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Short Communication

Observation of an Atypical Hairless Free-Ranging Individual of Grivet Monkey (Chlorocebus aethiops), at Wondo Genet Patch of Forest, Southern Ethiopia

Yosef Mamo[1*], Yitayal Alemu[2], Addisu Asefa[3]

[1] Hawassa University, Department of Biology, Ethiopia
[2] Hawassa University, Department of Wildlife and Ecotourism Management, Ethiopia
[3] Ethiopian Wildlife Conservation Authority, Ethiopia

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CORRESPONDING EMAIL
*Corresponding email:
yosefdubale@hu.edu.et

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Abstract

This study documents the observation of a highly unusual hairless female grivet monkey (Chlorocebus aethiops) at Wondo Genet College of Forestry and Natural Resources Campus, Ethiopia, a phenomenon not previously documented in free-ranging populations in the region. Following an initial report from local community members of a "strange looking" monkey, systematic field observations were conducted over a six-month period at two-week intervals to assess the individual's morphology, behavior, and interactions with conspecifics. The monkey displayed almost complete hairlessness, except for a small tuft on the tail, and weighed approximately 1.5 kg, substantively less than typical adults. Additionally, irregular white patches of depigmentation were present on the upper left flank, with no signs of dermal irritation or lesions. Behavioral observations revealed distinctly atypical foraging and social patterns. Unlike other troop members, the individual primarily foraged near office and training areas, avoided residential zones, and rarely engaged in grooming or close social interactions. Other monkeys initially avoided it, though selective tolerance from one adult male was occasionally noted. The hairless individual exhibited thermoregulatory behaviors, such as lying on sun-warmed rooftops during cooler mornings, presumably to mitigate cold stress due to the absence of fur. The findings suggest that common causes of hair loss, including infection, nutrition, stress, or over-grooming, are implausible explanations. Instead, hairlessness likely stems from an underlying genetic mutation or immunological dysfunction. This case underscores the importance of detailed documentation of rare morphological anomalies in wild primates; as these conditions may influence individual survival, social integration, and adaptive behaviors within both natural and human-modified environments.

Keywords: Alopecia; Ethiopia; feeding; monkey; primate; Wondo Genet.

1 Introduction

Ethiopia has 14 extant primate species and 23 distinct extant taxa (i.e., subspecies), including two endemic species – the Bale Mon-

key (Chlorocebus djamdjamensis) and the gelada (Theropithecus gelada) representing 33% of species–, and nine endemic taxa (Wallis, 2023). One species and five taxa are classified as globally threatened: two Endangered – Chlorocebus djamdjamensis ssp. djamdjamensis (Djam-djam Bale Monkey) and C. d. ssp. harennaensis (Harenna Bale Monkey) (Butynski & De Jong, 2025; Butynski et al., 2022; De Jong et al., 2022) – and three Vulnerable taxa – Cercopithecus mitis ssp. boutourlinii (Boutourlini's Blue Monkey), Erythrocebus patas ssp. pyrrhonotus (Eastern Patas Monkey) (Butynski & De Jong, 2025) and Theropithecus gelada ssp. gelada (Northern Gelada) (Fashing et al., 2019).

The Grivet Monkey (Chlorocebus aethiops) is distinguished from closely related species, particularly the Vervet monkey (Chlorocebus spp.), by its black facial skin with a white line above the eyes, black hands and feet (Butynski and De Jong, 2022) . Several authors note that the taxonomy and biogeography of Chlorocebus monkeys in Ethiopia are particularly complex and requiring further research (Wallis, 2023) . Currently, three subspecies are recognized: the common grivet C. a. aethiops, Matschie's grivet C. a. matschiei, and Hilgert's grivet C. a. hilgerti (Butynski et al., 2022) . The latter two are endemic to Ethiopia, with C. a. matschiei (Matschie's grivet) being found west of the Eastern Rift Valley at altitudes ranging from 440–3,000 m above sea level, and C. a. hilgerti east of the Rift Valley at altitudes from 1,100–3,000 m above sea level (Butynski et al., 2022; IUCN, 2025) .

