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Breeding Activity Period, Distribution and Nest Performance of Rufous-vented Prinia, *Prinia burnesii burnesii* (Blyth), in Pakistan

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Abstract.- This study was undertaken in the wake of absence of any description on breeding activity period, present distribution status and nest performance of the Rufous-vented Prinia *Prinia burnesii burnesii* (Passeriformes: Sylvidae) inhabiting the Indus Plains of Pakistan, as well as North-west India. It was found that breeding activity season was marked with the territorial male calls from February 10 to May 18, when fledglings could be seen around River Indus between Chashma Barrage (in the north) to Guddu Barrage (in the south) and in other tributaries, where suitable alluvial habitats are found. Rufous-vented Prinia was observed building nest on March 26 at Faridabad (30°30' N 70°45' E). Predominantly female remained inside the nest for 59.9% (n = 49) of the total time (2,678 minutes) observed during incubation period. By April 20 chicks were hatched. Both male and female birds were observed provisioning the chicks. During rearing period (April 18-May 1) the female remained inside the nest for 23.75% (n = 141) of the total time (2,467 min) observed. Our observations conclude overall breeding period of Rufous-vented Prinia from nest-building to fledging encircles around 38 days. During this time, male and female, both birds contribute significantly in rearing of chicks.

Key words: breeding biology, endemic bird area, nest performance, *Prinia burnesii*, vulnerable.

INTRODUCTION

The Rufous-vented Prinia can be recognized due to its number of field identification marks. Sides of head and cheeks white, bill pale horny, legs and feet pale brown, under-tail coverts are deep rufous, which along with other characteristics is prominent mark of identification (Grimmett *et al.*, 1998). In Pakistan, it is spanning much of Punjab along the Indus, Jhelum, Chenab, Ravi and Sutlej rivers, and extending down the Indus into southern Sindh. In the northern part of its range in Khyber Pakhtunkhwa, it occurs around the town of Dera Ismail Khan on the banks of the Indus, to Chashma Barrage (Showler and Davidson, 1999). The Indian subcontinent represents three isolated populations of the species. Where, the nominate subspecies *Prinia burnesii burnesii* (Blyth) occurs along the River Indus and its tributaries in Pakistan (Roberts, 1992) and adjacent North-west India (Collar *et al.*, 1994). We made present observations at Faridabad (30°30' N 70°45' E), situated 8 kms west of Taunsa Barrage (30°45' N 70°45' E) over the Indus. Other subspecies *P. b. cinerascens* (Walden) is distributed in north-east India along the plains of the Brahmaputra in Assam and Bangladesh, and some of the tributaries of the Ganges in Bangladesh west to Bihar (Ripley, 1982). While the third recently discovered subspecies (*P. b. nipalensis*) is known from Koshi Tappu of Koshi River (Baral *et al.*, 2007).

Examination of skins at the Bombay Museum of Natural History revealed that *P. b. cinerascens* differs from the nominate race. It is being slightly smaller and shorter-tailed having olive-grey upper parts with diffuse darker streaking, compared with warm rufous-brown upper-parts, heavily streaked dark on the crown, nape, mantle and back in the nominate. Also there is less pronounced supercilium and eye-ring. The cold grayish white under parts, lacking streaking on breast and flanks in *P. b. cinerascens* while, warm buff-brown with darker streaking in the nominate. The undertail-coverts are pale buffish-grey in *P. b. cinerascens* as compared to bright cinnamon-rufous in the nominate. Bare part coloration of the two races also differs: *P. b. cinerascens* has a horny-black bill, with a bluish tinge to the lower mandible, compared with a paler horn colour with straw-coloured tip and lower

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mandible in the nominate. Moreover, the legs are brownish, plumbeous or slaty-brown rather than flesh-coloured (Showler and Davidson, 1999). The two races *burnesii* and *cinerascens* are sufficiently morphologically distinct to be treated as two separate species, given the marked differences in proportions, plumage pattern and colour, and eggs. Their strikingly similar songs may reflect retention of an ancestral song-type in the absence of selection for change despite long isolation, which might qualify one or both for threatened status (BirdLife International, 2001; Rasmussen and Anderton, 2005). The Rufous-vented Prinia is listed as "Vulnerable" (Collar *et al.,* 1994) and "near threatened" (BirdLife International, 2001). The eastern population was formerly locally common (Ali and Ripley, 1987) but there are few recently published records (Collar *et al.,* 1994). In Pakistan, Roberts (1992) reported its status as 'Frequent'. He also noted that this Prinia has spread away from the Indus to fringes of manmade, permanent lakes and seepage zones around irrigation headwork's and locally common or abundant in its restricted habitats in Punjab and northern Sindh but less common in southern Sindh.

