to measure the effect of BJMB on wildlife through a wildlife monitoring team for seven months during 1991 under the leadership of Late Professor Kazi Zakir Husain (Department of Zoology, University of Dhaka, Dhaka) under Jamuna Multipurpose Bridge Authority (JMBA) with financial support from World Bank, and submitted a report. As per report of the monitoring team, JMBA led a research program on concerned area's wildlife and environment as "Wildlife Protection and Monitoring" for three years (1995-97). They led this kind of research program to find out the possible effect of BJMB on the concerned area's wildlife and environment in the future (20-50 year later). According to the recommendation of vice president of World Bank (Mr. Ismail Mubarak), Late Professor Kazi Zakir Husain led this research program. The team started to collect biodiversity sample. Besides it, the field workers of this research program started to collect dead wild animals, and following them, the local people also started to collect dead animals and gave those animals to research program authority. By this way, the museum has been established day by day and this process is going on until now.

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In the middle of 1996, officers of JMBA, Professor A. M. Feroj Ahmed, and a visiting team of donor authority came to visit this project office (Fasholandi, Bhuapur). At that time, Late Professor Kazi Zakir Husain proposed to establish a museum and the donor authority accepted the proposal. Thus, this museum was established at the old-field office building of JMBA. On 4 September 1999, the museum was transferred to East Housing Complex of BJMB, and opened for public from November 2003.

Description of the museum

The museum is an L type building covering an area of 111.48 m², consisting of one office room, one laboratory and two display galleries, the total museum is fully air-conditioned. The museum has a good collection of animals and plants. According to museum records there are 112 specimens of mammals (22 species), 340 birds (83 species), 199 reptiles (31 species), 140 fishes (128 species), 101 eggs of birds (39 species), 279 nests of birds (64 species), 32 species of snails and oysters. In addition, 535 specimens of insects, 911 specimens of plants (numbers of species of both groups are not yet determined) and 644 socio-archeological specimens have been collected and preserved. The total number of preserved specimens is more than 3500.

MATERIALS AND METHODS

The present study was conducted at the Bangabandhu Jamuna Multipurpose Bridge Housing Area Museum from February to April 2010. A total of 279 nests of 64 species of birds are preserved in sealed glass cages in the fully air-conditioned museum, of which 77 nests of 10 passerines species were studied. The nests were measured with the help of a waxy thread, hand scale (30 cm), and a measuring tape (152 cm) as became convenient.

The following measurements of each of the nests were recorded: (1) total length by using a ribbon tape, (2) total width by a scale and (3) circumference (inside and outside) of the nests (with scale and tape). The trees from where the nests were collected and the height of the nests from the ground were noted from the museum records. The shapes of the nests have been described as seen in the preserved condition.

As all nests were sealed in glass boxes, so it was not possible to identify and record all kinds of material by which the nests were built. Nest materials of

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the studied nests were identified by naked eyes. Photographs of the nests were taken with the help of a camera (SAMSUNG PL55).

RESULTS AND DISCUSSION

Seventy-seven nests of 10 species of passerine birds belonging to 6 families were studied (Table 1) and nest of each species has been described and compared.

TABLE 1: STUDIED NESTS OF BIRDS AT THE BANGABANDHU JAMUNA MULTIPURPOSE BRIDGE MUSEUM

Taxa	English name	Local name
Family 1. Laniidae 1. <i>Lanius schach</i> Linnaeus, 1758	Long-tailed shrike	Baghatiki
Family 2. Corvidae 2. <i>Oriolus xanthornus</i> (Linnaeus, 1758)	Black-hooded oriole	Holdey pakhi
3. <i>Rhipidura albicollis</i> (Vieillot, 1818)	White-throated fantail	Lej-nachani
4. <i>Hypothymis azura</i> (Boddaert, 1783)	Black-naped monarch	Kalokhopa chatak
5. <i>Terpsiphone paradisi</i> (Linnaeus, 1758)	Asian paradise flycatcher	Shahi bulbuli
6. <i>Aegithina tiphia</i> (Linnaeus, 1758)	Common iora	Fatikjol
Family 3. Musicapidae 7. <i>Zoothera citrina</i> (Latham, 1790)	Orange-headed thrush	Sutatuni
Family 4. Cisticolidae 8. <i>Prinia burnesii</i> (Blyth, 1844)	Rufous-vented prinia	Laltola prinia
Family 5. Sylviidae 9. <i>Turdoides earlei</i> (Blyth, 1844)	Striated babbler	Dora satbhai
Family 6. Nectariniidae 10. <i>Nectarinia zeylonica</i> (Linnaeus, 1766)	Purple-rumped sunbird	Moutushi

