A REPORT OF PIEBALDISM IN BONNET MACAQUE *Macaca radiata* IN THE NILGIRIS, INDIA

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ABSTRACT

This communication documents the first recorded case of piebaldism in the Bonnet Macaque *Macaca radiata*, observed in the Nilgiris region of Tamil Nadu, India. We observed and photographed an individual with piebaldism, characterized by localized white patches on the legs and tail with normal eye colouration, in the context of a larger troop of individuals with normal coloration. Little is known about the distribution of colour aberrations in wildlife and their ecological and physiological implications.

Keywords: Colour aberrations, partial leucism, Western Ghats

Coloration patterns in mammals result from a combination of factors, including haemoglobin, structural coloration, and melanin pigmentation (Bradley & Mundy, 2008). Several colour variants can arise from differences in the production of melanin in local areas or over the entire body. The absence of melanin in small, specific regions is known as piebaldism, while a partial absence over larger areas is termed leucism, and the complete absence is called albinism (Fertl & Rosel, 2002; Miller, 2005; Acevedo & Aguayo, 2008).

In Neotropical mammals, albinism, melanism (higher-than-usual melanin deposition, resulting in darker coloration), and leucism are the most frequently reported conditions, with piebaldism being reported less frequently. These color variations result from genetic mutations affecting melanin production and distribution (Abreu et al., 2013; Lucati & Lopez-Baucells, 2016). Piebaldism is characterized by a localized absence of melanin, resulting in irregular white patches on the skin and fur, while the eyes retain normal coloration (Mahabal et al., 2019). This pattern differs from leucism, where melanocyte development is disrupted over larger areas. Piebaldism is often referred to as 'partial leucism' or 'partial albinism' because its genetic basis is not always distinguishable through visual assessment alone (Zalapa et al., 2016; Romero & Tirira, 2017).

The upper Nilgiris region in Tamil Nadu, India, is characterized by montane shola grasslands interspersed with plantation trees of exotic species such as wattle *Acacia mearnsii* De Wild and *Acacia dealbata* Link, blue gum *Eucalyptus globulus* Labill, and pine *Pinus roxburghii* Sarg, contributing to a unique ecological landscape. This report presents the first documented case of piebaldism in the Bonnet Macaque *Macaca radiata* (É. Geoffroy), in both wild and captive populations in India.

On 4 November 2024, at 12:45 h., a troop of *M. radiata* was observed playing near human habitation in Korakunda (11°13'33.20"N 76°35'0.17"E), the Nilgiris. One individual with completely white legs and a white tail was observed in the troop (Fig. 1). A video recording was made for further documentation of this individual's anomalous coloration. A detailed literature review confirmed that this condition was consistent with piebaldism. In India, 55 mammalian species across eight orders and 19 families are known to exhibit colour aberrations, with 14 reports of piebald individuals across eight families and eight species (Mahabal et al., 2019; Kurhade & Lande, 2023). Among primates, hypomelanism, albinism, melanism, and leucism have been widely documented in India, particularly in the Assamese Macaque *Macaca assamensis* McClelland, Rhesus Macaque *Macaca mulatta* (Zimmermann) (Mahabal et al., 2019), *M. radiata* (Deepan et al.,



Fig 1. Piebaldism in Bonnet Macaque *Macaca radiata* showing white patches on the legs and tail and normal eye coloration; individual observed alongside individuals with normal pigmentation.

2019), and Tufted Gray Langur *Semnopithecus priam* Blyth (Samson et al., 2021). However, while cases of hypomelanism, albinism, and leucism have been reported in *M. radiata*, this is the first recorded case of piebaldism in this species in India.

Further studies should be encouraged to document colour aberrations in wildlife to determine the frequency of these variants and their ecological and physiological implications for affected animals (Samson et al., 2017; Samson et al., 2021).

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