

THE ECOLOGY AND CONSERVATION OF THE MURIQUI (*BRACHYTELES*): REPORTS FROM 2002–2005. INTRODUCTION

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This special issue of *Neotropical Primates* is dedicated to the miqui (genus *Brachyteles*), the largest of the New World primates and one of the flagships for conservation efforts worldwide. Two species are now recognized, the southern miqui (*B. arachnoides*) and the northern miqui (*B. hypoxanthus*). Southern miquis are classified as Endangered, while northern miquis rank among the 25 most Critically Endangered primates on the planet (Strier *et al.*, 2006). They are endemic to the Atlantic Forest of southeastern Brazil, one of the “hottest” of the biodiversity hotspots; very highly threatened regions with exceptionally large numbers of endemic species (Myers *et al.*, 2000).

The Atlantic Forest hotspot is distributed over more than 23 degrees of latitude and encompasses parts of three countries—Brazil, Argentina, and Paraguay. The forest once covered nearly 1,360,000 km² in Brazil alone; nearly 15 percent of the nation’s territory and spanning all or part of 15 states (Galindo and Câmara, 2003). The Brazilian Atlantic Forest shows impressive biodiversity gradients, with extraordinary levels of biological diversity in a varied set of landscapes and socioeconomic contexts. Eighty (80 percent) of the 24 primate species and subspecies in the Brazilian Atlantic Forest are endemic, including two endangered endemic genera—the lion tamarins (*Leontopithecus*) and the miquis. It is unquestionably one of the most threatened regions, not only in Brazil but worldwide. Less than 8 percent of the original forest persists, much of which is fragmented, degraded and polluted, and still hunted. More than 60 percent of the animals and the vast majority of plants threatened with extinction in Brazil are found in this biome alone (Paglia, 2005).

Miquis were first described by naturalists in the 19th century (1806), but it was Aguirre’s (1971) pioneering monograph that brought their plight to the attention of Brazilian scientists and conservationists, such as Ademar F. Coimbra-Filho (1972) and Célio Valle (Valle *et al.*, 1984). Since the late 1970s, research on primates and protected areas in the Atlantic forest carried out by these scientists, together with Russell Mittermeier, Gustavo Fonseca and others, showed that this region ranks among the most diverse and most endangered on Earth. The initial focus on primates has now blossomed into a number of internationally and nationally supported conservation projects. Work on the lion tamarins (Kleiman and Rylands, 2002) and the miquis, and the importance of the Atlantic forest to the survival of these endemic genera, provide some of the best examples of the use of flagship species to achieve broader conservation objectives.

The results of these efforts are evident in the new discoveries about miquis and conservation initiatives described in this volume. Contributors include researchers and conservationists from academic and both governmental and nongovernmental organizations. Some have devoted the greater part of their professional careers to miquis; others are more recent partners who bring comparative perspectives from their work in other ecosystems and on other primates and nonprimate fauna to ongoing miqui research and conservation efforts.

Among the many advances in research have been the insights from captive management of miquis at the Centro de Primatologia do Rio de Janeiro (Pissinatti), and from field studies that describe newly contacted populations in the states of Minas Gerais (Melo and Dias), Rio de Janeiro (Garcia), Espírito Santo (Mendes, Santos and Carmo.; Vieira and Mendes) and Paraná (Koehler *et al.*) and new research on previously studied populations in São Paulo (Martins; Talebi and Soares). Long-term data on the northern miquis at the Estação Biológica de Caratinga/ Feliciano Miguel Abdala Private Reserve

(hereafter, RPPN-FMA) in Minas Gerais have provided insights into reproductive ecology and demography (Strier) and the populations of sympatric primates in this forest (Almeida-Silva *et al.*). Other studies also contribute with new insights into the genetics of wild populations (Fagundes), and directives for the conservation and management of this species (Mendes *et al.*; Pontual and Boubli; Oliveira, Marini-Filho and Campos).

Conservation efforts have increasingly involved local human communities in primate conservation programs, as exemplified in a recent initiative in Caratinga (Pontual and Boubli). The government has also become more involved in supporting conservation, as is clear with the efforts of the Coordination for the Conservation of Threatened Fauna and Migratory Species (*Coordenação de Conservação da Fauna Ameaçada de Extinção e Migratória—COFAU*) of Brazil's Institute for the Environment (*Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis—IBAMA*), and the associated Center for the Protection of Brazilian Primates (*Centro de Proteção de Primatas Brasileiros—CPB*), also part of IBAMA, created in 2001 (Oliveira, Marini-Filho, and Campos). IBAMA created an international advisory committee for the conservation of the murequi in 2003, involving many of the authors in this special issue. Consideration of the Atlantic forest brown howler monkey was later deemed essential too, and in 2005 the committee became the "International Committee for the Conservation and Management of the Atlantic Forest Atelids." All issues concerning research, monitoring and conservation of these species are now discussed, and given direction and resolution, through this government committee.

