FIRST RECORD OF TWINS IN WILD BLACK AND GOLD HOWLER MONKEYS *(*ALOUATTA CARAYA*)*

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Abstract

Twinning is a rare occurrence in non-callitrichid wild primates. Here we report an observation of twins in wild black and gold howler monkeys (*Alouatta caraya*). In May 2023 an adult female howler monkey was observed carrying twin infants that had been born the night before. The female was observed for 5 hours on the first day after birth. Both infants were observed to change positions on their mother frequently during their first day of life. Through long-term monitoring of the group, we additionally can report the twins both survived their first year of life, longer than found in previous records of twins in other *Alouatta* species.

Keywords: Atelidae, Latin America, multiple-birth, Paraguay, reproduction

Resumen

Los nacimientos múltiples son eventos poco comunes en primates silvestres que no sean callitrichideos. Aquí informamos el primer registro en monos aulladores negros y dorados (*Alouatta caraya*) silvestres. En mayo del 2023 observamos a una hembra adulta de mono aullador trasladando dos crías que habían nacido la noche anterior. La hembra fue observada durante 5 horas el primer día después del nacimiento. Durante el primer día de vida, ambas crías cambiaron de posición con frecuencia sobre la madre. Atraves de monitoreamiento de largo plazo del grupo, podemos reportar que los gemelos sobrevivieron su primer año de vida, más que en registros anteriores de gemelos/mellizos de monos aulladores.

Palabras clave: América Latina, Atelidae, nacimiento múltiple, Paraguay, reproducción

Ñemombyky:

Ka'i kuera oikova ka'aguyrehe sa'i ojehecha heñoiva mokoi ojuehegua oñondive. Ape romombe'u ojehechaha ka'i karaja ra'y heñoiha mokoi ojohegua oñondive ka'aguype. Jasypo 2023 jave rohecha petei ka'i karaja kuña kakuava oraharamo ijapere umi ememby kuera heñoi va'ekue pe pyharepe. Heñoî rire pe arape romaña kuri pe kuñavare po aravo pokukue. Pe arape voi mokoiveva umi ka'i ra'y rohecha ova ha ova py'ïnde ysy aperehe. Upeguive añepyru ahai ko articulo. Umi ka'i ra'y kuera oikovepa pe ary pokukue. Hetave ara oikove hikuai ñambojojaramo umi ymave ejehecha vaykuegui.

Ñe'ẽ tenondegua: Latino Amerikape; Ñemoña; Paraguai; Teñoi ojuehegua; Teñoi Heta

Introduction

Single infant births are the norm for most species within the order Primates, with multiple infant births (such as twins or triplets) being rare outside the Callitrichidae (Chapman et al., 1990; Beltrán and Stevenson, 2012). Some species that typically give birth to a single offspring have been observed to have twin births, including macaques (*Macaca thibetana*, Xia et al., 2012), langurs (*Presbytis entellus*, Winkler et al., 1989), gracile capuchins (*Cebus imitator*, Manson, 1999), spider monkeys (*Ateles belzebuth belzebuth*, Link et al., 2006), and several species of howler monkeys (*Alouatta palliata*: Chapman and Chapman, 1986; *Alouatta seniculus*: Richard-Hansen et al., 2000; Beltrán and Stevenson, 2012, *Alouatta ululata*: Freire-Filho et al., 2025). In general, howler monkeys have a single-infant birth pattern, with a gestation period of around six months, and an interbirth interval of around 16 months (Rumiz, 1990; Kowalewski and Zunino, 2004; Pavé et al., 2010a; Kowalewski et al., 2015). In the genus *Alouatta* the wild twin births that have been reported had low survival rates of infants apart from the recent case of *A. ululata* who were observed for a year until they became independent (Freire-Filho et al., 2025). In one case of twins, both of the *A. seniculus* infants disappeared soon after the first sighting and were assumed dead (Richard-Hansen et al., 2000). In a second twin birth in *A. seniculus*, one infant was still-born (asphyxiation by umbilical cord) and the other was live-born but died shortly after in an assumed infanticidal attack (Beltrán and Stevenson, 2012). In *A. palliata*, despite illness in the mother being observed 35 days after birth, the twin infants were observed to survive over the first year of life (Chapman and Chapman, 1986).

The black and gold howler monkey (*Alouatta caraya*) is found in northern Argentina, central and southwestern Brazil, Paraguay, eastern Bolivia and Uruguay (Bicca-Marques et al., 2021). Here we report the first known observation of twins in a wild group of *A. caraya*. The observation was made in Estancia Santa Ana (-26.836120, -58.024260) a 700 ha privately owned cattle ranch located 27 km east of the city of Pilar, Ñeembucú department, Paraguay. The Ñeembucú Wetland Complex is a naturally mosaic habitat of grasslands, islands of humid Chaco gallery forest, grasslands and swamps. The gallery forest at Estancia Santa Ana naturally exists in small, fragmented patches that have not been altered by anthropogenic activity, despite the land being used for cattle ranching. Approximately 15 to 20 groups of *A. caraya* can be found on the property residing in such habitat patches (Kane and Smith, 2020; Fundación Para La Tierra, unpubl. data).

