Hunting of Indian giant squirrel (*Ratufa indica*) by the lion-tailed macaque (*Macaca silenus*) in the Western Ghats, India

In most primate species, with the exception of Colobinae and Indriidae, faunal prey constitutes a significant portion of the diet[1]. The prey mainly includes arthropods and small vertebrates. The type of prey species varies with the body size of the primate species, with small-bodied primates such as prosimians feeding mainly on insects. The relatively large-bodied primates included small vertebrates such as lizards, birds, small mammals, etc. in their diet[2–4]. Occurrence of larger vertebrate prey such as hare, fawn of antelopes and other species of monkeys has been reported in the diet of large-bodied primates such as chimpanzees and baboons[5,6]. Consumption of large vertebrate prey has also been reported in capuchins[7]. Hunting, in terms of pursuit, capture and consumption of large vertebrate prey, has been well documented in chimpanzees[6,8,9], baboons[5,10] and capuchins[7]. Most macaques have an omnivorous diet with varying proportions of fruits, leaves, flowers, arthropods and, to some extent, small vertebrates[3,11–13]. The lion-tailed macaque (*Macaca silenus*) is an endangered species endemic to the evergreen forests of the Western Ghats, India. Its diet mainly consists of fruits, arthropods, flowers and other minor items such as moss, mushroom and grass[14,15]. The Indian giant squirrel is a large, diurnal, arboreal squirrel. It is widely distributed in peninsular India and occurs in the Western Ghats, Eastern Ghats and Central India[16]. The squirrel inhabits mainly moist deciduous, riverine and evergreen forests. Average body weight of an adult squirrel[17] is about 2 kg with a body length of 35–41 cm and tail length of about 60 cm. Here we report an incident of predation on a sub-adult Indian giant squirrel (*Ratufa indica*) by an adult, male, lion-tailed macaque.

This incident took place during our study on resource partitioning among sympatric, diurnal, arboreal mammals in the evergreen forests of the Indira Gandhi Wildlife Sanctuary, Tamil Nadu, India. The study site, Pachchapalmalai Shola (10°24′35.38″N and 77°0′31.34″E), is an evergreen forest fragment with an area of about 3.5 km^2. The diurnal, arboreal mammalian community at the study site consisted of two groups of lion-tailed macaques, ten groups of Nilgiri langur (*Semnopithecus johnii*), two visiting groups of bonnet macaque and several individuals of the Indian giant squirrel[18]. Two individuals of the Indian giant squirrel were chosen for the study and observations were made using *ad libitum* and scan sampling[19].

The following observations were made by one of the authors (H.S.S.). On 29 April 2001, at 9:20 am a few individuals from the study group of lion-tailed macaques were foraging for insects in the canopy. A sub-adult Indian giant squirrel, which was resting on a branch, jumped down to the ground and started to scurry. An adult male of the lion-tailed macaque group quickly descended to the ground and chased the squirrel for a distance of about 30 m. He hit the squirrel on its head with one swipe, pinned it to the ground and carried it off to a tree by holding it by the scruff of its neck. It was still alive when the monkey started to bite its head. In a few seconds, the squirrel was dead. The monkey ripped-off the skin on its head and started to eat the flesh around the neck. None of the other group members showed any interest, except a sub-adult male who came to the tree in which the adult male was present and sat in proximity. When the adult male finally dropped the carcass, the sub-adult male quickly descended to the branch from which the carcass hung and grabbed it. Not much was left of the squirrel, except a few parts of the viscera, half-eaten limbs and tail.

Faunal prey is an important component in the diet of the lion-tailed macaque. Although feeding on vertebrates is not frequent, there have been sporadic reports of lion-tailed macaques foraging on frogs, lizards, bats, small birds, three-striped squirrels, nestlings of the Indian giant squirrel and the large, brown, flying squirrel[11,13,20]. There is also one report of an unsuccessful attack on a mouse-deer fawn by the lion-tailed macaque[13], though it is not clear whether it was an attempt to predate upon the deer. While feeding on arthropods and smaller prey is common among most age-sex classes in the lion-tailed macaque, foraging on larger prey is mainly reported among the adult males[13]. All of the previous incidents suggest that the prey was detected at a close range and captured. This tactic of capturing of prey – scavenge hunting – requires least specialized predatory skills and energy and is characteristic of

omnivorous primates[1]. Although in the present incident the prey was detected at a close range, it was different from the previous incidents of predation on giant squirrel nestlings, because it was the first incident in the wild where the monkey successfully chased, captured and consumed an animal of such a large size. Moreover, the prey was not a nestling and hence was not restricted in its movements, and was faster than the monkey itself.

The observations were made on a group of lion-tailed macaques in an area where there were several individuals of Indian giant squirrel. The home range of the lion-tailed macaque group being large, it overlapped with home ranges of many giant squirrels. The macaque group was almost always in the home range of any giant squirrel in the study area. Sometimes macaques and squirrels were even seen on the same tree feeding in proximity, with little or no aggression. The giant squirrels do not give alarm calls when they see a group of lion-tailed macaques. This suggests that such opportunistic hunting behaviour occurs infrequently. Nevertheless, such sporadic incidents throw light upon behavioural plasticity and the ability of this endangered macaque to expand the spectrum of prey and include large vertebrates such as the prey described above. It also has implications for such behaviours which might have started as predominantly adult male activity to develop into a tradition of systematic predation by all members of the group, as is described for the yellow baboons[10].

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H. S. SUSHMA[1]
MEWA SINGH[2,*]

[1]*Wildlife Institute of India, Chandrabani, Dehradun 248 001, India*
[2]*Biopsychology Laboratory, University of Mysore, Mysore 570 006, India*
**For correspondence.*
e-mail: mewasingh@bsnl.in