Activity budget studies help determine if daily and seasonal time scales influence behavioural investments of the species (Khan *et al*., 1996). Its breeding starts from March to September in district Narra, Sindh (Doig, 1879). Whereas, Showler and Davidson (1999) observed a bird carrying nest material (grass-like vegetation) near Dera Ismail Khan on February 19, conforming observations made by Roberts (1992).

Previously, there have been partial descriptions on the breeding biology of Rufous-vented Prinia. The present work is the first and novel description of the nest performance of the species. Therefore, the study is aimed at analyzing complete breeding cycle of this globally important restricted range species.

MATERIALS AND METHODS

Literature was reviewed extensively to find any reference on breeding biology of Rufous-vented Prinia but sporadic information was found, not sufficient enough to understand the breeding biology.

Detailed observations on nest performance of the species started by observing nest building on March 26, 2007 at Faridabad (30°30' N 70°45' E), situated 8 kms west of Taunsa Barrage (30°45' N 70°45' E). During the observation, least efforts were made to conceal the observer due to natural tameness of the species to human presence. However, a distance of 3-4 m was maintained between nest and the observer. The distinction between male and female were made on the basis of their calling pattern and body size. Usually insects were observed in the beak of Prinia while provisioning at nest. The investigational nest was designated as nest 1. Thereafter, two more nests were found in close vicinity of the study area but kept aside from detailed study (Fig. 1).

Observations were made with the help of 8x40 Minolta binocular (Table I). Global Positioning System GPS (Garmin) was used to take geographical coordinates of the area. A still digital camera (Kodak, 3x magnification) was also used to procure periodical photographs of nestlings' status. The sound of birds was recorded through highly sensitive parabola microphone (Telinga Ltd. Scientific Microphone) on video recorder (SONY DCR-TRV110E).

RESULTS

At the onset of spring, the breeding season of Rufous-vented Prinia *Prinia burnesii burnesii* marks with the territorial male calls starting from February 10 and breeding activity continues until May 18 when fledglings could be seen at conceivable sites in suitable habitats over the stretch of River Indus between Chashma Barrage (in the north) to Guddu Baarage (in the south) and in other tributaries including Rivers Chenab, Ravi and Satluj, where suitable alluvial habitats are found (Table II). The territorial range of Rufous-vented Prinia males averages within 500 m from one nesting site to another.

In nest performance study, only female partner was observed bringing the nesting material. The nest was built in dense clump of Sarkand bush (*Saccharum spontaneum*). The measurements of all three nests were taken and described in (Table III).

Fig. 1. Photographs showing nest performance success of *Prinia burnesii burnessii* in the study area.

It was cup woven and supported by upright *S. spontaneum* stem. The nest was made up of thin straws lined with soft coarse grass and uppermost white lining of *Saccharum* fruit bedding disguising cotton like material. However, in a number of previous observations (AA Khan, pers. obs.), the Rufous-vented Prinia was observed feeding preferably in thickets of *S. spontaneum* grass clumps that have small Mesquite (*Prosopis pubescens*) tree grown in the center of Sarkand bush.

On April 1, 2007 first egg was laid in nest 1 in evening hours. Nevertheless, on April 3, three eggs were observed in the nest while fourth was laid on April 4. During incubation period (April, 1-17) only female partner incubated the eggs. While, male bird visited the nest site for once, only for 8 min (Table IV). It was observed that female largely remained inside the nest for 59.9% (n = 49) of the

total time observed (2,678 min).

Table I.- Data showing break up details of observation time spent on nest performance study.

