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Cover: Long-tailed Shrike *Lanius schach* resting on a dry branch after courtship. Digital illustration on Procreate. © Aakanksha Komanduri.



First record of leucism in Rock Hyrax *Procavia capensis* from Ibex Reserve Protected Area, Saudi Arabia

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Abstract: Pigment anomalies such as leucism and albinism are rare in wild mammals, often linked to genetic or developmental factors and sometimes carry ecological consequences. Here, we report the first record of leucism in the Rock Hyrax *Procavia capensis* from Saudi Arabia. The observation was made during routine monitoring in the Ibex Reserve Protected Area on 17 May 2025. The individual, an adult with pale pelage and normal dark eyes, was classified as leucistic. Given the healthy and non-fragmented hyrax population in the reserve, this case is likely an isolated anomaly rather than evidence of inbreeding or population-level genetic issues. This record extends the taxonomic and geographic range of leucism to *P. capensis* in central Saudi Arabia and underscores the importance of continued monitoring and systematic documentation of aberrant colour morphs in wildlife.

Keywords: Genetic variation, Hyracoidea, Mammalia, phenotypic anomaly, pigmentation anomaly, Procaviidae, wildlife monitoring.

Pigmentation anomalies such as leucism and albinism are rare but have been recorded in many vertebrate groups. These conditions, often collectively referred to as hypopigmentation, arise from a reduction in pigment production and can manifest as albinism, leucism, or piebaldism in birds and mammals (Abreu et al. 2013; Van Grouw 2013). Leucism is characterised by partial or complete loss of integumentary pigment

while typically retaining normal eye colour, in contrast to albinism, which also involves a loss or reduction of ocular pigmentation (Van Grouw 2013). Recording such observations improves understanding of their frequency, causes and possible conservation implications. The extreme rarity of leucistic morph in the animal kingdom could be linked with their odds of getting selected in nature, as these individuals may suffer from reduced foraging opportunities and communication, increased threats, affected organ development as well as physiological disadvantages, which are often poorly understood (Caro 2005; Fan et al. 2023). Hence, it is imperative to document the presence of such colour anomalies in different taxa and determine the causal factors, in addition to their distribution and survival probability.

In most animals, colouration plays a crucial role in camouflage, predator avoidance, and enhancing foraging efficiency (Ruxton et al. 2004; Stevens & Cuthill 2006). However, individuals exhibiting leucism or albinism may face survival disadvantages, as their conspicuous appearance makes them more easily

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detected by both predators and prey (Camargo et al. 2014). This heightened visibility can reduce survival prospects and, in some cases, disrupt normal social interactions (Barreto et al. 2023). Despite being relatively rare, pigment anomalies have been documented across a wide range of mammalian orders, including Carnivora (Talamoni et al. 2017; Descalzo et al. 2021; Chaudhuri et al. 2024), Chiroptera (Rocha et al. 2013; Romano et al. 2015), Primates (Aximoff et al. 2020; Barros-Diaz et al. 2022), and Rodentia (Camargo et al. 2014; Samson et al. 2017; Beninato et al. 2020). Comparable cases have also been observed in avifauna, with Islam et al. (2015) reporting leucism in the Houbara Bustard *Chlamydotis macqueenii* from Saudi Arabia. Notably, leucism has not previously been

recorded in any member of the order Hyracoidea.

STUDY AREA

The Ibex Reserve Protected Area, located within the Tuwaiq Escarpment landscape in Riyadh, Saudi Arabia, covers an area of 1,842 km² (Cunningham & Wronski 2009) (Image 1). The reserve is characterized by undulating limestone plateaus interspersed with canyon wadis (Wronski et al. 2012). Vegetation is sparse and during summer (May to October), temperatures average around 40 °C (Wronski et al. 2012). Rainfall is sporadic, peaking in winter with an annual average of around 60 mm (Wronski et al. 2012). In terms of its mammal diversity, the protected area has been the focus of a key conservation and reintroduction program of the vulnerable Nubian Ibex *Capra nubiana*.

