

RESEARCH NOTES

(I)

FIELD OBSERVATIONS OF NEWLY REPORTED MACAQUE FROM ASKOT WILDLIFE SANCTUARY, UTTARAKHAND

Uttarakhand is a hilly state situated in Western Himalayas. With more than 60 per cent area under forests and more than 13 per cent area under protected areas, it contains important and productive vegetational zones of Himalayas as well as has varied landscapes including snow-capped and conifer forest covered mountains in the north, forest covered foothills with numerous perennial rivers and streams and plain alluvial tracts. As a result, it is extremely rich in both faunal and floral biodiversity (Johnsingh, 2005). Also, the north western part of Uttarakhand comprising of Askot Wildlife Sanctuary is known for its richness, uniqueness, biological representativeness and presence of valuable biodiversity elements (Samant *et al.*, 1998). This area boasts of numerous east and west Himalayan species in its varied forest types (Adhikari, 2009). Such is the biodiversity of this region, that previously unreported species are still being discovered. A recent biodiversity survey in Askot Wildlife Sanctuary revealed the existence of previously unknown species of macaque in lower Gori valley of this Sanctuary (Chandola *et al.*, 2006). This robust but rather shy macaque looked apparently different from commonly found and only reported species of macaque from Uttarakhand, the rhesus macaque (*Macaca mulatta*) and confined itself closer to steep rocky hill slopes (Chandola *et al.*, 2006). A study was taken up to observe this mystery macaque from a closer distance and gather details about its morphology and behavior as well as to collect its high quality photographs so as it get clues on its identity. This article outlines the various morphological features, habitat preference and behavior of this macaque, which is referred to as Uttarakhand macaque in subsequent text.

This study was carried out in Askot Wildlife Sanctuary located in Pithoragarh District of Uttarakhand. It lies between 29°46'45" to 30°27'45"N latitude and 81°01'53" to 80°16'25"E longitude and covers approximately an area of 600 km² (Samant *et al.*, 1998). Situated in north eastern part of Kumaon, west Himalayas, it exhibits wide altitudinal range of 600 to 6905 m and undulating topography and diversity in climate and soil. Owing to diverse vegetation types like subtropical, temperate, subalpine and alpine, it offers a high diversity of species and habitats (Samant *et al.*, 2000).

The macaque troop as described in this article was located in the catchment area of river Kali in this Sanctuary. They were observed near the village Gueeyan which could be reached by taking a detour of about 6 km from Balwakot on Almora Dharchula highway via Jauljibi.

For this study, a field survey was conducted on 10th and 11th June 2006. Areas in the Gori River Valley and Kali River Valley were extensively searched for Uttarakhand macaques by driving on the road and taking cues from the settlements and villages all along the road. Villagers as well as 'Van Raji' tribesmen were also questioned extensively about the appearance and behaviour of these macaques. On locating the macaques, the troop was followed and observed throughout the day on 11th June 2006. Field notes on their morphology, behaviour, troop size and composition, movement etc. were taken. Number of photographs with telephoto lenses were taken. These photographs later helped in studying the various morphological features of this macaque. Photogrammetry was used to get the measure of tail to head-body ratio (T/HB ratio). Photographs which displayed clear body profiles were used to measure the length of head and body as well as tail which were then used in calculation of T/HB ratio (Sinha *et al.*, 2005). Also, for determining age class of individuals, adult males and adult females were distinguished by their externally visible genital organs. Adults were distinguished from juveniles or sub-adults by their larger size and heavier built in both males and females. Those macaques which were always seen in the lap of their mothers and only rarely did they strayed out were classified as babies.

The Uttarakhand macaque was found to be medium sized monkey with heavy built and thick furry coat. On the dorsal side, its upper half was golden-brown colour while lower half was chocolate brown. The ventral parts of the body and inner sides of the limbs, as well as tail, were clothed with whitish fur. Males had a dark face with light colour spectacles around the eyes and a band of black hair on the forehead, while females had red spectacles as well as pinkish bare skin around the mouth and nose and whitish band of hair on forehead. The whole face, except the muzzle and circumorbital area was covered with thick fur, with heavy whiskers and beard. The eyelids were white in both males and females. The rump had two white lobes, without a patch of bare