Date	Observation time				Minutes / day
	Morning hours		Evening hours		
26/03/2007	8:15	10:30	--	--	135
28/03/2007	8:30	9:30	--	--	60
31/03/2007	8:15	9:00	--	--	45
01/04/2007	9:00	9:35	--	--	35
03/04/2007	8:20	9:10	--	--	50
04/04/2007	8:40	9:45	--	--	65
07/04/2007	9:10	11:05	--	--	115
08/04/2007	--	--	16:30	18:35	125
09/04/2007	7:30	9:45	16:37	18:25	243
10/04/2007	8:10	10:20	16:10	18:20	260
11/04/2007	8:00	10:20	--	--	140
12/04/2007	7:30	9:45	16:50	18:10	215
13/04/2007	7:40	9:50	16:10	18:00	240
14/04/2007	7:20	9:30	16:15	18:15	250
15/04/2007	7:20	9:30	16:00	18:05	255
16/04/2007	7:00	9:15	16:10	18:15	260
17/04/2007	7:20	9:20	16:20	18:00	220
18/04/2007	7:40	9:45	16:05	18:00	240
19/04/2007	8:10	10:00	16:15	18:10	225
20/04/2007	6:35	8:45	17:30	18:15	175
21/04/2007	7:10	9:07	16:20	18:20	237
22/04/2007	6:30	8:30	16:25	18:00	215
23/04/2007	6:30	8:30	16:00	18:00	240
24/04/2007	6:30	8:30	--	--	120
25/04/2007	7:00	9:00	16:50	18:20	210
26/04/2007	6:45	8:45	16:45	18:15	210
27/04/2007	6:30	8:30	17:00	18:25	205
28/04/2007	7:00	9:00	17:25	18:25	180
29/04/2007	6:30	8:30	16:50	18:20	210
30/04/2007	6:30	8:30	--	--	120
01/05/2007	6:30	8:30	--	--	120
02/05/2007	6:30	6:35	--	--	005
Total observation period					5,425

On April 18, two chicks were hatched, while third and fourth chick hatched on April 19 and 20, respectively. Both male and female birds were observed provisioning the chicks. At times an approaching bird utters *twit-twit-twit* from the nearby bush and readily the bird inside the nest get ready to be fed. During rearing (time from hatching of first nesting to before fledging of first nestling) period (April 18–May 1) the female remained inside the nest for 23.75% (n = 141) of the total time observed (2,467 minutes). However, male bird remained inside the nest for 9.36% (n = 86) (Table IV). Fledging was observed on May 2 after 38 days from nest building to fledging. All nests were soiled within 45 days post-fledging that warrants afresh nest building in every breeding season.

DISCUSSION

At the emergence of spring around February10, Rufous-vented Prinia males start showing territorial calls predominantly after sunrise, which is often responded by the nearby males. This process continues until nest building starts after mid-February till end of March (Table I). However, during the main pre-breeding period (February 10 – April 10), and at hot midday timings, these males do not sing with exception of cloudy days. Showler and Davidson (1999) describe the call, a scolding or hissing *tsch-tsch-tsch-tschtsch-tsch-tsch-tsch* or *zeez-eez-eez-eez-eez-eez-eez*, and a single, distinctive, rather drawn-out nasal rising then falling *skeeeooo* and the song consists of a loud warbling, often with a scratchy quality, reminiscent of a Dunnock *Prunella modularis*. It consists of a regularly repeated complex phrase lasting 2-4 seconds and, on one occasion, was heard delivered in duet, the presumed female giving a slightly nasal or hissing *tuk-tuk-tuk-tuk-tuk-tuk-tuktuk-tuk tchuk tchuk tchuk*, falling in tone, in unison with the male's song phrase. Our vocalization observations conform well to the species' repertoire given by (Roberts, 1992; Showler and Davidson, 1999). Doig (1879) described two breeding seasons (pre and post monsoon) of Rufous-vented Prinia in Pakistan, whereas, post monsoon breeding season could yet not be confirmed in prolonged casual efforts in the study area. There is need for further concentrated efforts to confirm post-monsoon breeding season of the species in Pakistan.

