Occupancy, coat colour pattern and social organization of mixed-species and mixed-morphotype groups of Nilgiri langur (*Semnopithecus johnii*) and tufted grey langur (*Semnopithecus priam*)

Santanu Mahato[1,2,3], Honnavalli N. Kumara[2], Mridula Singh[4] and Mewa Singh[1,*]

[1]Biopsychology Laboratory and Institution of Excellence, University of Mysore, Mysuru 570 006, India
[2]Sálim Ali Centre for Ornithology and Natural History, South India Centre of Wildlife Institute of India, Coimbatore 641 108, India
[3]Department of Zoology, Bharathiar University, Coimbatore 641 046, India
[4]Department of Psychology, Maharaja's College, University of Mysore, Mysuru 570 005, India

A mixed-species group is formed due to an increase in close association among individuals of different species. Such groups also possibility of having diversity in size, phenotypic similarities and differences, and contrasting morphologies compared to the original species. We studied inter-individual variations in external morphology and social structure in mixed-species groups of Nilgiri langur (NL, *Semnopithecus johnii*) and tufted grey langur (HL, *Semnopithecus priam*) between 300 and 800 m in the Anamalai Tiger Reserve, Western Ghats in India. The study reports the largest number of mixed morphotypes in a population having a higher abundance of dark grey morphs at lower altitudes, light brown morphs in the mid altitudes and more dark brown morphs at higher altitudes. The group size of mixed species was mostly multi-male and multi-female and larger than the NL and HL groups. Our study provides a framework to determine their inter-specific interactions and reproductive strategies which are necessary in overlapping ranges.

Keywords: Altitudinal gradients, hybridization, langurs, mixed-species associations, sympatricity.

generally found in relatively denser forests, whereas grey wolves *Canis lupus* and Bengal foxes *Vulpes bengalensis* inhabit open country. If related species are in the same ecosystem, they still find different habitats. In the Anamalai Hills of the Western Ghats of India, the bonnet macaque *Macaca radiata*, a frugivore, and the Hanuman langur *Semnopithecus* sp., a folivore, are sympatric in the deciduous forests at lower altitudes, while the frugivore lion-tailed macaque *Macaca silenus* and the folivore Nilgiri langur *Semnopithecus johnii* are sympatric in wet forests at higher altitudes[4], thereby indicating that species with similar resource use, space out to different habitats. If two or more related species occur together in the same habitat, they may use different strata or substrata. Several primate species in the forests of Peru move and utilize resources in different parts of the same trees, such as vertical or horizontal and upper or lower canopy[5]. If found at the same stratum, sympatric species may specialize in different resource types or resource phenophases, but any food niche overlap, even for short periods of time, often results in inter-species agonistic interactions[6]. The distribution of resource utilization among neighbours influences the extent of overlap between space-sharing among individuals[7–10]