Ecology and Status of the Drill (*Mandrillus leucophaeus*) in Korup National Park, Southwest Cameroon: Implications for Conservation

Dissertation

Submitted in partial fulfillment of the requirements for the degree of

Doctor of Philosophy (Ph.D.)

at the Centre for Nature Conservation,

Faculty of Mathematics and Natural Sciences,

Georg-August-University of Göttingen

by

Christos Astaras
born in Thessaloniki, Greece

Göttingen 2009

Bibliographic information published by the Deutsche Nationalbibliothek
The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at http://dnb.d-nb.de.

D7

Referent:	Prof. Dr. M. Mühlenberg
Korreferent:	Prof. Dr. P. Kappeler
Tag der mündlichen Prüfung:	Juli 3, 2009

Astaras, Christos:
Ecology and Status of the Drill *(Mandrillus leucophaeus)* in Korup National Park, Southwest Cameroon: Implications for Conservation
ISBN 978-3-941274-19-8

1. Edition 2009, Göttingen

URL: www.optimus-verlag.de

Abstract

by: Christos Astaras

Supervisor: Michael Mühlenberg

The drill (*Mandrillus leucophaeus*) is a terrestrial primate endemic to the Cross-Sanaga-Bioko rainforests of Central Africa whose survival is endangered by increasing pressure from hunting and habitat loss. Few studies have ever examined the ecology of wild drills and our current understanding of the conservation needs of the species is limited. This dissertation presents the findings on wild drill ecology of a twelve month field study in a 63 km^2 section of Korup National Park in southwest Cameroon. It also evaluates the status and threats of the drill in the greater Korup region with the intent of improving the species' protection. Finally, the appropriateness of assuming near-identical ecologies between the drill and its better studied, allopatric, and sole congener – the mandrill (*M. sphinx*) – is assessed.

Analysis of fecal samples and feeding remains show that the drill maintains a diverse, yet not indiscriminate, omnivorous diet throughout the year consisting primarily of fruits and seeds, and to a lesser extent leaves, mushrooms and insects. Drills ingested and dispersed intact seeds from 110 seed types primarily during periods of fruit abundance, while there was a shift towards increased seed predation during the pronounced fruit-scarce dry season.

Visual and audio encounters of drill groups during 3,284 km of trail patrols provided information on group structure and primate associations. Mean group size was 43.3 ± 18.4 (range 25-77) and groups with both one and multiple males emitting the adult male specific two-phase-grunt were observed. Solitary males were encountered twice. Drills were in association with at least one additional primate species at some time during most of the encounters, involving all of the diurnal primates in Korup (*Cercopithecus mona*, *C. nictitans*, *C. erythrotis*, *C. pogonias*, *Procolobus pennantii preussi* and *Cercocebus torquatus*) except the chimpanzee (*Pan troglodytes*).

The total drill population was conservatively estimated at 950-1450 within Korup National Park and 2,500-3,000 in the entire Korup region, which makes the region a stronghold for the species' survival. However, drill sub-populations are becoming increasingly isolated within the ever more fragmented landscape and are

under hunting pressure everywhere. Eight core areas are identified across the region as priorities for protection. Interviews with local communities offered insight on the destructive practice of hunting with dogs as well as the socioeconomic role of dogs – information needed for effectively managing this major threat to drill survival. The drill was also found to suffer from a limited local recognition of its current status and legal protection, which is unfavourable for conservation. A series of short to medium term drill-focused initiatives are recommended for the protection of the species in the Korup region.

Zusammenfassung

Von Christos Astaras
Betreuer: Michael Mühlenberg

Der Drill (*Mandrillus leucophaeus*) ist ein terrestrischer Primat mit endemischer Verbreitung in der Cross-Sanaga-Bioko Regenwald-Region Zentralafrikas. Sein Fortbestand ist gefährdet durch zunehmenden Jagddruck und Habitatverlust. Bisher wurden nur wenige Studien zur Ökologie wilder Drills durchgeführt und unser gegenwärtiger Kenntnisstand über Anforderungen für einen erfolgreichen Schutz sind beschränkt. Die vorliegende Arbeit umfaßt Ergebnisse zur Ökologie wilder Drills basierend auf einer zwölfmonatigen Feldstudie in einem 38 km² großen Ausschnitt des Korup Nationalparks in Südwestkamerun, und evaluiert den Status und die Gefährdung des Drill in der Korup-Region mit der Absicht, den Schutz der Art zu verbessern. Darüber hinaus wird bewertet, ob es angemessen ist, anzunehmen, daß der Drill eine nahezu identische Ökologie mit seinem besser untersuchten, allopatrischen und einzigen congenerischen verwandten, dem Mandrill (*M. sphinx*) besitzt.

