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DISTRIBUTION AND CONSERVATION STATUS OF THE MAMMALIAN FAUNA OF TAKATTU AND ZARGHOON MOUNTAIN RANGE OF QUETTA DISTRICT

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Abstract

The present research work on mammalian fauna of the North-Eastern region of Quetta district was conducted from August 2022 to August 2023. Field surveys were conducted consequently in the Western-Eastern part of Takattu Mountains and relevant areas and Zarghoon Mountain Range of Quetta District. During the current study a total of 13 species belonging to 10 families 5 orders and 12 genera were recorded. Various species of wild mammals are under threats due to anthropogenic activities such as the fragmentation of habitat, Illegal hunting, over grazing of domesticated animals, Hunting and poaching of Suleiman Markhor (Cafra falconeri jerdoni), Indian Wolf (Canis lupus), Asiatic jackal (Canis aureus), Red Fox, (Vulpes vulpes) Stripped Hyena (hyaena hyaena), and Afghan Pika (Ochotona rufescens) have greatly reduced their number. Takatu and Zarghoon mountains have great importance in terms of the mammalian fauna.

Key words: *Anthropogenic activities, Conservation, Mammals, Quetta, Takatu, Zarghoon*

INTRODUCTION

Pakistan is a habitat of 195 species of (1-3). Out of 195 species of mammals, five are native to Pakistan, seventy one least concern, thirty eight data deficient, twelve are critically endangered (1 endemic), twelve endangering (three endemic), eight regionally extinct, twenty vulnerable, thirty two near threatened, and two are not evaluated (4).

Pakistan hosts an ungulate diversity rich in wild caprine with seven species and 12 subspecies (5, 6). Among the caprine populations, markhor is a flagship species in Pakistan, which is distinguished into two subspecies (7), the straight horned markhor (*Capra falconeri magacerus*) and flared horned markhor (*Capra falconeri falconeri*). The flared horned markhor includes the Kashmir and Astor markhor. Kashmir markhor occurs in Swat. Kabul markhor is reported from the south of Khyber Pass. Suleiman markhor is reported from Suleiman Range in Zhob, Tor Ghar in Killa Saifullah, Chitral and Dir. Astor markhor is found in Gilgit Baltistan. The straight horned markhor (critically endangered) includes Kabul and Suleiman markhor (8).

Balochistan topography is ideal for maintaining the health of the wild animals. Deer and markhor are the most commonly over hunted and illegally traded species in Balochistan. In Balochistan, extinction of diverse species is entirely attributable to the brisk tourist industry and local hunters (9). Balochistan's animal population has decreased as a result of habitat degradation and overhunting. Balochistan is home to a variety of wildlife species including wild sheep, Chiltan wild goat, Siberian ibex, Asiatic black bear and brown bear (10).

In the province of Balochistan, there are 14 wildlife sanctuaries, 3 national parks and 6 game reserves for the preservation of wild species (11).There are 4 species of threatened mammals in Balochistan, 2 species are endangered like the Urial (*Ovis vigeni*) and Straight Horned Markhor, 2 are Critically Endangered like the Balochistan Black Bear and the Chiltan Markhor (*Capra aegagrus chialtanensis*) (12).

Among the mammals of Balochistan, Asiatic cheetah (*Acinonyx Jubatus*), Chinkara (*Gazella Bennettii*) and goitered gazelle (*Gazella subgutterosa*) are inhabited in Chagai Desert in good numbers (13), beside mammals belonging to order Rodentia, lagomorpha and Insectivora are also found in large numbers. Due to the loss of habitat and ongoing hunting pressure, many animal species are suffering greatly. While some species accustomed to vast habitats, such as deserts and plains, are being brutally eradicated, those species which evolved to the high altitudes and harsh climate of remote valleys have been able to survive. Numerous species have little chance of surviving, and it's probable that others have already vanished or are suffering because of habitat loss and poaching (14).

The preservation of the regional and local richness of organisms in ecosystems is one of several objectives related to biological diversity conservation, as it is the prevention of species extinction or decline. However, several species that were formerly common are now in danger of going extinct because their habitats are being destroyed or fragmented, they are in danger from ongoing droughts, and humans are endangering their ability to live in the wild. Humanity will experience a catastrophic environmental calamity if these serious extinction-promoting elements are not stopped (15).

METHODOLOGY

STUDY AREA

Field surveys were conducted repeatedly in the North-Eastern Part of Quetta district, Balochistan (Fig.1a, b, c). Zarghoon Mountain, Spin Karez, Hanna Valley and Hanna Urak (Zarghoon); Takattu Mountain and Sra Ghurhgai (Takattu). study areas were regularly surveyed/studied.
Field trips were also conducted at night, for the observation of nocturnal mammals in the research area.