The newborn twins were observed during a research study on infant care behavior carried out from 14th May to 9th December 2023, as part of the long-term Fundación Para La Tierra Urban Howler Project (https://www.paralatierra.org/neembucuwetlands). During this time period 19 infants were recorded across six local *A. caraya* groups; all other cases were single births except the one described here. At the time of the first observation of the twins, the study group (a fully habituated group of eight individuals) was composed of an adult male, three adult females, a sub-adult female, two juvenile males and a juvenile female. At 07:32 on 24th May 2023 an adult female was observed carrying two newborns. The group had been followed from dawn until dusk the previous day and no infants were present. The female who was carrying the twins was the only female in the group who had shown signs of late pregnancy, a strong indication that the twins were born to her on the night of the 23rd May 2023. The possibility that one infant was adopted from another female in the group is highly unlikely, as neither of the other two females had infants at that time (one of these other group females gave birth to an infant three months later, at the end of July 2023). Here we present information about the first day's observation of the newborn twins and their mother, and verify the twins' survival to at least one year old; a later publication will provide more details of the development of the twins over the first year of life.

During the first observation period of the twins (7:33–12:30 of 24th May 2023), both infants moved on the mother in ventral, lateral and dorsal positioning, but were predominantly in ventro-ventral contact with her, particularly during resting periods, whilst the mother carried them on her side during a travelling and a feeding bout (Fig. 1). During a group displacement, within which the whole group travelled continuously for 7 minutes, the infants changed their positions continuously. The two infants did not appear to coordinate their movements on the mother or interact with each other on their first day of life. The mother was seen to actively interact with the infants, adjusting their contact position on two occasions; once to adjust their position on her ventral side prior to a group displacement, and once when a juvenile group member approached her.

For the majority of this first day of observation, the mother stayed distant (approximately 5m) from other group members, being inactive but alert for extended

Figure 1. *Alouatta caraya* twins, on their first day of life (May 24, 2023), observed in lateral contact with the mother as she feeds on palm fruits in the Ñeembucú Wetland Complex, Paraguay. Photograph credit: R. Taylor.

intervals. During group movement, the mother did travel in close proximity behind an adult female. The adult male of the group was also observed to remain within 5m of the mother for the majority of the first hour of observation, performing an affiliative reunion display with the mother on one occasion (Dias et al., 2008). On two other occasions the mother rejected agonistically the interaction of a juvenile male and an adult female after which she then groomed a juvenile female with the newborns in ventro-ventral contact.

The infants, both later confirmed as female, were similar in size and appeared to develop physically at similar rates, in terms of independent locomotion, interaction with the environment, interaction with other group members (Fig. 2). Both survived their first year, however one disappeared (and is assumed to have died) in July 2024, just as the mother had a new infant. The surviving twin appears to be doing well (as of July 2025) (Fig. 3) and is monitored twice per week as part of the Fundación Para La Tierra Howler Monkey Research Programme.

In Paraguay, wild primates are impacted by extreme deforestation and land use change (Smith, 2021; Smith et al., 2021a). While the twins' howler monkey group inhabits a natural environment that until recently has only experienced low-intensity cattle ranching, industrial agricultural rice production is beginning to encroach into the Ñeembucú department (R. Smith pers. obs. Sept. 2023). This may lead to habitat loss and fragmentation, pesticide use and increasing domestic animal encounters in the forest. Evidence for the potential impact of these threats in the Ñeembucú Wetland Complex has already been observed through high numbers of congenital malformations (cleft lip and/or palate in the Estancia Santa Ana howler population) (Smith et al., 2021b), road kills (Fundación Para La Tierra, unpubl. data) and parasitical infections (Kane and Smith, 2020; Fundación Para La Tierra, unpubl. data). With all of these risks added to the already documented low survival of *Alouatta* twins in the wild (Richard-Hansen et al., 2000; Beltrán and Stevenson, 2012) it is not yet known whether the surviving twin will make it to adulthood. However both survived until over a year old and were able to become more independent of their mother.

As no observable change in behaviour has been noted in *Alouatta* mothers with twins compared to singletons, it has been hypothesized that howler monkey females display maternal care behaviors suitable for caring for twins (Chapman and Chapman, 1986; Pavé et al., 2010b). Our observations that the newborns' primary positioning on their mother was ventral contact is in line with other studies of newborns in *Alouatta*. For singletons ventral positioning of newborn infants is standard, with exclusively ventral contact with the mother for at least the first day of life, and the subsequent transition to dorsal positioning is an important stage in infant development (Dias, 2005; Camargo and Ferrari, 2007). However, as records of twin births in *Alouatta* are so uncommon there are limited comparative data available. The surviving twin of Estancia Santa Ana, Ñeembucú will continue to be monitored long-term to document its development.

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Figure 2. *Alouatta caraya* twins at about 5 ½ months old with their mother (12th October 2023). A) the mother foraging whilst hanging by her tail and carrying both infants; B) both infants being carried on the mother's back while she feeds. Photograph Credits: R. Taylor.

Figure 3. Surviving twin in January 2025. Photograph Credit: W. Kobrinsky.

This research was approved by the Ministerio de Ambiente y Desarrollo Sostenible of Paraguay (MADeS) and complied with all local laws. The study was non-invasive and followed the American Society of Primatology Code of Best Practices for Field Primatology (2014).

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