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The Bats of the Eastern Black Sea Region in Turkey (Mammalia: Chiroptera)*

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Abstract: The study was carried out on 89 specimens representing 11 bat species, *Rhinolophus ferrumequinum*, *R. hipposideros*, *R. euryale*, *Myotis brandtii*, *M. bechsteinii*, *M. myotis*, *Pipistrellus pipistrellus*, *P. kuhlii*, *Nyctalus leisleri*, *Plecotus auritus* and *Miniopterus schreibersii*. The specimens were collected from the eastern Black Sea region between the 1992 and 1994. Some ecological features of the species and their localities are presented in this study.

Key Words: Bat species, eastern Black Sea region, Turkey

Türkiye'nin Doğu Karadeniz Bölgesi Yarasa ları (Mammalia: Chiroptera)

Özet: Bu araştırma, 11 yarasa türünü, *Rhinolophus ferrumequinum*, *R. hipposideros*, *R. euryale*, *Myotis brandtii*, *M. bechsteinii*, *M. myotis*, *Pipistrellus pipistrellus*, *P. kuhlii*, *Nyctalus leisleri*, *Plecotus auritus* ve *Miniopterus schreibersii*, temsil eden 89 örneğin incelenmesine dayanmaktadır. Örnekler 1992 ve 1994 yılları arasında Doğu Karadeniz Bölgesinden toplanmıştır. Bu çalışmada türlerin bazı ekolojik özellikleri ve kayıt yerleri verildi.

Anahtar Sözcükler: Yarasa türleri, Doğu Karadeniz Bölgesi, Türkiye

Introduction

So far, 32 bat species belonging to 5 families (Pteropodidae, Emballonuridae, Rhinolophidae, Vespertilionidae and Molossidae) have been recorded living in Turkey. It is known that the distributions of *Rousettus aegyptiacus*, *Taphozous nudiventris* and *Otonycteris hemprichi* reach the northernmost localities in the southern part of Anatolia. On the other hand, the distributions of *Myotis schaubi*, *Eptesicus nilssonii* and *Eptesicus bottae ognevi* are very close to the eastern border of Turkey (Benda and Horacek, 1998). The eastern Black Sea region was therefore selected as a study area in which the species mentioned above might be presumed to occur.

The present study was carried out to investigate the existence of those species in Turkey.

Materials and Methods

This study is based on 89 specimens belonging to 11 species from the provinces of Ordu, Giresun, Trabzon, Rize and Artvin in the eastern Black Sea region of Turkey. The specimens were collected between 1992 and 1994, and examined during this study.

Specimens were caught by a Japanese mist net, aerial trap and sometimes by hand from different places, caves, dens, roofs and around street lamps. Specimens were prepared as conventional museum types. Some ecological notes were recorded in the field.

Diagnostic characters were checked from the original descriptions and redescriptions of the species (Miller, 1912; Ognev, 1928; Corbet, 1978; Harrison and Bates, 1991; Albayrak, 1990, 1993). Records concerning bat flea and bat fly species were quoted from Aktaş (1987) and Aktaş and Hasbenli (1994) respectively.

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Results

The species caught from the eastern Black Sea region belong to the suborder Microchiroptera and the families Rhinolophidae and Vespertilionidae. The family Rhinolophidae is represented by 3 and Vespertilionidae by 10 species in the region.

Rhinolophus ferrumequinum (Schreber, 1774)

1774. *Vespertilio ferrum-equinum* Schreber, Säugeth., 1(53): 174.

Type locality: Burgundy, France

1853. *Rhinolophus ferrum-equinum*, Blasius, Wiegmann's Arch. Naturgesch., 19(1): 51- 52.

Ecological features: This species was encountered being solitary in a small cave, and forming colonies in respectively larger caves during summer. Individuals of this species are sensitive to light and sound during their rest on the ceiling of the cave, where they hang themselves upside down by their hindfeet. When disturbed, they hide in the crevices or fly out of the cave. They emerge from the cave during twilight. They use their feet for body contact to the walls. They live sympatrically with *Myotis myotis* and *M. blythii* in caves.

Specimens examined (8) and localities: Trabzon, Maçka, Bağışlı village, 1 ♀, 2 ♂♂ (2 November 1993); Ordu, Perşembe, Çaka, Boğazcık village, 1 ♀ (9 August 1994); 1 ♂ (11 August 1994), 1 ♂ (12 August 1994); Artvin, Ardanuç, Cehennemderesi, 1 ♂ (31 August 1994); Borçka, Camili village, 1 ♂ (a specimen found dead, sex unknown) 15 September 1994).

