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Contributions to the mammal fauna of Bitlis Province, Turkey

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ABSTRACT

The aim of study is to identify mammal species in the area and determine factors threatening these species. Field studies were conducted within different seasons (spring, summer, fall, winter) between 2011-2018 to identify mammal species in Bitlis province. As a result of field studies, totally 24 species belonging to orders Eulipotyphla, Chiroptera, Lagomorpha, Rodentia, Carnivora and Artiodactyla were identified. *Microtus schidlovskii* and *Mus macedonicus* are the new records for Bitlis province.

1. Introduction

Turkey, located in the Palearctic region, is considerably rich in biological diversity thanks to its geographical position. Ecological, geological, and climatic differences play an important role in occurrence of biological diversity. Due to zoogeographical position, species of European continent, species from cold regions of Siberia, and species adapted to desert habitat of Africa and Asia entered the Anatolia. This has become an important factor in increase of biological diversity of Turkey. Also, Turkey is the place where many mammalian species (*Apodemus mystacinus*, Bolkar Mountains; *Microtus guentheri*, Kahramanmaraş-Türkoğlu; *Spermophilus xanthoprymnus*, Erzurum) were first introduced to the world (Danford and Alston, 1877; Danford and Alston, 1880).

There are 5416 species from Mammalia class in the world. While almost all of these species inhabit in terrestrial habitats, very few inhabit in the sea. In the palearctic region where Turkey is also located, the class Mammalia is represented by 13 orders, 42 families, and 843 species (Wilson and Reeder, 2005). Approximately 170 species of mammals are present in Turkey (Toyran, 2011).

Bitlis province is located in Eastern Anatolia. The area of the province is 6,706 km^2. The average altitude of the province from sea level is 1545 m. Nemrut (2935 m) and Süphan Mountain (4058 m) are important elevations of the Bitlis province. Lake Van, Nazik Lake, Batmış (Cil) Lake, Aygır Lake, Arin Lake, Iron Reeds, Ahlat Bird Paradise and Ahlat reeds and Nemrut Crater Lake are the most important wetlands of the province. The most important plateau of the province is the Sütey Plateau (Anonymous, 2018a).

The aim of the present study is to reveal the species diversity of mammalian in Bitlis province.

2. Material and Methods

This study was based on field surveys carried out in the natural areas of Bitlis province between 2011 and 2018 (Figure 1). Both direct and indirect observations were carried out in the area for identification of mammalian species. The related studies that were performed until the present time were also reviewed with literature review.

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Since a great majority of mammalian species are nocturnal, in other words they rest (sleep), during the day time and active during the night, it is very hard to determine the majority of these animals through direct observation. In direct observations, traps to catch alive, which were specifically prepared for small rodents, traps made of ecological metal pipe were established for lesser mole rats living under galleries beneath the earth, and photo-traps were established to the places particularly where footprints and feces of animals were determined, in order to identify large species of mammals that are hard to observe. For identification of bat species, caves, public house, shrines, barns, and abandoned buildings were studied and the detected bats samples were caught with the aid of net. Species that were encountered as one-to-one during field studies were photographed via a photograph machine. In addition, mammals that were identified as dead in the field and on the roadside were recorded. Indirect observations were performed by monitoring of footprints, feces, nest, and fur remains. Species were given in table.

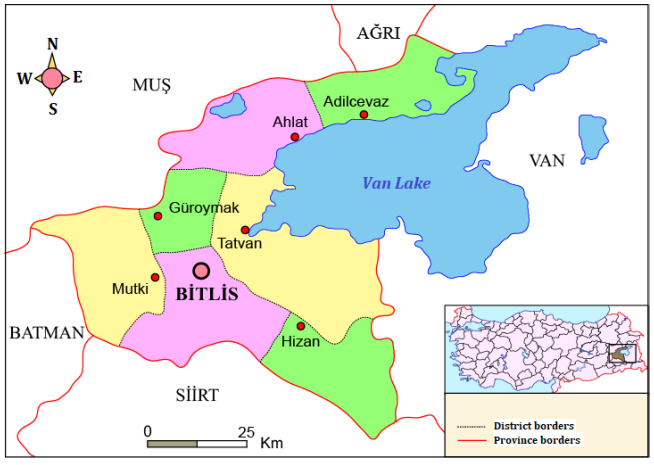

Figure 1. Map of the study area (Anonymous, 2018b)

3. Results

As a result of field studies conducted in the Bitlis province, 24 species of the orders Eulipotyphla, Chiroptera, Lagomorpha, Rodentia, Carnivora and Artiodactyla from mammalia class were detected through direct and indirect observations (Table 1, Figure 2, Figure 3).

So far, a total of 41 mammal species were reported from Bitlis province (Table 2).

The total number of species were recorded as 42 with the literature review. *Microtus schidlovskii* and *Mus macedonicus* are the new records for Bitlis province.