Wallis, 2023 noted that African primates are facing three main threats: poaching, , 2) habitat loss, and disease. Any of these factors (or a combination thereof) can significantly impact local populations of primates and, when occurring at a large scale, can affect the conservation status of an entire species or subspecies (Wallis, 2023) . Herein, we report first documented case of a hairless grivet monkey exhibiting alopecia at the Wondo Genet Patch of Forest, southern Ethiopia.

Alopecia is a condition characterized by partial or complete hair loss in areas typically covered by fur. While alopecia can occur in both wild and captive animals, it is most frequently documented in captive settings (Zhang, 2011). Among non-human primates, alopecia has received limited research attention, despite growing concern among animal welfare specialists and regulators regarding its potential implications for health and psychological well-being (Zhang, 2011).

The etiology of alopecia in primates is varied and multifactorial. Documented factors include natural processes including seasonality and aging (Steinmetz et al., 2006), nutritional imbalances (Rushton, 2002), endocrine disorders (Diani et al., 1995) , immunological disorders (Wiedemeyer et al., 2004), genetic mutations and physiological changes during pregnancy or the postpartum period (A. A. Beisner and Isbell, 2009). Alopecia may also result from dermatological conditions such as bacterial or fungal infections, parasitic infestations, and atopic dermatitis (Martin and Elewski, 2003; Otberg et al., 2007; Ovadia et al., 2005). In captive environments, over-grooming, frequently associated with social stress or overcrowding, has been identified as a significant contributor to hair loss (B. A. Beisner and Isbell, 2008; Reinhardt et al., 1986).

Despite this broad spectrum of potential causes, alopecia in wild primates remains understudied and is generally regarded as rare. This knowledge gap complicates efforts to explain cases of hair loss observed in free-ranging individuals. Given increasing environmental changes ranging from habitat loss and poaching to disease outbreaks (Wallis, 2023), there is a pressing need to document such atypical cases and better understand their ecological, physiological, and behavioral underpinnings.

This study presents an atypical case of alopecia in a female grivet monkey (Chlorocebus aethiops) observed in the Wondo Genet Forest of Ethiopia, East Africa. In February 2023, we initiated documentation of the behavior and physical condition of a free-ranging, hairless grivet monkey within the Wondo Genet College compound. Observations continued until the animal's disappearance in October 2024. Our objectives were to document the individual's morphological features, foraging behavior, grooming activity, movement patterns, social interactions, and other associated behaviors, as well as to discuss plausible causes of its hair loss within the context of primate health and conservation.

2 Materials and methods

2.1 Study Site

All observations were carried out within the Wondo Genet College of Forestry and Natural Resources compound (38°36'30'' and 38°39'0'' E; 7°5'30'' and 7°7'30'' N), in the southern part of Ethiopia at about 250 km from the capital. The elevation of the area varies between 1,600 and 2,580 m asl. The college's campus covers 840ha of land, comprising of large areas of forested habitat, bushland and grassland areas, as well as residential, office, and dormitory quarters (Girma et al., 2012). Surrounding the campus are local community settlements. The dominant tree species in the natural forest and woodlands include Celtis africana, Pouteria adolfi-friedericii, Acokanthera schimperi, Albizia schimperiana, Millettia ferruginea and Afrocarpus falcatus. Some parts of the forest area are covered by exotic tree plantations (Girma et al., 2012). The Wondo Genet Forest is home to more than 19 large-sized wild mammal species, including endemic ungulates such as Tragelaphus buxtoni, and Tragelaphus scriptus meneliki; carnivores such as Canis aureus, Felis serval, Crocuta crocuta and Panthera pardus, and primates including Papio anubius, Chlorocebus aethiops, and Colobus guereza, which are the most abundant species in the area (Girma et al., 2012).

