International Journal of Zoology Studies
www.zoologyjournals.com
ISSN: 2455-7269
Received: 02-06-2025, Accepted: 02-07-2025, Published: 17-07-2025
Volume 10, Issue 3, 2025, Page No. 19-21

Partial leucism in Red-vented Bulbul *Pycnonotus cafer* (Linnaeus, 1766) from Aravalli Hills, Ajmer, Rajasthan, India

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Abstract
Leucism is a condition in which a total absence of both melanin pigments in either parts or all of the plumage and skin due to a neural crest disorder resulting in the congenital absence of melanin cells from some or all of the skin areas. In Partial Leucism an organism has patches of white or pale areas due to a lack of pigment in certain regions of its body. The current article presents record on the occurrence of partial leucism in Red-vented Bulbul (*Pycnonotus cafer*) from Aravalli hills of Ajmer, Rajasthan, India. This note adds an anomaly in color patterns of birds found in Aravalli hills.

Keywords: Bulbul, Colour aberration, Colour anamoly, White, Ajmer

Introduction

In birds it is observed that the amount and occurrence of pigmentation is unusual in contrary to normal patterns and it can be classified into four major types as: Albinism (exhibiting pure white plumage or the wild-phase coloring pattern with extreme paleness), Erythrism (exhibiting an abundance of reddish coloring or pigmentation), Melanism (exhibiting an excess or high abundance of black or brown pigmentation), and Xanthism (excess of yellow pigmentation and such individuals are generally described as blonde) (Davis, 2007; Mills & Patterson, 2009; Guay *et al*., 2012) [5, 8, 14].

Leucism, is a condition characterized by a partial or total loss of pigmentation in the skin, feathers, or fur, while retaining normal pigmentation in the eyes, bill, and legs (Hume & van Grouw, 2014) [9]. Unlike albinism, which results from the inhibition of melanin production due to a tyrosinase enzyme deficiency, leucism is primarily caused by defects in the migration, survival, or differentiation of the pigment-producing cells (melanocytes) during embryonic development (Van Grouw, 2014). As a result, individuals with leucism exhibit white, pale, or patchy coloration in their integumentary structures, while their eyes remain normally pigmented, distinguishing this condition from true albinism. Leucism is typically a heritable recessive trait, often governed by a single gene, and it can be expressed to varying degrees depending on genetic and environmental factors (van Grouw, 2018) [20]. A common form, known as partial leucism, results in localized areas of depigmentation, such as white patches on an otherwise normally colored body, which may appear symmetrically or asymmetrically distributed (Izquierdo *et al*., 2018) [10]. This form is frequently observed in wild birds and mammals, where certain feathers, fur patches, or scales lack pigment while the rest of the body remains normally colored. In contrast to piebaldism, partial leucism tends to appear more irregular and can affect different parts of the body with no fixed pattern. Environmental influences such as disease, stress, injury, or nutritional deficiencies during early development can further exacerbate or trigger the expression of leucistic traits. Leucistic individuals are often more vulnerable to predation due to their increased visibility and may experience reduced fitness in the wild (Camacho *et al*., 2022; Van Grouw, 2021) [1, 19].

In this paper, we report a case of partial leucism in Red-vented Bulbul (*Pycnonotus cafer)* from Aravalli hills, Ajmer, Rajasthan, India.

Material and Methods

Study Area

The present study was conducted in the Aravalli Hills region of Ajmer, Rajasthan, a semi-arid zone characterized by rocky terrain, sparse vegetation, and scattered water bodies that support a variety of avifaunal species. This area, part of the oldest mountain range in India, provides a diverse habitat that is ideal for observing bird populations in both natural and human-influenced environments (Sharma *et al*., 2024; Choudhary *et al*., 2024; Choudhary *et al*., 2025) [2, 3, 16].

Fig1: Map indicating point of observation.

An opportunistic observation was made to document occurrences of abnormal plumage coloration. Observations were made without the use of bait or playback, allowing for natural behavior to be recorded. Data collection included photographic documentation, species identification, GPS coordinates, and detailed notes on the extent and pattern of colour abnormality. This non-invasive approach allowed us for the efficient recording of plumage anomaly.

Result and Discussion

During the field survey conducted in the Aravalli Hills region of Ajmer, Rajasthan, a case of partial leucism (Figure 2) was opportunistically recorded in a Red-vented Bulbul (*Pycnonotus cafer*), on 6th July 2025. The observed individual displayed typical species characteristics such as the black head and brownish body plumage. However, a distinct white patch at the throat feathers was noted. This coloration is not characteristic of the normal plumage pattern of the species, which typically has uniformly brown feathers.

The white patches observed are indicative of partial leucism, where localized areas of the bird's plumage lack melanin pigmentation, but the eyes, bill, legs, and other body parts retain their typical coloration (Davis, 2007) [5]. This observation aligns with documented descriptions of partial leucism, where melanocyte development or migration is impaired only in specific regions, leading to asymmetrical or localized depigmentation. The retained dark pigmentation in the eyes and the rest of the plumage confirms that this is not a case of albinism.

Such plumage anomalies are considered rare in wild bird populations and may arise due to genetic mutations or environmental stressors such as nutritional deficiencies, disease, or exposure to contaminants during feather development (Eeva *et al*., 2006) [6]. The occurrence of this trait in a single individual suggests it is an isolated incident rather than a population-wide trend.

Fig 2: Partial leucism in Red-vented Bulbul.

Instances of aberrant plumage coloration, including leucism, erythrism, progressive greying, brown aberration have been reported from various parts of Rajasthan, including Ajmer and nearby districts (Jangir *et al*., 2023; Jangir *et al*., 2024a; Jangir *et al*., 2024b; Choudhary *et al*., 2024) [2, 11, 12, 13]. Notably, complete leucism is rarely documented due to the low survivability of such individuals in the wild, given their reduced camouflage and increased predation risk.

Across the known range of Red-vented Bulbul, similar cases have been recorded in multiple regions (Gabadage *et al*., 2015; Sharma *et al*., 2018; Venugopal, & Rathod, 2019) [7, 17, 21], particularly in urban or semi-urban habitats. These records indicate that color abnormalities are sporadic but widespread, and their documentation is crucial to understanding the broader impacts of genetics, environment, and urbanization on avian physiology (Shakshi *et al*., 2023) [15].

This record contributes to the growing body of data on aberrant plumage conditions in Indian avifauna and emphasizes the importance of continuous field observations in documenting such rare morphological variations.

Conclusion

The opportunistic documentation of partial leucism in a Red-vented Bulbul (*Pycnonotus cafer*) from the Aravalli Hills in Ajmer, Rajasthan, highlights the presence of plumage coloration anomalies within local avifaunal populations. Characterized by localized depigmentation—specifically white patches on the tail—this case represents a classic example of partial leucism, where melanin is absent in certain body parts while other pigment features remain unaffected. Such occurrences, though rare, have been increasingly observed in various bird species across Ajmer and broader Rajasthan, suggesting a need for further attention to morphological abnormalities in wild bird populations.

These abnormalities may result from genetic mutations, developmental issues, or environmental factors, including pollution, nutritional deficiencies, or habitat stress. Although partial leucism does not always severely affect survival, it may influence predation risk, mating success, and social interactions. The observation reinforces the importance of systematic field monitoring and documentation of avian plumage disorders, which can serve as useful indicators of genetic health, environmental pressures, and ecological balance within bird populations. Continued fieldwork in regions like the Aravalli Hills, combined with public engagement and photographic records, will play a key role in enhancing our understanding of such rare yet ecologically relevant phenomena.

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