*Pakistan J. Zool., vol. 48(4), pp. 1209-1212, 2016.*

**Short Communication**

# Mammalian Diversity of Tolipir National Park, Azad Jammu and Kashmir, Pakistan

**Abu ul Hassan Faiz[1,2]* and Fakhar-i-Abass[2]**
*[1]Bioresource Research Centre, 34-Bazar Road, G-6/4, Islamabad, Pakistan*
*[2]Department of Zoology, Women University, Bagh, Azad Jammu and Kashmir, Pakistan*

**Article Information**
**Received 22 July 2015**
**Revised 23 December 2015**
**Accepted 2 January 2016**
**Available online 1 June 2016**

**Authors' Contribution**
**FA conceived the project and supervised the work. AHF executed field work, collected the data and wrote the article.**

**Key words**
**Biodiversity, mammals, topographic variations.**

**ABSTRACT**

Survey of the mammalian diversity of Tolipir National Park (52 km$^2$) conducted during summer 2014, recorded 30 species belonging to 19 families. On international level common leopard (*Panthera pardus*) is Near Threatened, bent-winged bat (*Miniopterus schreibersii*) is Conservation Dependent (CD) and black bear (*Ursus thibetanus*) is Vulnerable to extinction. All the other species are common. Diversity indices (Simpson Index 0.08, Shannon Wiener index 3.24) have been calculated to document richness and evenness of species in an ecosystem, therefore, there is urgent need to protect mammalian diversity in natural landscape.

Tolipir National Park, (33°53'49.80"NL, 73°51'52.54"E; Pir Panjal range of Inner Himalayas, located in districts Rawalakot and Bagh, Azad Jammu and Kashmir, Pakistan) is a relatively small area (52km$^2$) exhibiting a wide heterogeneity in the available habitat conditions: thick forested growth of tall trees, especially in inaccessible slopes and deep ravines/ ditches, natural grassland with scattered growth of the shrubs, terraced agriculture and the human habitation, all located at different patches. The altitudinal variation (1400 to 4100 m above mean sea level) further adds to its faunal diversity. Protected thick forests present on the northern slopes with limited human habitation are the safe refuge for human shy species, which can harvest food energy available with human habitation and cultivated agricultural fields, especially when it is in limited supply in the natural forested tract during harsh winters or during years of low rainfall.

The scattered information about mammalian species is available in literature on the habitat, biology and distribution range of different species for Pakistan and India. (Roberts, 1997; Grizmek, 2002a).The specific reference to the diversity of mammalian fauna is lacking for the Tolipir National Park area; though a reference is available on floral diversity (Faiz *et al*., 2014). The present study was designed with the objective of investigating the mammalian diversity in the Tolipir National Park.

*Materials and methods*

Topographic features, such as, elevation, aspect, slope, accessibility (road/tracks) of the area, water channels, and human settlement were marked with GPS and a topographic map was prepared by using (Arc View 3.3 and Google Earth Pro 4.2 platform).

The map was used to develop strategy for animal sampling. The walking tracts available in the area were walked during morning session 5 am to 9am and 3pm to 6pm in the evening session. The whole sampling session (6 months) was started from 1st February till 1st August 2014).

Field rodents were sampled by employing trap-line method (Cunningham *et al*., 1983; Rudran and Foster, 1996). Three transect lines, each with 40 traps (20 rat traps and 20 mouse traps) at 20 m spacing were set for 7 consecutive days, and captured animal/s collected in the morning and evening.

Camera trapping was exercised for large human shy and nocturnal species. Camera traps were placed along trails or paths actively used by animals as evident from signs, such as, tracks, feeding signs, marking signs (spray, scrape), pug/hoof marks, digging signs, scats/ feaces and other signs. In each grid, five camera trapping units were fixed.

Simpson's diversity index was calculated by formula: $D = (\Sigma n\ (n-1)/(N\ (N-1)$; where N is total number of organisms of all species and n is the total number of organisms of a particular species. Shannon and Wiener (1949) diversity index was calculated by formula: Pi is S / N, where: S is number of individuals of one species and N is total number of all species.

