Short Communication

Albinism in a juvenile Rhesus Macaque *Macaca mulatta* (Zimmermann 1780) from the Brahmaputra Valley of Assam, India (Primates: Cercopithecidae)

Neeraj Bora[1]*, Sanghamitra Buragohain[2], Deep Jyoti Borah[3], Chiranjib Bora[4], Sandip Choudhury[2], Jyotismita Das[1]

Abstract - Color aberrations are rare phenomena in wild mammals and are often associated with genetic disruptions affecting melanin production or deposition. The Rhesus Macaque *Macaca mulatta*, one of the most widespread primate species in India, has only rarely been reported to exhibit albinism or related pigmentary abnormalities in natural populations. Here, we document a case of albinism-like color aberration in a juvenile rhesus macaque observed in the Brahmaputra Valley of Assam, India.

The individual, a juvenile male, displayed a uniformly light cream-colored coat and bluish eyes, rather than the complete depigmentation and red or pinkish eyes characteristic of true albinism. Based on phenotypic characteristics, the observed condition may be consistent with a form of oculocutaneous albinism potentially associated with mutations affecting melanin synthesis or transport, such as those involving the *SLC45A2* gene; however, no genetic analyses were conducted, and this interpretation remains speculative.

Behavioral observations indicated that the juvenile experienced significant social challenges within its troop, including aggression from adult males, possibly triggered by its atypical coloration. To our knowledge, while a previous case of albinism in a rhesus macaque has been reported from the Barak Valley of Assam, this represents the first documented record from the Brahmaputra Valley. This report highlights the need for further research into color aberrations in rhesus macaques and their potential implications for social interactions and survival in wild populations.

Key words: albinism, India, melanin, mutation, rhesus macaque.

Riassunto - Caso di albinismo in un giovane macaco rhesus *Macaca mulatta* (Zimmermann 1780) dalla valle del Brahmaputra, Assam, India (Primates: Cercopithecidae).

Le aberrazioni cromatiche rappresentano fenomeni rari nei mammiferi selvatici e sono spesso associate a alterazioni genetiche che influenzano la produzione o la deposizione della melanina. Il macaco rhesus *Macaca mulatta*, una delle specie di primati più ampiamente diffuse in India, presenta solo raramente casi documentati di albinismo o di anomalie pigmentarie correlate nelle popolazioni naturali. In questo lavoro viene descritto un caso di aberrazione cromatica di tipo albinistico in un macaco rhesus giovanile osservato nella valle del Brahmaputra, nello stato dell'Assam (India).

L'individuo, un maschio giovanile, presentava un mantello uniformemente color crema chiaro e occhi di colore bluastro, piuttosto che la completa depigmentazione e la colorazione rosso-rosata degli occhi tipiche dell'albinismo vero. Sulla base delle caratteristiche fenotipiche, la condizione osservata potrebbe essere compatibile con una forma di albinismo oculocutaneo potenzialmente associata a mutazioni che influenzano la sintesi o il trasporto della melanina, come quelle coinvolgenti il gene *SLC45A2*; tuttavia, non essendo state condotte analisi genetiche, tale interpretazione rimane di natura speculativa.

Le osservazioni comportamentali indicano che il giovane individuo ha affrontato significative difficoltà sociali all'interno del gruppo, inclusi episodi di aggressione da parte dei maschi adulti, probabilmente innescati dalla sua colorazione atipica. Per quanto a nostra conoscenza, sebbene un precedente caso di albinismo in macaco rhesus sia stato segnalato nella valle del Barak, questo rappresenta il primo caso documentato per la valle del Brahmaputra. Il presente contributo sottolinea la necessità di ulteriori ricerche sulle aberrazioni cromatiche nel macaco rhesus e sulle loro potenziali implicazioni per le interazioni sociali e la sopravvivenza delle popolazioni naturali.

Parole chiave: albinismo, India, macaco rhesus, melanina, mutazione.

[1] Department of Zoology, Nagaon University, Nagaon, Assam, 782001 India.
[2] Department of Zoology, Nowgong Girls' College, Nagaon, Assam, India.
[3] Wild Aid Assam, Nagaon, Assam, India.
[4] Department of Zoology, Gauhati University, Guwahati, Assam, India.

* Corresponding author: neerajbora15@gmail.com

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Northeast India harbours one of the highest diversities of primates in the country, supporting nearly half of the primate species recorded from India. Among these, the Rhesus Macaque *Macaca mulatta* (Zimmerman 1780) is one of the most widespread and adaptable species. The species is documented from all northeastern states of India and is characterised by a highly flexible ecology and social organisation. Rhesus macaques are social animals that live in multi-male, multi-female groups, typically comprising 20-30 individuals, although group size may vary depending on habitat type and anthropogenic influence (Lindburg, 1980; Maestripieri, 2010).