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1. Long-tailed shrike (*Lanius schach*) (Plate-1)

The nest looks like a bowl (externally) and a cup shape (internally). Outer surface of the nests was rugged. The average (n = 5) length and width of the nests were 7.2 cm (range 5-9 cm) and 15 cm (range 12-18 cm) respectively. The average inside and outside circumferences were respectively 23.25 cm (range 18.25-25.13 cm) and 47.11 cm (range 37.70-56.55 cm) and depth of the nest cavity was 3.4 cm (range 3-3.5 cm). Inner-diameter of the nest of this species was reported as 7.62 to 8.25 cm and depth 4.45 to 5.41 cm (Sattymurti 1979). The nests of this species are deep compact cup-like (Ali 1996).

Identified nesting materials were polythene, thread of plastic sac, roots of grass, hard grass stem, grass leaf, plant debris, rope, durba grass (*Cynodon dactylon*), twigs, root of water hyacinths (*Eichhornia crassipe*), kash (*Catkin grass*), stem of grass, coarse grass root, various kinds of thread, dry stem of creeping herb. Sattymurti (1979) reported that grass stems, fine twigs, cotton-wool, old rags, dead leaves, pieces of snake skin, and all sorts of odds and ends are incorporated in the structure of nests of long-tailed shrike which are more or less strongly bound together by fine, tow-like vegetable fiber. The nest of long-tailed shrike is an untidy affair with bits of rag, cotton wool and other rubbish in the exterior wall (Roberts 1992). It is usually lined with fine grass fibers and quite neat in the interior cup (*op. cit.*). According to Ali (1996) nesting materials of this species are twigs, grass, wool, rags, etc.

They build their nests mainly in thorny trees such as babla (*Acacia nilotica*). The mean height of nest was 5.26 m (range 4.49-6.1 m) from the ground. This species prefers to build nest in thorny trees and the recorded maximum height of the nests at 15 ft (4.57 m) from the ground (Sattymurti 1979). Most nests of this species are built in trees and/or thorn bushes 3 to 5 m from the ground (Roberts 1992). The nests are placed in forks of branches of small tree usually under 5 m (Ali 1996) or 1.5-4 m above the ground (Grimmett *et al.* 1999).

2. Black-hooded oriole (*Oriolus xanthornus*) (Plate-2)

The average length and width of the nests were 8 cm (range 7-10 cm) and 11.83 cm (range 13-11 cm) respectively (n = 3). The average inside and outside circumference were respectively 21.47 cm (range 12.57-32.98 cm) and 39.56 cm (range 38.58-40.84 cm) and depth of the nest cavity was 5.67 cm (range 5-7 cm). Nesting materials were leaf and bark of banana plants (*Musa* sp.), rope, thread of 2 to 3 kinds of tree leaf, polythene, cotton like substances, and unidentified rachis. The average height of the nests from the ground was 5.39 m (range 3.05-10.68

m). The height of the nests was 4-10 m from the ground in a large tree (Grimmett *et al.* 1999).

3. *White-throated fantail (Rhipidurus albicollis) (Plate-3)*

The nest is cup-shaped having a long base and built within 2-3 twigs. The average (n = 3) length and width of the nests were 5.77 cm (range 5-6.8 cm) and 4.77 cm range (range 4.3-5 cm) respectively. The average inside and outside circumferences were respectively 13.62 cm (range 12.57-14.14 cm) and 15.71 cm (range 15.71-15.71 cm) and the depth cavity was 2.1 cm (range 2-2.3 cm). Fantail flycatcher built a very neat and compact cone-shaped nest made with comparatively thick walls and a shallow cup-like depression in the center (Roberts 1992).

Nesting materials used were threads of banana-plant barks, san (*Impertea cylenderica*) and grasses. This is a beautifully neat cup nest built with grasses and fibres, well-plastered nest and smoothed with spiders' webs and fashioned from dried grasses (Roberts 1992, Ali 1996, Grimmett *et al.* 1999).

The mean height of the nests from the ground was 2.34 m (range 1.83-3.05 m). Roberts (1992) reported that the most nests of the fantail flycatcher are built quite low down, within 3 m from the ground. The nests are placed in a crotch or fork of twig usually under 3 m up (Ali 1996) or in a horizontal fork (Grimmett *et al.* 1999).

