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Natural History

First record of White-Collared Peccary (*Dicotyles Tajacu*) with Piebaldism across its entire distribution

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Abstract

Coloration is crucial for mammalian adaptation, influencing predator defense and social behavior. In recent decades, chromatic anomalies have been documented in Neotropical mammals, including albinism, leucism, and piebaldism, affecting several species. Piebaldism is a rare autosomal disorder characterized by asymmetric depigmented patches on the body. This study presents the first record of piebaldism in the collared peccary (*Dicotyles tajacu* Linnaeus, 1758) throughout its distribution. The record was obtained using camera traps at the Estação Ecológica (ESEC) da Terra do Meio in 2023. Observations showed that the affected peccary coexisted normally with other peccaries and engaged in typical feeding and social behaviors, suggesting that piebaldism does not affect individual social interactions. This finding is consistent with the literature indicating that chemical signals are more important than visual signals in Tayassuidae. This finding highlights the need to understand the frequency and distribution of chromatic anomalies to assess their implications for conservation plans over time.

Key words: chromatic anomaly, artiodactyla, neotropical, genetics.

Resumen

La coloración es crucial para la adaptación de los mamíferos, influenciando aspectos como la defensa contra depredadores y el comportamiento social. En las últimas décadas, se han documentado anomalías cromáticas en mamíferos neotropicales, como el albinismo,

el leucismo y el piebaldismo, que afectan a diversas especies. El piebaldismo es una rara condición autosómica que se caracteriza por marcas despigmentadas asimétricas en el cuerpo. Este estudio presenta el primer registro de piebaldismo en el pecarí de collar (*Dicotyles tajacu* Linnaeus, 1758) en toda la región neotropical. El registro se realizó con cámaras trampa en la Estação Ecológica (ESEC) da Terra do Meio en 2023. Durante las observaciones, se notó que el pecarí afectado convivía normalmente con otros pecaríes, realizando comportamientos típicos de alimentación y socialización, sugiriendo que el piebaldismo no altera la sociabilidad entre los individuos. Esta observación es consistente con la literatura que indica que las señales químicas son más importantes que las visuales en la sociabilidad de los Tayassuídeos. Este hallazgo resalta la necesidad de estudiar la frecuencia y distribución de anomalías cromáticas para evaluar sus implicaciones en la conservación.

Palabras clave: anomalía cromática, artiodactyla, neotropical, genética.

Coloration patterns in mammals perform important roles in adaptive processes, from sexual selection, intra and interspecific communication, disease, protection, hunting, success to defense and camouflage against predators (Caro,2005; Caro et al. 2014; Caro & Mallarino, 2020; Howell et al. 2021). In rare cases, individuals may present abnormal coloration patterns, such as albinism (Abreu et al. 2013). Those cases result from the expression of recessive genes and are often associated with a higher vulnerability to predation, malformation, and other diseases (van Grouw 2006; Abreu et al. 2013; Guastalla et al. 2021). This flaw, associated with the expression or production of the melanin pigment, can result in a myriad of phenotypes. Those can be classified as albinism, the complete absence of skin, eyes, and hair pigmentation due to a lack of melanin production through different genetic mechanisms, easily characterized by reddish eyes (Pawelek and Korner, 1982); leucism, when individuals have an absence of pigments only on skin and hair, but normal eye color; and piebaldism, when individuals lack skin pigmentation only in specific parts of the body, but the eye color remains normal or blue (Acevedo & Aguayo 2008; Lucati & López-Baucells, 2016). An increasing number of mammal coloration anomalies have been recorded in the Neotropics. Such cases have been reported for more than seven taxa (Abreu et al. 2013), including Chiroptera (Lucatti & López-Baucells 2016), marsupials (Abreu et al. 2013), Carnivora (Talamoni et al. 2017; Cronemberger et al. 2018; Scrich et al. 2019; Aximoff et al. 2021a), primates (Vasconcelos et al. 2017; Leandro-Silva et al. 2022) and ungulates, from deers (Guastalla et al. 2021), to tapirs (*Tapirus terrestris*) (Landis et al. 2020) and Tayassuidae species (collared-peccary and white-lipped peccary) (Veiga, 1994; Silva et al. 2019; Aximoff et al. 2021b). The only three records of chromatic anomalies for *D. tajacu* at the neotropical region are from leucistic individuals of the Brazilian Atlantic Forest (Veiga, 1994; da Silva et al. 2019) and an individual with no identified anomaly (Urgiles-Verdugo et al. 2024). Here, we report the first record of a *D. tajacu* with piebaldism in the entire range.

