

**The socio-ecology of the black-shanked douc
(*Pygathrix nigripes*)
in Mondulhiri Province, Cambodia**



Photo by Allan Michaud

**by
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Statement of originality

The work presented in this thesis is, to the best of my knowledge and belief, original and my own work, except where acknowledged. Material has not been submitted either in whole or in part, for a degree at this or any other university.

A handwritten signature in black ink, appearing to read 'Benjamin Miles Rawson', with a long horizontal flourish extending to the right.

Benjamin Miles Rawson



Dedicated to Michelle, Anne and Howard
for your faith in me and the sacrifices you have made



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Abstract

This thesis details research into the ecology and behaviour of the black-shanked douc (*Pygathrix nigripes* Milne-Edwards, 1871), an Endangered colobine found in eastern Cambodia and southern Vietnam. The study was conducted in Seima Biodiversity Conservation Area (SBCA), Mondulhiri Province, Cambodia, over a period of 20 months, from January 2003 to August 2004, and therefore represents the longest-term study of any species in the genus.

Distributional and relative density data show that black-shanked doucs preferentially utilise evergreen forest. There they maintain the largest group sizes and highest relative densities. The species is also commonly found in semi-evergreen and mixed deciduous forest, although the latter may be sub-optimal due to limited food resources. *P. nigripes* additionally occurs in dry deciduous dipterocarp forest but probably only where it is associated with one of the first three forest types. Group sizes appear to be lower in sub-optimal habitats as suggested by the ecological constraints model.

Four major social units occur in the species: one-male units (OMUs), bands comprised of several OMUs, bachelor groups and lone males. OMUs averaged 7.5 individuals, and were composed of a single male, several females and offspring. Black-shanked doucs have a fission-fusion social system, with fusion of OMUs into bands occurring more commonly in the wet season. The maximum band size recorded was 26 individuals.

Activity budgets were similar to other colobine species. Inactivity dominated with a frequency of 61%, feeding 27%, travel 6%, social behaviour 3%, and other activities 2%. Daily distribution of activities was also a typically colobine pattern with high rates of feeding in the morning, a long midday period of inactivity followed by a second feeding bout in the afternoon. Locomotion was predominantly quadrupedal although frequencies of brachiation were significant. The majority of activities occurred in the middle to upper forest canopy: only one instance of terrestriality was recorded. Several behaviours not previously documented in wild doucs were observed, including paternalistic behaviour and allomothering.

Contrary to previous studies on the feeding ecology of *Pygathrix*, *P. nigripes* at the site was best characterised as a seed predator, with 40% of feeding records being dedicated to seeds. Leaves, especially young leaves, also comprised a significant part of the diet.

Doucs were highly selective in their diet, feeding from only 35 positively-identified plant species and with 44% of all feeding records coming from only five species. Legume species were heavily targeted. Diets did not track resource abundance across seasons with the exception of high levels of flower consumption correlated with high availability during the dry season and seed consumption during the wet season.

SBCA holds the largest known population of the species across its range and is under active conservation management by the Wildlife Conservation Society and the Forestry Administration of the Royal Government of Cambodia and therefore represents one of the best opportunities for long-term conservation of the species. Having an understanding of habitat preferences, feeding ecology and behaviour as presented in this thesis provides a basis for management of the species at this site and beyond.

Contents

Acknowledgements	v
Abstract	vii
Contents	ix
List of figures	xiii
List of tables	xv
Chapter 1: Introduction	1
Thesis overview	1
Background to the current research	1
Research aim	2
Research significance	3
Research limitations	4
Thesis outline	4
Putting <i>Pygathrix nigripes</i> into context	6
Taxonomy and anatomy	6
Overview above the generic level	6
Overview at the generic level	7
Affinities with <i>Rhinopithecus</i>	7
Affinities with <i>Nasalis</i>	8
Affinities with <i>Mesopithecus</i>	11
Speciation in the genus <i>Pygathrix</i>	11
Distribution and status	13
Distribution of genus <i>Pygathrix</i>	13
Distribution of <i>Pygathrix nigripes</i>	15
Status of <i>Pygathrix nigripes</i>	16
Chapter 2: Study area	19
Historical overview	19
Seima Biodiversity Conservation Area	21
Primate fauna	24
Camp 6	27
Weather	29
Chapter 3: Methods	33
Study site selection	33
Phenology transects	33
Transect setup	33
Tree measurements	35
Tree identification	36
Phenological monitoring	38
Feeding trees	39
Animal observation protocol	40
Equipment used and personnel	40
The study animals	40
Behavioural sampling protocol	42
Ethogram	43
Behavioural categories	43
Forest use	46
Detecting <i>P. nigripes</i> groups	46

