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Notes on the Mammals Found in Kazdağı National Park and Its Environs

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Abstract: The present study is based on species collected and observed in Kazdağı National Park and its surroundings. Field collections yielded 40 mammal species from 6 orders: Insectivora (4), Chiroptera (14), Lagomorpha (1), Rodentia (11), Carnivora (8), and Artiodactyla (2). Of the species recorded in this study, 6 were new records from north-west Anatolia: *Sorex volnuchini*, *Rhinolophus hipposideros*, *Myotis emarginatus*, *Eptesicus serotinus*, *Hypsugo savii*, and *Microtus subterraneus*.

Key Words: Mammalia, distribution, Kazdağı National Park, north-west Anatolia, Turkey.

Kazdağı Milli Parkı ve Çevresinin Memeli Hayvanları Üzerinde Notlar

Özet: Bu çalışma, Kazdağı Milli Parkı ve çevresinde toplanan ve gözlenen türler hakkındadır. Arazi çalışmaları sonucunda, 6 takımdan toplam 40 memeli hayvan türü tespit edildi: Insectivora (4), Chiroptera (14), Lagomorpha (1), Rodentia (11), Carnivora (8) ve Artiodactyla (2). Bu türlerden *Sorex volnuchini*, *Rhinolophus hipposideros*, *Myotis emarginatus*, *Eptesicus serotinus*, *Hypsugo savii* ve *Microtus subterraneus*, Kuzeybatı Anadolu'dan ilk kez bildirilmektedir.

Anahtar Sözcükler: Mammalia, dağılım, Kazdağı Milli Parkı, Kuzeybatı Anadolu, Türkiye.

Introduction

Turkey has many different climatic and ecological conditions and establishes a land bridge between 3 continents and because of these factors has a rich mammalian fauna. More than 150 mammalian species have been recorded or identified in both the European and Asiatic parts of Turkey (Bennet, 1835; Danford and Alston, 1877; Matschie, 1900; Thomas, 1903, 1906a, 1906b, 1920; Miller, 1908a, 1908b; Satunin, 1908; Blackler, 1916, 1926; Pocock, 1930, 1932, 1938; Bechthold, 1940; Misonne, 1957; Kahmann, 1961; Spitzenberger and Steiner, 1964; Corbet and Morris, 1967; Felten and Storch, 1968; Kumerloev, 1970a, 1970b, 1975; Haas and Gruninger, 1971; Baytop, 1973, 1974; DeBlase and Martin, 1973; Mursaloğlu, 1973; Morlok, 1978; Spitzenberger, 1978; Doğramacı, 1989a, 1989b; Helversen, 1989; Kurtonur and Özkan, 1991;

Obuch, 1994, 2001; Çolak et al., 1997, 1998; Kryštufek et al., 1997, 2001; Yiğit et al., 1997, 1998a, 1998b, 2001, 2002; Çolak and Yiğit 1998, 2002; Yiğit and Çolak 1998; Özkurt et al., 1999, 2000; Sachanowicz et al., 1999; Sözen et al., 1999; Çolak 2003; Spitzenberger et al., 2003; Hulva et al., 2004; Jaarola et al., 2004; Juste et al., 2004). There are 33 national parks in Turkey, and Kazdağı National Park in Balıkesir and Çanakkale provinces was founded in 1993 (Figure 1). Kazdağı National Park serves as an important refugia for fauna that escaped from Europe during glacial periods (Demirsoy, 2002). Biodiversity is poorly understood and undersurveyed in many of Turkey's national parks, including Kazdağı. The aim of this study was to increase the knowledge of mammalian fauna of Kazdağı and its environs.

