

## Breeding behaviour of the Purple-rumped Sunbird *Nectarinia zeylonica*

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A pair of Purple-rumped Sunbirds *Nectarinia zeylonica* had nested on a drooping branch of a live *Ber* (*Zizypus* sp.) tree in Nagpur, Maharashtra in the months of August-October 2005. The nest was visible directly from the ground floor residence of the author. The author recorded time budgeting data of the breeding pair till two nestlings fledged. The present paper describes the findings of the breeding behaviour of the Purple-rumped Sunbirds.

### Methods:

The nest was about five meters from the author's window. Binoculars were used whenever need was felt, particularly, to observe the female or nestlings inside the nest. During the present study the nest was never approached nor inspected to know the status of its contents. Hence the paper does not contain information about when the eggs were laid. The present data was collected only through opportunistic observations about the breeding behaviour of the *N. zeylonica*. All observations are of a single pair and single nesting attempt.

### Observations:

#### Nest building and incubation:

26<sup>th</sup> August, 2005: A pair of Purple-rumped Sunbird's varied, excited notes were heard. Both female and male were seen flapping wings, flicking tails, leaning forward in front of each other and calling. The female flew to the author's backyard and returned with a small piece of choir (coconut chord) and flew around a thin branch of the *Ber*, about ten feet above the ground. She flew again towards the backyard and was seen pulling choir from our clothesline. The male followed her meter behind, calling constantly. Soon the nest site had gathered a few whorls of choir. Every time the female brought some nesting material, she first perched on a side branch, called a short 'cheek' and then landed near or above the nest. Both birds were seen rubbing both sides of their bills on the branches, many times.

27-28<sup>th</sup> August, 2005: The female continued collecting choir, pieces of paper, caterpillar frass, small seeds, spider webs, etc. and attaching the

material to the nest. The male actively followed (guarded?) the female, but he was never seen bringing any nesting material to the nest. He just followed her wherever she went and kept calling. Even when she was pulling the choir he was just singing in front of her.

29<sup>th</sup> August, 2005: The nest had taken its shape and the nest entrance was ready. Now it looked like a piece of rubbish hanging to a branch. But still there was see-through hole in the nest. The female peeped through the nest, brought some silk floss and put it inside. For the first time, she entered the nest, squatted, rotated herself inside the nest and then peeped out from the entrance.

30<sup>th</sup> August, 2005: The female started sitting inside nest for longer periods (45 seconds to 2 minutes). Also she was seen attaching nesting material from outside. The female was seen attaching material at the porch of the entrance hole. Here it must be mentioned that the nest entrance was facing east and this porch provided the incubating female and then the **nestlings**, relief from direct sunlight.

31<sup>st</sup> August, 2005: The number of visits by the female to the nest was less. But she sat and spent few minutes in the nest whenever she entered it. She was seen bringing cotton, silk floss and small feathers to the nest and putting it inside. The male followed the female on lesser sorties.

1<sup>st</sup>-3<sup>rd</sup> September 2005: The female perched near the nest and called 'cheek' and 'whichivi...whichivi' repeatedly. Male also perched near the nest, flicked its tail excitedly with raised head and called 'chikivi...chikivi' when the female was on some other branch. The male repeated the call. This continued. The male, which was following the female, also led her to the nest singing continuously. From 3<sup>rd</sup> September 2005 night the female started roosting in the nest. It rained heavily on the same night.

4<sup>th</sup> September 2005: Both the sunbirds were seen in the tree. The male kept singing. The female entered the nest only at 14:50 hrs when there was bright sunlight. She roosted in the nest again.

5–6<sup>th</sup> September 2005: The male peeped into (inspected?) the nest twice by peeping deep inside during observations on both days.

10–20<sup>th</sup> September 2005: The female started spending more time (incubating?) in the nest. However she never stayed in the nest for very long durations during the day and incubated in smaller periods. (The author was out of station from 21 to 24<sup>th</sup> September 2005 and hence no observations were taken).

