

Plumage aberration in Chestnut-bellied Sandgrouse (*Pterocles exustus*) from Rajasthan, India

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Abstract Individuals with color aberrations are distinguished in species with cryptic colouration, which may also affect their social interactions. Color aberrations in birds have been extensively studied in the scientific community, however, aberrations in many species are unknown or poorly understood. In this study, we present the first record of plumage aberration in Chestnut-bellied Sandgrouse (*Pterocles exustus*). A female with brown aberration was recorded in Jaisalmer, Rajasthan, India.

Keywords: avian plumage aberration, brown colour aberration, Chestnut-bellied Sandgrouse, plumage variation, Rajasthan

Összefoglalás Színezeti aberrációval rendelkező egyedek a rejtőszínű fajoknál is megfigyelhetők, és az aberráció náluk is hatással lehet a társas interakciókra is. A madarak színaberrációit a tudományos közösség széles körben tanulmányozza, ugyanakkor e színezeti formák számos fajnál még feltáratlanok vagy kevésbé ismertek. Ebben a tanulmányban a barnahasú pusztaityúk (*Pterocles exustus*) tollazati színaberrációjának első feljegyzését mutatjuk be egy Jaisalmerben (Rajasthan, India) észlelt, barna aberrációjú tojó esetét tárgyalva.

Kulcsszavak: tollazati aberráció, barna színaberráció, barnahasú pusztaityúk, színezeti változatosság, Rajasthan

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Background

The striking nature and ease of tracking of abnormal plumages have led to their detection in numerous wild bird species. Color aberrations develop from the deficiency or excess of specific pigments in feathers and skin, lead to various forms of color variation that deviate from the original plumage pattern. In birds, there are multiple forms of color aberrations mostly caused by mutations (van Grouw 2013, 2018). The commonly reported aberrations are albinism, brown, dilution, leucism, melanism and progressive greying (Sage 1963, van Grouw 2006, 2011, 2012, Koprade *et al.* 2014, Mahabal *et al.* 2016).



Figure 1. (A, C) Female Chestnut-bellied Sandgrouse with normal colouration; (B, D) female with 'brown aberration'

1. ábra Barnahasú pusztaityúk tojó normális színezettel (A, C) és barna aberrációval (B, D)

The qualitative reduction of eumelanin (responsible for black, grey and/or dark brown colors) results in 'brown aberration'. Because of partial oxidization of eumelanin, the black pigments remain dark brown while red-yellow and reddish brown stays unaffected (van Grouw 2013). Aberrations from partially oxidized eumelanin are sensitive to sunlight and bleach quickly. Plumage that is in direct exposure thus becomes almost white. Feet and bill become paler, but eyes remain unaffected (van Grouw 2012). The brown mutation could be induced by a single gene and passed down recessively via the female sexual chromosome (van Grouw 2006, 2012) increasing the probability that females are more likely to have brown plumage.

The Chestnut-bellied Sandgrouse (*Pterocles exustus*) is native to Africa and Asia, and it is found across India except in the northeast region of the country. The species favors open habitats such as rangelands, shrubland, grassland, and desert. The Chestnut-bellied Sandgrouse is sexually dichromatic. Males are more consistent on the head and breast, with a distinct black band across the upper breast. The face and throat are yellowish. Females have extensively mottled breasts and necks, with thin black line across the breasts. Females' upperparts are less brightly colored and more streaked than males (Khil *et al.* 2012).

Observation

On 6 December 2024, we located a Chestnut-bellied Sandgrouse flock with ~20 individuals, among which we spotted an adult female with remarkable pale plumage. The observation occurred at Silotara Pond, Jaisalmer, Rajasthan (26°59'28.7"N 71°45'03.0"E) falling in arid region of India. The unusual individual probably had 'brown aberration' (*Figure 1*). The typical sandy brown color turned to beige shade. The dark breast band was not visible, and the streaks on the throat, which are a distinguishing trait in females, were lighter and barely visible. Dark bars on the back turned to brighter shades. However, black bars on the belly and black underwings turned to dark brown and were least affected as that region is unexposed to sun. The yellowish-brown head was unaffected. The bird was photographed at 11:00 in the morning.

Discussion

To extent of the information we have, no cases of unusual plumage color were recorded in Chestnut-bellied Sandgrouse throughout their distribution range. Among other sandgrouse species, we found two examples in the scientific literature; 'brown' in Black-bellied Sandgrouse (*Pterocles orientalis*) from Israel (Smith 2010), and 'progressive greying' in Pin-tailed Sandgrouse (*Pterocles alchata*) from Spain (Benítez-López & García-Egea 2015). Recent plumage abnormalities reported from Rajasthan, India in various bird species that includes 'intersex plumage' in Plum-headed Parakeet (*Psittacula cyanocephala*) (Choudhary *et al.* 2024), 'erythrism' in House Sparrow (*Passer domesticus*) (Jangir *et al.* 2024a), 'progressive greying' in White-eared Bulbul (*Pycnonotus leucotis*) (Jangir *et al.* 2024b), 'melanism' in Black-headed Ibis (*Threskiornis melanocephalus*) (Sharma & Tripathi 2024), 'brown aberration' in Indian Pied Starling (*Gracupica contra*) (Jangir *et al.* 2023), and 'leucism' in Western Yellow Wagtail (*Motacilla flava*) (Bhardwaj 2020) suggests that shared environmental stressors or genetic factors may be contributing to abnormal occurrences in this geographical region.

Cases of 'brown aberration' are reported in a variety of birds that includes Eastern Wood-Pewee (*Contopus virens*) and a White-collared Manakin (*Manacus candei*) from Costa Rica (Lopez *et al.* 2024), Lava Gull (*Leucophaeus fuliginosus*) from Galapagos Islands, Ecuador (Reyes & Ortiz-Catedral 2023), Red-vented Bulbul (*Pycnonotus cafer*) (Thapa *et al.* 2023), Fulvous-breasted Woodpecker (*Dendrocopos macei*) (Pathania *et al.* 2020), House Crow (*Corvus splendens*) (Mahabal *et al.* 2015) and Gadwall (*Anas strepera*) from India (Patel *et al.* 2019), House Sparrow (van Grouw 2012), and Common Buzzard (*Buteo buteo*) from Poland (Ciach *et al.* 2011).

The documented individual's brown plumage differs from the usual cryptic coloration of the Chestnut-bellied Sandgrouse, which could influence the individual's fitness as coloration plays an essential role in survival in arid and semi-arid environments. Predators are likely to spot a bird with abnormal coloration more easily, increasing risk and making survival more difficult (Olea *et al.* 2010). Color aberrations in wild bird species are still insufficiently

recorded in many regions. This case study aims to contribute a new species in existing knowledge pool of color aberration in wild birds.

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