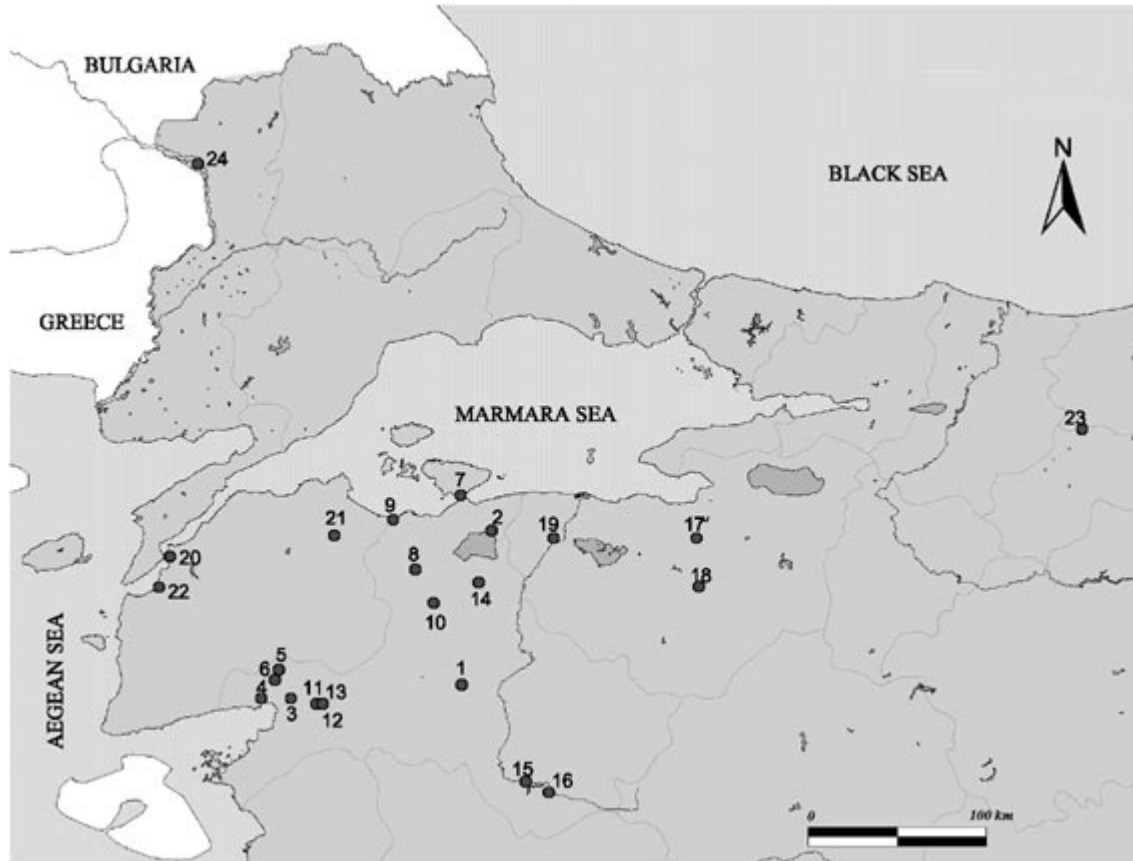


Figure 1. Map of localities mentioned in text. 1. Balıkesir (*Balıkesir prov.*), 2. Bird Paradise (Bandırma), 3. Havran, 4. Edremit, 5. Ceyizderesi in Kazdağı Mt., 6. Sarıkız hill in Kazdağı Mt., 7. Erdek and Hamamlı village (Erdek), 8. Gönen, 9. Denizkent (Gönen), 10. Kocapınar village (Gönen), 11. Havran Dam, 12. İnboğazı Cave in İnönü village (Havran), 13. Sarnıç Village (Havran), 14. Manyas, 15. Çaygören Dam (Sındırgı), 16. Osmanlar village (Sındırgı), 17. *Bursa prov.*, 18. İnegöl, 19. Karacabey, 20. Çanakkale (*Çanakkale prov.*), 21. Biga, 22. Turgut Reis Fort (*Çanakkale*), 23. Balıklı (*Düzce prov.*), 24. Edirne (*Edirne prov.*).

Materials and Methods

This study covers the results of field studies conducted since 2003 throughout Turkey, including north-west Anatolia. Specimens were caught by hand, mist-nets, and snap and Sherman live traps. Some mammalian species were observed and indirectly recorded from spoor, owl pellets and footprints. Checklists and reference books were used to identify species (Corbet, 1978; Niethammer and Krapp, 1978; Harrison and Bates, 1991; Kryštufek and Vohralík, 2001). The voucher samples were stuffed in conventional museum type; the bats and other specimens (insectivores, rodents, carnivores) have been deposited in the Mammalian Collection in Niğde University (NUZD) and in

Ankara University (Nr), respectively. All measurements and weights were taken using calipers and a balance to the nearest 0.1 mm and 0.1 g, respectively, as described in Harrison and Bates (1991). If a sample of a species was available, external measurements (mm) and weights (g) of adults were given as follows: total length – tail length – hind foot length – ear length \equiv weight.

