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SHORT COMMUNICATION

BREEDING BIOLOGY OF RED VENTED BULBUL (*PYCNONOTUS CAFER*) IN THE AREA OF RAWALPINDI/ISLAMABAD

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ABSTRACT

Breeding biology of Red vented bulbul (*Pycnonotus cafer*) was studied in the areas of Rawalpindi and Islamabad. A total of 45 nests were located in the study area out of which 35 nests were found active. Majority of successful nests (43%) were in the fork of trees followed by middle of the trees (29%) and on the top (11%) of the trees. Preferred nest height (53%) by red-vented bulbul was 1-2 meters from the ground. Vegetation material used for nest building by Red-vented bulbul was Beri (*Zizyphus nummalaria*) (31%) followed by Guava (*Psidium guajava*) (22%), Sheesham (*Dalbergia sissoo)* (18%), Snatha (*Dodonea viscosa*) (16%) and Date palm (*Phoenix dactylifera*) (13%). Highest percentage (51%) of nests was found with clutch size three followed by clutch size two and four. Predation rate was only 6% in eggs and 9% in nestlings. Breeding success in the present study was evaluated as good which was 82% and 86% for eggs and fledglings, respectively. Loss of nesting sites due to urban expansion and pollution negatively affect the population of Red - vented bulbul.

Key words: Red vented bulbul, breeding biology, hatching success

INTRODUCTION

The family *Pycnonotidae* is the largest family among passerine birds. There are 130 species of bulbul in worldwide, out of which 5 species are reported to occur in Pakistan (Lepage, 2007) and the R vented bulbul is one of them (Roberts, 1991). In Pakistan, it is widely distributed throughout the Indus plain and cultivated areas of all provinces except Baluchistan or any desert area (Roberts, 1991). The red-vented bulbul (*Pycnonotus cafer*) is described as common or Least Concern in IUCN Red list of avian species (IUCN, 2013). Breeding season in R vented bulbul starts from February and lasts till September (Balakrishnan, 2007).

This species is found to be abundant in gardens, cultivated lands, shrubs, herbs and in lower mountains of the study area. This species is considered to be pest on cultivated lands. It has blackish crest on head, neck and throat. Its tail is black in color with a narrow white tip, but its rump and lower belly is pale grayish white. The under-tail coverts are bright crimson in color. Presently there is scarcity of information on red-vented bulbul in Pakistan and the only existing data refer to general biology and distribution. Hence the present study was designed to investigate the breeding biology by studying clutch size, hatchling success and fledgling rate, characteristics of nesting site and nest structure of red-vented bulbul in the areas of Rawalpindi and Islamabad.

MATERIALS AND METHODS

Study area: The present study was conducted from September 2009 to August 2010 in the area of Islamabad (33º 43´N and 73º 05´E) and Rawalpindi (30º 36´N and 73º 03´E). Red-vented bulbul builds nests on wide range of plant species. The study area lies in the monsoon belt and experiences two rainy seasons. The winter rain lasts from January till March and summer rain from July to September. Average precipitation in July 2009 was 480 mm and 750 mm. The temperature range for the data collection period was -2 ºC to 38.9 ºC (Regional Agromets Center Rawalpindi).

Field work: A total of forty five nests were selected from the study area. Nests and nesting sites were checked from all the study sites during breeding season at a 2 days interval, with a minimal disturbance to a bird. Direct observations were made for breeding success of red-vented bulbul in the study area. Inner and outer diameters, height and depth of the nests were recorded. Nest site characteristics like nesting tree, nest height from ground, nest position and the type of nesting material were recorded. Active nests were recorded by observing clutch size, hatching period and fledging period. The failure of nests was due to predation to eggs and nestlings. The type of predator was also recorded. The data is presented by calculating percentages, mean and standard deviations.