Analysen von Kotproben und Nahrungsresten zeigen, daß Drills eine diverse, aber nicht wahllose, omnivore Ernährung durch das ganze Jahr aufrechterhalten, welche

Primär aus Früchten und Samen, und zu einem geringeren Teil aus Samen, Pilzen und Insekten besteht. Drills nahmen auf und verbreiteten Samen von 110 Typen, vorzugsweise während Perioden hoher Fruchtdichte, während in der frucht-armen

Trockenzeit ein Wechsel hin zu einem höheren Anteil an Samenprädation beobachtet wurde.

Visuelle und optische Beobachtungen von Drill Gruppen während insgesamt 3284 km an Begehungen ermöglichten Informationen zu Gruppengröße und Primaten-Assoziationen. Die mittlere Gruppengröße betrug 43.3 ± 18.4 (Spannweite 25-77) und Gruppen sowohl mit einem als auch mehreren Männchen, die den spezifischen Ruf adulter Männchen ausstießen, wurden beobachtet. Solitäre Männchen wurden zweimal beobachtet. Während der meisten Beobachtungen waren Drills mit mindestens einer zusätzlichen Primatenart assoziiert, wobei alle tagaktiven Primaten des Korup Nationalparks (*Cercopithecus mona*, *C. nictitans*, *C. erythrotis*, *C. pogonias*, *Procolobus pennantii preussi* und *Cercocebus torquatus*), außer Schimpansen (*Pan troglodytes*), nachgewiesen wurden.

Die Größe der Drill-Population wurde für den Korup National Park auf konservative 950-1450 individuen geschätzt und auf 2500-3000 für die gesamte Korup-Region. Die Region ist damit wichtigster Stützpunkt für das Überleben der Art. Jedoch werden Teile dieser Population in der fortwährend fragmentierten Lanschaft zunehmend isoliert und unterliegen überall starkem Jagddruck. Acht Kernzonen höchster Schutzpriorität wurden in der Region identifiziert. Interviews in lokalen Dorfgemeinschaften bestätigten die für Drills destruktive Praxis der Jagd mit Hunden, sowie die sozio-ökonomische Rolle von Hunden – Informationen, die für effektives Management dieser Hauptgefährdung benötigt werden. Der Drill leidet außerdem auch unter einer begrenzten Anerkennung seines derzeitigen Status und für seinen Schutz unzureichenden legalen Schutzbemühungen. Eine Reihe kurz- und mittelfristiger, auf den Drill fokussierter Initiativen werden zum Schutz der Art in der Korup-Region vorgeschlagen.

Acknowledgements

A research project is rarely possible without the support of a multitude of people at all stages of its implementation, and my doctoral research was not an exception. I am grateful to have benefited from the guidance, assistance, funding and academic or friendly advice of so many colleagues, friends and organizations, whom I want to acknowledge and thank here.

First of all, I would like to thank my supervisor Michael Mühlenberg, whose faith in my abilities and the feasibility of the proposed research made this study possible to start with, while his "help first - ask questions later" approach to supervision helped me countless times all these years. Matthias Walter was my daily advisor, mentor, confidant and friend and I am truly indebted to him. Together with the rest of the ZfN stuff and colleagues, he made for an academic – yet relaxing – environment. Special thanks go to Monica and Andrea for timely handling paperwork even when I was absent in the field for months.

I am grateful to the Government of Cameroon which through the Ministry of Scientific Research and Innovation (MINRESI) and Forestry and Wildlife (MINFOF) granted permission for this study. A special thanks goes to my friends Orume and Bobo for assisting with obtaining the permits. I also thank the Korup National Park Conservators Albert Kembou and Pascal Ndogmo for supporting my research in the park.

Funding for this project was provided by the Wildlife Conservation Society Research Fellowship Program, Center for Tropical Forest Science of the Smithsonian Institute, Conservation International's Primate Action Fund, American Society of Primatologists, Primate Society of Great Britain, and Columbus Zoo and Aquarium. The Alexander S. Onassis Public Benefit Foundation supported with a scholarship my studies (2004-2008) and covered the costs of this publication.

I would like to thank John Oates, Liza Gadsby, Bethan Morgan and Kate Abernethy for being supportive of a wild drill study from the very beginning and providing valuable feedback even from the proposal stage. They helped me build up the momentum and confidence I needed to pursue a study in a continent and research area then unfamiliar to me. I also thank WCS-Gabon which through Kate Abernethy and Lee White offered me the opportunity to familiarize myself first with mandrill research in Lopé, and the Pandrillus NGO which through my friends Liza Gadsby and

Peter Jenkins offered me a similar opportunity with drills at the Afi Mountains Wildlife Sanctuary.

In Cameroon, I would like to thank Joshua Linder who introduced me to Korup region during my first field visit, and whose CUNY team formed the basis of this study's "Drill Team". Naturally, I want to thank the members of my research team, Cletus Arong, Daniel Awoh, Jonas Awoh, Motoh Jackson and David Okon, along with occasional members Usumanu Adamu, Joseph Molango and Celestine Awoh. Urs Kalbitzer and Lisa Freudenberger of the ZfN provided field assistance in the second field season, but above all invaluable company. I also thank the great number of people who worked as porters, often under blistering sun or pouring rain. All of you made this project really possible. I also thank the Chiefs and communities who hosted us during our field surveys, as well as the people who participated in the various interviews.