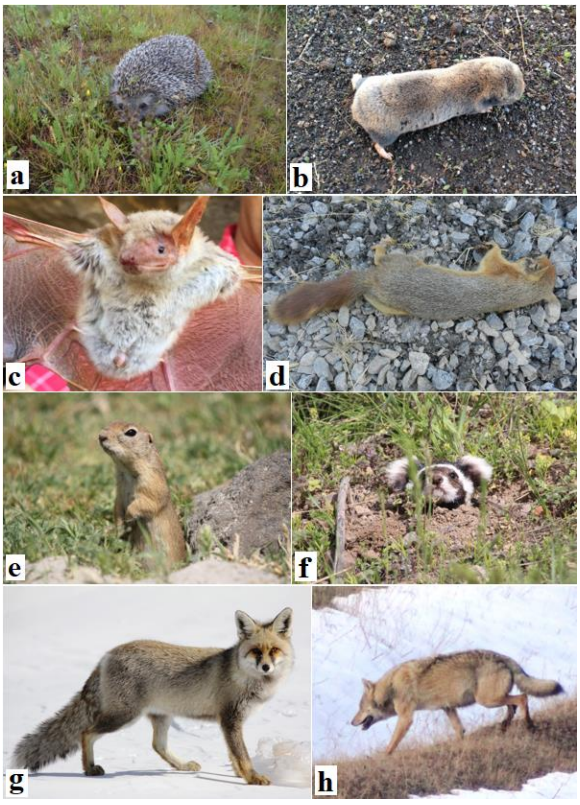

Figure 2. Some mammal species detected from Bitlis Province (a. *Erinaceus concolor*; b. *Nannospalax nehringi*; c. *Myotis blythii*; d. *Sciurus anomalus*; e. *Spermophilus xanthophrymnus*; f. *Vormela peregusna*; g. *Vulpes vulpes*; h. *Canis lupus*)

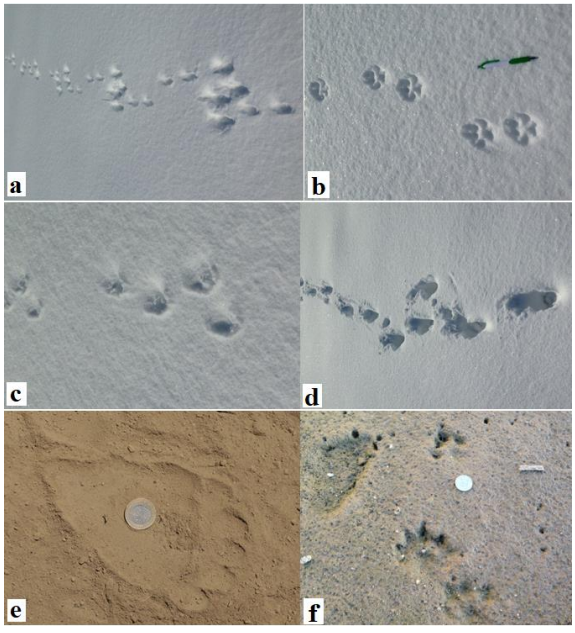

Figure 3. Footprints of some mammals (a. *Lepus europaeus*; b. *Vulpes vulpes*; c. *Martes foina*; d. *Canis lupus*; e. *Ursus arctos*; f. *Lutra lutra*)

Table 1. Mammal species of Bitlis Province and conservation status (detected in this study)

Species	Localities	BERN	CITES	IUCN
Erinaceus concolor	around Bitlis province	EK-III	EK-I	LC
Talpa davidiana	Tatvan	-	-	DD
Myotis blythii	Ahlat	EK-II	-	LC
Myotis capaccinii	Ahlat	EK-II	-	VU
Lepus europaeus	around Bitlis province	EK-III	-	LC
Sciurus anomalus	around Bitlis province	EK-II	-	LC
Spermophilus xanthophrymnus	Adilcevaz, Tatvan	EK-III	-	NT
Microtus schidlovskii	Tatvan	-	-	LC
***Microtus* sp.**	Güroymak	-	-	-
Arvicola amphibius	Ahlat, Güroymak, Tatvan,	EK-II	-	LC
Mus macedonicus	Rahva	-	-	LC
Rattus rattus	Rahva	-	-	LC
Nannospalax nehringi	around Bitlis province	-	-	DD
Vulpes vulpes	around Bitlis province	-	-	LC
Canis lupus	around Bitlis province	EK-II	-	LC
Mustela nivalis	around Bitlis province	EK-III	-	LC
Martes foina	around Bitlis province	EK-II	-	LC
Vormela peregusna	Ahlat, Tatvan	-	-	VU
Meles meles	Mutki	EK-III	-	LC
Felis silvestris	Buzlupınar	-	-	LC
Lynx lynx	Buzlupınar	EK-III	EK-I	LC
Ursus arctos	Güroymak, Tatvan	EK-II	EK-II	LC
Lutra lutra	Hizan, Tatvan	EK-II	-	NT
Sus scrofa	around Bitlis province	EK-III	-	LC

4. Conclusions

Taking into account the number of mammal species in Turkey, the number of species identified in this study is remarkable. The following ones were identified to be leading factors to threat mammalian species in Bitlis province.

a) Restriction of habitats of species as a result of fast settlement and destruction of forestry areas.

b) Hunting unconsciously.

c) Mammalian deaths resulting from increased traffic intensity.

d) Unconscious use of wetlands and resources of water.

e) Destruction of reedy areas forming habitat for European water vole (*Arvicola amphibius*) which is a rodent mammalian species.

f) Restoration of historical structures that are abundant in the region, where bat species shelter especially during summer, without ignoring these species.

g) Brown bear (*Ursus arctos*) is quite spread in the region and has been considered as a threat for local people engaging in beekeeping.

h) Destruction of riparian regions due to road construction works negatively influences nest of otters.

