Langur - chital association in Mudumalai Tiger Reserve, Western Ghats

Tharmalingam Ramesh*, Riddhika Kalle, Kalyanasundaram Sankar and Qamar Qureshi

Introduction

Interspecific associations occur in closely related species and species from different orders (Stensland *et al.*, 2003). Examples of such associations in India are often lacking or very broad and rarely documented. A classic example of this association in India is the langur-chital association. The common langur (*Semnopithecus entellus*), a colobine monkey is widespread across India and Sri Lanka (Ellerman & Morrison-Scott 1966). The fallen fruits and leaves on the forest floor, a result from arboreal foraging by the common langur, attract a large congregation of chital (*Axis axis*) very often to forage on the fallen food items. Primate-ungulate associations play crucial role in the dispersal of heavy seeded fruits. Such mutual associations minimize chances of predation risk upon both species as they recognize and respond to anti-predator alarm calls produced by either of the species. Predation risk from large predators tends to increase the size of primate groups so that they can benefit from increased vigilance (Van Schaik & Horstermann 1994). The participation in the association does not inflict any costs in terms of inter-specific food competition since they have non-overlapping niches (Majolo & Ventura 2004). Feeding association between langur and chital have been documented in Kanha, Madhya Pradesh (Newton 1989) and Rajasthan (Gurm *et al*. 1976). In order to minimize the lacunae, an opportunistic survey was carried out in Mudumalai Tiger Reserve to document langur-chital associations.

Materials and Methods

This study was conducted in Mudumalai Tiger Reserve, Western Ghats, from January 2008 to April 2010. The reserve (11^0 32'–11^0 43' N; 76^0 22'–76^0 45' E) is situated at the tri-junction of Tamil Nadu, Karnataka and Kerala states at an elevation ranging from 900 to 1,266 m. This 321 sq. km reserve is bounded by Wayanad Wildlife Sanctuary on the west, Bandipur Tiger Reserve in the north, and in the south by Nilgiri North Forest Division (Figure 1). The vegetation types are classified into dry thorn forest, dry deciduous forest, moist deciduous forest, semi-evergreen forest, moist bamboo brakes and riparian fringe forest (Champion and Seth 1968). The forest inhabits high density of major herbivores and large predators (Ramesh 2010).

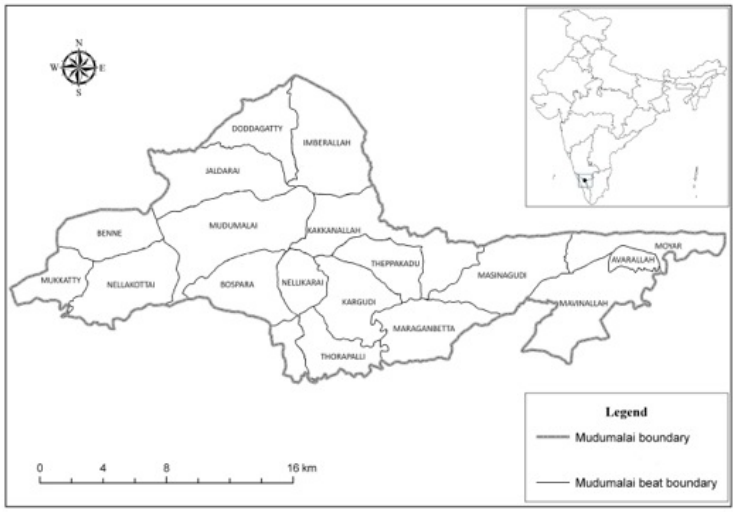

Figure 1. Location of Mudumalai Tiger Reserve, Western Ghats.

Data was collected opportunistically while conducting line (n = 20) and vehicle transects (n = 5) as a part of the field study on prey-predators. Langur and chital associations were recorded whenever both species were observed together at a radial distance of 30 m diameter. Feeding behaviour was observed on encounter during which their food items were categorised into leaves, seeds, flowers and fruits. In addition to this, number of individuals of langur and chital involved in the association was also noted.

Results

A total of 74 observations of langur - chital association were obtained. The group size of langur ranged from 2 to 20 while that of chital was 2 to 80. The estimated mean group size of langur and chital was 7.6 ± 0.44 SE and 18.0 ± 2.6 SE respectively. On 48 occasions, chital fed on food materials dropped by langur during its arboreal forage; such as leaves (73.1%), fruits (17.3%) and flowers (9.6%). *Anogeissus latifolia and Tectona grandis* were the most frequently utilized trees during the association. Leaves (64.2%) represented the main food item for langur followed by fruits (24.5%), and flowers (11.3%) (Table 1.).

Discussion

Mixed species association (n = 5) between langur and other ungulates/ primates such as gaur *Bos gaurus,* sambar *Rusa unicolor* and bonnet macaque *Macaca radiata* were also noticed. In Mudumalai, chital fed on food items of 14 tree species dropped by langur. In Kanha 19 tree species were recorded as food plants of chital which were dropped by langur (Newton 1989). A wide variety of food plants were recorded in the diet of langur indicating the high availability of palatable food plants in the study area (Ramesh *et al.,* 2009).