#### **After Hatching:**

25<sup>th</sup> September–5<sup>th</sup> October 2005: Both the parents were seen feeding the nestlings continuously from morning till it was dark. The female took a lion's share in feeding the nestlings. The male still followed the female on many occasions. The female roosted in the nest every night. The nestlings called a feeble 'cheek', which grew louder as the nestlings grew day by day.

#### **Taking the nestlings out:**

6<sup>th</sup> October 2005: This day at 09:00 hrs the female arrived, fed one of the nestlings and then as the nestling demanded more food the female moved her head sideways or retreated back, instead of feeding. At 09:19 hrs and 09:22 hrs the male also started behaving like this with the nestlings. They waved the head 5-6 times as the nestling tried to grab the food or bill of the parent. This behaviour was not observed in the afternoon and in the evening. When observed through the binoculars it was noted that the nestlings were sitting one over the other inside the nest!

On 7<sup>th</sup> October 2005: One nestling nearly came out of the nest in its attempt to get the food (07:30 hrs). Its one wing came out of the nest at (08:08 hrs). But it retreated back into the nest. At 08:46 hrs both the parents arrived and the female started hovering in front of the nest. But the male dodged her and both flew. At 08:59 hrs the female again hovered in front of the nest, perched on a side branch and drooped its wings and started calling. It fed the nestling and waved its head sideways. Now the nestlings were sitting side-by-side inside the nest. At 09:57 hrs when the parent sunbirds arrived calling, one nestling which was peeping out got its one wing stuck out in the nest entrance as it tried to retreat. Hence, it came out and clinged to the nest. In this position both the sunbird parents fed it. The nestling again entered the nest, now head-first. On this day the head waving behaviour by the parents was observed only in the morning.

8<sup>th</sup> October 2005: In the afternoon one nestling fledged and the fledgling was located 75meters away on a tree-top (5 meters up). The sunbird parents were

seen feeding it there. In the evening the female was seen calling the fledgling and as it followed, she led it to a nearby Mango (*Mangifera indica*) tree-top by 18:07 hrs (10 meters up).

9<sup>th</sup> October 2005: At 06:30 the second nestling was calling from the nest. At 10:30 hrs the nestling also had fledged. Thus the nest became empty.

#### **After Fledging:**

The pair kept visiting the tree daily. On 5<sup>th</sup> November 2005 (25 days after the nestlings had fledged) at 08:30 hrs the (same?) sunbird pair visited the tree. The female clinged to the branch just above the nest and then peeped into (inspected?) it. Then it flew and hovered in front of the nest.

#### **Inter-specific interactions:**

1. On 29<sup>th</sup> August 2005, at 17:15 hrs the sunbird pair along with a pair of Red-vented Bulbuls *Pycnonotus cafer*, a pair of Purple Sunbirds, a pair of House Sparrows *Passer domesticus* and an Oriental White-eye *Zosterops palpebrosus* gave alarm calls. The call of the Purple-rumped Sunbird was like 'whichi...whichi'. The reason of these alarm calls could not be understood.
2. On 30<sup>th</sup> August 2005 at 09:19 hrs a House Sparrow male arrived and inspected the nest. After sometime when the female Sunbird was working at the nest, this House Sparrow male arrived and landed on the nest branch just above the Sunbird. Then the House Sparrow male pecked on the back of the Sunbird female! The Sunbird first tried to attack the Sparrow. But the Sparrow pecked on the Sunbird's back again! Now the Sunbird opened its wings and hanged to the nest without moving. The Sparrow flew. This 'peeping tom' again visited the nest in absence of the breeding Sunbird pair, pecked at the nest and flew.
3. On 26<sup>th</sup> September 2005, an Ashy Prinia *Prinia socialis* visited the tree. It looked confused as the nestling called from the nest. The nestlings replied to it's 'cheeb' calls, implying that they were also confused. After some time the two fledglings of Ashy Prinia were seen in the tree. The Sunbird nestlings kept replying to the calls of the Ashy Prinia fledglings. This Prinia family visited the tree next day also and had similar interaction.
4. On 27<sup>th</sup> September 2005, two Purple Sunbirds (a male and a female) arrived in the tree. The nesting female chased the intruder female away whereas the nesting male whisked the intruder male away.
5. On 29<sup>th</sup> September 2005 at 15:13 hrs an eclipsed Purple Sunbird male arrived and clinged to the

nest. It peeped in, hovered in front of the nest and then flew. A second eclipsed Purple Sunbird male with different marking on the chest arrived, clinged, peeped in and hovered in front of the nest. It retracted its head when an open gape of a nestling popped out demanding food. It flew. Then both these visitors were seen on the electric wire simultaneously. The next day a Purple Sunbird female was seen in the tree. The nesting female chased the intruder away.