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Table 2. Mammal species of Bitlis Province (previous records)

TURKISH NAME	SCIENTIFIC NAME	REFERENCES
Kirpi	*Erinaceus concolor*	Frost et al., 1991
Acem Köstebeği	*Talpa davidiana*	Kryštufek et al., 2001; Benda and Obuch, 2009; Sözen et al., 2012
Küçük Beyazdişli Böcekçil	*Crocidura suaveolens*	Tez, 2000
Çiftrenkli Beyazdişli Böcekçil	*Crocidura leucodon*	Tez, 2000
Ev Sivri Faresi	*Crocidura russula*	Kefelioğlu and Tez, 1999
Cüce Yarasa	*Pipistrellus pipistrellus*	Demirsoy, 1996
Pürtüklü Yarasa	*Pipistrellus nathusii*	Albayrak, 1990; Benda and Horácek, 1998
Uzunkanatlı Yarasa	*Miniopterus schreibersii*	Demirsoy, 1996
Farekulaklı Küçük Yarasa	*Myotis blythii*	Albayrak, 1990; Demirsoy, 1996; Albayrak and Aşan, 2001
Uzunayaklı Yarasa	*Myotis capaccinii*	Karataş et al., 2003
Savi'nin Cüce Yarasası	*Hypsugo savii*	Demirsoy, 1996
Akdeniz Nalburunlu Yarasası	*Rhinolophus euryale*	Demirsoy, 1996
Nalburunlu Küçük Yarasa	*Rhinolophus hipposideros*	Demirsoy, 1996
Nalburunlu Büyük Yarasa	*Rhinolophus ferrumequinum*	Demirsoy, 1996
Mehely Nalburunlu Yarasası	*Rhinolophus mehely*	Demirsoy, 1996
Yaban Tavşanı	*Lepus europaeus*	Demirbaş and Albayrak, 2013
Kafkas Sincabı	*Sciurus anomalus*	Toyran, 2012
Anadolu Yer Sincabı	*Spermophilus xanthophrymnus*	Toyran et al., 2012
Ağaç Yediuyuru (Hasancık)	*Dryomys nitedula*	Holden, 1996; Yiğit et al., 2006
Arap Tavşanı	*Allactaga williamsi*	Yiğit et al., 2006
Su Sıçanı	*Arvicola amphibius*	Yiğit et al., 2006
Cüce Avurtlak	*Cricetellus migratorius*	Yiğit et al., 2006
Siyah Ev Faresi	*Mus domesticus*	Yiğit et al., 2006
Sıçan	*Rattus rattus*	Yiğit et al., 2006
Anadolu Körfaresi	*Nannospalax nehringi*	Yiğit et al., 2006; Coşkun et al., 2009
Kaya Faresi	*Apodemus mystacinus*	Yiğit et al., 2006
Kızıl Tilki	*Vulpes vulpes*	Demirsoy, 1996; Toyran, 2016
Kurt	*Canis lupus*	Demirsoy, 1996; Can, 2004; Toyran, 2016
Gelincik	*Mustela nivalis*	Demirsoy, 1996; Toyran, 2016
Kakım	*Mustela erminea*	Demirsoy, 1996
Kaya Sansarı	*Martes foina*	Demirsoy, 1996; Toyran, 2013; Toyran, 2016
Alaca Sansar	*Vormela peregusna*	Turan, 1984; Demirsoy, 1996; Toyran, 2016
Porsuk	*Meles meles*	Demirsoy, 1996; Toyran, 2016
Yaban kedisi	*Felis silvestris*	Demirsoy, 1996; Toyran, 2016
Vaşak	*Lynx lynx*	Demirsoy, 1996; Can, 2004; Toyran, 2016
Ayı	*Ursus arctos*	Demirsoy, 1996; Can, 2004; Toyran, 2016
Su Samuru	*Lutra lutra*	Demirsoy, 1996; Toyran, 2016
Pars	*Panthera pardus*	Toyran, 2018
Yabani Domuz	*Sus scrofa*	Albayrak et al., 2007
Yaban Keçisi	*Capra aegagrus*	Zengingönül, 1987; Demirsoy, 1992; Albayrak et al., 2007
Çengelboynuzlu Dağkeçisi	*Rupicapra rupicapra*	Albayrak et al., 2007