Results and Discussion

Order: Insectivora

Erinaceus concolor

Hedgehogs were observed at night during fieldwork. Hedgehog droppings were common both in the National

Park and its environs. Its distribution is likely restricted by altitude as the numbers of droppings decrease with increasing altitude in the park. The taxonomic and distributional studies were performed on the hedgehog by Dođramacı and Gündüz (1993). They included western Turkey in the hedgehog's area, as in this study. This study found that the hedgehog is among the most common insectivorous mammals in Anatolia.

Sorex volnuchini

This species was recorded from Gönen (Balıkesir), which is located north of Kazdađı. External measurements and weight of a male specimen: 100 – 45 – 13 – 7 \equiv 17. The westernmost distribution of this species in Turkey was previously reported from Balıklı (Düzce) (see Kryřtufek and Vohralík, 2001) and thus this collection represents a range extension and is now the westernmost location for its distribution.

Crocidura leucodon

A single shrew was captured from hazelnut and mixed deciduous forests around a small tributary in Ceyizderesi vicinity. It is similar to *C. leucodon lasia* in terms of its large sizes. External measurements and weight of a male specimen: 120 – 39 – 12 – 8 \equiv 11. According to Kryřtufek and Vohralík (2001), the tail length is less than 63% of the head and body. In our specimen, this proportion was found to be 48% of head and body length. In addition, Kazdađı was also included to the distribution area of *C. leucodon* by Kryřtufek and Vohralík (2001).

Talpa levantis

These moles were only recorded from owl pellets around Çeyizderesi in Kazdađı. We found some skeletal remains of their forefeet and mandibles in pellets, which most probably belong to *Strix aluca*. This species was reported from Bandırma, Manyas and Çanakkale in north-west Anatolia (Dođramacı, 1989b). Kazdađı is now a new location and the south-westernmost locality for its distribution.

Order: Chiroptera

Rhinolophus ferrumequinum

About 20-30 greater horseshoe bats were observed at the entrance of İnođazı Cave at night on 31 May 2004. External measurements and weight of an adult male: 100 – 43 – 11 – 25 \equiv 13. Its forearm length is 55.5 mm. Additionally, 2 adult males were captured in a

barn of an old house in Osmanlar village (Sındırgı) in 31 August 2003 and a cave near Kocapınar village (Gönen) in September 3rd 2003. *R. ferrumequinum* was also reported from Havran by Çađlar (1965, 1968), Felten et al. (1977) and Albayrak (1993) and from Erdek by Steiner and Gaisler (1994).

Rhinolophus hipposideros

About 30 lesser horseshoe bats were found in old houses nearby Çaygören Dam near Sındırgı. Prior to this survey, there was no record of *R. hipposideros* in this area. The nearest known locality is Bursa (Çađlar, 1965, 1968).

Rhinolophus euryale

The Mediterranean horseshoe bat was captured in the following localities: ancient ruins in Hamamlı village near Erdek, a cave near Kocapınar village of Gönen, and İnođazı Cave near Havran. *R. euryale* was formerly reported in the same location by Albayrak (1993), and this represents the second record in north-west Anatolia.

Rhinolophus blasii

Several individuals were seen in İnođazı Cave at night on 30 May 2004. The forearm of an adult measured 44 mm. Blasius' horseshoe bat was previously recorded from Havran by Çađlar (1965, 1968), Kock (1974), and Felten et al. (1977).

Rhinolophus mehelyi

Many individuals were observed in İnođazı Cave at night on 31 May 2004. Mehely's horseshoe bat was formerly reported from Havran by Çađlar (1965, 1968), DeBlase (1972), and Felten et al. (1977), and from Erdek by Steiner and Gaisler (1994).