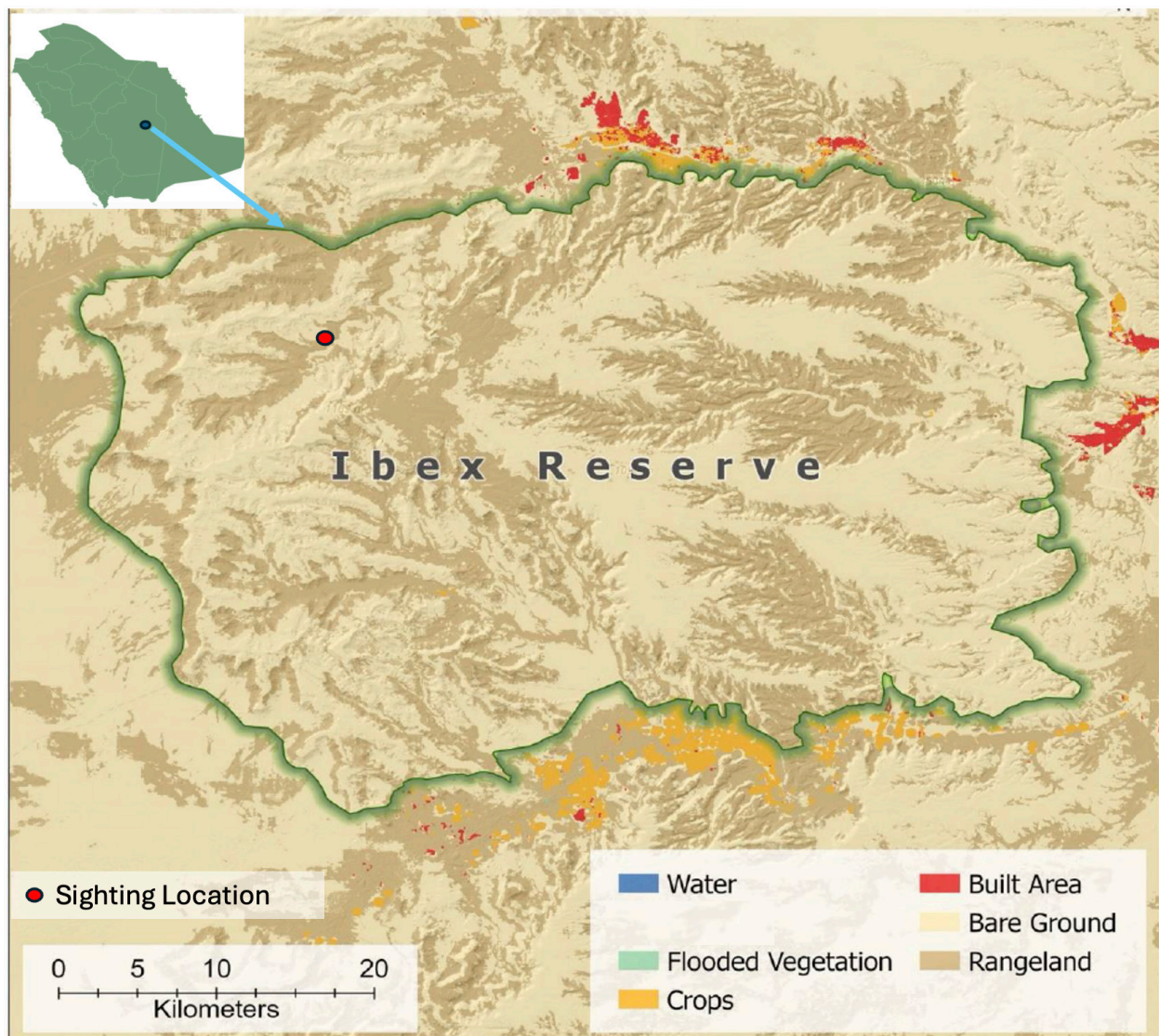


Image 1. Ibex Reserve Protected Area (showing the location of leucistic Rock Hyrax observation).