In Mundemba, I would like to thank my good friend Orume Robinson for his company and assistance on multiple occasions, as well as Linus Arong and his family, Rose Achik, Mambo Peter, Bonaventure Nimpa, and the members of the now named "Mundemba Sombos" basketball team for stress releasing match-ups. Peter Späth and his wife Karin were both great company and assistance (especially in offering baby chimp Ilor a future at Limbe Wildlife Center). Lawrence Baya also helped our team in more than one occasion.

In Limbe, I am indebted to so many colleagues – come friends – who supported me with equipment, housing, books, academic stimulus, a safe retreat during the 2008 riots, and hours of friendly discourse. I am especially grateful to Aaron Nicholas, Ymke Warren, Anthony Nchanji, Comfort, and Amelia Stott from the WCS-Limbe office, Felix Lankester, Simone de Vries, and Sandy Jones from the Limbe Wildlife Center, and Bethan Morgan, James Christie, and Emma Fenton from CRES.

In Douala, the Greek community invariably treated the rare bouts of home sickness with a game of backgammon – frappé coffee at hand – and good food. A special thanks to my good friends Peter, Terry and Archangel for their hospitality and love, as well as Mr. Alekos and Mrs. Anastasia owners of the Mediterranée restaurant, Mr. Takis and Mr. Kostas. A special thanks goes to late Mr. Manos for his immense help with painlessly extracting my equipment from the Douala Airport Customs, and

Mr. Anestis Arno for his generous support for the renovations of the basketball court in Mundemba.

I am indebted to Bruce Gill, Vasily Grebennikov, Michael Ochse, Brian Fisher and Paul Eggleton for the identification of insect remains, and to Xander van der Burght, Carel Jongkind, and Thomas Duncan for the identification of plants and seeds. Motoh Jackson was responsible for identification of plants in the field. In Göttingen, I received friendly academic advice on various aspects of primatology from German Primate Center researchers (Christian Roos, Michael Heistermann, Dietmar Zinner, Thomas Ziegler and Keith Hodges) and I thank them for that. As important was the welcome distraction and friendship of my fellow "co-sufferers" Amaryllis, Christina, Foteini, Lena, Marios, Natalia, Nikolas, Nikos, Philippos, Soula, Thanos, and Thea.

Last but not least, I would like to thank my parents Theodore and Anastasia for their ceaseless love and support throughout my student life, my grandfather and namesake Christos, my brother Alexander who worried I would not make it past kindergarten, and my Katerina. To all of you I dedicate this study.

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2PG:	Two-phased grunt (a characteristic call of adult *Mandrillus* males)
BBPP:	Bioko Biodiversity Protection Program
CAFECO:	Cameroon Agriculture and Forestry Exploitation Company
CFA:	see FCFA
CIRMF:	Centre International de Recherches Médicales de Franceville, Gabon
CITES:	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CRES:	Conservation and Research for Endangered Species of the Zoological Society of San Diego
CRNP:	Cross River National Park
DED:	German Development Service (Deutscher Entwicklungsdienst)
DRBC:	Drill Rehabilitation and Breeding Center
FCFA:	Francs de la Communauté Financière Africaine (a.k.a. CFA), currency
FR:	Forest Reserve
GTZ:	German Society for Technical Cooperation (Deutsche Gesellschaft für Technische Zusammenarbeit GmbH)
IUCN:	International Union for Conservation of Nature and Natural Resources (until 2008 a.k.a. World Conservation Union)
KFDP:	Korup Forest Dynamics Plot
KFW:	German Development Bank (Kreditanstalt Für Wiederaufbau)
KNP:	Korup National Park
LWC:	Limbe Wildlife Center
NGO:	Non-Governmental Organization
NP:	National Park
NTFP:	Non-Timber Forest Product
MINFOF:	Ministry of Forestry and Wildlife (Cameroon)
MINEF:	Ministry of Environment and Forestry (Cameroon, split in MINFOF and MINEP)
MINEP:	Ministry of Environment and Nature Protection (Cameroon)
MINRESI:	Ministry of Scientific Research and Innovation (Cameroon)
pers. comm.:	personal communication
pers. obs.:	personal observation
PSMNR-SWP:	Programme for the Sustainable Management of Natural Resources in the Southwest Province
PZ:	Peripheral Zone (of KNP)
SPSS:	Statistical Package for the Social Sciences
TOU:	Technical Operation Unit
TRC:	Transformation Reef Cameroon (logging company)
WAZA:	World Association of Zoos and Aquariums
WCS:	Wildlife Conservation Society
WWF:	World Wide Fund for Nature