PROGRAMME

The Final Oral Examination
for the Degree of

DOCTOR OF PHILOSOPHY
Interdisciplinary Graduate Program
Departments of Anthropology and Biology

Denise Gabriel
2007  Queens University  BScH

“Ecological flexibility in a disturbed landscape: An assessment of the behavioural and health ecology of ring-tailed lemurs (Lemur catta) in relation to forest fragmentation”

Monday, June 17, 2013
2:00pm
Halpern Centre for Graduate Students (GSS)
Room 108/112

Supervisory Committee:
Dr. Lisa Gould, Department of Anthropology, UVic (Supervisor)
Dr. Barry Glickman, Department of Biology, UVic (Co-supervisor)
Dr. Steig Johnson, Department of Anthropology, UVic (Member)
Dr. Terry Pearson, Department of Biochemistry and Microbiology, UVic (Outside Member)

External Examiner:
Dr. Giuseppe Donati, Professor, Oxford Brookes University

Chair of Oral Examination:
Dr. Graham Voss, Department of Economics, UVic
Abstract

Habitat fragmentation potentiates biodiversity loss worldwide. Species preservation requires an integrated understanding of wildlife-habitat relationships, including biogeographical patterns, community structures, and resource distributions. However, species responses to habitat fragmentation may vary considerably as a function of the species ecological flexibility and the unique attributes of each fragment habitat. As such, assessing the suitability of fragments for sustaining animal populations necessitates evaluating the ways in which a species acts upon and within its specific ecological conditions. In this dissertation, I explore the behavioural and health ecology of an ecologically flexible primate, the ringtailed lemur (*Lemur catta*), occupying forest fragments in south-central Madagascar. The fragments differ in isolation, degree of anthropogenic pressure, and *L. catta* food resource structure. Anja Special Reserve is a 34 ha rocky-outcrop forest fragment that is isolated from other forests by a mountain range, national highway, and a matrix of anthropogenic crops and rocky savannah. Since gaining its protected status in 1999, it has become one of the most frequently visited tourist reserves in the country. *L. catta* in this reserve have access to abundant food and water resources year-round due to the introduction of non-native fruit trees and the construction of an artificial lake for cattle watering and pisciculture, which support a population density of *L. catta* (6.6 lemurs/ha) that is higher than at any other site in which the species has been studied. In comparison, the Tsaranoro Valley forest is a 53 ha rocky-outcrop forest fragment that is surrounded by a matrix of grassy savannah, a few anthropogenic crops, a small village, and three camps for adventure tourism. While land clearing is pronounced in the valley, a few fragments remain within range for *L. catta* dispersal. *L. catta* in this fragment have limited access to anthropogenic resources and the population density (1.13 lemurs/ha) is one-sixth that at Anja. During the late dry season of 2010 and mid- to late-wet season of 2011, I found intraspecific variation in habitat use, activity patterns, energy expenditure, and feeding ecology of *L. catta* based on the spatial characteristics and resource structure of each habitat. In addition, the populations varied in measured health parameters, stress and endoparasites, which reflect the respective challenges that *L. catta* face as a function of the
unique ecological conditions of each fragment. These results illustrate differences in the quality of the habitats and the potential fitness consequences that the *L. catta* populations must cope with, with important implications regarding the long-term suitability of these fragments for sustaining these populations. Such information is integral when assessing the viability of wildlife populations in degraded landscapes and should be a primary consideration for wildlife managers in biodiversity conservation.

**Awards, Scholarships, Fellowships**

2010 **Postgraduate Scholarship (PGS D),** Natural Sciences and Engineering Research Council of Canada  
2010 **Postgraduate Research Grant,** Primate Conservation Incorporated  
2010 **President’s Research Scholarship,** University of Victoria  
2009 **Canada Graduate Scholarship (CGS M),** Natural Sciences and Engineering Research Council of Canada  
2009 **President’s Research Scholarship,** University of Victoria  
2008 **Ord and Linda Anderson Interdisciplinary Scholarship,** University of Victoria  
2007 **CIHR Training Program in Neurobiology & Behaviour,** University of British Columbia  
2006 **Dean’s Award for Students Returning from Exchange,** Queen’s University  
2003 **Entrance Honours with Merit,** Queen’s University  
2003 **Governor General’s Academic Medal-Bronze,** Holy Trinity High School

**Presentations**

**Gabriel, D.N.** Ecological correlates of the stress response in fragment-dwelling *Lemur catta* of Madagascar’s central highlands. Canadian Association of Physical Anthropology, November 2012; *National, Oral Presentation*

**Gabriel, D.N.** Health ecology of *Lemur catta* inhabiting forest fragments of Madagascar’s central highlands. International Primatological Society, August 2012; *International, Oral Presentation*


Gabriel, D.N. and Gould, L. Variation in fecal testosterone and intragroup agonism in relation to reproductive state, dominance rank, and age in wild adult female ring-tailed lemurs (*Lemur catta*); Canadian Association for Physical Anthropology, Oct 2009 *National, Oral Presentation*

Gabriel, D.N., Boehnke, S.E., and Munoz, D.P. The effect of frequency and spatial location on auditory saccade latency. (Honours work); 10th annual meeting for Health Science Research Trainees, Queen’s University, May 2007; *Institutional, Poster Presentation*

**Publications**