Nearly all of the advances described in this volume build on what has been a long-standing and ongoing commitment to the dual priorities and synergistic dynamics between research and conservation programs. Thus, knowledge obtained from basic research is as necessary for the development of informed conservation and management plans as effective conservation and management plans are for the continuity of research.

In an historical act, in 2003 the Brazilian Ministry for the Environment (MMA), through its Project for the Conservation and Sustainable Use of Brazilian Biological Diversity (*Projeto de Conservação e Utilização Sustentável de Diversidade Biológica Brasileira—PROBIO*) (in partnership with The World Bank and the Global Environment Facility) approved, simultaneously, three large conservation projects to work on different northern murequi populations (one in Espírito Santo and two in Minas Gerais). The total amount approved for the three projects was the record-breaking sum of 1 million reais (roughly equivalent to U\$500,000); never in Brazil had a species attracted such large funds from the government. This was strong evidence of the growing awareness of, and concern for, the critical state of *Brachyteles hypoxanthus* and its Atlantic Forest habitat.

The three projects were complementary, and formed a coordinated strategy to increase our understanding of the species, and contribute to its conservation. The first of the projects assumed responsibility for the development both of a conservation program in Espírito Santo State and of comparative analyses of the conservation genetics of all northern murequis. The second was responsible for developing a long-term field study of a wild population of murequis inhabiting possibly the only large non-fragmented forest for the species—the Rio Doce State Park, Minas Gerais—in addition to locating other remnant populations of northern murequis. The third project involved a synthesis of the ecology of the genus *Brachyteles*, and conservation measures for the northern murequi population at the RPPN-FMA, Caratinga, now estimated to support approximately 25% of the remaining animals of the species. Murequis at this site have been intensively studied since the early 1980s, and the analyses of Strier (1993/1994) have shown that the only factor now hampering the continued growth and expansion of the RPPN-FMA murequi population, and thus its long-term survival, is the availability of habitat. The RPPN-FMA is an island surrounded by open pastures, and a major goal now is to regenerate forest within and around the Reserve and to establish faunal corridors to connect it to neighboring forests.

The RPPN-FMA is one of the five protected forests encompassed by the "Murequi Nucleus," an area of nearly 1 million ha that contains the largest remaining northern murequi populations in the species' entire range. The four other protected areas are a national park that extends across the state borders of Minas Gerais and Espírito Santo (Caparaó), two state parks (Rio Doce and Serra do Brigadeiro), and a second private reserve in Minas Gerais (Mata do Sossego). The Murequi Nucleus was conceived by researchers Luiz Paulo Pinto and Adriano Paglia at Conservation International–Brazil, which, with the participation of government officials, NGOs and private landowners, are now actively engaged in the challenge of expanding and linking these protected areas. The product of these efforts will be the establishment of conservation connectivity across the Murequi Nucleus, providing critical habitat for the healthy expansion of populations of murequis and other species.

This initiative and several others were discussed during a workshop held in Belo Horizonte in May of 2005, with the support of Conservation International–Brazil and PROBIO. Jean Philippe Boubli organized the workshop with the goal of developing a global perspective for future discussions on the conservation and management of the two murequi species. Some of the presentations given at this workshop are included in this volume.

Another recent product is the completion of a management plan for northern muriquis, coordinated by Sérgio L. Mendes and discussed and revised at the May 2005 meeting of the Committee for the Atlantic Forest Atelids. The plan suggests a number of measures, including biomonitoring studies of demography, genetics, parasites, and hormones, as well as practical activities such as management in captivity, environmental education, and habitat restoration. This Management Plan constitutes the basis for the preparation of an Action Plan, which will be the next step in organizing an integrated system for monitoring and conserving the northern muriqui.

The articles in this special issue of *Neotropical Primates* are a sample of the diversity of approaches being taken for the conservation of muriquis. Clearly, tremendous advances in our knowledge of this species and its conservation needs have been made. Yet, this collection also emphasizes the simultaneous need for ongoing efforts on behalf of northern muriquis, and greater investment in comparative studies on southern muriquis. Our ability to develop an informed conservation management strategy for both species of muriqui will depend upon the continuity of integrated research and conservation efforts that involve partnerships among universities, government, and nongovernmental organizations. There is also an urgent need to incorporate more extensive assessments of local population genetics into management plans, and to establish priorities among protected populations to ensure they have the habitat they need to expand to sizes which can provide some guarantee for their long-term health and survival.

The future of muriquis looks more promising today than it did a quarter century ago, but it is still, by no means, secure. Our task for the next 25 years is clear.

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