NOTES

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Natural History

Color on color, what color is it? A first known case of leucistic three-striped palm squirrel (*Funambulus palmarum*) in Telangana, India

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Resumen

El leucismo se expresa como la decoloración casi total de ciertas partes del cuerpo o de la totalidad, pero conservando el color típico de ojos, uñas y piel. Presentamos el primer caso conocido de leucismo en una ardilla palmera de tres rayas en Telangana, India. El 12 de diciembre de 2022, observamos una ardilla de palma de tres rayas juvenil de color blanco junto con su madre y otro juvenil en el dique del tanque Rayasamudram en Ramachandrapuram del distrito de Sangareddy, Estado de Telangana, India. Era blanco, con el hocico, las orejas y las extremidades rosadas, pero sus ojos eran de color normal. Por lo tanto, concluimos que la ardilla de palma de tres rayas juvenil estaba afectada por leucismo. La observación es el primer reporte de leucismo en ardillas de palma de tres rayas en el estado de Telangana, India. Documentar la coloración anormal ayuda a comprender las causas subyacentes de este fenómeno y su prevalencia, distribución e impacto en la supervivencia.

Palabras clave: Aberración cromática, Leucismo, Ardilla, Telangana, India

Abstract

Leucism is expressed as the almost total decoloration of certain or whole parts of the body, but preserving the typical color of eyes, nails, and skin. We show the first known case of leucism in a three-striped palm squirrel in Telangana, India. On 12th December 2022, we observed a white-coloured juvenile three-striped palm squirrel along with its mother and another juvenile on the bund of the Rayasamudram tank in Ramachandrapuram of Sangareddy district, Telangana State, India. It was white, with a pinkish snout, ears, and limbs, but its eyes were normal colored. Hence we concluded that the juvenile three-striped palm squirrel was affected by leucism. The observation is the first report of leucism in three-striped palm squirrels in the state of Telangana, India. Documenting abnormal coloration will help provide insights into the underlying causes of this phenomenon and their prevalence, distribution, and impacts on survival.

Keywords: Color aberration, Leucism, Squirrel, Telangana, India

Leucism is a genetic abnormality of partial loss of pigmentation, causing individuals to appear partially or entirely white (Samson et al. 2017; Cleamant Kiran Kumar et al. 2021). The trait is controlled by a single locus, with the allele controlling leucism being recessive to normal pigmentation (Owen & Skimmings 1992). Leucism, however, does not affect soft exposed skin, such as the nose and eyes, which appear normally pigmented, differentiating the condition from albinism (Owen & Skimmings 1992; Samson et al. 2017; Cleamant Kiran Kumar et al. 2021). Leucism and other abnormal color phases are rare in the wild because they are often selected against (Moller & Mousseau 2001; Caro 2005). The frequency of leucism has been linked with inbreeding, increasing the probability of white phenotypes (Owen & Skimmings 1992; Bensch et al. 2004). Abnormal color in animals is often considered to be a disadvantage (Moller & Mousseau 2001), because it may reduce an individual's ability to communicate, increase detection by predators (Camargo et al. 2014), or decrease the effectiveness of hunting (Caro 2005). In the case of sexual selection, abnormal color may result in low breeding success. White coloration compromises protection from ultraviolet radiation and scatters light toward the skin, which may have thermoregulatory consequences (Caro 2005). Rare coloration may also increase an animal's appeal to hunters and poachers (Owen & Skimmings 1992). Despite these disadvantages, reports of leucistic animals at mature life stages still occur (Fertl & Rosel 2009).

An endemic rodent species of three-striped palm squirrel (*Funambulus palmarum*) belonging to the family Sciuridae found in southern India and Sri Lanka at elevations from sea level up to 2,000 masl (Molur et al. 2005; Thorington & Hoffmann 2005). Three-striped palm squirrels have widely distributed species listed as a Least Concern category in the IUCN Red List (Nameer & Molur2017). In general, it is an extremely adaptable species mostly seen in activity in diurnal and semi-arboreal. It occurs in tropical and subtropical dry deciduous forests, mangrove forests, grasslands, scrublands, plantations, rural gardens, and urban areas. Wherein, in Sri Lanka, it is found throughout the island except in deep jungles (Molur et al. 2005). The present note represents the first known case of leucism in a three-striped palm squirrel in Telangana, India.

On 12th December 2022, the first author (KRT) observed a white-coloured juvenile three-striped palm squirrel was seen along with its mother and another juvenile on the bund of the Rayasamudram tank (17.50999, 78.29043) in Ramachandrapuram of Sangareddy district, Telangana State, India. It was white, with a pinkish snout, ears, and limbs, but its eyes were normal colored (Figure 1A). Among the three individuals only one had white color fur, the other two individuals had normal color with three stripes on the dorsum. Hence, we concluded that the juvenile three-striped palm squirrel was affected by leucism. Leucism is a total lack of pigmentation in the whole body due to an inherited defect in the pigment transfer process affecting white or whitish hair, pale skin, and normal-colored eyes (Samson et al. 2017). The coloration of three-striped palm squirrel (Figure 1B) is yellowish brown or brown colored on the back and creamy white on the belly with short fur (Menon 2003).

In the Indian region, there were few records observed on leucism in three striped and five striped palm squirrels. Samson et al (2017) recorded the first known case of a leucistic three-striped palm squirrel in India (Gudalur, The Nilgiris, Tamil Nadu). Sayyed and Mahabal (2016) observed similar characteristics of leucism in the five-striped palm squirrel *Funambulus pennantii* from Satara District of Maharastra, India and it was the first report of leucism from the central part of India. Ramesh Singh Yadav et al. (2019) recorded the

leucistic five-striped palm squirrel from the partially man-made forest at Zamania, Gahzipur Uttar Pradesh, North India. Kamalakannan et al. (2019) recorded the leucistic five-striped palm squirrel from the IIRS campus, near the Golden Jubilee hostel, IIRS, Dehradun, Uttarakhand, India. Cleamant Kiran Kumar et al. (2021) observed three leucistic three-striped palm squirrels in human-dominated areas of the upper Nilgiris region, Tamil Nadu, India. News articles published in India from Surat and Mumbai on rare albino squirrels without confirming the species or whether these are true albinos or leucistic. All the above-mentioned, as well as present observations, are recorded in semi-forested as well as human habitations, this conclusive evidence indicate that habitat fragmentation plays a crucial role in occurrences of leucism in Palm squirrels in India. This situation is likely influencing the emergence of species with leucism, in agreement with (Holyoak 1978; Bench et al. 2000; Lopucki & Mróz 2010), and Samson et al (2017) who state that the frequency of occurrence of Individuals with atypical colorations in a wild population is affected mainly by the isolation of populations. The observation is the first report of leucism in three-striped palm squirrels in the state of Telangana, India. Biologists need to document abnormal coloration among species of birds, reptiles, or mammals to help provide insights into the underlying causes of this phenomenon and their prevalence, distribution, and impacts on survival (Samson et al. 2021).

FIGURE 1. A) Leucistic Three-Striped Palm Squirrel in bund of the Rayasamudram tank in Ramachandrapuram of Sangareddy district, Telangana State, India. B) Normal Coloured Three-Striped Palm Squirrel

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