2.2 Observation method

Our study began following an informal report from local community members livening near the college campus. They reported seeing a "strange looking" monkey, unlike any species they had previously encountered in their lifetime. This initial account captured

our interest. We conducted a preliminary literature review to investigate whether similar cases had been documented in Ethiopia. However, no published records describing such an occurrence were found. Based on the report, we attempted to locate the individual. After several attempts, we successfully observed the animal and identified it as a female grivet monkey (Chlorocebus aethiops). The individual displayed unusual morphological features, which distinguished it from other grivet monkeys.

We systematically monitored the hairless individual over a period of approximately six months, conducting observations at two-week intervals. This consistent monitoring schedule allowed us to record not only its physical condition but also its daily activity patterns, behavioral adaptations, and social interactions within the troop. Such regular monitoring sessions also allowed us to track subtle changes in its health and appearance over time. In October 2024, however, the individual abruptly disappeared from the study area. Despite repeated efforts to locate it during subsequent observation sessions, we recorded no further sightings. The exact cause of its disappearance remains uncertain, but we propose three plausible explanations for this outcome:

- **Predation** – The individual may have been killed by domestic dogs commonly found near the campus, or to wild carnivores inhabiting the surrounding forest.
- **Human-related mortality** – It is possible that local people deliberately killed the animal, either due to crop raiding or other forms of human–wildlife conflict.
- **Dispersal or emigration** – The monkey may have migrated to a different area, either independently or as part of broader troop movement, which is a natural behavior in many primate populations.

Although we initially considered capturing the monkey for detailed morphological measurements, skin biopsy, and blood sampling, we decided against this approach. Given the animal's skittish temperament, as well as the high risk of stress-induced mortality associated with capture and handling, we prioritized non-invasive observation. Accordingly, our method consisted of direct field observations and photographic documentation. On a weekly basis, we recorded the following behavioral and morphological aspects:

- **Morphological features:** external appearance and any observable anomalies.
- **Foraging behavior:** food items consumed and feeding strategies.
- **Grooming activity:** frequency and occurrence of self-grooming or grooming by conspecifics.
- **Movement patterns:** daily ranging and spatial use within the campus.
- **Social interactions:** responses to conspecifics and other animals, when applicable.
- **Other associated behaviors:** signs of stress, avoidance, or adaptation to human-dominated areas.

In addition to direct field observations, we conducted a comprehensive review of relevant literature to explore potential causes of hairlessness in free-ranging grivet monkeys. Our primary aim was to answer the question: what factors could cause the hair loss observed in the individual monkey at Wondo Genet? The review included examination of studies on genetic conditions, disease-related hair loss, environmental stressors, nutritional deficiencies, and social or behavioral influences that could contribute to alopecia in primates. By integrating insights from previous research with our own observations, we sought to identify plausible explanations for this unusual condition and place it in context within the broader understanding of grivet monkey biology.

3 Results and Discussion

This initial observation captivated our attention and prompted us to conduct a preliminary review of the literature to determine whether similar cases had been reported in Ethiopia. We found no published records or reports describing this phenomenon. Furthermore, during our survey, we encountered no other hairless individuals in the area apart from the one under our observation.

During the first week of observation, the hairless monkey gradually relocated its range toward the vicinity of the main office buildings on the campus. This movement appeared to be a behavioral response to two significant pressures. First, the animal was frequently harassed and chased by domestic dogs owned by members of the surrounding community, posing a constant threat to its safety. Second, negative perceptions among some local residents further exacerbated its vulnerability. Certain individuals regarded the monkey as "ugly" or associated its unusual appearance with bad spirits and misfortune, leading to hostile attitudes and occasional attempts to drive it away. The combined effect of these pressures likely influenced the animal's decision to seek refuge in areas with higher human activity on campus, where it experienced relatively less disturbance.

The observed individual was a completely hairless monkey, which distinguished it from previously reported cases of partial hair loss in other primates. For instance, hairless vervet monkeys observed in Umlalazi Nature Reserve exhibited alopecia accompanied by sparse hair coverage (Jenkins, 2015). Similarly, captive Japanese macaques (Macaca fuscata), a species closely related to grivet monkeys, have been documented exhibiting alopecia characterized by patchy hairless areas (Zhang, 2011). Notably, Japanese macaques are among the most extensively studied primates worldwide and are frequently referenced in research and breeding programs due to their ecological and behavioral significance (Institute, 2002; Kawai and Ohsawa, 1983. The complete absence of hair in the observed individual thus represents a distinct condition, differing from the partial or patchy hair loss described in these related cases.

