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Nestling Growth and Development of Himalayan bulbul, (*Pycnonotus leucogenys*) in Udhampur District, Jammu and Kashmir (UT), India

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ABSTRACT

The present study was carried out to study nestling growth and development of Himalayan Bulbul (*Pycnonotus leucogenys*) in Udhampur district of Jammu and Kashmir, UT (India). The safety and welfare of the bird(s) has taken on priority to made sure that the study do not put at risk the nest(s) or the birds in any way. For this, the pictorial data have been gathered during the breeding season of Himalayan bulbul from April 2020 to August 2020 in the suburban areas of Tehsil & District Udhampur (32.93°N 75.13°E, J&K, UT), India. Himalayan bulbul made a cup shaped nest composed of grass, root fibers, stem fibers, broom fibers, twigs etc. in bushes or low side branches of tree and even in the unoccupied and occupied houses with mean outer diameter of 15.21±0.62 cm, inner diameter of 7.58±0.72 cm and the depth of nest depression 4.59±0.28 cm. Female generally laid three eggs in a clutch. Both sexes took part in incubation of the eggs which was completed in 11-12 days. After incubation the 1st egg was hatched out and synchronously 2nd and 3rd egg were hatched out with in an interval of 24 hour per egg. The parents were found to take care of the nestling. At the age of 9-10 days the flight feathers were completely emerged and would continue to elongate till fledging and beyond. At the age of 10-11 days the nestling fledged out from the nesting area. It was found that Himalayan bulbul have completed the nestling growth and development (from nest building to fledging) in 4 weeks.

Key words: Himalayan bulbul, *Pycnonotus leucogenys*, Nestlings, Growth, Development, Udhampur.

INTRODUCTION

The *Pycnonotus leucogenys* commonly called as Himalayan bulbul or White-cheeked bulbul is a species of songbird in the family Pycnonotidae of the order Passeriformes. The Himalayan bulbul is considered to belong to a superspecies along with the white-eared bulbul, African red-eyed bulbul, Cape bulbul, White-spectacled bulbul, and Common bulbul (Fishpool & Tobias 2020). It is a resident bird of Jammu and Kashmir and is also found in adjoining northern areas of the Indian Subcontinent. The members of the Pycnonotidae are wide spread in South Asia, Africa, Madagascar and Islands of western Indian Ocean (Sibley & Monroe 1990; Fishpool & Tobias 2005; Woxwold et al. 2009). There is a fair amount of information available on the breeding of wide spread and low lying Pycnonotids (Liversidge 1970; Vijayan 1975 1980; Walting 1983; Ali & Ripley 1983; Hsu & Lin 1997; Kruger 2004; Fishpool & Tobias 2005 & Balakrishnan 2007, 2009, 2010, 2011). Studies on the growth and development of nestling birds give insight into the environmental and social factors such as parasite infection, predation pressure, food supply, and amount and type of parental care that are important to a species during its reproductive cycle (Lack 1968; Ricklefs 1968). Studies on nestling growth and development have been an area of concern for a greater part of the last century (Sutton 1935; Walkinshaw 1948) and continue to be of concern today. This is not surprising since studies on growth of nestling can provide a wealth of biological information that has

larger effects for avian management and conservation. The basic information is still limited for many species despite of studying this history of nestling development (Starck & Ricklefs 1998). Hence, much information on development can still be gained from studying the development patterns of similar species and from comparative studies, across avian orders. A better understanding of the factors that influence reproductive success is a vital component of avian conservation (Jonsomjit *et. al.* 2007). Indeed, the relatively short time period young spend developing in the nest is a very difficult part of a bird's life cycle and a developmental path of nestling's can affect its survival to independence, its survival as an adult, and its future reproductive success (Jonsomjit *et al.* 2007). Though *Pycnonotus leucogenys* falls under the 'least concern' category as per red data book of IUCN (Birdlife International 2012), but the information on nestling growth and development is scanty, which this manuscript provides. As the studies on the nestling growth and development of this bird in Udhampur are lacking. So in the light of this background, this paper attempt to gather pictorial information on nestling growth & development of Himalayan bulbul in its natural habitat in district Udhampur. The present study can provide a wealth of biological information that has larger effects for avian management and conservation.

MATERIAL AND METHODS

Study Area

The area under study was the suburban part of Tehsil & District Udhampur, Jammu & Kashmir, India (fig. 1). Udhampur is located in the Shivalik range of Himalayas which is a part of the Northwest Lower Himalayas with mostly mountainous topography. Udhampur city is situated at 32.93°N 75.13°E in a relatively semi plateau part of the district at an altitude of 756m (2480 feet) from mean sea level. The climate of study area is sub-tropical and the temperature ranges between 40°C during summer while in winter dips to 2°C or even sometimes to zero with yearly rainfall is 130cm mostly in rainy season and winters because of Western disturbances. However due to altering climate patterns snowfall has been experienced in some years. Heavy hailstorms with piles of hail can be experienced in February and March of 2011(Kumar 2019).