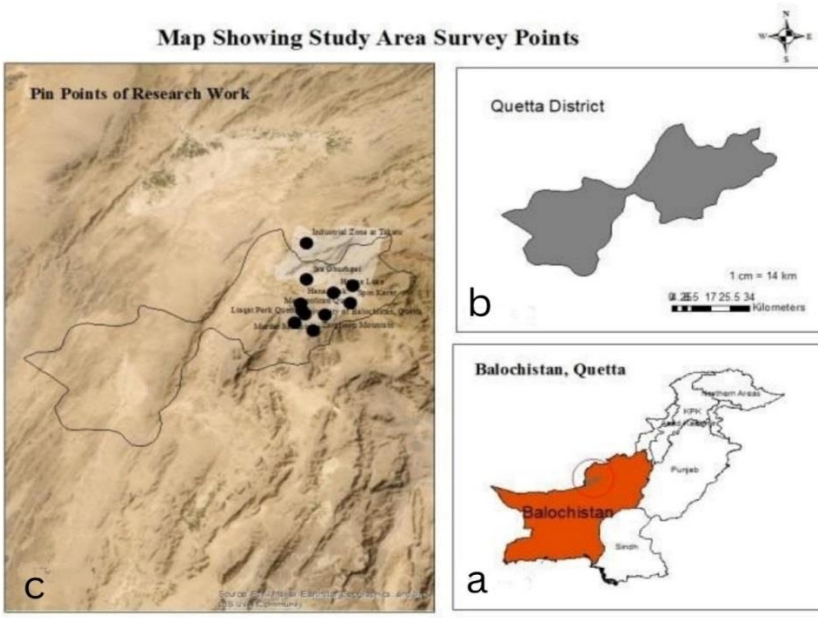

Fig. 1 (a) Map of Pakistan **(b)** Map of Quetta District. **(c)** Study Area

SAMPLE/DATA COLLECTION

Depending upon the habitats (that were included in the study area) various methods for the collection of mammals were used. For the data/sample collection, Mobile Camera, highly magnifying/zooming or and focusing HD Nikon P900 Camera and binoculars were used. GPS was used to record the locations and Arc-GIS 10.2.1 was used for map development. Area volunteers were asked to help find out sites enrich in species. The occurrence of mammals was also confirmed sporadically through interviewing local people, game watchers, visitors, farmers, firewood collector and elderly people to gather important information about the past and present status of wild mammalian fauna. Usually, photographs were shown to the people to confirm the identification and presence of the mammalian species. Indirect record of the occurrence of species was made by the presence of signs like track, dens or tunnels, impressions of foot prints, presence of fecal pallets and information collected by indirect ways include interviews of

wildlife officials, traders, hunters and local communities. Nocturnal animals were also surveyed using search lights. Both, direct (taking photos, seeing through nude eyes and hearing calls or voices) and indirect (group questionnaire Survey, foot-prints, burrows, holes and feces) methods were applied during mammalian survey of the area. Small mammals were searched in habitats like bushy areas, sandy plain areas, Agricultural fields and near human habitations. Signs such as burrows, footprints, holes and presence of fecal material were taken into the account to record the occurrence of the mammals in the area. The rainy season sometimes becomes supportive as old tracks (especially of nocturnal animals) diminish while the new tracks can easily be identified. Surveys were carried out during early morning, at dusk and during night by using lights on the top of the vehicle.

After data collection the following characters were observed to identify specimens. Fur/Hair, body Color, presence or absence of horns, Number of mammary glands, formula of teeth and other morphological traits.

RESULTS

A number of researchers/departments have conducted research work on the distribution, diversity, and conservation of the Mammalian fauna of Pakistan including Balochistan province but no research has been conducted regarding the biodiversity and conservation Measures of the mammalian fauna of North-Eastern region of Quetta District, Balochistan, Pakistan. This is the first attempt to conduct research on the distribution and conservation of mammal's fauna of Quetta District, particularly the North-Eastern region of the Quetta district of Balochistan. During the present study 13 species belonging 10 families and 12 genera were recorded. Among the total of 13 species, 3 were herbivores, 6 were carnivores and 4 were omnivores. 9 species of large mammals including, Common Leopard (*Panthara Pardus*), Indian Wolf (*Canis lupus),* Striped Hyena *(Hyena hyena)* (By indirect way), Asiatic Jackal *(Canis aureus),* Common Red Fox *(Vulpes vulpes),* Jungle Cat *(Felis chaus),* Porcupine *(Hysrtix indica*), Stone/Beech Marten *(Martes foina),* Suleiman Markhor (*Capra falconeri jerdoni*) while 4 species of small mammals including Mouse (*Mus musculus*) Afghan pika, (*Ochotona rufescens*) Hedgehog (*Hemiechinus auritus*), Vole (*Microtus afghanua*) were recorded (Table. I).