6. On 7<sup>th</sup> October 2005 the Sunbird parents located a female Purple Sunbird in the tree. Both chased it away.
7. On 21<sup>st</sup> October 2005 (after fledging) a Purple Sunbird pair visited the tree. After some time the female visited the nest. It pulled some choirs. Then ate (or collected) the caterpillar sheet or seeds in bill and flew.
8. The Sunbirds did not bother about the visits of Laughing Dove *Streptopelia senegalensis*, Oriental Magpie Robin *Copsychus malabaricus*, Indian Silverbill *Lonchura malabarica*, Indian Robin *Saxicoloides fulicata* to the nest tree and their presence nearby the nest. The Sunbird pair usually did not attend the nest; the female away collecting nesting material or food and the male following her.

#### **Intra-specific interactions:**

On 26<sup>th</sup> September 2005, at 14:40 hrs two *N. zeylonica* females were seen visiting the nest simultaneously! One, presumably the nesting female, fed the nestlings whereas the other hanged onto the nest and inspected it. They again repeated this act within few minutes, this time the 'guest' female even tried at pulling some nesting material from the exterior of the nest. The nesting female did not attack or chase this 'guest' female away. The author had no idea as to who this second female was. She never visited the nest again.

#### **Some interesting observations:**

On 30<sup>th</sup> September 2005 at 08:36 hrs the male was seen pecking on the glass of the window of the opposite house. One more day it was seen peeping into the mirror of a bike parked inside the building premises. It then pecked on the mirror from behind!

#### **Nest-site fidelity:**

Here the Purple-rumped Sunbird pair nested at the same site they had nested last year. Purple-rumped Sunbird seem to have an attachment to the nest and the nesting tree as they were seen visiting the tree and the nest even one month after fledging.

#### **Preening:**

Both the Sunbirds were seen to have certain habits. The commonest thing, which they do, is rubbing the bill on both sides on a branch. That is presumably to maintain the sharpness of the bill to penetrate through the corolla (petals) of larger flowers. They preened wings and feathers of the body throughout the day. The favoured time for preening seems to be 07:30 hrs to 08:40hrs and the favoured place for preening was the electric wire, which got morning sunlight.

#### **Roosting habits of the Sunbirds:**

From 3<sup>rd</sup> September 2005 onwards the female was seen roosting inside the nest. The last timings she entered nest to roost were recorded as 18:07, 18:05, 18:11, 18:13, 18:08, 18:10, 18:10, 18:13, and 18:11 hrs (n=9). Thus the preferred time to go to roost was between 18:05 to 18:13 hrs.

The male never roosted in the *Ber* tree. It flew to some other tree to roost. When the female started roosting in the nest, the male showed interesting behaviour before leaving the tree. On 4<sup>th</sup> October 2005, it came and clinged the nest called her out, and then peeped into nest, again clinged the nest twice when she was inside and then flew to roost.

On 6<sup>th</sup> October 2005 the male even entered the nest once, then clinged the nest before flying away to roost. On 7<sup>th</sup> October 2005 also the male took her out twice as she was settling in. The male let her roost at the right time and not before it.

#### **Vocalizations:**

All the calls are high pitched and metallic. This is an attempt by the author to word or vocalize the various calls as perceived by him.

**Calls of male:** The male called like 'tititititi' (5 syllable), which also was felt like 'tsee-tsee-tsee-tsee-tsee'. Also, it gave a continuous 'chikivi-chikivi-chikivi' call while following the female. Another short call heard from the male was 'chooit-chooit' which was also felt like 'tooit-tooit'.