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Adult rhesus macaques are medium-sized primates, with an average body length of approximately 0.5 m. Males are generally larger than females, being 5-10 cm taller and 2-3 kg heavier on average (Maestripieri, 2010). The species is characterised by thick fur ranging from dark brown to sandy brown, often with an orangish hue on the hindquarters (Menon, 2014). Rhesus macaques occupy a wide range of habitats, including tropical and subtropical forests, dry and semi-arid regions, mountainous landscapes, and swampy areas, and are increasingly observed in close proximity to human settlements due to their high ecological plasticity (Maestripieri, 2010).

Colour aberrations are rare phenomena resulting in abnormal pigmentation of an animal's fur, feathers, or skin and are generally caused by genetic anomalies affecting melanin production or deposition (van Grouw, 2013; van Grouw, 2021; Bora *et al*., 2024). Although considered uncommon, colour aberrations have been reported across a wide range of vertebrates, including birds and mammals (Mahabal *et al*., 2016; Mahabal *et al*., 2019). In birds,



Fig. 1 - The juvenile male colour aberrant (albinistic) rhesus macaque at Koroioni village in Assam, India. / Il giovane macaco rhesus con colorazione aberrante (albinistica) nel villaggio di Koroioni in Assam, India (©Deep Jyoti Borah).

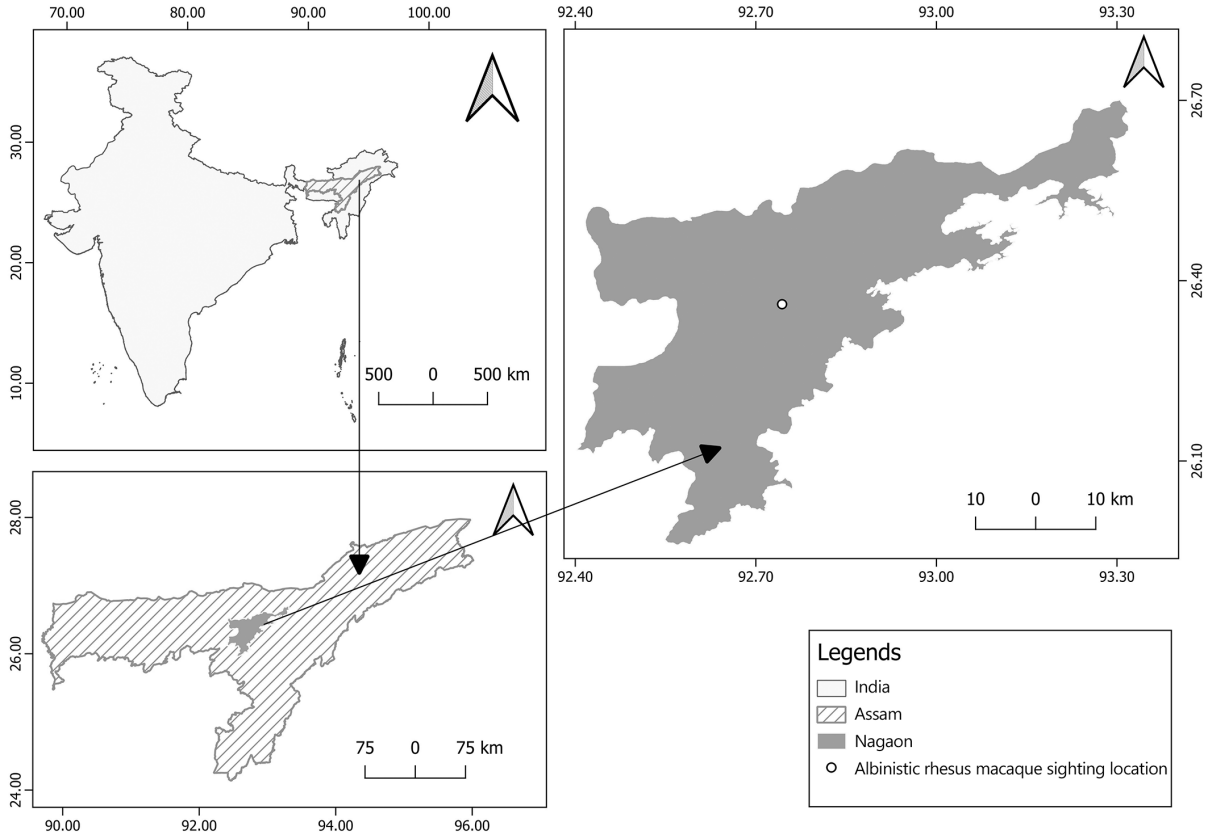


Fig. 2 - Map reporting the recorded location of the albinistic rhesus macaque. / Mappa che illustra la località di osservazione del macaco rhesus albinistico.

such aberrations have been classified into categories such as albinism, leucism, progressive greying, brown, ino, dilution, and melanism (van Grouw, 2021). However, as noted by Lucati & López-Baucells (2017), no universally accepted classification system exists for colour aberrations in mammals, and the terminology used in avian studies cannot always be directly applied to mammalian taxa.