RESULTS AND DISCUSSION

Nest construction, placement and success: The data on the nesting success of red-vented bulbul is given in the Table 1. Red-vented bulbul built nests at different heights on different plants or even on same plant. It preferred to make nest on the forks (44%) of the trees followed by middle (27%) of the trees as compared to top (16%) of the trees. These finding are in agreement to the studies done by Vijayan (1980) who reported that red-vented bulbul preferred to build nest in thorny trees and bushes and mostly nested in central position. Balakrishnan (2010) reported that black bulbul makes successful nests in the middle of the trees. In present study percent successful nests (43%) were more in the fork of the trees followed by middle of the trees as compared to the nests placed on the top (11%) of the trees. The percent failure of nests was high when the nests were placed on the top of the trees (30%) than in the middle of the trees (20%).

The data on the height of the nest from ground shows that preferred nest height (53%) by red-vented bulbul was 1-2 meters as compared to top of the trees (11%) with height 2-3 meters. These findings appear to be partially similar to the findings of Watling (1983) and Vijayan (1980) who reported that red-vented bulbul prefer to make nests 2-4 meters high. Red-vented bulbul possibly preferred medium sized trees for nest construction in the study area which were thorny and very close to each other. Balakrishnan (2010) reported that the nests are not distributed uniformly on the plants. The failure of the nests was more on top heights as compared to middle and lower positions of the tree. It was observed that most nests were destroyed during building or after their completion due to heavy wind, rain fall and pressure of predators.

In the study area the preferred vegetation for nest building by Red-vented bulbul was Beri (*Zizyphus nummularia*) (31%) followed by Guava (*Psidium guajava*) (22%), Sheesham (*Dalbergia sissoo)* (18%), Snatha (*Dodonea viscosa*) (16%) and Date palm (*Phoenix dactylifera*) (13%). However, the reproductive success in these trees varied with the nesting success. The possible reasons for reproductive failure on successful nesting trees were the presence of rodents (*Rattus rattus*) and raptor species (Barn Owl *Tyto alba*, Crested Eagle *Morphnus guianensis*) in the study area. The other reason for failure of the nests on beri (*Zizyphus nummularia*) was the location of nests near the residential area and may have some effects of local pollution.

Nest characteristics: The data on the different characteristics of the nest is shown in Table 2. The mean nest height from ground was 97.06 ± 20.46cm (range = 65 – 145). The mean outer diameter of nest was 10.22 ± 3.62cm (range = 4.4 – 18.1) and mean inner diameter of nest was 8.48 ± 1.95cm (range = 3.7 – 14.5). The mean outer nest height in centimeters was 6.36 ± 1.37cm (range = 4.1 – 8.8) and mean nest depth in centimeters was 5.06 ± 1.71cm (range = 2.6 – 7.9). Our findings regarding nest characteristics are in agreement with the results of studies done by Watling (1983), Vijayan (1980), Ali and Reply (1987), Balakrishn (2007; 2010 and Parajapati *et al*., 2011).

Clutch size and reproductive success: The data on the reproductive success of red-vented bulbul is given in Table 3. The eggs of the bulbul were oval shaped, with ground color pinkish white with small red brown dots. In 35 active nests the clutch size ranged from 1-4 with the average of 2.5. Three eggs were found in 51% of the nests followed by 26% percent of the nests having two eggs, 14% percent of the nests having four eggs and 9% percent of the nests having only one egg. These findings are partially similar to the previous studies (Balakrishnan, 2007 and 2010; Fishpool and Tobias, 2005), which indicated that 96% of the nests in this species have two eggs, and the remaining has three eggs. Ali and Reply (1987) reported that the clutch size in Pycnonotids is two and rarely three.

The hatching and fledgling success in those nests which have only one egg was 6% and 0%, respectively. Similarly hatching and fledgling success in nests having two eggs was 23% and 20%, having three eggs were 43% and 37% and having four eggs were 11% and 11%, respectively. The overall percentage of hatching was 83% which was higher than the fledgling success 68%. The possible reason for the fledgling failure in Red-vented bulbul is heavy rainfall, predation and human disturbance. Incubation period and nestling period recorded in Red vented bulbul were similar to all species of Asian and African bulbuls (11-13 days) (Vijayan, 1980; Watling, 1983; Hsu and Lin, 1997; Kruger, 2004; Fishpool and Tobias, 2005; Balakrishnan, 2007 and 2010).