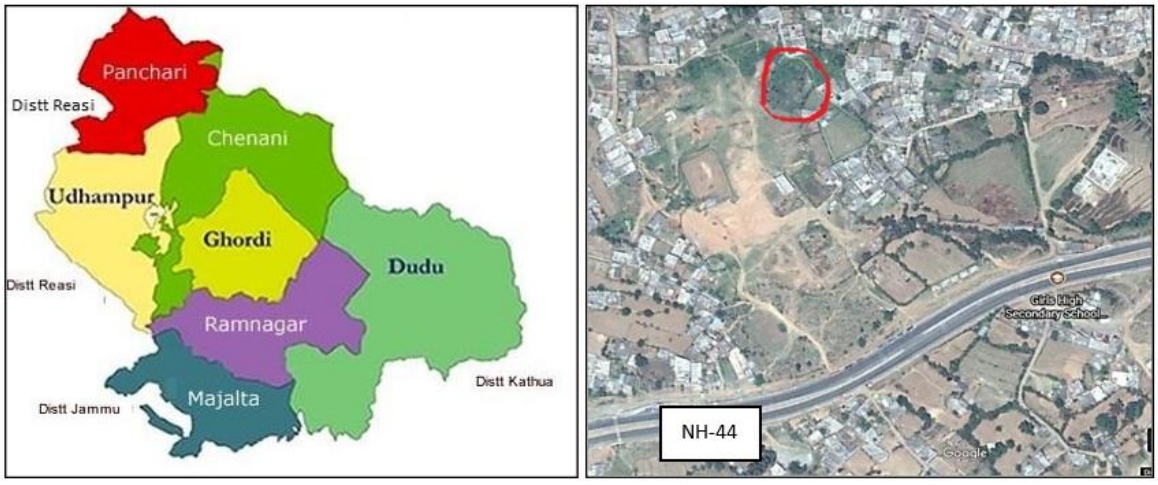

Fig. 1. Map of Udhampur District and Nesting area of Himalayan bulbul.

Nest Searching and Monitoring

This study aimed to gather pictorial data of nestling growth and development of Himalayan bulbul in breeding seasons during April –August, 2020 in the suburban area of district Udhampur, India. Nesting region of Himalayan bulbul mainly include residential area having concrete houses, few unoccupied houses, roads, Govt. buildings etc. Out of five nests reported, two were found in the house building, three were in bushes and low lying branches. The nesting sites were visited when we have observed that the parent was not sat on the nest, and only approached it when the bird left on its own. For the safety and welfare of the bird we have selected only one nest that constructed on climber plant *Aristolochia elagens,* to gather pictorial data of nestling growth and development. Each nest was observed daily until the young one fledged out. Field visits were carried out to monitor nests in most parts of the day almost on alternate days or as required during the breeding season of this species (April to August). To gather pictorial data of nestling growth and development during the regular field survey, key observations were made with the naked eye about 5m away from the nesting area and photographs were taken with Nikon D-5300 (70-300mm lens) camera. The photography was slightly challenging due to high pitched threat call and aggression shown by the Himalayan bulbul. To fulfill this motive, the nests were observed twice a day at various sites.

RESULTS AND DISCUSSION

Himalayan bulbul (Fig. 2a) builds their nests in the bushes, low lying branches of plants and even in the occupied and unoccupied buildings. A total of five nests were observed during the study. Nest of Himalayan bulbul was cup-shaped and made up

externally from stems, stems bark and fibers, grass fibers, root fibers and internally from broom fibers, wool and hair etc. (Fig. 2b & 2c). One nest was reported to be constructed on a climber plant *Aristolochia elagens* commonly called Calico Flower. The broom fibers used for nest construction were especially belonging to a grass species *Thysanolaena latifolia* of Poaceae family. Himalayan bulbul generally laid three eggs, one per day (Fig. 2d). Similarly, a number of other avian species also laid eggs at 24 hours interval (Franks 1974; Aguon & Conant 1994; Prather & Cruz 1995; Dhanda & Dhindsa 1998; Kumar 1999; Kumar *et al.* 1999). The eggs of Himalayan bulbul were dull white with red spots with average dimensions 22.66 ±0.2 mm X 16.57 ± 0.17 mm. Himalayan bulbul, like most other species, did not lay eggs until the nest was complete. However, there were species that lay eggs even before the nest completion (Natarajan 1997). It was very difficult to distinguish the male and female Himalayan bulbul morphologically. Both the sexes take part in incubation alternately. The incubation period of Himalayan bulbul in our study was found to be ranged from 11-12 days depending upon the environmental conditions. The average incubation period for various species of bulbuls ranges from 11-14 days (Brosset 1981). Hsu & Lin (1997) reported mean incubation period of 11.4 days in Styan's bulbul. While Balakrishnan (2010) reported incubation period of 12-13 days in Square-tailed black bulbul. On the 6th day of incubation, the wider side of the egg has shown dark coloration that became more and more dark with the passage of time (Fig. 2b). After the completion of incubation, hatchlings were come out of the eggs. They were naked with closed eyes and wholly dependent on the parents for feeding etc. The shells of the eggs were thrown out by the parents to keep nest clean. It was found that parents were spent most of the time in the nest for providing warmth to the hatchlings. It was also reported that whenever an intruder approached the nest, the parents came close to the intruder producing loud sounds watching carefully without going away from the nest but remaining in full guard.