4. *Black-naped monarch (Hypothymis azurea) (Plate-4)*

They build cup-shaped nests, which are mainly placed in Y-shaped branches of trees. The average (n = 5) length and width of the nests were respectively 5 cm (range 3.7-6 cm) and 5.6 cm (range 5-6 cm). The average inside and outside circumferences were 12.12 cm (range 11-14 cm) and 15.6 cm (range 13-18 cm) respectively and the depth of the nest cavity was 2.86 cm (range 2-3.5 cm). The nest of black-naped flycatcher is being a deep but very small cup or cone (Roberts 1992).

Nesting materials were bark and thread of banana plant, supari (*Areca catchu*) thread, fungi, net and egg sac of spider, mosses, broad leaf of grasses, polythene, san, banana plant leaf, etc. Black-naped flycatcher makes a deep cup-nest like a woven with fine grass stems well plastered with cobwebs and decorated on the outside with white spiders' egg cases or sometimes-small pieces of lichen or of leaf (Roberts 1992, Ali 1996). They build a neat cone-shaped nest, covered with cobwebs and spiders' egg cases and with nest material often trailing from the bottom (Grimmett *et al.* 1999).

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They build their nests mainly in trees such as mango tree (*Mangifera indica*). The average nest height from the ground was 2.56 m (range 1.22-6.71 m). They also build nests at 3-5 m high from the ground in a tree, bush or bamboo clump (Grimmett *et al.* 1999).

5. Asian paradise flycatcher (*Terpsiphone paradisi*) (Plate-5)

The outside of the nests are like cone-shaped and inside cup-shaped. The average (n = 13) length and width of the nests were 6.31 cm (range 5-7cm) and 7.61 cm (range 5.3-9 cm) respectively. The average inside and outside circumferences were respectively 18.39 cm (range 15.08-21.99 cm) and 23.73 cm (range 16.65-28.27 cm) and depth of the nest cavity was 3.28 cm (range 2.5-4.5 cm).

The identified nesting materials were leaf and bark of banana plant, san, egg sac of spider, root of plant, rachis, 3 to 4 types of thread materials of plant origin, pumpkin (*Cucurbita maxima*) like plant's stem, cotton, bamboo (*Bambusa arundinacea*) leaf and straw. The nests of paradise flycatcher are usually conspicuous, being well decorated on the outside with silvery spiders' webs and white spiders' egg cases (Roberts 1992). The inner cup is woven and bits of leaf also used (*op. cit.*). Commonly bits of web and leaf hang down in a tail from the bottom of the cone (Roberts 1992). The nests are compactly woven cups made up of fine grasses and fibres, plastered outside with cobwebs (Ali 1996); often with loose material dangling below and covered with cobwebs and spiders' egg cases (Grimmett *et al.* 1999).

They build their nests mainly in tree type plants such as jarul (*Lagerstroemia speciosa*), mango, etc. The nests are mainly placed in Y-shaped branches of trees. The average height from the ground was 3.97 m (range 2.14-7.63 m). Typical locations of the nests of Asian paradise flycatcher are in the vertically hanging branches of trees, or climbing wild roses growing near water (Roberts 1992). Often the nest is woven around one single vertical hanging branch, or a climbing vine stem such as *Clematis montana* and another typical situation is in the fork of a quite small sapling or side branch of a tree (*op. cit.*). Nests can be located as low as 1.5 m (eye-level) up to 9 or 10 m from the ground (Roberts 1992). They built nests in the crotch or elbow of a twig 2 to 4 m up from the ground (Ali 1996) and in a tree fork 1-15 m above the ground (Grimmett *et al.* 1999).

6. *Common iora* (*Aegithina tiphia*) (Plate-6)

The nest is like three-fourth of a local chicken egg. The average (n = 12) length and width of the nests were 3.77 cm (range 2.5-5 cm) and 6.09 cm (range 5-7.5 cm) respectively. The average inside and outside circumference were respectively 11.4 cm (range 10.8-13 cm) and 13.66 cm (range 15.3-12.66 cm) and depth of the nest cavity was 2.97 cm (range 1.8-4 cm). The egg cavity was about 5.08 cm in diameter and varied from 2.54 to 3.18 cm in depth (Sattymurti 1979).