The presence of deer gleaning under the tree while langurs are in the tree canopy represents a case of "active" association between them. Newton (1989) suggested that the frequency distribution of the closest approaches between langur and chital were not chance encounters if within a distance of 25 m from the troop. Chital might associate with langur only when they

Wildlife Institute of India, P.O. Box # 18, Chandrabani, Dehra Dun-248 001, Uttarakhand, India.
***Corresponding Author Email: ramesh81ngl@gmail.com**

Table 1. List of food plants and parts dropped by common langur and eaten by chital during the association in Mudumalai Tiger Reserve, Tamil Nadu (January 2008 – April 2010).

Plant species	Langur			Chital		
	L	Fr	Fl	FL	FFr	FFl
	Number of observations					
Anogeissus latifolia	8	-	-	8	-	-
Bauhinia racemosa	1	-	1	1	-	1
Bombax ceiba	1	2	1	1	-	1
Emblica officinalis	-	5	-	3	5	-
Grewia tilifolia	1	-	-	1	-	-
Lannea Coromandelica	1	-	2	1	-	2
Mangifera indica	1	2	1	2	1	1
Radermachera xylocarpa	2	-	-	2	-	-
Schleichera oleosa	1	-	-	1	-	-
Schrebera swietenioides	2	-	1	2	-	-
Psterocarpus marsupium	2	-	-	2	-	-
Tectona grandis	10	-	-	10	-	-
Terminalia crenulata	1	2	-	2	2	-
Terminalia tomentosa	3	2	-	2	1	-
% of plant part eaten	**64.2**	**24.5**	**11.3**	**73.1**	**17.3**	**9.6**

Fr – Fruits, Fl – Flower, L – Leaf, FL – Fallen Leaf, FFr – Fallen Fruits, FFl – Fallen Flower

are detected foraging. These strategies occur probably depending upon the balance between benefits in terms of increasing forage efficiency which the deer would gain by following the langur thereby increasing vigilance level in both species. The occurrence of association differed in relation to the food category selected by langur. The presence and number of deer gleaning totally depends on the quantity of food dropped by langur. Increase in foraging efficiency for at least one of the species participating in the association is one of the main reasons why feeding associations between species evolved while the other species is predator vigilant (Waser 1987). Responses to potential predators suggested that chital and langur responded to each other's alarm behaviour in Kanha (Newton 1989). Therefore, the association between langur and deer seems more likely to be a case of commensalism, or at least of asymmetrical mutualism (Newton 1989), than of pure mutualism. Agonistic interactions between langur and deer were observed on five occasions in Mudumalai and similar observations were noticed by Newton (1989) in Kanha. These interactions always consisted of langur threatening a deer in order to retrieve food items dropped from the tree. Although arboreal fruits are attractive food resources for deer, it would be difficult for it to obtain them as it is entirely terrestrial. Langurs bring down enormous quantities of *Phyllanthus emblica* fruits that are then cached by terrestrial mammals like chital (Prasad *et al.,* 2004).

Primates have always been beneficial for terrestrial mammals through their interspecific associations. Collared peccaries (*Pecari tajacu*) have also been observed consuming fruits dropped by black howler monkeys (*Alouatta caraya*) in the central region of the Brazilian Pantanal (Desbiez and Keuroghlian 2010). The Japanese sika deer (*Cevus nippon*) often waits to browse fruit falls under the tree where Japanese macaque (*Macaca fuscata yakui*) groups forage (Koda 2012; Agetsuma *et al.,* 2011; Majolo and Ventura 2004). In Venezuela, similar associations between collared peccary groups and troops of capuchin monkeys (*Cebus olivaceus*) have been reported (Robinson and Eisenberg 1985). Given the prevailing high density of chital and langur in Mudumalai, deer would have ample opportunity to encounter a langur troupe foraging without the need of active searching. It is evident that the association between chital and langur throughout India provide anti-predator and foraging activities. Although our conclusions from this study are vague it necessitates further comprehensive studies for future behavioural ecology research in India.

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Announcement

Conservation of Faunal Diversity of Western Ghats: Problems and Perspectives
30th - 31st August 2012
Venue: Sri Jagadguru Chandrashekhara Bharathi Memorial (Sri JCBM) College, Sringeri

Western Ghats is a home for rich floral and faunal diversity, thus considered as one of the thirty-four hot spots of global biodiversity. It is also the source of a great number of rivers, cultures and civilizations. Unfortunately uncaring for this pristine wealth, the human beings in their greed are abusing the resources and are endangering the environment, threatening the bio-diversity and pushing the universe towards slow but certain destruction. However, a redeeming factor has been the increasing awareness among the educated public. As a result, serious discussions are being held in several quarters to consider major issues like conservation of natural resources and sustainable ways of utilization of the resources.

Loss of habitat and food resources for wild animals, urbanization, industrialization, mining and indiscriminate deforestation are some of the issues that held to be addressed immediately as these are causing the movement of wild fauna towards villages and towns endangering their own lives and those of the population. Even though much have been achieved in documentation, threat assessment, conservation and conflict of fauna, more need to be done in to made discussion with public. With the intention of focusing attention of the stakeholders on this issue, a National level Seminar is being organized with the following broad themes:

1. Status and distribution of wild fauna in the Western Ghats
2. Threats and conservation of wild fauna
3. Man- animal-culture relations
4. Animal- plant interaction

Contact: Dr. H.C. Veerappa Gowda, Principal, Sri JCBM College, Sringeri - 577139, Karnataka.
E-mail: srijcbmc.sringeri@gmail.com;

Mr. E.S. Kumaraswamy Udupa, Coordinator, Head, Department of Botany, Sri JCBM College, Sringeri, Karnataka.
E-mail: udupa_sringeri@yahoo.co.in