Growth and Development

After incubation of 11-12 days, the 1stegg was hatched out (Fig. 2e) and synchronously2nd and 3rd egg were also hatched in an interval of 24 hour per egg (Fig. 2f). The hatched nestlings were naked, having brownish red skin with blackish spots of capital, humeral, alar, spinal, crural and femoral feather tracts. The ventral side become more transparent through which the visceral parts were easily observed. The legs were light yellow, the bill was brownish black, and egg tooth was conspicuously visible. No sign of any natal downy feathers were found in the nestlings of Himalayan bulbul. It was observed that the hatched nestlings gave soft squeaks and extended their necks vertically to beg. The bright creamy colour gape was visible during begging. The gape flanges were light yellow or somewhat creamy in colour. At the age (days counted from 1st egg hatched) of 2 days the nestlings body was still naked, although the feather tracts were now became dark spotted as the future feathers were started to develop. The eyes of the chick were still remained close at this stage (Fig. 3a & 3b). At the age of 3-4 days, the dorsal pins, alar pins and capital pins looks like quill at first, began pocked through the skin of feather tracts. The pin feathers were surrounded by sheath that protects them as they grow out from the pit like follicle. At the age of 5 days old nestling (Fig. 3c & 3d) the alar pins, capital pins and dorsal pins were clearly emerged out of skin. At this age, the sheathed feathers were rapidly grown. The crural, caudal, ventral and humeral pins were just emerged out. The eyes began to open as slits. At the age of 6 days old nestling (Fig. 3e & 3f), it was found that the first feather burst out from tip of sheath at dorsal and alar tracts. The nestling continued to gape. It was very interesting to observe that the hungriest baby chirps the loudest and gapes the most to stimulate feeding by the parents. At this stage the nestlings started to attain maximum weight at an explosive rate. The nestling competes and begging for food at the same time. It was found that young ones fed every 4-5 minutes by the parents to attain maximum growth at the age of 4-6 days. Nestling could use sight as well as sound and touch to sense the parents arrived with food. They started to imitate the parent call. It was also reported that in case of any danger or threat call received from the parents they hunker down themselves, with eyes closed in the nest. Parents were found to brood the nestlings for first 5-6 days. At the age of 7 days old nestlings (Fig. 4a & 4b) the innermost primaries, all secondaries, ventral tract, crural tract and most dorsal-tract feathers were emerged and that had partially exploded from their sheath resembling like paint brush. The sheaths of the primary feathers have broken through the skin and began to grow. These feathers were the "pin feathers". The primary feather were continued to come out of the sheaths. At the age of 8 days old nestlings (Fig. 4c to 4f) the primaries, secondaries, tertiaries, dorsal feather, ventral feather, crural feather, capital feathers, and rectrices (caudal feathers) were completely came out of their sheaths. The primaries continue to grow and the feathers lateral to cervical region began to emerge. The young ones were become more mobile and able to crawl around the nest and stretch their wings out more effectively. They may stretch and hop a little to strengthen muscles and grasp objects in the nest. Though their bodies were not fully feathered, after this point the nestling might considered entirely feathered for the sake of observing (Fig. 5a to 5c). The nestlings were almost fully feathered by day 10, except for the mid-ventral region around the belly. The feathers had developed enough and covered all over the body of the nestlings. They should be capable of weak, short-distance flights by this time. At the age of 10 days the flight feathers were completely emerged (Fig. 5d to 5f) and would continue to elongate through fledging and beyond. The nestling stood up on the margin of the nest and made for fledging, they jumbled together, glare toward adults,

clean, exercise their wings, stretch, move their wings, stand on the margin of the nest and look out of the nest. At the age of 10-11 days, the nestling fledged out from the nesting area (Figure 5d to 5f). Though the chicks may not be fully grown they would reach adults size and resembled with their parents with in 2 to 3 weeks after fledging. From nest building to fledging, the Himalayan bulbul has taken 4 weeks. After fledging young birds typically remain in close vicinity of their parents for a short period. During this period, the young birds must learn to survive on their own in the open environment.