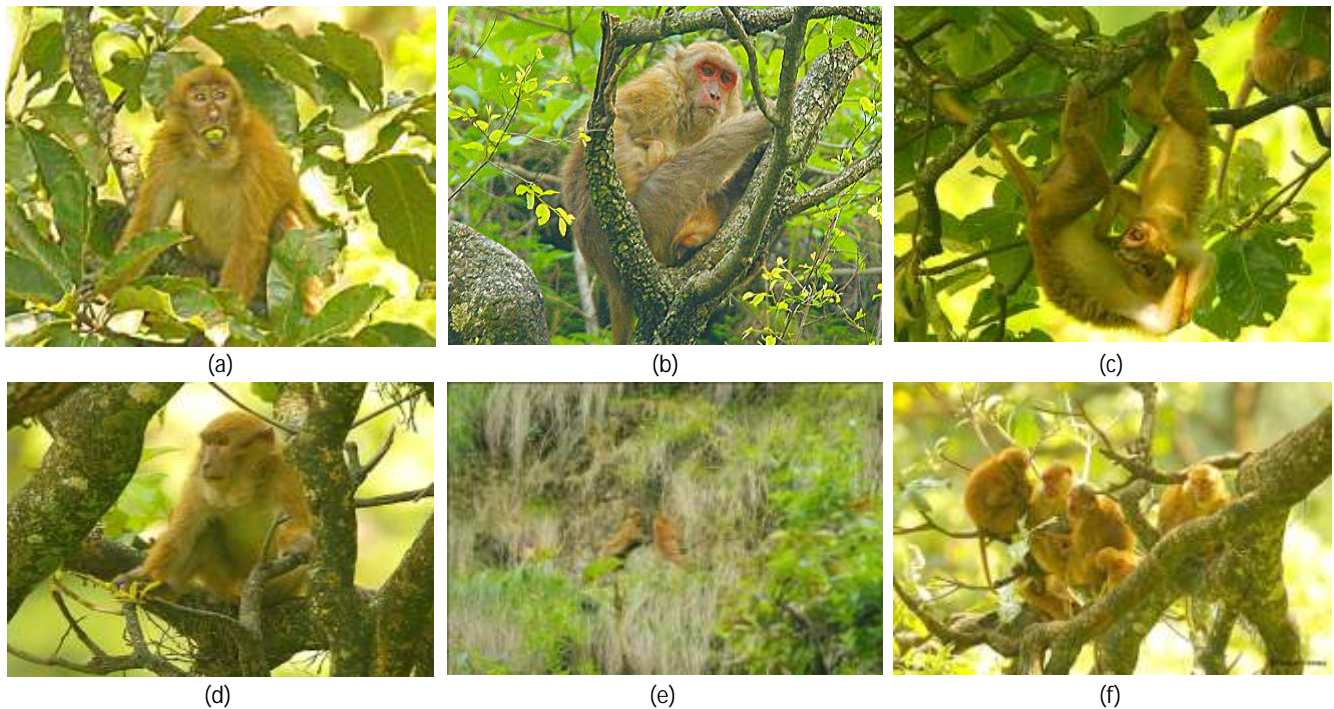


Fig. 1: Uttarakhand macaques. a: Adult male feeding on *Diploknema butyracea*. b: Adult female with baby. c: Two juveniles fighting. d: Male showing pointed ears and large cheek pouches. e: Macaques on steep rocky slopes which they inhabit. f: Macaques resting and grooming. All photos by Amit Verma.

skin. They had sharply pointed ears. Their cheek pouches were large and expandable to almost half the size of the head (Fig. 1 (a), (b), (d)). Tail to head-body ratio (T/HB ratio), which is considered as important criteria for subspeciation (Fooden, 1982) in macaques, was calculated to be 0.75 in males and 0.65 in females.

The observed macaque troop had 20 members with 2 adult males, 4 adult females, 10 juveniles or sub-adults (including both males and females) and 4 babies, each of which was carried by the adult females.

Uttarakhand macaques were observed between altitudes of 1100 and 1500 m. They seemed to prefer steep rocky cliffs with scanty vegetation for resting (Fig. 1 (e)) but thick forest and dense foliage for feeding.

During morning hours, the Uttarakhand macaques were observed feeding on ripened fruits of *Diploknema butyracea* (*Bassia butyraceae*) (chiura) trees, which were growing on the hill slopes. They first hurriedly stocked the fruits in their large cheek pouches and then ate them at leisure. While eating, they used their palm to push the cheek pouch to move the ripened fruit into the mouth. They sucked the juice out of the fruit and spitted out the outer skin and kernel. They were also observed picking and eating grass on the rocky cliffs to which they retired when approached.

In afternoon, after their chiura feeding frenzy was over, they were observed grooming, resting and sleeping

on the same chiura trees. Adult females caressed and groomed their babies while sub-adults were seen playing and fighting with each other (Fig. 1 (c), (f)). As evening approached, the macaques climbed down the tree and went downhill and rested for some time on steep cliff face before vanishing in the thick vegetation near the stream.

Though new to the scientific records, this macaque had been known to villagers since long. They called it '*kala bandar*' owing to its darker face and deeper coloured coat as compared to more commonly found rhesus macaque. They described this macaque as much more aggressive than rhesus and it would attack if cornered. Though Uttarakhand macaque raided maize and wheat crops, they never entered the villages and avoided proximity with human habitation. Villagers were found to be tolerant towards this macaque.

Morphological characters, behaviour and the habitat preference of this enigmatic macaque clearly distinguish it from *Macaca mulatta*, the only other member of macaca genus reported from Uttarakhand. But this macaque has morphological similarities with Assamese macaque (*Macaca assamensis*). *Macaca assamensis* have two subspecies - *Macaca assamensis assamensis* and *Macaca assamensis pelops*. Both these subspecies have similar dorsal and ventral coat color, similar pattern of thick hair on face and similar spectacled look in males and females (Fooden, 1982;

Chalise, 2003) as that of this newly reported macaque from Uttarakhand. But T/HB ratio in *M.a.assamensis* is 0.35 in males and 0.43 in females and T/HB ratio in *M.a.pelops* is 0.56 in males and 0.48 in females (Fooden, 1982) while T/HB ratio in this macaque from Uttarakhand is 0.75 in males and 0.65 in females. This dissimilarity in important morphological characteristics puts a doubt over the taxonomic status of this species. Also, both the subspecies of *Macaca assamensis* are found in eastern and mid Himalayas, their western most limit being in central Nepal (Fooden, 1982; Fooden, 2003) while this macaque with typical T/HB ratio has till now been reported only from Uttarakhand, thus it clearly being allopatric to *Macaca assamensis*.

The exact taxonomic status of this species can only be determined after detailed morphological and genetic studies are carried out. But regardless of it being an existing species or new species or subspecies, it is certain that this new-look macaque is a new record for Uttarakhand. And it is imperative that all measures be taken to conserve the habitat and landscape of this macaque and thus ensure its survival. In Askot Wildlife Sanctuary, which is densely populated, conservation of this macaque is a challenging task due to local developmental demands. Hence there is urgency for further studies of this macaque to understand its needs and secure everything critical for its survival.

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