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INTRODUCTION

Behavioral Ecology of Western Gorillas: New Insights From the Field

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The papers in this issue are from a conference held in May 2002 at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany. This conference brought together researchers from all current western gorilla sites for the first time with the aim of synthesizing the most current information available on western gorilla behavioral ecology. Our goal was to assess the degree of behavioral diversity in gorillas in light of our current understanding of social evolution. The articles include 1) synopses of the current information on western gorilla foraging strategy, social behavior, life history, and genetic variation; 2) more-detailed descriptions of home-range use and intergroup encounters across sites; and 3) the first description of the social behavior of western gorilla females. Am. J. Primatol. 64:139–143, 2004.

Key words: foraging strategy; social behavior; home range use; intergroup encounter

INTRODUCTION

Socioecological studies attempt to explain the mechanisms by which variation in ecological factors, such as predation pressure and the abundance, quality, and distribution of food, alter the demographic make-up and social relations between individuals within groups, and explain the evolution of different types of social systems [Isbell, 1991; van Schaik, 1989; Wrangham, 1980]. In the two decades since the earliest socioecological models appeared, a tremendous amount of data has been amassed that has allowed researchers to test the basic premises of these models, further refine the models themselves, and gain a clearer understanding of the factors that shape social diversity in primates [reviewed in Koenig, 2002]. However, notably missing are data with which to test these models in great apes.

The first step toward understanding the factors that shape ape sociality is to describe the behavioral diversity within and between great ape species. However,

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with the notable exception of chimpanzees [Boesch et al., 2003], our knowledge of intraspecific (or intragenus) variation in great ape behavior has lagged considerably behind that regarding many other primates, including Cercopithecines [e.g., Barton et al., 1996], Colobines [e.g., Koenig et al., 1998], and Platyrrhines [e.g., Boinski et al., 2002]. This is largely due to the enormous amount of time (and/or manpower) required to habituate apes to the presence of humans, and the subsequent length of study time required as a result of the great ape's slower life histories and more dispersed sociality. Data are particularly incomplete for gorillas. Although the behavior of one population of eastern gorillas is well documented as a result of nearly 40 years of research by Dian Fossey and colleagues at one site [reviewed in Robbins et al., 2001], far less is known about other eastern populations or the more numerous, yet largely unknown, western gorillas.

Early studies in the 1960s by Sabater Pi and colleagues [reviewed in Jones & Sabater Pi, 1971] indicated that western gorillas live in habitats where fruit is

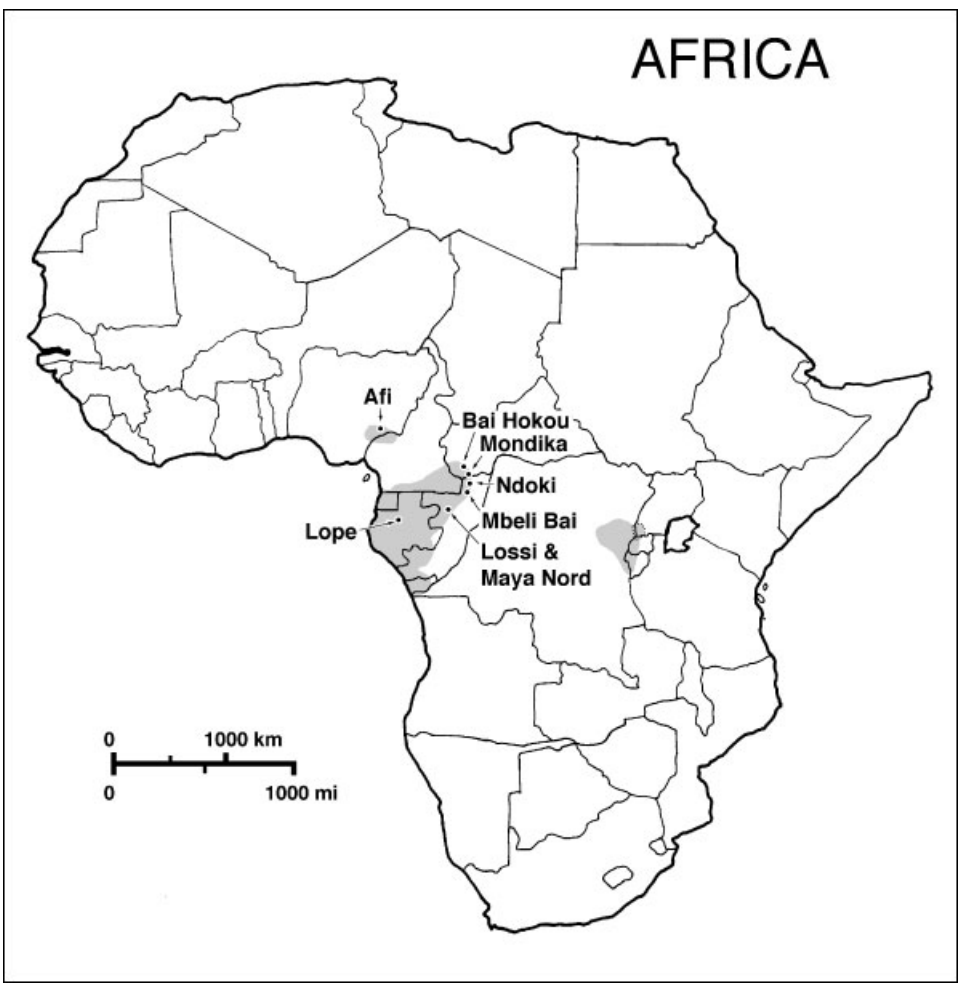

Fig. 1. Western gorilla study sites.