*Results*

The available direct/ indirect information on distribution of mammalian fauna in Tolipir area (Table I) suggests the presence of a minimum of 30 mammal

* Corresponding author: sabulhussan@gmail.com
0030-9923/2016/0004-1209 $ 8.00/0

**Table I.- Mammal species recorded in Tolipir National Park during 2013.**

| Order / Family | Common names (Scientific names) | Frequency of observations | International status |
|---|---|---|---|
| Soricomorpha | | | |
| Soricidae | Asiatic pygmy shrew (*Sorex minutus*) | 30 | LC |
| Chiropetra | | | |
| Pteropodidae | Fulvous fruit bat (*Rousettus leschenaultii*) | 14 | LC |
| Rhinolophidae | Lesser horse shoe bat (*Rhinolophus hipposideros*) | 11 | LC |
| Megadermatidae | Indian false vampire bat (*Megaderma lyra*) | 14 | LC |
| Rhinolophidae | Horse shoe bat (*Rhinolophus ferrumequinum*) | 7 | LC |
| Vespertilionidae | Himalayan pipistrelle (*Pipistrellus javanicus babu*) | 13 | LC |
| | Common bent–wing bat (*Miniopterus schreibersii*) | 8 | CD |
| | Dark whiskered bat (*Myotis muricola*) | 8 | LC |
| | Gilgit tubed-nose bat (*Murina tubinaris*) | 7 | LC |
| Primata | | | |
| Cercopithecidae | Hanuman langur (*Semnopithecus entellus*) | 41 | LC |
| | Himalayan Rhesus monkey (*Macaca mulatta*) | 53 | LC |
| Carnivora | | | |
| Canidae | Golden Jackal (*Canis aureus*) | 39 | LC |
| Ursidae | Asiatic black bear (*Ursus thibetanu*) | 22 | V |
| Mustelidae | Stoat (*Mustela ermine*) | 16 | LC |
| | Yellow throated martin (*Martes flavigula*) | 10 | LC |
| Viverridae | Himalayan palm civit (*Paguma larvata*) | 16 | LC |
| Felidae | Jungle cat (*Felischaus*) | 20 | LC |
| | Panther or leopard (*Panthera pardus*) | 11 | NT |
| Cervidae | Barking deer (*Muntiacus muntjak*) | 7 | LC |
| Cetartiodactyla | | | |
| Lagomorpha | Himalayan or Royle's pika (*Ochotona roylei*) | 15 | LC |
| Ochotonidae | | | |
| Rodentia | | | |
| Sciuridae | Small Kashmir flying squirrel (*Hylopetes fimbriatus*) | 22 | LC |
| | Giant red flying squirrel (*Petaurista petaurista*) | 28 | LC |
| | Indian crested porcupine (*Hystrix indica*) | 28 | L C |
| | House mouse (*Mus musculus*) | 42 | LC |
| | House rat (*Rattus rattus*) | 37 | LC |
| | Himalayan field mouse (*Apodemu srusiges*) | 46 | LC |
| | Turkistan rat (*Rattus turkestanicus*) | 29 | LC |
| | Indian mole rat (*Bandicota bengalensis*) | 28 | LC |
| | Short tailed mole rat (*Nesokia indica*) | 24 | LC |
| | Royle's high mountain vole (*Alticola roylei*) | 16 | LC |

CD, conservation dependent; LC, least concern; NT, near threatened; V, vulnerable.

species. These include two primates (Himalayan rhesus monkey, hanuman grey langur); eight (8) Chiropetra (Indian false vampire bat, fulvous fruit bat, Himalayan pipistrelle, lesser horseshoe bat, common bent-wing bat, dark whiskered bat, Pallas's tube-nosed bat, Torresian tube-nosed bat or northern tube-nosed bat, Gilgit tube-nosed bat, and horseshoe bat); seven (7) carnivores (golden jackal, common leopard, Asiatic black bear, jungle cat, stoat or ermine, Himalayan palm civit and yellow-throated martin); and 12 rodents (Himalayan field mouse, house mouse, roof rat or house rat, Eurasian pygmy shrew, Turkestan rat, Indian mole rat, short-tailed mole rat, small Kashmir flying squirrel, Royle's high mountain vole; and one artiodactyle (barking deer)

species. The value of Shanon Wiener index and Simpson diversity indices were 3.24 and 0.08, respectively to predict the evenness and richness of species in ecosystem.

*Discussion*

All 30 species, recorded in summer, are expected to be resident in the area, though these may show some local seasonal movements between different altitudes in Tolipir area and/ or adjacent areas. The sighting of some of the species is very low, suggesting a rare status of these species in Tolipir National Park area. These animals include: horseshoe bat, barking deer, Gilgit tube-nose bat, dark whiskered bat, common bent-wing bat and yellow-throated martin. All these species have been regarded as Least Concern Species on a global scale (IUCN 2015-2). Common bent-wing bat requires special concentrated studies, so that special protection can be afforded to the species to ensure its future survival. National Park area can have a special international interest, if a viable population of this species exists in the area, and its ecology is understood. Himalayan rhesus monkey is very common, having high sighting record. The species is bold and lives around human settlements and hence presents frequent sightings, yet this may not reflect its population status in the area, which needs further studies. Association with the human habitations and its higher dependence on human household wastes can expose the species to food toxins, infections and certain harmful chemicals of anthropogenic origin. Two other species, *i.e.*, field and house mouse providing high sightings are also commensal to man. Grey langur is equally abundant in the area and has provided high sighting records despite the fact that the species is human shy. The species provides special attraction for wildlife enthusiasts and general public.