Chapter 4: Vegetation and phenology	49
Introduction.....	49
Methods.....	51
Results	52
Forest structure	52
Height	52
DBH	54
Basal area and tree density	55
Lianas	55
Mortality and tree-falls.....	56
Forest productivity	57
Flowering cycles	58
Fruiting cycles.....	59
Leaf production cycles	61
Species richness and diversity	65
Discussion	67
Forest structure	67
Phenological patterns at the site	70
Flower production	70
Fruit production	71
Leaf production	72
Habitat typologies: when is semi-evergreen mixed deciduous?	74
Summary	77
Chapter 5: Activity budgets and behaviour	79
Introduction.....	79
Methods.....	79
Results	81
Activity budget	81
Category subdivisions	81
Activity pattern by hour in the day.....	84
Age and sexual variation	86
Inactive	87
Feed.....	87
Travel.....	87
Social	87
Other.....	89
Seasonal variation	90
<i>Ad libitum</i> behavioural observations	92
Copulation.....	92
Allomothering.....	93
Paternalistic behaviour.....	94
Agonistic behaviours.....	95
Canopy usage	96
Support usage	99
Discussion	100
Inactive behaviour	100
Vigilance behaviour and predation.....	101
Feeding behaviour	103
Locomotion	104
Brachiation	105

Social behaviour	107
Play	107
Grooming.....	108
Aggression	109
Inter-group aggression	110
Intra-group aggression	111
Vocalisations	111
Sexual behaviour.....	113
Parental behaviour	115
Allomothering	115
Paternalistic behaviour	117
Summary	118
Chapter 6: Group size, group composition and ranging behaviour.....	121
Introduction	121
Methods	122
Results	125
Group size and composition.....	125
Group size	125
Breeding group composition.....	127
Unmated males	127
Seasonality and group size	127
Habitat and group size	128
Habitat and group density	129
Group cohesion	130
Ranging behaviour	131
Day ranges	131
Home range.....	132
Sleeping sites	132
Discussion	134
Group size and composition.....	134
Group size	134
Group composition	136
Unmated males	139
Does habitat and season affect group size and density?	141
Ranging behaviour	144
Summary	146
Chapter 7: Feeding ecology.....	147
Introduction	147
Methods	150
Results	152
Consumption by plant part	152
Hourly trends.....	153
Age and sexual variation.....	154
Seasonal variation	156
Consumption versus availability	156
Dietary diversity and selectivity	158
Discussion	163
What is the <i>Pygathrix nigripes</i> feeding niche?	163
Do diets of <i>Pygathrix nigripes</i> track resource abundance and energy requirements?	172
What implications does diet have for species distribution, carrying capacity and conservation of <i>Pygathrix nigripes</i> ?	175
Summary	179

Chapter 8: Conclusion	181
Habitat preferences	181
Behaviour	182
Social structure.....	184
Feeding ecology	185
Scope for future studies	186
References	189
Appendix 1: Tree species found on transects	209