3.1 Morphological features

The monkey with alopecia was estimated to weigh approximately 1.5 kg and measure 30 cm in length (from the top of the head to the base of the tail), noticeably smaller and lighter than typical adult members of its species. In comparison with other conspecific individuals, the hairless monkey exhibited several strikingly unusual morphological characteristics that clearly distinguished it from the rest of the troop (Figure 1). The normal Grivet monkeys have black facial skin, hands, and feet; a white line on the face just above the eyes; long, white whiskers on the cheeks; and a white tuft on the tip of the tail (Figure 2). In contrast, the observed monkey with alocepia was almost entirely devoid of body hair, with the exception of a small tuft of fluffy hair concentrated at the tip of its tail (Figure 3 and 4). Remarkably, throughout the entire duration of our monitoring period, the individual did not show any signs of hair regrowth, maintaining its hairless condition until the time of its disappearance. We did not observe any sign of sores or itching on its body including around the white patches. This persistent lack of fur suggests a chronic rather than a temporary condition, raising questions about possible underlying genetic, pathological, or environmental causes. The complete absence of body hair also exposed the underlying skin and accentuated its skeletal and muscular structure. This gave the individual a markedly different appearance and likely contributed to its social and ecological challenges within both the monkey troop and the surrounding human community.

Figure 1: The alopecia disease-infected grivet monkey individuals at Wondo Genet area (Photo: Yitayal Alemu, 2024).

Figure 2: The observed female hairless individual (picture on the left side) and a normal female member of the same species observed at the site (Photo: Yitayal Alemu, 2024).

Figure 3: White patches on the upper left flank of the hairless monkey (Photo: Yitayal Alemu, 2024).

The morphological condition of the hairless monkey reported here is unique compared to previous case reports that describes par- tial hair loss in other primates, unlike the complete hair loss ob- served in the present case. For instance, hairless vervet monkeys observed in Umlalazi Nature Reserve exhibited alopecia accompanied by sparse hair coverage (Jenkins, 2015). Similarly, captive Japanese macaques (Macaca fuscata), a species closely related to grivet monkeys, have been documented with alopecia characterized by patchy hairless areas (Zhang, 2011). The complete absence of hair in the observed individual therefore represents a distinct condition, differing from the partial or patchy hair loss described in these related cases.

3.2 Foraging behavior

Most other grivet monkeys at the Wondo Genet College Campus are frequently observed gathering in groups around cafeterias and residential areas, often snatching bread or other food from people. This hairless individual, however, did not exhibit such behaviors. Instead, she primarily foraged around the office and training buildings, feeding on leftovers from training refreshments where food was abundant. She was never observed venturing into residential areas. When sensing potential threats, she occasionally vocalized, signaling danger as her troop would.

The observed hairless monkey often wandered around office and training room areas, and rarely displayed the typical social or foraging behaviors seen in other members of its troop. Occasionally, however, like other grivet monkeys, she attempted to climb trees,