Melanin is the primary pigment responsible for skin, fur, and feather coloration in both birds and mammals, and colour aberrations arise due to disruptions in its synthesis, transport, or deposition (van Grouw, 2013; 2021). Albinism represents a genetically inherited condition caused by mutations in genes involved in melanin biosynthesis. Importantly, not all forms of albinism result in completely white individuals; only true albinos entirely lack melanin in the skin and fur and typically exhibit red or pinkish eyes due to the visibility of underlying blood vessels (van Grouw, 2021).

On 23 November 2024, we encountered a light cream-coloured juvenile male rhesus macaque (Fig. 1) in Koroioni village (26.360845° N, 92.74349° E), Nagaon district, Assam, India (Fig. 2), following information provided by local residents. The individual displayed a uniformly pale, cream-coloured coat rather than complete depigmentation, suggesting that it cannot be classified as a true albino. Furthermore, the eyes of the individual appeared bluish rather than red (Fig. 3). Based on these phenotypic characteristics, the observed colour aberration may be consistent with a mutation affecting



Fig. 3 - The bluish eyes of the studied rhesus macaque indicate that it is not a true albino, a condition that includes complete depigmentation of the iris (red eyes). / Gli occhi azzurri del macaco rhesus studiato indicano che non si tratta di un vero albino, una condizione che prevede la completa depigmentazione dell'iride (occhi rossi). (©Deep Jyoti Borah).

melanin production or transport, potentially involving the *SLC45A2* gene, which in humans is associated with Oculocutaneous Albinism type 4 (OCA4). However, we emphasise that this interpretation is speculative and based solely on phenotypic observations, as no genetic analyses were conducted.

Behavioural observations indicated that the juvenile experienced considerable social challenges within its troop. The individual was observed being chased and aggressively attacked by adult males, possibly following separation from its mother. Several group members gathered around the juvenile and engaged in physical interactions, which may have been triggered by its atypical pale coloration. The juvenile sustained visible injuries, including scratches and bite marks on its legs and body. Local residents intervened to prevent further harm, provided basic first aid, and monitored the animal throughout the day. The juvenile was subsequently released back into its natural habitat later that evening, and despite the injuries, its overall condition appeared stable.

In India, cases of albinism and other colour aberrations have been documented in a range of animal taxa, including primates. Nevertheless, reports of albinism in rhesus macaques remain scarce. A few cases have been reported from different parts of the country (Singh & Mohnot, 2009; Mahabal *et al*., 2019), and a recent study documented an albino rhesus macaque from the Barak Valley in southern Assam (Sonar *et al*., 2025). To date, however, no published records exist of albinism in rhesus macaques from the Brahmaputra Valley of Assam. The present observation therefore represents the first documented case from this region.

This report highlights the need for further investigations into colour aberrations in rhesus macaques and other primates, particularly with regard to their genetic basis and potential effects on social interactions, survival, and group dynamics in wild populations.

REFERENCES

Bora N., Bora C., Sharma S.R. & Das J., 2024 – First photographic record of a colour aberrant Spotted Dove *Spilopelia chinensis* from the Brahmaputra valley of Assam, India. *Ornis Hungarica*, 32 (1): 238-242.

Lindburg D.G., 1980 – The macaques: studies in ecology, behavior, and evolution. *Van Nostrand Reinhold*, New York.

Lucati F. & López-Baucells A., 2017 – Chromatic disorders in bats: a review of pigmentation anomalies and the misuse of terms to describe them. *Mammal Review*, 47 (2): 112-123.

Maestripieri D., 2010 – Rhesus macaques. In: Encyclopedia of animal behavior. Breed M.D. & Moore J. (eds.). *Academic Press*, Oxford, 3: 70-74.

Mahabal A., van Grouw H., Sharma R.M. & Thakur S., 2016 – How common is albinism really? Colour aberrations in Indian birds reviewed. *Dutch Birding*, 38: 301-309.

Mahabal A., Sharma R.M., Patil R.N. & Jadhav S., 2019 – Colour aberration in Indian mammals: A review from 1886 to 2017. *Journal of Threatened Taxa*, 11 (6): 13690-13719.

Menon V., 2014 – Indian Mammals. A Field Guide. *Hachette Book Publishing India Pvt. Ltd*.: 70-71.

Singh P. & Mohnot S.M., 2009 – Occurence of albino macaque in the desert town of Bikaner, Rajasthan. *Tiger Paper*, 36 (4): 28-30.

Sonar B., Singh B., Talukdar N.R. & Choudhury P., 2025 – First report of albino rhesus macaque *Macaca mulatta* (Zimmerman, 1780) from Barak Valley, Assam. *Journal of Wildlife Science*, 2 (2): 68-70.

van Grouw H., 2013 – What colour is that bird? The causes and recognition of common colour aberrations in birds. *British Birds,* 106 (1): 17-29.

van Grouw H., 2021 – What's in a name? Nomenclature for colour aberrations in birds reviewed. *Bulletin of the British Ornithologists' Club*, 141 (3): 276-299.