List of figures

Figure 2-1	Map of Seima Biodiversity Conservation Area	22
Figure 2-2	Clearance along the Samling road	25
Figure 2-3	Collecting resin from <i>Dipterocarpus alatus</i> tree	25
Figure 2-4	Captive juvenile silvered langur (<i>Trachypitecus margarita</i>)	25
Figure 2-5	Female yellow-cheeked crested gibbon (<i>Nomascus gabriellae</i>)	26
Figure 2-6	Pygmy loris (<i>Nycticebus pygmaeus</i>) splayed and dried	26
Figure 2-7	Crossing the O'Mahoit River in the wet season	26
Figure 2-8	Rainfall data from the study site	30
Figure 2-9	Temperature data from the study site	30
Figure 2-10	Daily air temperature and polynomial trend lines for April and December 2003	31
Figure 2-11	Daily air temperature and polynomial trend lines at 1.5 m and 10 m above the ground	32
Figure 3-1	Study site showing camp, transect and cut trail locations and habitat types	34
Figure 4-1	Distribution of tree heights by transect	53
Figure 4-2	Distribution of tree DBH by transect	54
Figure 4-3	Distribution of tree basal area by transect	55
Figure 4-4	Cumulative mortality and broken stems of transect trees	57
Figure 4-5	Monthly percentage of trees with flowers	60
Figure 4-6	Monthly percentage of trees with fruits	61
Figure 4-7	Monthly percentage of trees without any leaves	62
Figure 4-8	Monthly percentage of trees with new leaves	63
Figure 4-9	Monthly percentage of trees with no leaves and new leaves	64
Figure 4-10	Species incidence curve for Transects 1 and 2 combined	66
Figure 4-11	Percentage of Importance Value Index (IVI) for dominant plant species	67
Figure 5-1	<i>P. nigripes</i> activity budget	81
Figure 5-2	Frequencies for travel by different locomotion types	82
Figure 5-3	Frequencies for social behaviours	83
Figure 5-4	Activities by hour in the day	85
Figure 5-5	Activity budget summary for <i>P. nigripes</i>	86
Figure 5-6	Frequencies of travel by different locomotion	88
Figure 5-7	<i>P. nigripes</i> activity budget by season	91
Figure 5-8	Monthly variation in infant to adult ratio in bisexual groups	92
Figure 5-9	Mean canopy usage for <i>P. nigripes</i> by age and sex class	97
Figure 5-10	Canopy usage by <i>P. nigripes</i> compared with forest stratigraphy	98
Figure 5-11	Main activity budget categories stratified by canopy height and compared to transect tree heights	98
Figure 5-12	Main activity budget categories stratified by supports used	99

Figure 5-13	Locomotion categories stratified by supports used.....	100
Figure 6-1	Map of SBCA showing WCS transect locations	124
Figure 6-2	Frequency distribution of estimated group sizes from Camp 6.....	125
Figure 6-3	Frequency distribution of estimated group sizes from SBCA core area	126
Figure 6-4	Frequency distribution of estimated group sizes from Camp 6 and SBCA core area combined.....	126
Figure 6-5	Histogram of group sizes in the wet and dry seasons	128
Figure 6-6	Percentage of sleeping and feeding trees within distance categories from nearest river. .	133
Figure 7-1	Frequencies for feeding on different food types	152
Figure 7-2	Percentage of food items eaten at different times of the day.....	153
Figure 7-3	Frequencies for feeding on different food types, by age and sex class	155
Figure 7-4	Frequencies for feeding on different food types, by season.	155
Figure 7-5	Availability indices of fruits (including seeds), flowers and young leaves by month.....	157

List of tables

Table 3-1	Number and duration of encounters with black-shanked doucs during this study.....	42
Table 3-2	Relative frequencies for various forms of detection of black-shanked doucs.....	47
Table 4-1	Height, DBH, basal area, density and mortality for trees and lianas	58
Table 4-2	Simplified phenological patterns in leaf loss and flush	64
Table 4-3	Spearman Rank Correlation Coefficient matrix for phenophases and environmental variables.....	65
Table 4-4	Summary of forest structural data from other studies compared to this study.	69
Table 5-1	Activity budget summary for <i>P. nigripes</i>	84
Table 5-2	Percentage of grooming samples received and imparted	89
Table 5-3	Activity budget summary for <i>P. nigripes</i> by age and sex classes.....	90
Table 5-4	Activity budget summary for <i>P. nigripes</i> by season.....	91
Table 6-1	Primate encounter rates on all transects, 2003-2005.....	129
Table 6-2	Correlations between encounter rates and habitat types	130
Table 6-3	Details of ranging behaviour of one group on 1st August 2004.	132
Table 6-4	Sleeping tree species, height and DBH.....	133
Table 6-5	Literature summary of genus <i>Pygathrix</i> group size and composition	137
Table 6-6	Male:Female and Adult:Immature ratios in odd-nosed colobine species.	140
Table 6-7	Six most preferred species and the monthly availability of utilised plant parts based on transect data.	143
Table 7-1	Percentage of food items eaten at different times of the day.	154
Table 7-2	Frequencies for feeding on different food types by age and sex class.....	154
Table 7-3	Correlations between availability indices and stem counts of phenology trees.....	156
Table 7-4	Correlations between plant part consumption and availability.....	158
Table 7-5	Positively identified plant taxa that <i>Pygathrix nigripes</i> was observed feeding from.....	161
Table 7-6	Selection ratios for the 15 plant species with the greatest number of feeding records	162
Table 7-7	Percentage contribution of different plant parts to diet in several Asian colobine species.	171