**Calls of female:** The female announced its arrival to feed the nestlings with a single short 'chit' ('tzit') call. This is also the commonest call heard from the female. However, sometimes it calls 'chooit-chooit' before and after feeding the nestlings. The female calls the male as 'whichit-whichit'.

The alarm call of the female at the sight of a cat was noted as a continuous 'tooitit-tooitit' or 'chooichit'.

**Calls of the nestlings:** The nestlings gave long 'cheet' 'cheet' singular calls repeated every few seconds. The volume of this call grew as the nestlings grew.

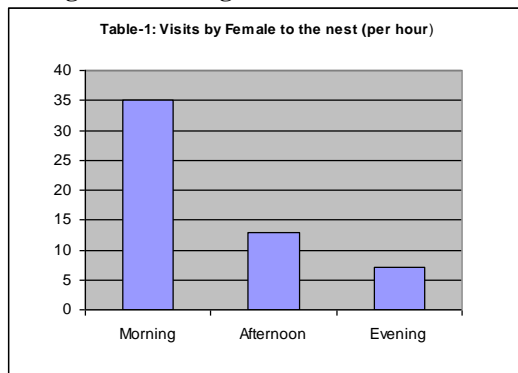
#### **Discussion:**

#### **Contribution of parents in nest building:**

Nest building was considered from first day of the study (26<sup>th</sup> August 2005) till the day when the female was seen roosting inside the nest (3<sup>rd</sup> September 2005). And the female started sitting in the nest from this day. Also the female was still giving the finishing touches to the nest after this date.

In the morning the activity was more, and it decreased towards the evening (see Table-1). In the mornings a total of 126 visits by female for nest building were counted in 216 minutes of observations (34.99 visits per hour). In the afternoon the female visited the nest 25 times in 117 minutes (12.82 visits per hour). In the evening the nest building sorties went down to 9 visits in 77 minutes (7.01 visits per hour). Contribution of the male to nest building was nil and never brought any nesting material for the purpose during total observation period of 410 minutes. The male visited the nest, presumably to examine its progress and okay it to the female.

**Table-1: Visitation rate female to the nest during nest building**



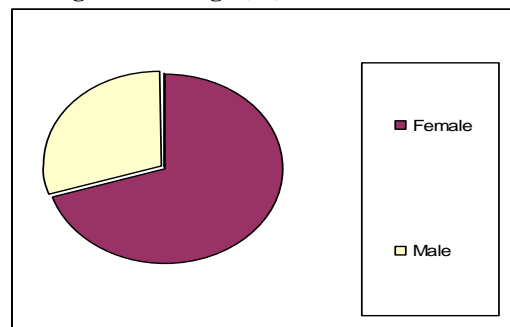
**Egg-laying and Incubation:**

The time-budgeting of the females' visits revealed some interesting data. On 1<sup>st</sup> September 2005, the female entered the nest for the first time and spent 45 second inside. She squatted, rotated herself inside and had a feel of the interiors. Also she did some material fixing while sitting inside. She roosted in the nest on 3<sup>rd</sup> September 2005 for the first time. Then she roosted inside the nest on all days she was observed in the evening. From 6<sup>th</sup> to 8<sup>th</sup> September 2005 an average 30.25% of time the female attended the nest (59 minutes out of 195 minutes). However the attentive period increased to 57.27% during 10 to 20<sup>th</sup> September 2005 (307 minutes inside nest out of 568 minutes). This meant that the female was incubating the eggs. But the female did not incubate eggs in continuous stretches and spent time in smaller periods from one minute to several minutes. On 14<sup>th</sup> September 2005, it rained and during observations of 77 minutes the female never entered the nest.