Nesting materials were san leaf-blade (*Impertea cylenderica*), thread and bark of banana plant, spider net and fern rachis. The outer surfaces of the nests were plastered with spider nets. The walls of the nest composed of vegetable fibers, are throughout thickly coated externally with cobwebs (Sattymurti 1979). The nests of common iora are like a compact shallow cup of grasses, neatly and copiously plastered with cobwebs (Ali 1996, Grimmett *et al.* 1999).

They build their nest in various kinds of tree. The average height of the nests from the ground was 4.87 m (range 2.17-9.1m). The birds usually build their nests at a height from 10 ft (3.05 m) to 25 ft (7.63 m) from the ground (Sattymurti 1979); nests are placed in a crotch or fork of twig 2 to 4 m up from ground (Ali 1996) and usually 1- 9 m above in trees or bushes from ground (Grimmett *et al.* 1999).

7. *Orange-headed thrush* (*Zoothera citrina*) (Plate-7)

The nests are bowl-shaped externally, but internally cup-shaped. Outer surface of the nests were rugged. The average (n = 6) length and width of the nests were 6.75 cm (range 6-7.5 cm) and 12.93 cm (11-15 cm) respectively. The mean inside and outside circumferences were respectively 2.70 cm (range 20.42-23.56 cm) and 40.26 cm (range 34.56-43.98 cm) and depth of the nest cavity was 3 cm (range 2.3-4 cm).

Nesting materials were different parts of grass (leaf, stem and root), rachis of different trees, like babla, epil epil (*Leucocaena leucocephala*), amloki (*Phyllanthus embelica*), bark of banana plant, roots of bamboo and other unknown plants, polythene, straw, twig and bamboo leaf. The nest of this species is built with roots, twigs and grass with a good deal of mud used in its construction (Sattymurti 1979). They build a shallow cup shaped nests, covered in mosses (Grimmett *et al.* 1999).

Nests are mainly built in trees like mango/aam (*Mangifera indica*), gab (*Diopyros peregrina*), etc. The average height of nest from the ground was 3.36 m (range 1.53-3.66 m). The nest is rarely placed above a height of about 4.58 m from the ground (Sattymurti 1979); and it is usually built in the fork twigs of a tree less than 2 m high from the ground (Roberts 1992). The height of the nests

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from the grounds is usually 1-5 m in the fork of a tree or bush (Grimmett *et al.* 1999).

8. Rufous-vented prinia (*Prinia burnesii*) (Plate-8)

The nests are sac like. The average (n = 3) length and width of the nests were respectively 10.67 cm (range 10-11 cm) and 5.83 cm (range 5.5-6.5 cm). The average inside and outside circumferences were 11.52 cm (range 6.28-14.14 cm) and 18.19 cm (range 17.28-20.42 cm) respectively and depth of the nest cavity was 6.67 cm (range 6.5-7 cm). According to Roberts (1992) the nest is always deep cup woven around.

Nesting materials were thread of kash, san and/or straw. It is lined with vegetable down, usually *Calotropis procera* fluff, and always a few feather (Eates and Doig, in Roberts 1992). According to Grimmett *et al.* (1999) the nests are deep cup-shaped of coarse grasses, woven around plant stem. They build their nests mainly in grass type plants. The average height of the nests from the ground was 1.56 m (range 0.61-7.01 m). Roberts (1992) mentioned that the nest is nearly always built in the middle of a dense clump of tall grass (*Saccharum munja*) and located with a meter of the ground. The nests are placed in tall grass clump, within 1 m of ground (Grimmett *et al.* 1999).

9. Striated babbler (*Turdoides earlei*) (Plate-9)

Externally the nests look like bowl and internally cup-shaped. Outer surface of the nests were highly rugged. The average (n = 15) length and width of the nests were 11.07 cm (range 8-13.5 cm) and 14.37 cm (range 9-17 cm) respectively. The average inside and outside circumferences were respectively 23.43 cm (range 12.57-34.58 cm) and 45.76 cm (range 25.13-59.69 cm) and mean depth cavity was 4.95 cm (range 3.5-6 cm).

