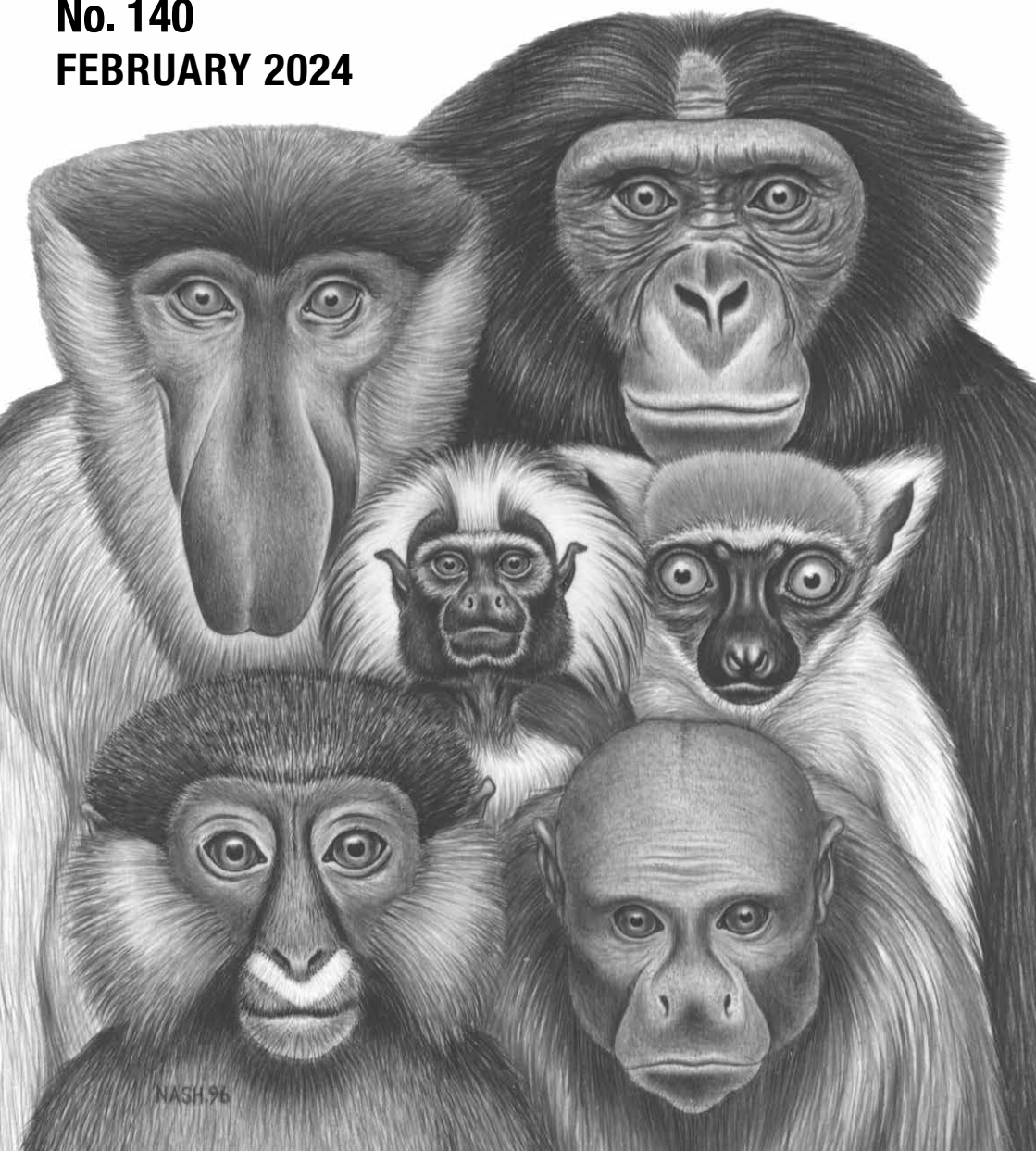


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Rare and Understudied Primates

A Brief Perspective on Forty Years of Research and Conservation of the Northern Muriqui, *Brachyteles hypoxanthus*

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In 1982, I accompanied Russ Mittermeier on a trip to southeastern Brazil, to see a rare primate known in English as the woolly spider monkey and in Portuguese as "O Mono" (Aguirre, 1971), but now referred to by its Tupi name, Muriqui, by all. I was a second year graduate student interested in deciding for myself whether the muriquis inhabiting the small forest fragment at Fazenda Montes Claros, in Caratinga, Minas Gerais, Brazil would make good subjects for my PhD research. In those days, very little was known about the social behavior of wild Platyrrhines beyond howler monkeys, which were the only primates in the Americas that ranked among the top 10 genera cited in the scientific literature (Southwick & Smith, 1986). Latin American primatologists were already at the forefront of

ecological studies, which was distinct from the anthropomorphic emphasis coming out of North American primatological programs based in Anthropology departments at that time (Strier, 2017a).

The sparsity of information on the murret's social behavior was perfect for me because I was seeking a species with which to evaluate predictions generated from the socioecological models (Strier, 1999). Those models were based mostly on African and Asian primates with closer ecological and phylogenetic relationships to ourselves, so the murret would provide a great independent test case of the models' predictions (Strier, 1994, 2017b).

It also helped that I fell in love with the murret at first sight. Their expressive faces, large size, long-limbs, and prehensile tails, their grace and agility in motion, and even their spicy, cinnamon-like smell...everything about them intrigued me (Figure 1). I was smitten long



Figure 1. Northern murret in motion © Carla B. Possamai - Murret Project of Caratinga

before they revealed to me their uniquely peaceful way of life.