The record was obtained between June and August 2023, through the National Biodiversity Monitoring Program - MONITORA Program, developed by the Chico Mendes Institute for Biodiversity Conservation (ICMBio), at the Terra do Meio Ecological Station (ESECTM) in the basin of the middle Xingu River, northern region of Brazil, in the "Terra do Meio" mosaic of

protected areas. Indigenous and riverine peoples have historically occupied the region (Balee et al. 2020). The MONITORA Program applies the TEAM (Tropical Ecology Assessment and Monitoring) protocol for terrestrial vertebrates (Jansen et al. 2014), using a grid of 60 camera traps distributed across the two Terra Firme protected areas. The cameras, of the Bushnell® brand (Trophy Cam), are arranged in a regular grid with a density of one camera-ra per 2km². The cameras were placed on the trunks of the trees at knee height and remained active in the field 24 hours a day for 30 days. The images were processed on the Wildlife Insights platform (Ahumada et al. 2020).

We had a total effort of 2657 camera days between June and August, with 148 photographs of a female *D. tajacu* with white body parts (one-hour intervals between photographs), totaling five independent records. They were made between June 23 and August 8 and included the animal alone and in groups, with periods of daytime (06:00 - 18:00) and nighttime (19:00 - 05:00) activity. Non-pigmented parts include the area between the snout and the top of the skull, the forelimbs, the front of the belly, the sides, and the blue eyes (Figure 1). Images of the animal's back can be used to verify sex. Despite the chromatic anomaly, the individual frequently interacted with conspecifics, including olfactory investigation in the heard and olfactory contact with other individuals (Figure 1A) (Byers & Bekoff, 1981).

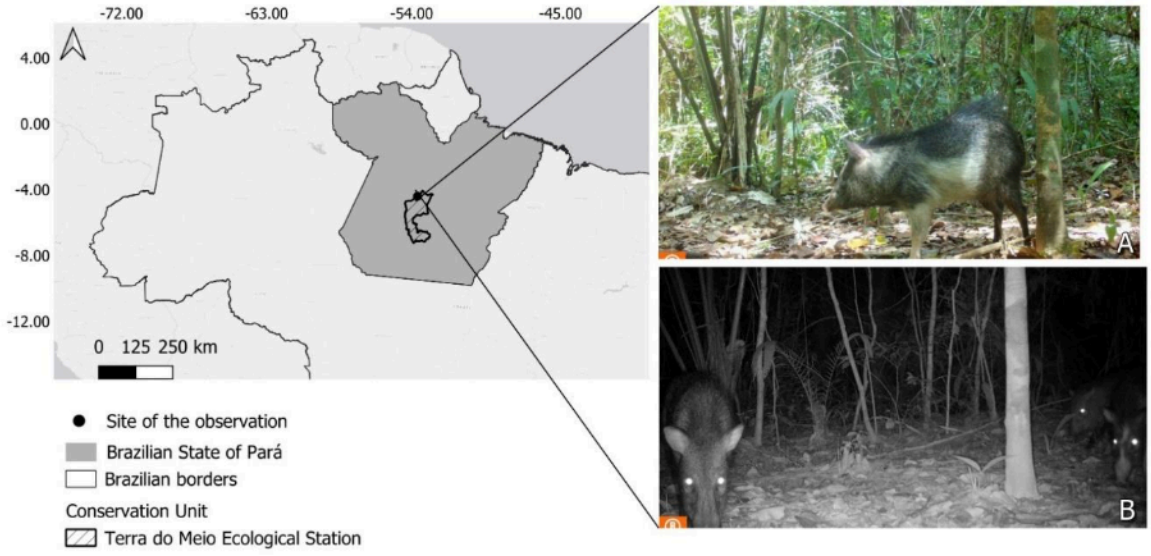

Figure 1: Photos taken by TEAM protocol camera traps of *D. tajacu* at the Terra do Meio Ecological Station. On the left, a map of the area where the individual was observed. On the right: a) individual with piebaldism; b) individual interacting with conspecifics.

Our results show that individual with piebaldism socialized normally with the group. In *T. pecari*, Aximoff et al. (2021b) argue that because the species has olfaction as its primary sensory tool, individuals with different pigmentation would not be harmed by rejection from the group. The same pattern is observed in *D. tajacu*, where interaction often involves vocalizations or smell (Byers & Bekoff, 1981; Kiltie & Terborgh, 1983). In the Atlantic Forest,

a leucistic individual of *D. tajacu* was observed interacting with other individuals in 45.5% of the records, indicating that sociability is independent of the coloration of the individual (Silva et al. 2019). This record is only possible due to monitoring programs with cameras or occasional records, demonstrating the fundamental role of these tools in assessing the status of these populations and the importance of communicating these records (Guastalla et al. 2021). Factors such as endogamy, related to habitat fragmentation, are pointed out as possible causes of increased occurrences that may jeopardize the future viability of these populations (Arriaga-Flores et al. 2016; Guastalla et al. 2021). We recommend that future studies investigate the frequency of these mutations and, in the case of social species, the possible adaptive effects on the survival and sociability of individuals.

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