SPECIES

Impact of red-neck pattern on pairing in Black-headed ibis *Threskiornis melanocephalus*

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ABSTRACT

For the study of the breeding biology of near threatened BHI *Threskiornis melanocephalus*, Nehru Talai "25.21°N, 74.38°E" of Bhilwara city was selected. During continuous study from four different seasons (2019-2022) at this site, we observed many individuals with red patches on their neck. The red-colored patterns are due to the deposition of pigment in skin of the neck. At present there is strong evidence as to its significance. We saw the significance of red neck patterns on pairing as well as breeding of BHI.

Keywords: Black-headed Ibis, Red neck patterns, Nehru Talai, Pairing success

1. INTRODUCTION

Many wading birds belonging to the Family Ciconiiformes and Pelicaniformes like Ibises, egrets and herons are colonial nesters and show both plumage and bare part color changes during the breeding season. The bare skin's colour, especially the cere, bill and legs enhance (Hancock et al., 1992). In species that nest colonially or asynchronously, these changes are significant because they indicate readiness for reproduction. This species has a long down-curved black bill and prominent bare black head and neck. The body of this species is elongated but robust. The tail of the BHI bears grey ornamental feathers (Ali and Ripley, 1987; Hancock et al., 1992; Matheu and Del-Hoyo, 1992). Both the male and female BHI are similar in size and appearance.

The breeding plumage of BHI is well described in the literature (Grimmett et al., 1998; Gadhvi, 2001; Ali, 2002; Kumar et al., 2005) and during the breeding season, there is no mention of any red colouring on body parts. Literature shows, a birdwatcher (A. Rajaram pers. comm.) has seen red colouring on the hindneck in July 2003 but he did not describe it. This characteristic was observed in other members of the same genus like Malagasy Sacred Ibis *Threskiornis bernieri* and Australian White Ibis *Threskiornis moluccus* but not in *T. melanocephalus* (Slater et al., 1986). A mysterious character recorded in BHI *Threskiornis melanocephalus* during breeding season (Senma and Acharya, 2009). In India, breeding colonies of BHI have red patch on the hindneck (Kannan et al., 2010; Guptha et al., 2012).

2. MATERIAL AND METHODS

Nehru Talai "25.21°N, 74.38°E" of Bhilwara, Rajasthan, India was selected for the study of red patterns of BHI (Figure 1). Bird Census Techniques such as focal

DISCOVERY SCIENTIFIC SOCIETY

method, visual encounter method and scan-sampling method were used for the study. During the study period, we visited once every three to four days and kept the travel time in the late morning and afternoon, we took with us some necessary equipment's like camera, binocular and a laser distance meter. During the study, we studied from a distance of 50-60 meters by hiding ourselves and without disturbing the birds (Barve et al., 2020).

Figure 1 Map indicating the Nehru Talai (Dhandolai), in Bhilwara, Rajasthan, India

3. RESULTS

We observed many BHI in the colony with red-colored patterns on its neck. We observed a total of 417 breeding pairs of Black-head Ibis, out of which 51 individuals were observed with red-colored patterns on its neck (Table 1). However, there is no observation of red coloration on other body parts. We check all the images of BHI, published on the www.eBird.org website. Surprisingly, only 03 images are available on this website without its significance. Literature shows there are no clues as to its significance, whereas we observed the significance of this characteristic.

Table 1 Figures indicating individuals of BHI with red-neck pattern

Table 2 Comparison of pairing success between normal and red neck BHI

Season	Normal BHI		BHI with red-neck patterns	
	No. of individuals	No. of breeding pairs	No. of individuals	In breeding pair (♂/♀)
2019-20	460	161	40	18
2020-21	448	111	13	9
2021-22	358	58	14	8
2022-23	179	36	50	16

4. DISCUSSION

(1) These patterns were observed in both male and female individuals. The males with these patterns attract the female soon through their courtship or the males were more attractive to the females with the patterns. In BHI, the pair formation was done within 2-3 days but red neck individuals were started nest building by making pairs in less time than normal individuals.

(2) We observed that the red neck patterns were dark before/during pair formation, but the darkness gradually decrease from nest building to further events. So, after that, the patterns become light-colored (Table 3).

Table 3 Several figures indicating the change in brightness of red neck patterns of BHI

	
Before	After
	
Before	After
	
Before	After

	
Before	After
	
Before	After
	
Before	After

	
Before	After
	
Before	After

5. CONCLUSION

In conclusion of both the above observations, this redneck pattern helps in the courtship of both males and females to promote quick pairing. Resulting in the breeding success of BHI becomes increase (Figure 2).

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Author Contribution

Anil Kumar Sharma (AKS) made regular visits to Nehru Talai and observed most of the individuals of Black-headed Ibis (BHI) with red-neck patterns. Certain photographs were captured by Anil Kumar Tripathi (AKT). Individuals with red-neck patterns available on www.eBird.org were searched by AKS. Bird Census Techniques were understood by AKT. Both authors had equal contribution to the result preparation from the observations. For this research work, we did not take any funds or financial support from any organization. Also, we did not hold any conference or presentation related to this work.

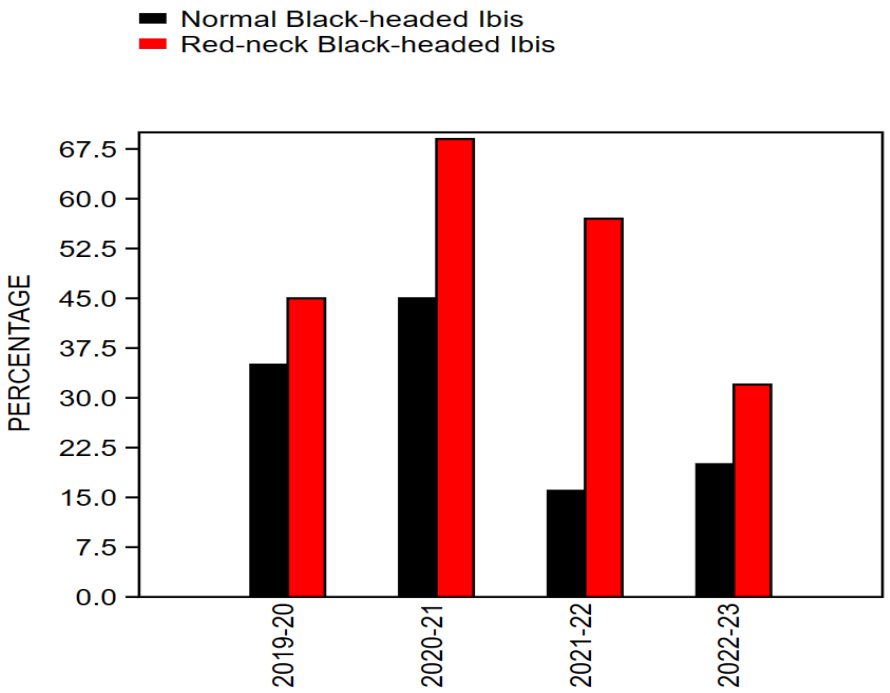

Figure 2 Comparison of the pairing success* between normal and red neck individuals of BHI

$$*PAIRING\ SUCCESS\ (\%) = \frac{TOTAL\ NUMBER\ OF\ BREEDING\ PAIRS}{TATAL\ NUMBER\ OF\ INDIVIDUALS} \times 100$$

Informed consent

Not applicable.

Ethical approval

The Animal ethical guidelines are followed in the study for species observation & identification.

Conflicts of interests

The authors declare that there are no conflicts of interests.

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The study has not received any external funding.

Data and materials availability

All data associated with this study are present in the paper.

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