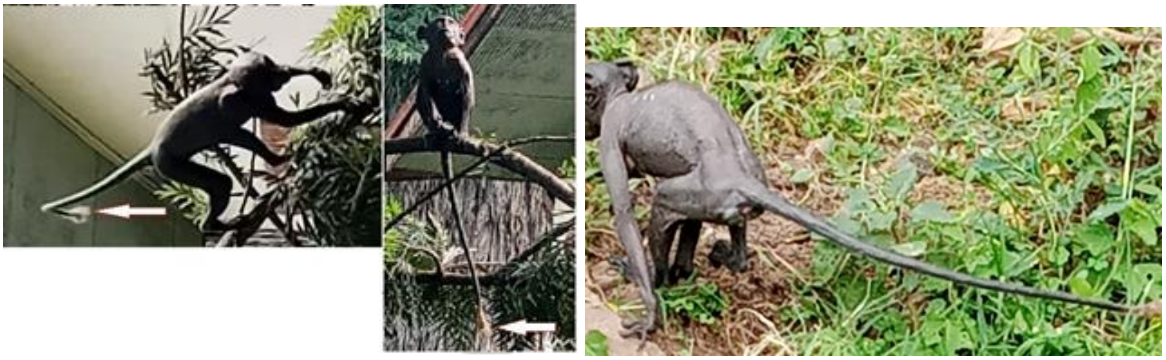

Figure 4: Only fluffy hair was observed around the tip of its tail (Photo: Yitayal Alemu, 2024

traverse electric lines between poles, and move across the rooftops of office buildings (Figure 4).

Troops of Grivet monkeys in the Wondo Genet College Campus usually gather in large groups around students' cafeterias and residential building areas and snatch bread and the like from peo- ple. The hairless monkey was not observed doing that. It never attempted to cross to residential areas. It was instead observed predominantly feeding on flowers, pods and fruits from plant sources, but sometimes seen scratching ground surfaces and feeding on insects. Like the normal grivet monkeys, the observed hairless monkey also fed both on the ground and on the trees (Figure 5 and 6).

3.3 Social interactions with other conspecific monkeys

When the hairless monkey was first observed in the area, it was clear that other members of the troop actively avoided social interaction with it, often moving away or fleeing in its presence. Over time, however, the troop gradually become somewhat accustomed to its presence, allowing it to move freely within the group, though they consistently maintained a reasonable distance. Direct social interactions such as grooming, close proximity, or mating attempts—were rarely observed between it and other group members (Figure 7). The only notable exception involved occasional close encounters, approximately one meter apart, with a single adult male near the office quarters. Interestingly, this same male was also observed spending timing with this individual at a greater distance, approximately three meters within relatively open grassland areas. This behavior suggests a degree of selective social tolerance rather than complete integration into normal troop dynamics.

3.4 Other Associated Behaviors

Early in the morning, when temperatures are relatively low, the hairless monkey exhibits behavior that is distinct from other members of the troop. Unlike its conspecifics, it is often observed lying alone on top of the office roof (Figure 8), presumably absorbing heat from the sun and the warmed surface. This behavior suggests that it may be experiencing discomfort or thermal stress during colder periods, likely due to its exposed, hairless skin. During cooler morning hours, she consistently remains isolated from other troop members, occupying buildings' corrugated iron rooftops. This solitary behavior and preference for elevated, sun-exposed surfaces may serve as a thermoregulatory strategy, highlighting the potential challenges posed by her hairless condition in coping with low ambient temperatures. Her reliance on artificial or sun-warmed surfaces for warmth indicates a behavioral adaptation to mitigate the physiological stress associated with cold exposure.

Most of the time, it wanders around office buildings, which appear to provide a sense of security and relative safety. These areas may offer protection from potential threats and harsh environmental conditions, such as exposure to cold, and also allow it to remain within sight of the troop while minimizing direct social interactions. Its preference for these built structures suggests a behavioral adaptation that balances the need for warmth, safety, and limited social engagement, reflecting the unique challenges posed by her hairless condition. Local residents informed us that they had never seen or heard of such kind of strange looking monkeys in their lifetime. We also haven't come across any literature or report from Ethiopia and elsewhere regarding this animal. Based on our discussions, many people dis like this strange looking animal mainly due to its unusual appearance. Consequently, they consider it as possible source of evil spirit.

3.5 Plausible Explanations for Hair Loss in the Observed Monkey

A central question raised by this case is: what caused the un- usual hairlessness in the observed grivet monkey at Wondo Genet? Alopecia in non-human primates (NHPs) has been associated with a wide range of biological, environmental, and behavioral factors. However, closer examination of the animal's condition and behavior suggests that many of the common explanations can be ruled out in this particular case.