Myotis capaccinii

Several individuals of the long-fingered bat were observed in Sarnıç Village (Havran). An adult male, hunting on the water surface of a stream, was mist-netted after dusk. The bats were also found in İnođazı Cave at night on 30 May 2004. In addition, this species was netted in ancient ruins in Hamamlı village near Erdek. A single record in north-west Anatolia is from near Manyas Bird Paradise by Spitzenberger (1973).

Myotis blythii

The lesser mouse-eared bat was found in ancient ruins in Hamamlı village near Erdek and Turgut Reis Fort near Çanakkale. There are 2 previous records for this bat in

north-west Anatolia: Erdek by Steiner and Gaisler (1994) and Balıkesir by Albayrak (1993).

Myotis myotis

A pregnant female from a colony of several hundred individuals, which was netted in İnboğazı Cave at night on 30 May 2004, gave birth on 3 June 2004. External measurements and weight of this female: 137 – 60 – 16 – 27 \equiv 20. Its forearm length is 65 mm. The greater mouse-eared bat was reported from Havran by Çağlar (1965, 1969) and Spitzenberger (1996).

Myotis emarginatus

A cluster of about 30-40 bats was observed in İnboğazı Cave above Havran Dam near İnönü Village, Havran on 30 and 31 May 2004. Geoffroy's bat was freely hanging on the ceiling near the entrance. A cluster formed by pregnant females was found in the cave. We also captured a female with an embryo 12 mm in length. The species was also observed in ancient ruins in Hamamlı village near Erdek. A review was performed on *M. emarginatus* in Turkey by Karataş and Özgül (2003). Prior to this study, there were no records of Geoffroy's bat from north-west Anatolia.

Eptesicus serotinus

The serotine was observed on a bird survey tower in Manyas Bird Paradise in September 2003. *E. serotinus* was first recorded in this area by this study. The nearest location to Manyas Bird Paradise was Edirne (Benda and Horáček 1998).

Pipistrellus pipistrellus

The pipistrelle is common in towns. It was also observed near pine forests on mountain slopes, especially olive plantations. A pregnant female was netted under a streetlight in Edremit on 28 May 2004. Another female was mist-netted in Havran Dam on 31 May 2004, with 2 embryos of 8.5 and 6.5 mm. It was established that these bats emerge before dusk just after sunset. The species from Balıkesir formerly reported by Albayrak (1993) were also found for the second time in north-west Anatolia.

Pipistrellus nathusii

Nathusius' pipistrelle is a rare species in Turkey and it has only been reported from provinces (Bitlis, İstanbul, Kırklareli, Sakarya), except for Balıkesir (Bandırma) (Lehmann, 1966, Benda and Horáček, 1998). Two adult males were mist-netted in Manyas Bird Paradise at

midnight in September 2003. In this study, the bat was recorded for the second time in Bandırma.

Hypsugo savii

A male and a female were netted near Havran Dam in September 2004. *H. savii* has not been recorded in this area. Its closest locality was known as İnegöl (Bursa) (Helvesen, 1989).

Miniopterus schreibersii

A large cluster of the long-winged bat was found in İnboğazı Cave on 30 May 2004. Forearm length of a female and a male are 45.2 and 45.5 mm, respectively. Additionally, some specimens were netted in ancient ruins in Hamamlı village near Erdek and in a cave near Kocapınar village, Gönen. It was observed that the species forms large colonies in underground sites. This bat was recorded from Havran by Çağlar (1965, 1969) and Albayrak (1993), near Manyas Bird Paradise by Spitzenberger (1973), and from Balıkesir, Gönen, and Havran by Karataş and Sözen (2004).

Order: **Lagomorpha**

Lepus europaeus

Hares were directly observed in many places on Kazdağı in the field excursions performed on the spring and autumn. Droppings, which were mostly found in areas where the forest has been cleared, were also strong evidence for its common distribution on Kazdağı and its environs. The droppings were more common in the deforested areas and meadows than in forested areas. This finding also indicated that hares prefer deforested rather than forested areas.

Order: **Rodentia**

Sciurus anomalus

Caucasian squirrels were observed many times in Kazdağı and its environs. This species usually occupies the middle and lower parts of mountains. Three male specimens were also captured from Gönen (Balıkesir). External measurements and weight of a male specimen (Nr 1899): 390 – 155 – 65 – 31 \equiv 350.

