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Alloparental behaviour of an adult male Rhesus Macaque (*Macaca mulatta*)

Prerna Sharma[1], M. V. Baijuraj[2]

[1]PhD Scholar, Amity Institute of Forestry and Wildlife, Noida.
[2] Director, Conservation Projects, Willdife SOS, Agra.

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EDITED BY
Qamar Qureshi
Wildlife Institute of India, Dehradun

*CORRESPONDENCE
Prerna Sharma
prernawildlife@gmail.com

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Abstract

We report an unusual case of caregiving by an adult male rhesus macaque (*Macaca mulatta*) at Sur Sarovar Bird Sanctuary, India. Observations from 7th June to 15th July, 2024 followed the adult male engaged in behaviors typically associated with female macaques, such as carrying, grooming, and protecting an infant male. Despite his aggressive interactions with other macaques, the adult male exhibited significant nurturing behaviors, including allowing the infant to suck from his nipple and maintaining close physical proximity for protection. These findings expand on previous research by demonstrating that male rhesus macaques can exhibit rare but impactful caregiving behaviors, underscoring the need for further investigation into such atypical male-infant interactions.

Keywords: Allocare, Male parenting, Non-maternal care, Primate social behaviour, Sur Sarovar Bird Sanctuary.

Introduction

In primates, the bond between mother and infant is crucial for the development of social skills and survival (Bastian *et al.*, 2003). While maternal care is typically central, alloparental care, including that by males, is also observed across species. Evidence of male caregiving is strongest in species with known paternity, but males in various social structures can exhibit care behaviors (Fernandez-Duque *et al.*, 2009; Ostner *et al.*, 2013). Males of rhesus macaques (*Macaca mulatta*) also show paternal care behaviors (Langos *et al.*, 2013; 2015), although these are less common and typically less emphasized than maternal care. Research in primatology often focuses on broader behavioral patterns such as mating systems, social dynamics, and parental care roles rather than individual instances of caregiving by specific males.

The ecological success of rhesus macaques is largely due to their adaptability to human-induced environmental changes and their interactions with people (Maestripieri, 2010). Despite their specific mate preferences, rhesus macaques tend to be highly promiscuous due to their multi-male and multi-female group structure, which offers numerous mating opportunities. However, females usually give birth to one infant, as twins are uncommon and have a low chance of survival. Mothers care for their young alone, without assistance from the father or other family members (Maestripieri, 2010).

Rhesus macaques are known for their complex social structures and typical gender roles within their groups. Traditionally, females are the primary caregivers for infants, while males play more peripheral roles, primarily focused on mating and maintaining group hierarchy (Cooper *et al.*, 2022). Langos *et al.* (2013) studied male-infant associations in rhesus macaques, where paternity is uncertain, and found that biological fathers were more inclined to affiliate with their own offspring compared to unrelated infants. However, interactions with adult males can positively influence the growth and development of young macaques (Langos *et al.*, 2015). This suggests that even in the absence of clear paternal recognition, male macaques can still participate in nurturing behaviors that benefit the young. This note presents a unique case of an adult male rhesus macaque exhibiting atypical caregiving behaviors

towards an infant, expanding on existing observations of male-infant interactions (Langos *et al.*, 2013; 2015; Guo *et al.*, 2022).

Observations

The observations were made in the Sur Sarovar Bird Sanctuary (27° 14' 12.28" N, 77° 51' 11.91" E), in an area allocated for the residences of the range forest officer, guards, and foresters. This section is located within the sanctuary, adjacent to a national highway, and includes the forest office, reception area, interpretation center, parking lot, and a children's park. Several troops of rhesus macaques live in this area, utilizing shared resources such as food, water, play areas, nursery space, and shelter. The region is characterized by an abundance of trees that provide both sustenance and refuge. The macaques have ample opportunities to obtain food through natural foraging as well as from human subsidies. After years of cohabitation, the authors have become familiar with many individual monkeys that visit this area on a regular basis. The troop under observation consists of approximately 40-50 individuals, including three adult males. There are around 15 adult females, 14 of whom have infants and juveniles from the previous birth cycle. Additionally, there are about 10 subadults.