The area is also inhabited by important populations of the Arabian Wolf *Canis lupus*, and Arabian Gazelle *Gazella arabica* in addition to other mammal species. The protected area also supports a healthy population of Rock Hyrax *Procavia capensis*.

OBSERVATION AND DISCUSSION

In Saudi Arabia order Hyracoidea is only represented by Rock Hyrax which is distributed along the western mountains extending from the Gulf of Aqaba down southward reaching the Yemen border. It is also associated with the rocky terrain of Tuwaiq mountains in central Saudi Arabia. The distribution of the Rock Hyrax is limited by the presence of rocky terrain with steep mountains. The Rock Hyrax is a robust, rabbit-like mammal with short ears and a short tail, weighing around 4 kg. Typically, it has thick, grey-brown fur that varies in shade depending on the environment. The species is assessed as 'Least Concern' by the IUCN Red List (Butynski et al. 2015), but it is listed as Near Threatened in the National Red List of Saudi Arabia.

Here, we present the first record of a leucistic Rock Hyrax, from a central Saudi Arabian protected area. During routine trail monitoring on 17 May 2025 at Ibex Reserve Protected Area (approximate coordinates: 23.492° N, 46.348° E), we detected an unusually pale

Rock Hyrax individual. The animal, an adult *Procavia capensis*, was observed on a rocky outcrop at 1700 h. It was readily identified as leucistic by its partially white pelage and normal dark eyes (Image 2). The individual's unique pattern of pale fur provided a natural visual marker, allowing us to reliably distinguish this hyrax from conspecifics during subsequent monitoring and to avoid duplicate observations. The Ibex Reserve is known for its rugged Tuwaiq escarpment habitat, which is ideal for the Rock Hyrax. The hyrax population in this reserve is good, reflecting effective protection.

The retained dark eye colour in the observed rock hyrax, combined with its pale/white pelage, supports classification as leucism rather than albinism. Leucism in wild mammals is uncommon and has been linked to a range of causes, including genetic factors such as recessive alleles, genetic drift in small or isolated populations, and occasional developmental anomalies (Caro & Mallarino 2020). Ecological effects, such as increased detectability to predators, have been noted for some species. However, leucistic individuals are capable of reaching adulthood and reproducing successfully, and isolated observations do not necessarily indicate underlying population-level genetic issues.

In the present case, the Ibex Reserve supports a



Image 2. Leucistic Rock Hyrax *Procavia capensis* observed on 17 May 2025 in Ibex Reserve, Saudi Arabia. © Naif Alajami.

healthy and non-fragmented Rock Hyrax population, making it unlikely that this single observation reflects inbreeding or other genetic bottlenecks. Instead, it is best regarded as a rare, individual anomaly. Continued monitoring and the systematic archiving of photographic vouchers will be valuable for documenting any future occurrences and understanding possible patterns.

Comparable records of leucism and other pigment anomalies in wildlife have been reported from diverse regions and taxa. For example, Barreto et al. (2023) described the first known case of leucism in a Brazilian rodent *Kerodon rupestris*, Chaudhuri et al. (2024) reported a leucistic Sloth Bear *Melursus ursinus* in India, and Al-Sheikhly et al. (2018) documented aberrant white plumage in the endangered Basra Reed Warbler *Acrocephalus griseldis*. Each of these studies stresses that although pigment anomalies are rare, their documentation is important for understanding both proximate causes and broader ecological implications. Similarly, Abreu et al. (2013) and Barreto et al. (2023) highlight that recording such events contributes to knowledge of environmental contexts in which they arise. Our report extends the taxonomic and geographic record of leucism to *P. capensis* in Saudi Arabia.

While some studies note higher leucism frequency in small or isolated populations due to reduced genetic diversity, the current observation confirms that such individuals can survive to adulthood without obvious growth limitations. The hyrax in question appeared fully mature and in good condition, indicating no apparent developmental disadvantage in this case. Interestingly, Ortiz-Hoyos et al. (2020) suggest that in diurnal species, leucistic and albino individuals may experience reduced predation risk compared to nocturnal species, as the latter are more visible in low-light environments. This may help explain how visibly distinctive individuals like this hyrax can persist in the wild.

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