Nesting materials of this species were identified to be elephant grass (*Saccharum arundinacum*), durba grass (*Cynodon dactylon*), bamboo leaf, grass root, unknown leaf, covering of epil epil fruit, leaf like mango tree, vadal grass, polythene, san, kash, benjani grass (*Sporobolus diander*), bark of banana plant, several kinds of grass, rachis of different trees (babla, epil epil, amloki and krisnachura [*Delonix regia*]). The nest of striated babbler is quite a substantial affair, being a thick walled cup, lined only with slightly finer grass leaves, with the outer cup woven largely of dried reed leaves (Roberts 1992). The nests of this species are a neat, massive, cup-shaped structure of grass, reed- leaves, rootlets, etc., bound to close growing reed-stems or placed in a bush surrounded by grass

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(Ali 1996). Striated babbler builds a compact, thick l-walled cup, placed in a small bush among tall grass (Grimmett *et al.* 1999).

They build their nests mainly in grassy plants such as elephant grass. The mean height from the ground was 1.56 m (range 0.61-7.01 m). Nests of striated babbler were located close to the ground (0.75 m high) (Roberts 1992).

10. Purple-rumped sunbird (*Leptocoma zeylonica*) (Plate-10)

The nests are balloon-shaped, which increase in thickness towards bottom. At the middle position it has an opening (7.45 cm, range 3.14-9.42 cm, n = 12) to enter into it. The nest is firmly attached and hanging from a twig of tree. The average (n = 12) length and width of the nests were 13.42 cm (range 10-15 cm) and 6.75 cm (range 6-8.5 cm) respectively. The average outside circumferences was 21.07 cm (range 18.85-26.70 cm) and depth of the nest cavity was 3 cm (range 2.3-4 cm). Sattymurti (1979) reported that an average length of the nests (top to bottom) was 12.7 to 15.24 cm long and about 7.6 cm in diameter; and the entrance hole was 2.54 to 3.18 cm in diameter.

The identified nesting materials were jute fiber, rope, bark of tree, banana leaf and thread, 2-3 types of unidentified leaf, grinding materials (like saw dust) of tree (mainly boroi [*Zizyphus mauritiana*]) with spider net, cotton like thread, small leaf (like rain tree [*Albizia saman*]), thread of kashful (Catkin grass), several kinds of leaf and cotton. Purple-rumped sunbird built a very neat nests of grasses, vegetables fibres and sometimes with spiders web (Sattymurti 1979). The nests are an oblong pouch of soft grasses, rubbish and cobwebs, draped with pieces of bark, wordy refuse and caterpillars' dropping, with a projecting portico above the lateral entrance hole and suspended from the tip of a branch of bush or creeper (Ali 1996).

They build their nests mainly in trees at an average height of 2.71 m (range 1.83-4.58 m) from the ground. Sattymurti (1979) reported that the height of nest of purple-rumped sunbird ranged 10 ft (3.05 m) to 30 ft (9.05 m) high from the ground. The nests of this species are suspended 2-17 m up in a tree or shrub (Grimmett *et al.* 1999).

CONCLUSION

The study was carried out on 77 nests of 10 passerine birds' species (long-tailed shrike *Lanius schach*, black-hooded oriole *Oriolus xanthornus*, white-throated fantail *Rhipidura albicollis*, black-naped monarch *Hypothymis azura*, Asian paradise flycatcher *Terpsiphone paradisi*, common iora *Aegithina tiphia*,

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orange-headed thrush *Zoothera citrina*, rufous-vented prinia *Prinia burnesii*, striated babbler *Turdoides earlei* and purple-rumped sunbird *Nectarinia zeylonica*) of 6 families from the collection of Bangabandhu Jamuna Multipurpose Bridge Regional Museum. Same species of birds built same type of nests in same types of plant. They mainly used plant materials or plant derivatives to build up nests. Nesting materials of the same species were almost similar. Nest measurements (total length, width, circumference, nest cavity) of the same species were almost same.



PLATE 1- LONG-TAILED SHRIKE (*Lanius schach*)



PLATE 2- BLACK-HOODED ORIOLE (*Oriolus xanthornus*)



PLATE 3- WHITE-THROATED FANTAIL (*Rhipidura albicollis*)



PLATE 4- BLACK-NAPED MONARCH (*Hypothymis azurea*)

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PLATE 5- ASIAN PARADISE
FLYCATCHER (*Terpsiphone paradisi*)



PLATE 6- COMMON IORA
(*Aegithina tiphia*)



PLATE 7- ORANGE-HEADED GROUND
THRUSH (*Zoothera citrina*)



PLATE 8- RUFOUS-VENTED PRINIA
(*Prinia burnesii*)



PLATE 9- STRIATED BABBLER
(*Turdoides earlei*)



PLATE 10- PURPLE RUMPED SUNBIRD
(*Nectarinia zeylonica*)

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