On 7th June 2024, we observed an adult male carrying an infant male. Initially, we speculated that he might have taken the infant from a nearby female. On 9th June 2024, we observed the adult male with the infant once again. To gain a closer perspective, we observed the male and the infant from a safe distance.

The infant appeared to be in a good physical condition, although one eye appeared slightly whitish and larger. The adult male exhibited alertness towards us and remained focused during our observation. He was regularly seen being groomed by females and sub-adults and frequently engaged in long chase-offs against other macaques. Females in his proximity tended to avoid eye contact and maintained a distance when approaching him. On another occasion, we observed this adult male chased another male, during which the infant clung to his back in a manner typically associated with maternal attachment. The adult male also exhibited aggressive behavior towards other adult and sub-adult males during these encounters.

During a subsequent visit, the adult male returned to the previously described area with the infant, who was active and appeared to be in good health, suggesting adequate sustenance. The infant remained closely attached to the adult male, who demonstrated protective and vigilant behavior, ensuring the infant's safety by consistently keeping him nearby. The adult male also exhibited controlling behaviors, such as restricting the infant's movement and pulling him close, particularly to shield him from potential threats like dogs.

We observed the infant sucking one of the male's nipples (see Figure 1), which had elongated due to this behavior. Our observations spanned over a month (7th June, 2024 to 15th July, 2024), during which we saw the adult macaque actively engaging in caretaking of the infant. On one morning, we observed that the adult male macaque prevented the infant from sucking or touching his nipple by lying flat to block access. The infant typically used to suck the male's nipple and fall asleep. Most of the time, the male permitted this, but on a few occasions he tried to avoid it. Notably, the adult macaque groomed the infant, causing it to fall asleep promptly. Additionally, a sub-adult monkey was also seen grooming the infant in the presence of the male macaque. Whenever the adult macaque needed to chase off another monkey, a sub-adult held the infant securely. Several sub-adults appeared to assist the male macaque in caring for the infant. Recently, we saw an adult female and her sub-adult son in close proximity to the male and the infant. During a chase-off by the adult male, the female accompanied the infant. However, the infant continuously called out and tried to move towards the male.

The infant consistently traveled on the adult male's back, unlike other infants, who primarily clung to their mothers' chests. The infant closely followed the adult male and confidently explored the environment. Whenever they arrived at the observation site in the sanctuary, the infant vocalized while the adult male remained silent. However, if dogs were present, the male vocalized and held the infant tightly, while the infant stayed silent.

Notably, the macaque did not display aggression towards us while we observed him and the infant from a distance, which contrasts with the behavior of other adult females with infants in the area. Our subsequent observations during the period confirmed that the infant was also a male. Lately, we observed that the adult male had been increasingly leaving the infant with other troop members. However, the infant seemed to be adjusting to brief separations but appeared more at ease when the adult male was in close proximity.

Conclusions

Based on the findings of Langos *et al.* (2013, 2015), rhesus macaques are ideal for studying male care due to their social structure, where females mate with multiple partners, leading to paternity uncertainty and involvement of multiple males in infant care. Sires generally interact more with their own offspring, but unrelated males also provide care. Despite protective mothers limiting male access, these male-infant interactions can significantly enhance infant survival and well-being. Our observations of an adult male taking on caregiving roles typically associated with females support the idea that male rhesus macaques engage in nurturing behaviors. This aligns with the findings of Langos *et al.* (2015), showing that such behaviors benefit the young. However, it is important to acknowledge that our conclusions are drawn from a single incident involving one male. While this observation adds to the understanding of male caregiving behaviors in rhesus macaques, it also underscores the need for caution in generalizing these findings. This highlights the importance of further research to understand the motivations behind such extended care behaviors.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

DATA AVAILABILITY

No datasets were generated or analyzed during this observational study. However, photographic documentation of the observed behaviors is available upon request.

AUTHORS' CONTRIBUTION

The first author conducted the observations and prepared the manuscript. The second author contributed to troop identification, additional observations, and photography.

Figure 1. The adult with elongated nipple.

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