Fig. 2. (a) Himalayan bulbul (adult), (b to c) Nest, (d) Eggs, (e) Hatching, (f) Hatching completed

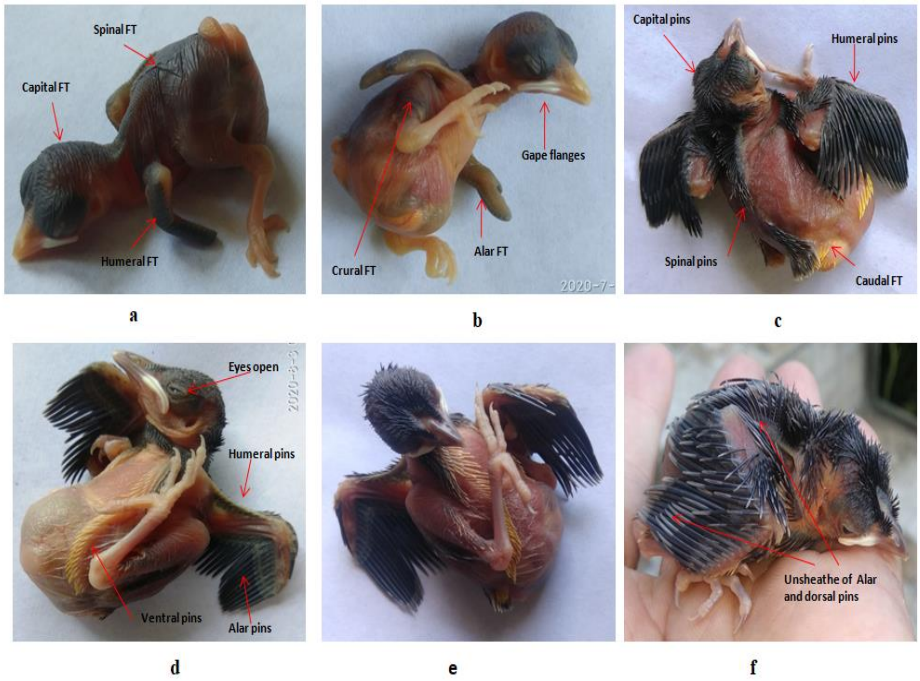

Fig. 3. (a to b) 2 days old nestling showing feather tract (FT), (c to d) 5 days old nestling, (e to f) 6 days old nesling.

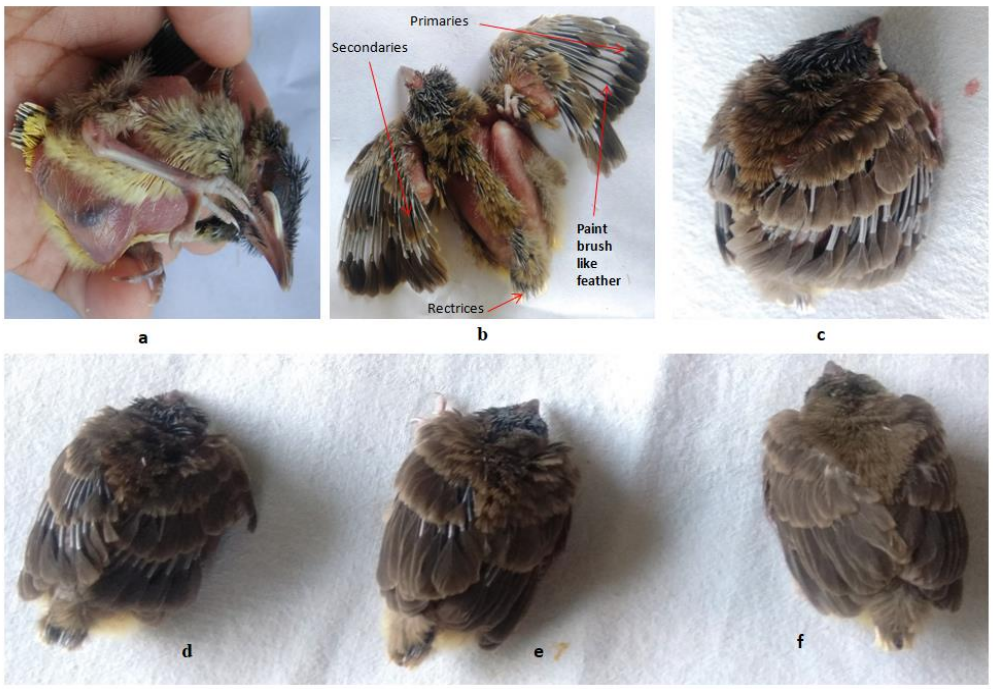

Fig. 4. (a to b) 7 days old nestling, (c to f) 8 days old nestlings

Fig. 5. (a to c) 9 days old nestlings, (d to f) 10 days old nestlings fledged out from their nesting area.

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