According to Roberts (1992) observation, both parents were bringing nesting material, whereas, in our findings so far, only female has been observed bringing the nesting material and building the nest as also described by Ali and Ripley (1987).

In the present study, three nests of Rufous-vented Prinia were found in grass clumps of Sarkand bush *Saccharum spontaneum* present at the edge of moist mixed reed-bed bush-forest containing extensive *Phragmites karka* and *Typha angusta*, which is in line with the findings of (Ticehurst, 1922). Similarly, Doig (1879) also found his first nest near the bank of a minor canal. These

Table II.- Overall breading activity period of *P. b. burnesii* in Pakistan.

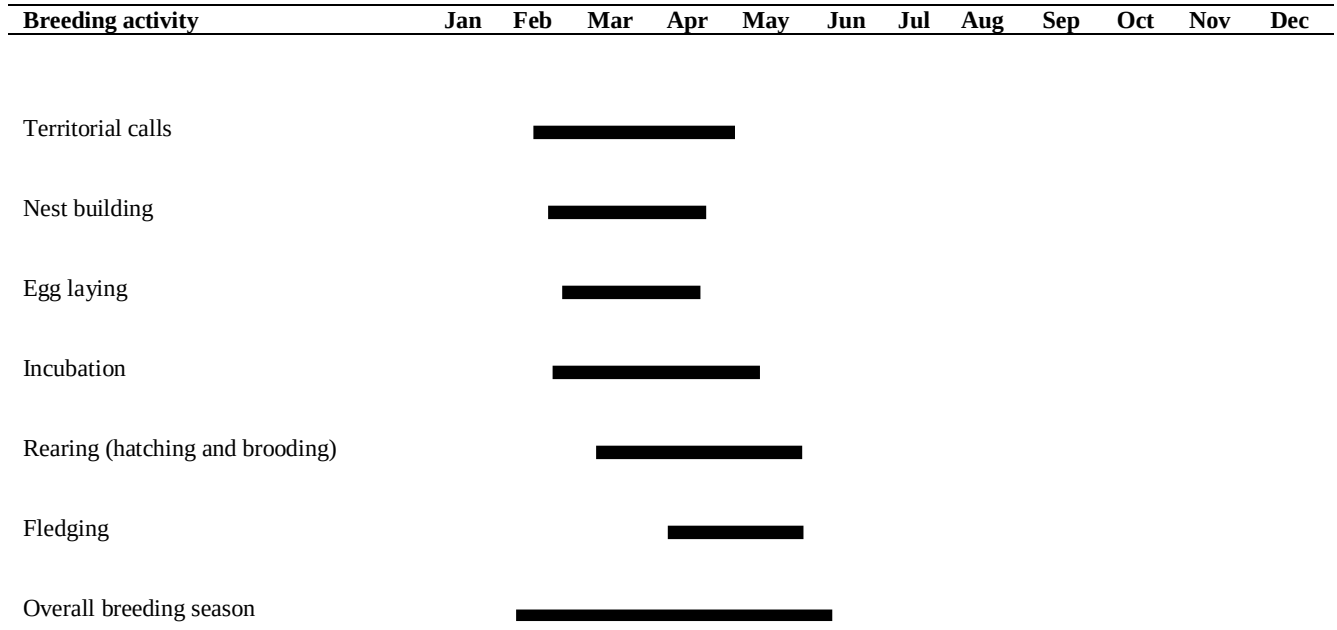

Table III.- Comparison among three nests of *P. b. burnesii* documented at study area.

Nest number	GPS position	Depth	Width	
			East to West	North to South
Nest number	GPS Position	Depth	East to West	North to South
Nest 1	30°30N 70°44'47E	75	80	70
Nest 2	30°30N 70°44'41E	60	65	85
Nest 3	30°30N 70°44'50E	70	70	75
Mean±SD	75±4.08	70±1.80	73.3±2.36	

Table IV.- *Prinia burnesii burnesii* nest performance time activity budget analysis.

