

**POPULATION, HABITAT AND BEHAVIOURAL STUDY OF HIGHLAND LANGUR
SEMNOPITHECUS ENTELLUS IN LANGTANG NATIONAL PARK, NEPAL**



A thesis submitted for the partial fulfillment of the requirements
for the Master's Degree in Zoology (Ecology)

By

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RECOMMENDATION

It is my pleasure to mention that Mr. Purna Bahadur Ale has successfully completed the dissertation work entitled “POPULATION, HABITAT AND BEHAVIOURAL STUDY OF HIGHLAND LANGUR *SEMNOPIITHECUS ENTELLUS* IN LANGTANG NATIONAL PARK, NEPAL” under my supervision and guidance. This is the candidate’s original work and to the best of my knowledge this dissertation has not been submitted for any other degree. I recommend that the dissertation be accepted for partial fulfillment of the requirement for the Master’s Degree in Zoology (Ecology).

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APPROVAL

On the recommendation of Supervisor Dr. Mukesh Kumar Chalise, Associate Professor, Central Department of Zoology, Tribhuvan University, the dissertation work entitled “POPULATION, HABITAT AND BEHAVIOURAL STUDY OF HIGHLAND LANGUR *SEMNOPITHECUS ENTELLUS* IN LANGTANG NATIONAL PARK, NEPAL” submitted by Mr. Purna Bahadur Ale has been approved for the partial fulfillment of the Master’s Degree in Zoology with Ecology as special paper.

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ACCEPTANCE

The dissertation work entitled “POPULATION, HABITAT AND BEHAVIOURAL STUDY OF HIGHLAND LANGUR *SEMNOPIITHECUS ENTELLUS* IN LANGTANG NATIONAL PARK, NEPAL” submitted by Mr. Purna Bahadur Ale has been accepted for the partial fulfillment of the requirement of Master’s Degree of Science in Zoology with Ecology as special paper.

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DECLARATION

I have declare that the work presented in this dissertation entitled “POPULATION, HABITAT AND BEHAVIOURAL STUDY OF HIGHLAND LANGUR *SEMNOPIHECUS ENTELLUS* IN LANGTANG NATIONAL PARK, NEPAL” has been done by myself and has not been submitted elsewhere for the award of any degree. All sources of information have been specially acknowledged by reference to authors or institution.

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ABSTRACT

The study was carried out in the month of Feb, March, July and August of 2007 and 2008. A total of 149 Highland Langurs *Semnopithecus entellus* were encountered which were living in 6 groups within the total visually accessible area of 32 km² in Langtang National Park. The mean group size was found 24.83 (Range 7-48) individuals. The group density was found 0.18 groups / km² with a population density of 4.65 individuals/ km². Among the total counted monkeys, 29.53% were adult female, 12.08% adult male, 8.05% sub-adult male, 13.42% sub-adult female, 21.42% Juveniles and 15.43% infant during the study period. The adult sex ratio (male to female) observed during the study period was 0.40 (40 males per 100 females) i.e. 1:2.5 (Range 1:1.88-1:3.57). Birth rate (infant to female ratio) was found 0.52 (52 infants per 100 females) during the study period. The average group size was 24.83 (Range 7-48) in the study area.

In systematic plots, the highest IVI (49.40) was recorded for *Quercus semicarpifolia* followed by *Ilex dipyrena* (29.02), *Alnus nepalensis* (27.52), recorded for *Leucosceptrum canum*. In Langur encountered plots, the highest IVI (88.29) was recorded for *Quercus semicarpifolia* followed by *Cotoneaster frigidus* (42.31), *Rhododendron campanulatum* (33.36), *Castanopsis indica* (31.27), *Dodecadenia grandiflora* (20.78) and *Ilex dipyrena* (19.72). Similarly the lowest IVI (12.36) was recorded for *Euonymus grandiflorus*. There are significant difference in the diversity index, dominance index and evenness of tree community between systematic and Langur encountered plots ($t=4.645682$, $P < 0.05$). Index of similarity value for tree species was 41.025% between systematic plots and Langur encountered plots. Among the four types of behavior (Moving, resting, foraging and grooming), foraging was found as maximum (54%) which was followed by moving (26%), resting (12%), grooming (4.5%) and other social behaviors (3.5 %). Future work on seasonal diet analysis, niche overlapping and inter-troop competition of the species would be additive to lay out the in-depth knowledge in ecology which may answer the question: how are highland Langurs fit and ecologically adapt in such narrow range of habitat and harsh climatic condition along Trishuli river?

Key words: *Semnopithecus entellus*, Langtang National Park, population, habitat, behavior

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ABBREVIATIONS AND ACRONYMS

asl	- Altitude from Sea Level
CAMP	- Conservation Assessment and Management Plan
dbh	- Diameter at Breast Height
DNPWC	- Department of National Parks and Wildlife Conservation
DUHE	- Durham University Himalayan Expedition
Fig	- Figure
INGO	- International Non-Governmental Organization
IUCN	- International Union for Conservation of Nature and Natural Resources
IVI	- Important Value Index
LNP	- Langtang National Park
m	- Meter
m ²	- Square Meter
Max	- Maximum
Min	Minimum
mm	- Millimeter
NGO	- Non-Governmental Organisation
P/ha	- Per Hectare
Sq. Km. / km ²	- Square Kilometer
UNDP/FAO	- United Nations Development Programme / Food and Agricultural Organization
USA	- United States of America
VDC	- Village Development Committee