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- J. W. Duckworth, East Redham Farm, Pilning, Bristol BS12 3JG, U.K.*
- R. J. Wilkinson, 27 Blackbrook Park Avenue, Fareham, Hants PO15 5JN, U.K.*
- R. J. Tizard, 1901 Nueces Drive, College Station, Texas 77840, U.S.A.*
- R. N. Kelsh, 67 Wickham Way, Park Langley, Beckenham, Kent BR3 3AH, U.K.*
- S. A. Irvin, 15 Mill Street, Mildenhall, Suffolk IP28 7DP, U.K.*
- M. I. Evans, Montrose, Llandeiniol, Llanrhystud, Ceredigion SY23 5AN, U.K.*

## Some observations on the nesting activities of Chestnut-headed Bee-eaters *Merops leschenaultii* and Green Bee-eaters *M. orientalis* in Chittagong, Bangladesh

K. M. NURUL HUDA

During the winter of 1991, I observed the nesting activities of the two species of bee-eaters in a hillock at Chittagong city (22°03'N 91°08'E), Bangladesh. The city has many hillocks at elevations below 100 m. The Prabartak hill is one such, and is situated in front of the local medical college. Its elevation ranges from 80-100 m, and covers an area of about 1,000 m<sup>2</sup>. The top of the hill was flattened in the past to accommodate an orphanage, a students' hostel and a school. The north and west facing slopes support some denuded remnants of former semi-evergreen forest, that existed all over the hilly areas of Chittagong nearly half a century ago. On the other sides, the hill has been subjected to excessive human activities, including the establishment of housing units and the removal of earth. These sides are exposed to severe erosion following monsoon rain. Thus steep slopes appeared with no visual barrier in front. These steep earth banks attracted numbers of breeding bee-eaters *Merops*.

From the end of December 1990 until April 1991 I kept notes on the nesting activities of some birds on Prabartak hill. These included the Chestnut-headed Bee-eater *Merops leschenaultii* and Green Bee-eater *M. orientalis*. They utilized the earth banks for nesting purposes.

A pair of Chestnut-headed Bee-eaters appeared near the earth bank on 2 January 1991. My attention was drawn when I saw them frantically digging in the earth bank. Whilst one bird was digging the other kept a constant vigil from a nearby perch. Upon sighting an intruder, the bird on watch uttered a specific call that alerted the digger, who would immediately leave the nesting tunnel and join the waiting partner in mobbing the predator, usually a House Crow *Corvus splendens*.

The digging of the tunnel apparently continued for almost a month, because during this period the digging bird did not spend long enough in the tunnel for it to be incubating. At the end of this time the partners started to spend periods of 10-15 minutes inside the tunnel, indicating that they were busy incubating. The longest single session of incubation was 25 minutes.

It had not been possible to check the contents of the nest and establish the exact date of laying because the nest tunnel was high up in an inaccessible position. On 20 March one of the parents carried the first food item into the tunnel, indicating that the young were hatched. The other parent also carried food into the nest soon after the other bird emerged.

In summary, it appears that in Bangladesh the Chestnut-headed Bee-eater starts nesting activities in January (mid winter), lays eggs in mid February (late winter), and the first nestlings hatch by mid March, indicating the incubation period of about a month.

The feeding sorties continued until almost the end of April. The prey identified included small moths Lepidoptera and dragonflies Odonata. The adults arriving with food paused only very briefly at the entrance to the nest tunnel before slipping inside. After the young had flown I measured the nest tunnel; it was about 30 cm deep and 8 cm in diameter.

By mid January, the Green Bee-eater started appearing on the steep slope of Prabartak hill, where the Chestnut-headed Bee-eater was already digging its nest. However, there were dozens of Green Bee-eaters and, by the end of January, 13 pairs had built nest tunnels within 5 m of the Chestnut-headed Bee-eaters nest. The digging of the nest tunnels, incubation period and care of the nestlings by the Green Bee-eaters appeared quite similar to those of the Chestnut-headed. The Green Bee-eaters fed their chicks almost entirely with dragonflies, supplemented with smaller insects occasionally. Before entering the nest tunnels they paused for a couple of seconds on a nearby perch, perhaps to check for imminent danger.