Table I. Description of species in the study area

Species	*Common Name*	*Characteristics*	*Reference*
Canis aureus	Golden Jackals (Fig. 2a)	In general appearance Golden jackals resemble wolves, but have proportionately shorter, smaller and lighter legs, Shorter tail and more elongated tarso. The iris is dark brownish or light.	(Linneaus, 1758)
Vulpes vulpes	Red Fox (Fig. 2b)	Heavy fur with long hairs. The red-brown color is dominant in this fox, on the back there is dark median band. The under parts are much lighter with a whitish or bluish-gray tone. The bushy tail color is red-brown with a white tip.	(Linneaus, 1758)
Felis chaus	Jungle Cat or wild cat	The body is yellowish-gray or dark sandy in color without any markings. The belly hairs are long and pale cream, four or five brownish rings on the long legs. There is white color of hairs on the muzzle, throat and belly, dorsally they are dark brown lined. Tail is generally shorter and less than half of the body's length.	(Schreber 1777)
Cafra Falconeri jerdoni	Suleiman Markhor (Fig. 2c)	Reddish grey color and the tone of color in summer appears more yellowish buff and grey in winter. Legs are short, thick and with broad hooves. Its height (up to shoulder) is 35 inches and length is 52 inches. The length of male's horns is up to 36 inches while the horns of female have	(Hume, 1875)

		a length of 6-7 inches.	
Hystrix indica	Indian Crested Porcupine (Fig. 2d)	The short tail is white, The coarse hair covered the face and muzzle, and the hair partly covered rounded ears. Hairs also cover both fore and hind feet, Short limbs with five strong toes.	(Kerr, 1792) `
Ochotona rufescens	Afghan Pika (Fig. 3a)	In general, it has soft silky fur and blue gray under fur, body is reddish sandy, creamy- buff on the belly fur, tail lacks any traces. The hind feet slightly elongated with four toes while the fore feet have five toes with sharp black claws which are used as armed.	(Gray, 1842)
Martes foina	Beech Marten	It has a soft fur with glossy guard hairs and a dense under fur with brown color. The limbs are darker than back. The darker and long bushy hair covered the tail. The head is broad between the rounded and short ears. The forelimbs are powerful and body is long.	(Erxleben, 1777)
Mus musculus	House Mouse	The belly fur is whitish, the dorsal fur is grayish brown, and the muzzle is pointed and sharp. The ears are rounded and partially naked. The tail is pink gray in color.	(Linnaeus, 1758)
Hemiechinus auritus	Afghan Hedgehog	The spines are longer and bear three dark bands with the external tip being whitish in color. Hair covering the lower part of the head, the upper part of the head and ears has a mixture of white hairs. Hairs of abdomen, limbs, and tail are reddish-brown.	(Blyth, 1845)

Fig. 2. (a) Golden Jackal (b) Red Fox (c) Suleiman Markhor (d) Indian Creasted Porcupine

CONSERVATION STATUS OF MAMMALS

Various species of wild mammals are going to become threatened due to human activities such as the loss and fragmentation of habitat, Overgrazing, deforestation (Fig. 3b). Over Grazing by domesticated sheep and goats, pollution and ongoing hunting pressure, periodic Droughts, Coal mining project in

research area Hunting and poaching of Suleiman Markhor are suffering greatly the population of wild Mammals.

Indian Wolf, Red Fox and Afghan Pica have greatly reduced their number. According to the local communities the leopard is seen 3-4 years ago in the study area, but the present study conform its extension. Due to mammalian rich fauna of great importance the Takatu Mountain and associated areas must be declared as a National park to protect threatened species including the endangered Suleiman Markhor. Deforestation (Fig. 3b) was observed in Takattu Mountain, Sra Ghurhgai and Spin Karez to a great damaging extent. Large populations of domestic goats and sheep were observed while grazing and browsing on various varieties of plant species and thus competing with Suleiman markhor and other herbivores (Afghan pika and Indian Crested Porcupine) in Takatu montains, they are also cause the food scarcity for Suleiman markhor. During research work Coal mining projects were also observed at Spin Karez close to Zarghoon Mountain which disturbed wild life badly.

Fig. 3. (a) Afghan Pika (b) Deforestation (Ephidra)

DISCUSSION

The Mammalian fauna of Pakistan is comprised of 198 Species (16). Due to killing and habitat fragmentation Common leopard (*Panthara Pardus*) has become uncommon in Pakistan. While Snow leopard (*Panthara uncia* or *Uncia uncia*) is critically endangered. Globally seven populations of Brown bear (*Uqrsus arctos*) were distributed In Pakistan (17). Balochistan black Bear (*Ursus thibetanus gedrosianus*) is a subspecies of Asiatic black bear and is found in higher hill ranges of Balochistan viz Takhte Suleiman, Toba Kakar, Ziarat, Kalat and Khuzdar (18).