Three species of large carnivores, i.e., golden jackal, common leopard and black bear have been reported from the area. Jackal is globally Least Concern Species, while the common leopard is Near Threatened, Asiatic black bear is Vulnerable (IUCN Red list of Threatened species 2015-3) and Common bent-winged bat is Conservation Dependent. These species have wider home ranges, requiring larger areas. Common leopard and black bear are though important at national and international levels, yet are expected to invite reaction of the local human population when their population increases.

Two species of flying squirrels, *i.e.*, giant red and Kashmir, are present in denser coniferous forest tracts. These species are nocturnal and arboreal, requiring tree holes or snags for daytime roosting and feeding during the night. The flying squirrels require special habitat and attract wildlife enthusiasts and nature lovers. Two other rodent species, *viz.*, Indian crested porcupine and Himalayan pika, have the potential to act as pest for the orchards and forest plantations, especially when these are young and during winter. These species are expected to meet strong public reaction. This mammal richness of Tolipir National Park is comparable with Khunjrab (25 species, Qureshi *et al.*, 2011) and Macharia (14 species, Sohail, 2015) National Parks of Pakistan. This species diversity is also close to that recorded for Arunachal Pradesh National Park (India: 35 species, Mishra *et al.*, 2006) and Langtang National Park (Nepal: 32 species, Fox *et al.*, 1996). Prey species diversity (primates, ungulates, rodents) in Tolipir National Park may be adequate to support large carnivores *i.e.*, common leopard and black bear, a common feature of the mammalian fauna of different Protected Areas throughout the Himalayas (Aryal and Kriegenhoffer, 2009).

The camera traps supplemented by local knowledge can provide robust data to wildlife managers to monitor the long-term population or biodiversity trends (Marsh and Trenham, 2008). Presence of ungulate feces adjacent to mounds/burrows of pikas indicates that several small herbivores share their distributions with the larger ungulates and confirm the findings of Namgail (2009) that the species within each of these groups have similar ecological requirements; the distributional congruence of herbivores is determined largely by their current ecology. Thus, the co-distribution of small and large herbivores in Tolipir National Park could be determined largely by active selection of habitats by these herbivores, according to their adaptations.

The present work is an attempt to describe some aspects of faunal biodiversity of Tolipir National Park. Further studies on seasonal variation and home range may lead to the development of standard monitoring procedures which could be of value in assessing the environmental stability of the Park area.

*References*

Aryal, A. and Kriegenhoffer, B., 2009. *J. Threat. Taxa.*, 1: 562-566.

Cunningham, D.M., and Moors, P.J. 1983., Dept. of Internal Affairs, Wellington.

Faiz, H.A., Ghufarn, M.A., Mian, A. and Akhtar, T., 2014. *Biologia*, **60**: 43-55.

Fox, J., Yonzon, P. and Podger, N., 1996. *Conserv. Biol.*, **10**:562-569.

Grzimek, 2002a. *Grzimek's animal life encyclopedia Vol. 16. Mammals V*, 2nd ed. Thomson Gale, London, pp. 586.

IUCN, 2015. *Red list of threatened species*, Version 2015, 2. August 03.

Mishra, C., Madhusudan, M.D. and Datta, A., 2006. *Oryx*, **40**: 29-35.

Marsh, D.M. and Trenham, P.C., 2008. *Conserv. Biol*., **22**: 647–655.

Namgail T, Mishra C, de Jong CB, van Wieren SE, Prins HHT,

2009. Divers. Distr. 15: 940–947

Qureshi, R., Waseem, A.K., Bhatti, G.R., Babar, K.H., Shahid, I., Mohammad, S.A., Mohammad, A. and Atif, Y., 2011. *Pak. J. Bot*., **43**: 849-861.

Roberts, T.J., 1997. *The mammals of Pakistan*. Ernest Benn, London.

Rudran, R. and Foster, M.S., 1996. In: *Measuring and monitoring biological diversity*, Smithsonian Press, Washington, pp. 71–80.

Shannon, C.E. and Weaver, W., 1949. *The mathematical theory of communication.* University of Illinois Press, Urbana, pp. 117.