Four species of bee-eaters *Merops* have been recorded in Bangladesh (Khan 1982). Khan (1987) noted that both the Chestnut-headed and Green Bee-eaters lay eggs during summer (April to July). The Chestnut-headed was stated to lay in holes made on hill slopes or river banks, while the Green occupied holes in the isles dividing paddyfields, or in the earth banks alongside highways.

The above observations indicate that both species may start breeding in Bangladesh as early as January, and that they may both occupy an urban habitat. The observations also constitute the first detailed observations of the breeding of bee-eaters in Bangladesh.

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*K. M. Nurul Huda, Department of Zoology, Chittagong University, Chittagong, Bangladesh.*

## Birds feeding on flowers in India

V. SANTHARAM

Between the months of November and January in 1991-1992 and 1992-1993, I saw birds feeding on the flowers of *Clitoria ternatea* (Fabaceae), a common climber at the Peech-Vazhani Wildlife Sanctuary (Trichur District, Kerala). Four bird species: Asian Koel *Eudynamis scolopacea*, White-cheeked Barbet *Megalaima viridis*, Asian Fairy Bluebird *Irena puella*, and Red-vented Bulbul *Pycnonotus cafer* were observed feeding on the flowers on at least 16 occasions. While some birds consumed the whole flowers, the others discarded the large (standard) petal. Up to three flowers were consumed in succession by the birds. Apart from the above-mentioned species, I have noticed Purple Sunbird *Nectarinia asiatica*, Vernal Hanging Parrot *Loriculus vernalis* and Golden-fronted Leafbird *Chloropsis aurifrons* consuming nectar (and also possibly eating pollen) from these flowers without damaging them. On 27 November 1992, I saw a Red-vented Bulbul feed on a *Clerodendron infortunatum* (Verbenaceae) flower. Earlier, in January 1988 at the Mundanturai Tiger Reserve, Tamil Nadu, I had seen Plum-headed Parakeets *Psittacula cyanocephala* plucking *Helicteres isora* flowers which were then squeezed with the mandibles for nectar and discarded (Santharam 1996).

References about flower-eating by birds are scanty in standard works on pollination biology (e.g. Faegri and Pijl 1978). Welty (1979) mentions that some birds eat flowers and flower buds. In Africa, the habit of flower-eating is more common and widespread than seems generally appreciated. There, bulbuls, starlings and weavers were noticed feeding on flowers (Pettet 1977, Oatley and Skead 1972). In the Neotropics and West Indies, there are very few reports of birds consuming flower parts (Skutch 1944, Feinsinger *et al.* 1979, Janson *et al.* 1981, Riley and Smith 1986), and the bird species involved are Prong-billed Barbet *Semnornis frantzii*, Emerald Toucanet *Aulacorhynchus prasinus*, saltators *Saltator* and parrots Psittacidae. In Sri Lanka, the Yellow-browed Bulbul *Iole indica* was seen feeding on flowers and flower buds of *Apama siliquosa* in the Makandawa Forest Reserve (Mahendra Shiriwardhane pers. comm.).

Observations of birds feeding on flowers in India are scattered in the literature. In Table 1, I present a summary of these reports, and Table 2 gives some details of the flower species. A total of 30 species of birds from 13 families has been reported feeding on flowers in India, including the present observations. The majority of the birds involved are basically frugivorous or granivorous species, and some are generalized feeders. However, most of these species are known to feed on nectar (Ali and Ripley 1983). Records of birds feeding on flowers at Peechi have been in the late wet season or the dry season. Riley and Smith (1986) have observed birds feeding on flowers both