It is worth noting that, like many other primates, murrets underwent a taxonomic revision around the millennium that split their once monotypic genus, *Brachyteles arachnoides*, into two species: the northern murret I was studying gained a new Latin name, *B. hypoxanthus*, and the southern murret retained the original, *B. arachnoides*. Subsequent molecular analyses have reinforced this split, which is estimated to have occurred about 2.2 million years ago (Chaves et al., 2019). While justifiable on both scientific and conservation grounds (e.g., Strier and Fonseca, 1996/1997), this reclassification has created some confusion in the literature because many people are not aware of this change in the Latin name, and inappropriately rely on the old name instead of the new one, even when referring to the same individual murrets. This is a good reminder to all primatologists: it is good practice to pay attention to the geographic location of populations instead of just the Latin names, which can change with taxonomic revisions. Comparative analyses are especially impacted when taxonomic revisions are not taken into account, for they risk misrepresenting the behavior patterns of closely-related taxa.

I discovered that northern murrets, unlike other primates, live in egalitarian societies in which aggression is rare. Instead of challenging one another, inter-individual conflicts are

resolved by mutual avoidance or reassuring hugs (Figure 2). Group members mate openly, and females can choose to mate with multiple partners in close succession, without threats or interference. Males are philopatric, spending their entire lives in their natal groups with their mothers and male relatives, whereas females disperse before the onset of puberty to join new groups where they establish their reproductive careers. Although patrilocality also occurs in primates such as chimpanzees, bonobos, and the muriqui's other close atelin relatives, spider monkeys and woolly monkeys, muriquis are the only ones that combine patrilocality with such high levels of tolerance among and between the males and females in their groups.

Comparative studies have since confirmed that the muriquis' hippie-like behavior is similar in other groups and populations living under different ecological and demographic conditions. Such comparative data are always important, but these have been especially so because the history of isolation of my study population could have cast doubts about how much of their unusual behavior was typical for the species. In fact, many primates today live in different conditions than they did in the past, and so this concern about group or population peculiarities extends to other primates in addition to muriquis (Strier, 2017b). Comparative studies of muriquis have shown that while their diet may vary, their pacifism generally does not (Strier, 2021a).

Equally compelling, the muriquis' egalitarian society has persisted across generations and under different group sizes and population densities. From 1983 to 2015, my study population in Caratinga grew from an original 50 individuals living in two social groups to more than 350 individuals living in five groups. Instead of increasing their antagonism toward one another, the muriquis maintained their practice of avoiding direct competition by splitting into smaller subgroups with fission-fusion dynamics, and then by expanding their vertical niche to include the ground. From 2016 to 2022, the population declined from its peak size to 232 individuals, and their tolerance toward one another has persisted.



Figure 2. Northern muriqui hugs
© Pablo Fernicola - Muriqui Project of Caratinga

Deciphering which parts of the muriquis' behavioral repertory are flexible and which, like their peacefulness and female dispersal patterns, are resistant to change, has been a challenging process. (Strier, 2021a). Yet, reflecting back on what we've learned about northern muriquis over the past 40 years, I would rank these distinctions between their flexible versus conservative behavior patterns to be among if not the most important discoveries, both for our understanding of comparative primate behavioral ecology, and for our ability to advance conservation and management efforts for this species. These discoveries have stimulated new questions and new perspectives about muriquis and other primates, and they are directly informing many of the Brazilian-led conservation management programs now underway (e.g., Jerusalinsky et al., 2011; Strier et al., 2021; Melo et al., In prep.).

Our long-term study has shown that natural demographic fluctuations can have outsized effects in isolated populations where dispersal is limited and the recruitment of conspecifics is non-existent. Yet, despite our ongoing monitoring, the causes of these fluctuations can only be speculated (Strier and Ives, 2012; In prep.), and there is little we can do, short of active management, to mitigate their impact on the population's persistence. Considering that the Caratinga muriquis still account for about one-quarter of all northern muriquis, what happens to this population continues to play a big role in the future of the species.

Fortunately, there is now a large team of Brazilian scientists and conservationists actively engaged in research and conservation on behalf of northern muriquis. These collaborators include nearly 100 Brazilian students who have participated on the Muriqui Project of Caratinga and have contributed to the long-term monitoring efforts since 1986. I am also fortunate to have other colleagues and collaborators who coordinate other muriqui projects elsewhere and are leaders in conservation and management decisions for the species. The engagement of scientists at the National Center for Research and Conservation of Brazilian Primates (CPB) of the Chico Mendes Institute for Biodiversity (ICMBio) has been critical for the creation of Brazilian National Action Plans and Protocols for muriquis (Jerusalinsky et al., 2011; Valença-Montenegro et al., 2021).

One of the most pressing priorities for the northern muriquis is the establishment of a forest corridor to connect my study population (the Caratinga muriquis), which inhabits the Private Natural Heritage Reserve (RPPN) Feliciano Miguel Abdala, with another isolated population that inhabits the RPPN Mata de Sossego, about 50 km away. Although the Sossego population is comprised of a single group that has fluctuated in size between 25 and 38 individuals (Tabacow et al., 2021), its habitat is cooler and wetter, and thus more likely to remain suitable for muriquis under the warmer, drier conditions predicted to occur under impending climate change. Establishing connectivity between these populations will provide the Caratinga muriquis with a refuge as their habitat changes. At the same time, both populations will gain access to new reproductive partners, which is important for the maintenance of genetic diversity and avoidance of close inbreeding.

While we are actively pursuing funding to support the implementation of the Caratinga-Sossego corridor, this and other programs for population monitoring and both *in situ* and *ex situ* management of other northern muriqui populations are also underway (e.g., Melo, 2021; Tabacow et al., 2021; Melo et al., In prep.). These research and conservation programs and the many dedicated people involved with them give me cause for more optimistic about the future prospects for the northern muriqui—and other Brazilian primates—than I have had in the past.

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