**Contribution of male and female in feeding the nestlings:**

Feeding activity was considered from the day the nestlings were heard calling. The observations from 26<sup>th</sup> September 2005 to 7<sup>th</sup> October 2005 were considered for calculation purpose as the nestlings fledged on 8<sup>th</sup> and 9<sup>th</sup> October 2005 mornings. In 792 minutes of observations (see Table-2) in the mornings, the female fed the nestlings on 127 occasions, whereas the male fed on 49 occasions (13.33 visits per hour total, n=176). In 105 minutes of observations in the afternoons, the female did 16 feeding trips, whereas the male contributed only 7 sorties (13.14 visits per hour, n=23). In the evening, in 565 minutes of observations, the female did 48 sorties whereas the male contributed only 26 sorties (7.85 visits per hour, n=76). In total the observed feeding sorties by female were 191 (69.96%) and that by male were 82 (30.04%). Thus, the feeding rate was same in the morning and afternoon, whereas it decreased in the evening (see Table-3).

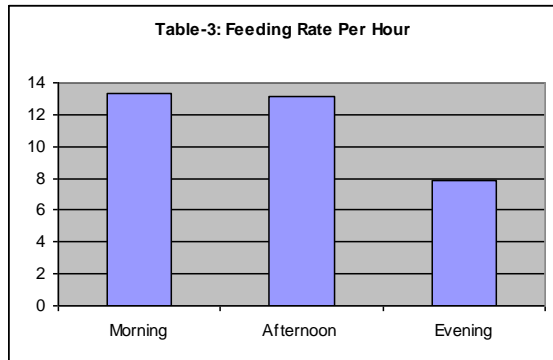
**Table-2: Contribution of male and female in feeding the nestlings (%)**



Generally, both parents arrived together to feed the nestlings. Hence, two types of behaviour were observed depending upon who fed first:

- (a) If the male fed first, it immediately flew off for another sortie and the female fed.
- (b) If the female fed first, the male scurried behind her without feeding the nestlings! Thus, the contribution of the male in feeding the nestlings was less than the female.

**Table-3: Feeding rate per hour by both the Sunbird parents**



**Nest sanitation:**

The female performed the major responsibility of keeping the nest clean. Out of 12 observations the female was seen removing and carrying away the excreta on 11 occasions (91.66%) and only once (8.33%) the male was seen removing the excreta. The parents peeped deep inside the nest; collected the excreta in the bill, which was seen as a white pellet, carried and dropped it in flight some 50 meters away from the nest. The pellet burst on the ground in the form of a splash. The favoured time of removing excreta is 08:23 hrs to 09:33 hrs (n=4) and 16:06 hrs to 18:05 hrs (n=7). Only once (n=1) the excreta were removed at 14:15 hrs.

**The male guarding the female and territoriality:**

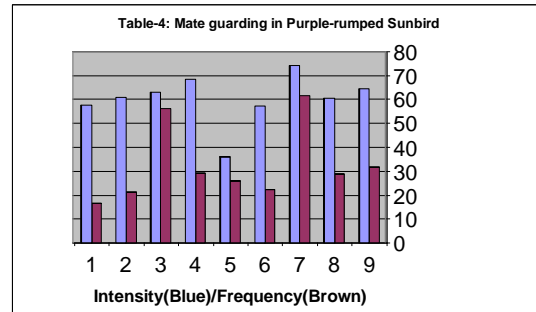
**During the nest building:** The male accompanied the female to guard her from competitor males. In 410 minutes of observations the male followed the female on 49 occasions calling (7.17 incidents per hour). But it never helped her in nest building by way of bringing nesting material.

**During feeding the nestlings:** During the feeding period, in which the male also contributed his efforts as much as (30.04%) of the total feeding sorties (n=273) done by the two parents. At the same time the male spent its energy in guarding the female. In 1462 minutes of observations the male followed the female calling on 54 occasions (2.21 incidents per hour) (see Table-4). That means the male guarded the female less vigorously after hatching and also helped her in her duties in bringing up their progeny (feeding the nestlings). Indicating that the male did not protect its territory vigorously (nest or nesting tree), but protected its mate from competition from other males.

The visits of Purple Sunbird and another female Purple-rumped Sunbird to the nest and the nesting

tree also indicated that the territory was not defended vigorously.

**Table-4: Intensity and frequency of mate guarding**



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**Reference:**

Kumar, S.A. 2005. Breeding behaviour of *Nectarinia zeylonica*. *Newsletter for Birdwatchers*. 43 (6): 80–82.

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