Spalax leucodon

The blind mole was not captured from the park, and no mounds were observed in the National Park, which has rugged terrain, and is also dominated by tree cover. However, the blind mole is very common in the plains and meadows of Biga, Gönen, Manyas, and Karacabey towns,

which are located to the north and north-east of the National Park. Four specimens captured around Denizkent (Gönen) (in the collection of Biology Dept., Karaelmas University, Zonguldak) town were examined, and the external measurements and weight of a male specimen (specimen number: 4935) are given as follows: 220 – 0 – 28 – 0 \equiv 306.

Microtus rossiaemeridionalis

The sibling vole was not trapped in Kazdağı, but it was very common in its environs, and was captured from Karacabey (Bursa), where it lives at the edge of forests and watery meadows in this area. External measurements and weight of a male specimen (Nr 3117): 176 – 45 – 20 – 14 \equiv 39. This vole was first recorded from Samsun by Dođramacı (1989a), and later many distributional records were given by Kefeliođlu (1995), Yiđit et al. (2003), and Jaarola et al. (2004). Therefore, it can be said that the sibling vole is one of the most common species among *Microtus* spp. in Anatolia.

Microtus subterraneus

Only 2 common pine voles (male) were captured from Çeyiz deresi in an area of hazelnut and birch trees in the National Park. Kazdağı is the new, westernmost location of its distribution in Anatolia. External measurements and the weight of a male specimen (Nr: 4959) are: 136 – 35 – 18 – 10 \equiv 26 (Figure 2).

Apodemus mystacinus

Abundant rock mice were captured in Kazdağı, and they live in pure rocky areas and rocky areas covered with large and small bushes or forest extending from sea level to 2700 m. Body measurements and weight of a male specimen (Nr: 4963): 229 – 128 – 26 – 20 \equiv 29. The recent taxonomic status and distribution of the rock mouse were reported from Turkey by Çolak et al. (2004).

Apodemus flavicollis

We recorded 3 specimens from Kazdağı and Gönen. The yellow-necked mouse is found in mixed forests extending from sea level to more than 2000 m a.s.l. Body measurements and weight of a female specimen (Nr: 4964): 222 – 120 – 25 – 20 \equiv 20.

Apodemus iconicus

The field wood mouse was trapped in Kazdağı and Gönen. *A. iconicus* inhabits the edges of mixed forest. We



Figure 2. A specimen of *Microtus subterraneus* from Kazdağı National Park

found this species in cultivated, bushy and open-grass areas around Gönen. This species is distinguishable from *A. flavicollis* by its stripe-shaped yellow neck. Body measurements and weight of a male specimen from Gönen (Nr: 2959): 200 – 114 – 23 – 16 \equiv 24.

Mus macedonicus

We recorded *M. macedonicus* at the edges of cultivated areas, crop areas, bushy areas, and near roads and houses in Gönen, Karacabey and Manyas. Body measurements and weight of a male specimen (Nr: 3191, Karacabey): 132 – 64 – 17 – 14 \equiv 16.

Mus domesticus

Specimens of *M. domesticus* were captured from houses, gardens, and cultivated and bushy areas in Gönen. *M. domesticus* is distinguishable from *M. macedonicus* by its coloration pattern, longer tail than head and body length, and ZI (Zygomatic index) < 0.50. Body measurements and weight of a female specimen (Nr: 2958): 158 – 68 – 19 – 14 \equiv 19.

Rattus rattus

The black rat was not captured from Kazdağı National Park, but this species is very common around Kazdağı

environs. Three specimens (2 female, 1 male) were trapped from Gönen (Balıkesir). External measurements and weight of a female specimen (Nr 2025): 360 – 195 – 32 – 24 \equiv 110. The morphotypes with their chromosomes of the black rat were reported in various localities from Turkey by Yiğit et al. (1998).

Chionomys nivalis

Only one snow vole (male) was caught by hand around Sarıkız hill at an altitude of 1750 m. The habitat is rarely covered with pines, and is characterised by rocky and stony ground. External measurements and weight of a male specimen (Nr 4960): 172 – 55 – 22 – 11 \equiv 41. The snow vole is commonly distributed in various parts of Turkey (Spitzenberger, 1971; Kryštufek, 1999).