more plentiful and eat more fruit compared to eastern gorillas, challenging the notion of gorillas as strict folivores. There were few subsequent studies of western gorillas (but see Calvert [1985]) until Caroline Tutin and Michel Fernandez established a long-term study site at Lope in Gabon in 1984. For the next decade, Tutin and colleagues provided a wealth of information on western gorilla foraging strategies [e.g., Tutin et al., 1991]. However, our knowledge of western gorilla behavior essentially stalled at this point. There were few studies of western gorillas, in large part due to the aforementioned difficulty of habituating western gorillas.

During the last decade this began to change, and several studies of western gorilla behavior were initiated (or started up again) across numerous sites in Central Africa. The studies differed considerably in primary aims and, as a result, in the data collection techniques used. Studies were conducted to habituate gorillas for ecotourism (e.g., in Bai Hokou, Central African Republic; and Lossi, Republic of Congo) as well as more traditionally research-oriented studies (e.g., in Ndoki and Mondika, Republic of Congo; Lope, Gabon; and Afi, Nigeria). The techniques included conducting indirect studies while the gorillas were being habituated, and directly monitoring large numbers of group of gorillas as they occasionally visited large swampy clearings or ''bais'' to feed on sodium-rich aquatic herbs (i.e., in Mbeli Bai and Maya Nord, Republic of Congo). Little communication occurred among researchers at different sites.

In May 2002, we, along with Caroline Tutin, organized a conference and workshop at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany. This endeavor brought together researchers from all current western gorilla sites for the first time with the aim of synthesizing the most current information available on western gorilla behavioral ecology. The current volume is an outgrowth of that meeting, and includes contributions from 18 researchers of seven different nationalities, representing eight western gorilla study sites located in four African countries (Fig. 1).

Papers in This Volume

Inevitably, with so many different people, approaches to data collection, and priorities at each site, there will be considerable variation in the amount and type of data available. However, given the overall paucity of data obtainable now and for the foreseeable future, we were delighted to learn in the workshops that although the amount of data at any single site may be small, when considered across sites the data provide a rich base from which we can begin to assess western gorilla diversity. Therefore, we commissioned new syntheses of western gorilla foraging strategy (Rogers et al.), life history and social behavior (Robbins et al.), and genetic variability (Vigilant and Bradley), which comprise the first three articles in the volume. Certain topics have been the subject of more intensive research across sites, or provide glimpses into western gorilla behavior that were not previously predicted. We requested the authors of longer-term studies to provide more detailed descriptions of these behaviors and the factors that influenced them at each site. These include papers on home-range use and degree of overlap with other gorilla groups (Cipolletta, Bermejo, and Doran et al.), and the frequency and nature of intergroup encounters (Bermejo and Doran et al.). Only recently has it become possible to provide descriptions of social behavior based on direct observation (but see Stokes et al. [2003]). The final article of this volume (Stokes) provides the first description of social relations among western gorilla females.

These contributions reflect the current state of our knowledge of western gorilla behavioral ecology, and provide some interesting hints as to the nature of variation in gorilla behavior. Most notably, changes in resource distribution result in dietary changes, which in turn alter both habitat use and group demographics.

Future Directions

However, this volume also serves as a reminder of the enormous gaps in our current knowledge. It is still unclear to what degree western gorillas incorporate high-quality and patchy resources (such as fruit) in their diet, and what impact this has on female social relations. Additionally, there have been persistent, but unverified, reports of overall reduced group cohesion and a tendency toward fission-fusion behavior both within and between groups of western gorillas. If this is true, it suggests that more dispersed sociality is a common feature of all great apes except mountain gorillas. There are some suggestions (albeit preliminary) that infanticide occurs less frequently than would be predicted given that groups dissolve upon the death of the male. This, together with the finding that males frequently exhibit reduced aggression toward some extragroup males, raises the possibility that social relations extend beyond group perimeters.

It will be possible to answer these and other currently unresolved questions only when individual behaviors can be consistently quantified based on direct observation across several groups and several sites. At that point we will be able to begin to gain a clearer understanding of the factors that shape social diversity in great apes and (since the great apes share a close phylogenetic relationship and unique traits, such as large brain and body size, with humans) our earliest human ancestors.

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