Four mammalian species in Balochistan are at the great risk, out of which two are endangered Such as straight horned markhor and afghan urial. Two are critically endangered Such as chiltan wild goat and Balochistan black bear while two Mammalian species have been become extinct from Balochistan, including Asiatic cheetah and Indian wild ass. In the Balochistan province Ninety two species of mammals were recorded in various National parks and districts of the province, Hingol National Park (HNP), Hazarganji Chiltan National Park, Khuzdar, Kharan, Noshki, Chagai, Ziarat, Qila Saifullah, and Zhob areas have been identified as hotspots for wildlife in Balochistan. Among mammalian fauna three Species are Near-threatened (NT), four species are Endangered (EN) and eight species are Vulnerable (VU) (19).

Nine large mammalian species were recorded from hazarganji chiltan national park such as, Striped Hyena *(Hyena hyena),* Asiatic Jackal *(Canis aureus),* Indian Wolf (*Canis lupus),* Jungle Cat *(Felis chaus),* Common Red Fox *(Vulpus vulpus),* Chiltan Markhor *(Capra aegagrus chialtanensis),* Stone/Beech Martin *(Martes foina),* Red Lynx *(Felis caracal),* Marbled Pole Cat *(Vormela peregusna)* while a total of 21 small mammalian species which belong to order, lagomorpha, Insectivora, Chiroptera and Rrodentia were recorded (20).

Table II. Mammalian Fauna of North-Eastern Part of Quetta district

No.	Order	Family	Common name	Scientific Name	F. Habit	Local Status	National Status	IUCN Status
01	Carnivora	Canidae	Indian Wolf	*C. lupus*	C	CR	EN	LC
02	Carnivora	Canidae	Asiatic Jackal	*C. aureus*	C	LC	NT	LC
03	Carnivora	Canidae	Red Fox	*V. vulpes*	C	EN	LC	NT
04	Carnivora	Hyaenidae	Striped Hyaena	*H. hyaena*	C	Ew	CR	NT
05	Artiodactyla	Bovidae	Sulieman Markhor	*Capra f. jerdoni*	H	EN	VU	NT
06	Rodentia	Hystrixae	Indian Creasted Porcupine	*H. Indica*	H	V	NT	LC
07	Carnivora	Mustelidae	Beech Marten	*M. foina*	O	CR	DD	LC
08	Carnivora	Felidae	Jungle Cat	*F. chaus*	C	CR	LC	LC
09	Rodentia	Muridae	House Mouse	*M. musculus*	O	NT	LC	LC
10	Carnivora	Felidae	Common Leopard	*p. pardus*	C	E	CR	VU
11	Lagomorpha	Ochotonidae	Afghan Pica	*O. rufescens*	H	LC	LC	LC
12	Rodentia	Cricetidae	Afghan/Quetta Mole Vole	*Microtus afghanua*	o	NT	NT	LC
13	Eulipotyphla	Erinaceidae	Afghan Hedgehog	*H.auritus*	O	LC	LC	LC

CONCLUSION

The results obtained in the current study provided Information about the mammalian fauna of North Eastern region of the Quetta District of Balochistan. During the present study 13 species belonging 10 families and 12 genera were recorded. Among the total of 13 species, 3 were herbivores, 6 were carnivores and 3 were omnivores. Nine species of large mammals including Striped Hyaena, Indian Wolf, Asiatic Jackal, Common Red Fox, Jungle Cat, Porcupine, Stone/Beech Marten, Suleiman Markhor while 4 species of small mammals including ,Mouse, afghan pika, Mole, afghan hedghog were recorded.

This area has rich variety of wild mammals which faces many threats such as hunting, trapping, poaching, habitats degradation and impacts of developmental projects particularly construction of industrialization zone in or near Takatu area.

RECOMMENDATIONS

The Government of Balochistan should take strict initiatives to protect the wildlife of the Quetta district. Most of the species of the area have been declined. **S**pecies like Stripped Hyena, Indian Wolf, Red Fox, Indian Crested Porcupine and Markhor (Suleiman Markhor) of the study area are at the verge of extinction. The Government of Balochistan should take steps to stop over-hunting. The official ban will help to protect the mammalian fauna. There is another need for a comprehensive initiative for the betterment of declining ecosystem. The government should take steps to stop the issue of deforestation, because the forest provides the natural environment to the wildlife in addition to the mammalian fauna of the area. There should be an awareness project for the natives and the introduction of strict passes for hunting to the tourists. Strict ban on hunting and unlawful trading of precious mammals should be implemented.

Conflict of Interest:

All authors have no conflict of interest.

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