Egg and nestling loss: The data on the egg and nestling loss is given in Table 4. The fate of eggs and nestlings of all 35 active nests was recorded. The hatching success in the present study was (82%) which is higher than those reported on other Pycnonotids: only 47% in Red vented bulbul in Fiji (Walting, 1983), 46.06% in Square-tailed black bulbul (Balakrishnan, 2010), 31.97% in Square-tailed black bulbul (Balakrishnan, 2007), 17.21% in Yellow-throated bulbul (Fishpool and Tobias, 2005) and 10.79% in Grey-headed bulbul (Balakrishnan, 2007).

The predation rate of eggs and nestlings in present study was 6% and 9%, respectively which is lower than reported for other Pycnonotids as 70%, (Watling 1983; Kruger, 2004; Fishpool and Tobias, 2005; Balakrishnan, 2007 and 2010). Nest predation rate is much higher in tropical passerines (71%) (Robinson *et al*. 2000; Stutchbury and Morton, 2001) than recorded in the present study on Red vented bulbul (22%). In present

study failure due to harsh weather and predation was often higher for eggs (18% loss) than nestling (12% loss). These results appear to be similar to studies done on other pycnonotids; Yellow-throated bulbul (*Pycnonotus xantholaemus*), Grey-headed bulbul (*Pycnonotus priocephalus*) and Square-tailed bulbul (*Hypsipetes ganeesa*) (Watling, 1983; Mermoz and Reboreda, 1998; Balakrishnan, 2007 and 2010). The predators present in the study area were raptor species including Crested eagle (*Morphnus guianensis*) and Barn owl (*Tyto alba)*, rodent species specially House mouse (*Rattus rattus*). The nests placed on the top of the trees were susceptible for raptors predation. A small percentage (only 2-3%) of losses in the egg and nestling were observed due to harsh weather conditions and human intervention.

Table 1. Nesting success of Red Vented Bulbul (*Pycnonotus cafer*) in the areas of Rawalpindi/Islamabad (n = 45)

		Total Nests		Successful Nests		Failed Nests	
		No.	% age	No.	% age	No.	% age
Position of nest	Terminal	7	16	4	11	3	30
	Fork	20	44	15	43	5	50
	Middle	12	27	10	29	2	20
	Others	6	13	6	17	0	0
	Total	45	100	35	100	10	100
Height of nest	0 - 1.0 m	16	36	15	42	1	10
	1.1 – 2.0 m	24	53	20	58	4	40
	2.1 – 3.0 m	5	11	0	0	5	50
	Total	45	100	35	100	10	100
Vegetation	*Dalberjia sisso*	8	18	7	20	1	10
	Zizyphus nummularia	14	31	10	28	4	40
	Phoenix dactylifera	6	13	6	17	0	0
	Psidium guajava	10	22	8	22	2	20
	Dodonea viscose	7	16	4	11	3	30
	Total	45	100	35	100	10	100

Table 2. Dimensions of nests of Red Vented Bulbul (*Pycnonotus cafer*) in the areas of Rawalpindi/Islamabad (n = 45)

Particulars	Mean SD	Range
Outer Diameter (cm)	10.22 ± 3.62	4.4 – 18.1
Inner Diameter (cm)	8.48 ± 1.95	3.7 – 14.5
Outer Nest Height (cm)	6.36 ± 1.37	4.1 – 8.8
Inner depth (cm)	5.06 ± 1.71	2.6 – 7.9

Table 3. Reproductive parameters of Red Vented Bulbul (*Pycnonotus cafer*) in the areas of Rawalpindi/Islamabad (n = 45)

Clutch size	No. of nests		Hatchling success		Fledgling success	
	No.	% age	No.	% age	No.	% age
1	3	9	2	6	0	0
2	9	26	8	23	7	20
3	18	51	15	43	13	37
4	5	14	4	11	4	11
Total:	35	100	29	83	24	68

Table 4. The eggs and nestling loss in Red Vented Bulbul (*Pycnonotus cafer*) in the areas of Rawalpindi/Islamabad

		Number	% age
Eggs loss	Number of eggs	95	100
	Infertile eggs	8	8.4
	Predated	6	6
	Other losses	3	3
	Hatched	78	82
Nestling loss	Number of nestlings	86	100
	Predated	8	9
	Fell out from nests	2	2
	Fledged	76	88

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