Order: **Carnivora**

Canis lupus

This species was recorded based on its droppings in Kazdağı National Park. Verbal communication with villagers confirmed the occurrence of wolves.

Vulpes vulpes

The red fox was recorded from the National Park based on droppings and a skull collected. The skull of a specimen shot by hunters was found in the upper part of Çamlıbel village (Figure 3).

Ursus arctos

Based on droppings and footprints in the snow, the brown bear was included in the mammal fauna of Kazdağı National Park. To date, there has been no detailed study on the taxonomy, distribution and ecology of the Turkish population of the brown bear.

Mustela nivalis

A single specimen was captured from Gönen (Balıkesir). External measurements and weight of a male specimen (Nr 1865): 350 – 100 – 42 – 16 \equiv 225.

Vormela peregusna

The marbled polecat was recorded from Gönen (Balıkesir). This species usually prefers marshy areas or riverine areas with reed beds in Turkey. External measurements and weight of a female specimen (Nr: 1888): 455 – 180 – 40 – 25 \equiv 270.

Although the marbled polecat were not directly captured or observed in the National Park, this species is somehow abundant around the National Park, and was recorded in various localities in Turkey (Danford and Alston, 1877; Lehmann 1966; Kumerloeve, 1967). More recently, the geographic variations of the population were determined by Özkurt et al. (2000).



Figure 3. A skull of *Vulpes vulpes* hunted in Kazdağı National Park.

Martes foina

Only 2 specimens of stone marten were captured around Gönen (Balıkesir) (Yiğit et al., 1998). Many droppings belonging to small carnivores were found in the National Park and most of these droppings are likely from the stone marten. External measurements and weight of a female specimen (Nr: 1830): 625 – 230 – 80-34 \equiv 1020. The stone marten is commonly distributed in Turkey (Danford and Alston, 1877; Kumerloeve, 1967; Yiğit et al., 1998).

Meles meles

A female was obtained from Gönen (Balıkesir). However, we did not find the typical badger burrow around the National Park in the field survey. It can be considered evidence of a low population density among badgers. External measurements and weight of a male specimen (Nr: 1864): 780 – 170 – 105 – 35 \equiv 5000.

Lutra lutra

Villagers reported that the otter is attracted to the fish farm in the rivers west and north-west of Kazdağı. In these locations, the riverbanks are mostly covered by stones. Unfortunately, additional evidence for otter occurrence at this site was not obtained during the survey. In general the habitat around river is solitary and suitable for the occurrence of the otter.

Order: Artiodactyla

Sus scrofa

Wild boars were shot in the National Park during a hunting drive. In February 2004, we examined 8 adult wild boars, and found that 6 females were pregnant. Eight embryos, probably at an age of a month, were found in 1 female (Figure 4). External measurements (cm) and weight (kg) of a male specimen: 168 – 23 – 33 – 14.2 \equiv 97.

Capreolus capreolus

Roe deer were seen in the National Park, and also many droppings belonging to this species were found in every type of habitat but mostly in flat places.

Conclusion

According to the direct and indirect records, the mammal fauna of Kazdağı and its environs is represented by at least 40 species: 4 Insectivora, 14 Chiroptera, 1 Lagomorpha, 11 Rodentia, 8 Carnivora, and 2 Artiodactyla. Apart from the mammal species listed above, some species which were not recorded in this study or were previously reported in the references will likely distributed around the National Park and its environs: *Muscardinus avellanarius*, *Myomimus roachi*,



Figure 4. Embryos of *Sus scrofa* hunted in Kazdağı National Park.

Dryomys nitedula, *Canis aureus*, *Mustela putorius*, *Martes martes*, and *Felis silvestris*. Of these species, *Glis glis*, *Dryomys nitedula*, *Canis aureus*, and *Felis silvestris* are most probably distributed in Kazdağı and its environs. It can be said that the occurrence of other species does not seem possible in this area. However, Oğurlu (1997) suggested that the carnivore droppings collected around Manyas (Balıkesir) belonged to *M. martes* without indicating distinguishing characteristics or examining the

specimens. The distribution and taxonomic status of *Myomimus roachi*, *Mustela putorius* and *Martes martes* are under discussion in the Asiatic part of Turkey.

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