One well-documented cause of hair loss in captive primates is hair-pulling due to over-grooming (Institute, 2002; Reinhardt et al., 1986). Excessive grooming can create bald patches and even skin lesions, particularly when females over-groom their infants. However, this seems unlikely in this case, as the observed monkey rarely

Figure 5: The hairless monkey climbs trees and walking on electric lines (Photo: Yitayal Alemu, 2024).

Figure 6: Predominantly feeds on flowers, pods and fruits from plant sources, but sometimes seen scratching ground surfaces (Photo: Yitayal Alemu, 2024)

Figure 7: Social interactions and grooming behavior display of the observed monkey with other conspecific members (Photo: Yitayal Alemu, 2024).

interacted closely with other troop members and thus was not subjected to the kind of intense social grooming that could explain its complete hairlessness. Stress has also been linked to in primate alopecia, as elevated cortisol levels can disrupt hair follicle cycles and lead to shedding (Thom, 2016). Yet social stress is also an unlikely explanation here. The monkey was free-ranging, not in a confined captive environment where crowding and competition often heighten stress-induced alopecia (Figure 4).

Another common factor is aging, as older NHPs have a higher proportion of hairs in the telogen (resting) phase, leading to chronic telogen effiuvium and hair thinning (Lutz, 2021). This explanation can also be excluded, as this grivet monkey in question was a young individual, estimated at less than one year old.

Dermatological conditions: including bacterial and fungal infections, parasitic infestations, and skin allergies are frequently associated with alopecia in animals. These conditions usually present with signs such as scarring, lesions, inflammation, or persistent itching. However, this individual showed none of these symptoms. Instead, its skin appeared smooth, evenly pigmented, and clean-shaven in appearance (Figure 1), making dermatological causes less plausible.

Diet and nutrition: can also contribute to alopecia. In Gabon, for example, protein-deficient diets have been shown to cause hair loss

Figure 8: The hairless monkey lying on roof top of the building presumably sun-basking to keep warmth (Photo: Yitayal Alemu, 2024).

in captive gorillas, while in Madagascar, consumption of Leucaena leucocephala by ring-tailed lemurs resulted in hairlessness due to the toxic amino acid mimosine. Seasonal changes in food availability can also affect alopecia severity, as seen in rhesus macaques. However, these dietary factors are unlikely here because this monkey and other individuals in the troop shared the same free-ranging diet and environmental conditions, yet only one individual exhibited hairlessness. After eliminating these potential causes, the most plausible explanations for this case are immunologic disorder or a genetic mutation affecting hair development. Although mutations in hairless genes are rare among non-human primates (Novak and Meyer, 2009), they remain a possible cause given the complete and uniform absence of hair in the observed monkey.

4 Conclusions

In conclusion, although common causes of hair loss such as overgrooming, stress, aging, infections, and nutritional deficiencies can be largely ruled out in this case, the unusual hairlessness observed in this free-ranging grivet monkey at Wondo Genet is most plausibly caused an underlying immunological dysfunction or a rare genetic mutation. These factors may have disrupted normal hair growth and maintenance, leading to distinctive hairless condition. Further investigations, including genetic analyses and health assessments, are necessary to confirm the exact cause and better understand its implications for the individual and the population.

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Availability of data and materials

All data generated or analyzed during this study are included in this manuscript [and its supplementary information files].

Competing interests

The authors declare that they have no competing interests.

Ethical declaration

This research was approved by Salale University Institutional Research Ethics Review Committee on 30th January 2024 through the approval Reference Number of SlU-IRERC-CANRS22/25. We confirm that the research was conducted in accordance with the principles embodied in the Declaration of Helsinki and in accordance with local statutory requirements. We also confirm that all participants were given written informed consent to participate in the study. Before starting the data collection process regarding views of key informants, all participants were informed about the study's title and purpose, the procedures involved, the participation being voluntary, potential risks and benefits, the confidentiality of the collected data, and contact information for any further inquiries. Accordingly, participants confirmed their voluntary agreement to participate in the study by signing the consent agreement form.

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