Nest performance by parent birds	Incubation	Rearing
Female	59.9%	23.79%
Inside the nest	(n = 49)	(n = 141)
Outside the nest	40.1%	76.3%
	(n = 42)	(n = 151)
Male	0.3%	9.4%
Inside the nest	(n = 1)	(n = 86)
Outside the nest	99.7%	90.6
		(n = 104)
Sub total of breeding activity period at nest	14 days	13 days

were built some 20-40 cm above the ground in order to avoid ground predation by small mammals. All three nests had wide opening to the western side of each nest probably to avoid direct effect of scorching sun. However, in a number of previous observations (AA Khan, pers. obs.), the Rufous-vented Prinia was observed feeding preferably in thickets of *S. spontaneum* grass clumps that have small Mesquite (*Prosopis pubescens*) tree grown in the center of Sarkand bush. The nests were built in grass clumps grown down and near the ground slopes, probably to avoid uprooting by direct exposure to strong wind. At all sites where Rufous-vented Prinia were observed, had the exact habitat conditions described above, coupled with Mesquite and agricultural lands presenting as forest edge. Such additional habitat preference has not been mentioned earlier (Ticehurst, 1922; Ali and Ripley, 1987; Roberts, 1992; Showler and Davidson, 1999). It is obvious that Mesquite was introduced as wild pest in Pakistan after 1965 so the earlier authors were not in view of Mesquite in our habitats at that

time. Additionally, agriculture was not of the advanced level in this part of the world as is now, which has drastically altered the overall natural habitat of certain "restricted range species" including Rufous-vented Prinia. Since this Prinia is very tamed to human appearance and rather prefers to exhibit her tameness in human presence, has adapted to communal gatherings, at the edge of agriculture lands that provide sufficient niche nearby. To our conclusion, Rufous-vented Prinia like that of Sindh Jungle Sparrow *Passer pyrrhonotus* has sufficiently adjusted to the altered habitat conditions, emerged due to human activities and establishment of very large irrigation system. Thereby, its population is fairly common in suitable habitats between Chashma and Guddu Barrages.

According to Doig (1879) the eggs vary in size from 65-80mm in length and from 50-55mm in width. The average of seven eggs is 72mm in length and 54mm in width. Baker (1924) describes the full compliment of eggs around three or four. In shape these were blunt and oval. The ground colour was white or pale greenish white and were thickly specked and spotted with dark reddish brown, profuse everywhere but even more so at the larger end. In present finding, the full clutch is four in two each of the three nests observed, which is concurrent with that of the findings of Baker (1924). Similarly, four eggs in a nest were observed in April 1997, in similar vicinity (AA Khan pers. obs.). The shape of eggs was also variable as described (Doig, 1879; Baker, 1924).

As per findings of Doig (1879), "the eggs found on March, 13 were of a pale green ground-colour, covered with large irregular blotches of purplish brown. While in July again, a nest was found, where the eggs were quite of a different type, showing very pale creamy ground-colour, having large rusty blotches, principally confined to the larger end". Similarly Baker (1924) describes variation in eggs shape and colouration. We also found pale creamy ground-coloured eggs in two nests, while pale green ground-coloured eggs in the third nest having three eggs. This is concurrent with the findings of Doig (1879) and Baker (1924).

The nests of Prinia are composed of coarse grass, the inside being composed of the finer parts; they are 100-125mm in external diameter and 62.5mm internal diameter, the cavity being 37.5 mm deep (Doig, 1879). Description of nesting material found overlaps with that of the observations of Doig (1879), however, the average depth of three nests in our case is 75 mm, which is almost double to his findings (Table II). The nest building was completed in three days and nest remained empty for three more days, while egg laying lasted for four days hence extending gross incubation period (time from the laying of first egg in nest till before hatching of first nestling) for 17 days in total. Most of the incubation activity was carried out by female bird, while male bird kept on supplementing food to her mate, at the nest. The rearing period stretched for 14 days while nestlings' fledged at early morning hours of 15th day. However, on April 22 at nest no.1, two chicks were found dead. Following physical examination we found no apparent real cause of their death. Only mucous secretions were excreting from anal openings of dead chicks, probably indicating food poisoning, which is point of concern.

Our observations conclude overall breeding period of Rufous-vented Prinia from nest-building to fledging encircles around 38 days. During this time, male and female, both birds contribute significantly in rearing of chicks.

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