

**Ecology and Taxonomy
of *Ateles geoffroyi* in
Parque Nacional Pico Bonito,
Atlántida, Honduras**

**By
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**A Thesis Submitted for the Degree of Doctor of
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Declaration

To the best of my knowledge and belief, the work presented in this thesis is entirely my own and contains no material previously published or written by any other person, except as acknowledged in the text.

Signed

A handwritten signature in black ink, appearing to be 'J.H. Hines', written on a light pink rectangular background.

**Justin J.H. Hines
March 2005**

Abstract

The first study on *Ateles geoffroyi* in Honduras, this research focused on the population of spider monkeys in Parque Nacional Pico Bonito, Atlántida, Honduras. Subgroup size of spider monkeys in Parque Nacional Pico Bonito ranged from 1-23 (n=55) individuals, with a mean subgroup size of 6.93 ± 4.53 individuals, which was larger than nearly all subgroup sizes reported in Central and South America. Mean subgroup composition consisted of 1.65 ± 1.16 adult males, 2.67 ± 1.69 adult females and 1.75 ± 1.92 juveniles. Sex ratio of adult males to adult females was 1:1.62, which was consistent with most Central and South American *Ateles* studies in the literature.

Of a possible 23 identified food tree species from 15 families, and 7 unidentified tree and vine species, spider monkeys were confirmed to consume fruits, leaves and/or seeds from 8 identified tree species, 1 unidentified tree species, and 1 unidentified vine species. Several of the confirmed genera consumed by *Ateles* in Parque Nacional Pico Bonito were consistent with other studies conducted in Central and South America, including *Dialium*, *Ficus*, and *Coccoloba*.

Combining pelage analysis and discriminant analysis of cranial and dental measurements from 140 skins and 253 adult crania, the taxonomy of the Central American *Ateles geoffroyi* was revised to recognize the taxa *Ateles geoffroyi yucatanensis*, *A. g. vellerosus*, *A. g. pan*, *A. g. geoffroyi*, *A. g. frontatus*, *A. g. ornatus*, and *A. g. grisescens*, with the recognition of a potential new taxon from northern Honduras, resulting in a revised distribution of *Ateles geoffroyi*, based on the pelage and cranial analyses.

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Introduction

The aim of this thesis is to present new data on the biology of the spider monkeys of Parque Nacional Pico Bonito, Atlántida, Honduras (primarily ecology and taxonomy) in the context of work by myself and previous researchers on *Ateles geoffroyi* in general. The field survey was generated when, in February 2000, Dr. Frances D. Burton and a small group of undergraduate and post-graduate students began researching all facets of Honduras and its political, cultural and environmental history. After sampling seven protected areas in the following year (Hines, 2002), Parque Nacional Pico Bonito was the clear choice as the best site in northern Honduras for long-term research. I had the opportunity to return to Honduras in 2002 to begin my thesis field research whose results are presented here in this thesis, together with an assessment of their taxonomic status and of the taxonomy of Central American spider monkeys as a whole.

The first chapter looks at the natural history of spider monkeys, focusing on how the genus *Ateles* was described, general physical characteristics of the focal species, *Ateles geoffroyi* and their social organization and dynamics. Loss of habitat and hunting for bush meat, medicine and the pet trade are facing populations of non-human primates the world over, and in this chapter I discuss some of the threats facing spider monkeys in Honduras. The chapter concludes with a summarization of *Ateles* research in Central and South America, current as of early 2005, and a comparison of the physical characteristics of *Ateles* to the other Atelins. **Tables 1.4** and **1.5** list over 30 field sites where spider monkeys have been studied in the last 70 years.

In the second chapter, I look at the political, social and economic background of Honduras, the third poorest nation in the western hemisphere. The National Park where I conducted this research, Parque Nacional Pico Bonito (PNPB), is described and I briefly look at the demographics and socio-political status of the surrounding villages. I continue with a description of the field site where the data was collected, and look at the other sympatric non-human primate species that were encountered in PNPB.

Methodology is the subject of the third chapter, and in it I discuss the site selection, trail system, identification of *Ateles* food sources and *Ateles* sampling techniques. Explanations on how data was collected for the taxonomic analysis, the statistical methods

employed to analyze the field and museum data, and the mapping methodology utilizing GIS software are all discussed in this chapter.

The fourth chapter looks at the utilization of resources by *Ateles geoffroyi* in PNPB. I compare the food resources identified in PNPB with those from other Central and South American study sites. I have identified some 23 potential food tree species from 15 families at the field site, of which 8 have been confirmed through observation. I then take a look at the food resources by trail, as well as the five most numerous species identified, examining the measurements collected.

The fifth chapter deals with the ecological and behavioural data collected at the field site in PNPB. I examine the factors that affected the study of *Ateles* in PNPB, and present the demographic data collected from 55 sightings throughout the course of the study. Mean subgroup size was determined to be 6.93 ± 4.53 individuals, the mean group composition being 1.65 ± 1.16 males, 2.67 ± 1.69 females and 1.75 ± 1.92 juveniles, resulting in an adult male:adult female sex ratio of 1:1.162. These results are compared to the results of other Central and South American studies to tease out similarities and differences between populations and taxa. The chapter concludes with a presentation of statistical predictors for sighting spider monkeys at the field site.

Taxonomy is the sole focus of the sixth chapter. A historical background of genus *Ateles* and *Ateles geoffroyi* is presented, looking at how pelage analysis has been used in the past to sort out the taxonomy of the Central American *Ateles* taxa. This is followed by an extensive pelage examination of museum and wild specimens from 35 locations from Mexico to Panama, accompanied by colour photos of specimens from each of the 35 areas. The pelage analysis is followed by a statistical analysis of 253 crania from every country in Central America (except El Salvador), as well as Colombia and Ecuador. The results of these two investigations are presented and illustrated graphically through a series of maps depicting the location of the sites, as well as a proposed revision for the range extensions of the Central American *Ateles*.

The remaining two chapters look at how this work fits into the greater understanding of Mesoamerican primates, and how it furthers our knowledge of *Ateles* in Honduras. I conclude with recommendations for the long-term conservation of *Ateles* in northern Honduras, with a specific focus on those areas where I have documented populations of *Ateles*.

I have spent countless hours in Honduras, from 2000-2003 forging relationships, hiking through jungles, and observing spider monkeys in their natural habitat. Even after all the time spent in the field, I have just scratched the surface of what there is to be discovered in Honduras regarding its endemic flora and fauna, and that there is still so much to be discovered about the spider monkeys of Parque Nacional Pico Bonito.

Justin J.H. Hines

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