Rhinolophus hipposideros (Bechstein, 1800)

1800. *Vespertilio hipposideros* Bechstein, Thomas Pennat's Allgemeine Uebers. Vierf. Thiere, 2: 629.

Type locality: France

1857. *Rhinolophus hipposideros*, Blasius Säugeth., Deutschland, 29.

Ecological features: They form colonies of either 10-15 or 30-40 individuals under the roofs, and inside cellars, barns, haylofts, mills, abandoned mosques and churches. They are relatively sensitive to light and sound during their daytime rest. They hang upside down on the ceiling of the cave when they rest. They are delicate animals and fly in a slow-moving way. They emerge at twilight. Bat flea *Rhinolophopsylla unipectinata* was rarely

encountered as an ectoparasite. They show sympatry with *Rhinolophus ferrumequinum*.

Specimens examined (25) and localities: Rize, Hemşin, Çamlıtepe village, 1 ♂ (16 September 1994); Çamlıhemşin, Şenyuva village, 1 ♂ (22 September 1992); Ordu, Gököy, Çetilli village, 3 ♀♀, 2 ♂♂ (27 July 1993); Gököy, Ahmetli village, Kayaaltı cave, 2 ♀♀ (2 September 1993); Trabzon, Vakfıkebir, Düzköy 6 km, 1 ♀ (6 September 1993); Giresun, Bulancak, Saraşlı, 9 ♀♀, 4 ♂♂ (12 August 1994); Artvin, Ardanuç, Çifte Köprüler, 1 ♀ (31 August 1994); Artvin, Borçka, Camili village, 1 ♀, 1 ♂ (15 September 1994).

Rhinolophus euryale Blasius, 1853

1853. *Rhinolophus euryale*, Wiegmann's Arch. Naturgesch., 19(1): 49-51.

Type locality: Milano, Italy

Ecological features: They live either solitarily or form colonies of 40-50 individuals in small caves during summer. They are very sensitive to light and sound. Some individuals were encountered resting upside down on the walls of cave near the ground. They might live sympatrically with the species *Rhinolophus ferrumequinum*, *Myotis myotis* and *Miniopterus schreibersii*.

Specimens examined (9) and localities: Ordu, Perşembe, Çaka, Boğazcık village, 1 ♂ (a specimen found dead, sex unknown), 4 ♀♀ (9 August. 1994); 2 ♂♂ (10 August 1994); 2 ♀♀ (12 August 1994).

Ten species of the family Vespertilionidae were encountered in the research area.

Myotis brandtii (Eversmann, 1845)

1845. *Vespertilio brandtii* Eversmann, Uralensibus Observati. Bull. Soc. Nat., Moscou, 2: 505-508.

Type locality: Foothills of the Ural Mountains, Russia

1970. *Myotis brandti*, Hanak, Bijdr. Dierk., Amsterdam, 40(1): 40-44.

Ecological features: This species was encountered during summer forming colonies of 15-20 individuals under the roof of a building in a cold valley where the species *Fagus orientalis*, *Garpinus orientalis*, *Pinus sylvestris* and *Alnus glutinosa* are dominant. During rain in the summer, they go out of the cave for 1 h when

twilight falls. A specimen of this species was caught by aerial net at night while it was preying on some flies attracted to street lights. They fly in a slow-moving way. They carry *Ischnopsyllus intermedius* and *Ischnopsyllus dolosus* bat fleas as ectoparasites.

Specimens examined (15) and localities: Rize, Çamlıhemşin, Çatköy, 2 ♀♀, 4 ♂♂ (27 August 1994); 3 ♀♀, 2 ♂♂ (28 August 1994); 3 ♀♀, 1 ♂ (29 August 1994).

Myotis bechsteinii (Kuhl, 1817)

1817. *Vespertilio bechsteinii* Kuhl, Ann. Wetterau. Ges. Naturk., 40(1): 30-33.

Type locality: Hanau, Hessen, Germany

1900. *Myotis bechsteinii*, Mehely, Monogr. Chiropt. Hungariae, Budapest, 184-190.

Ecological features: Nine pregnant females of this species were encountered in a small antique bath with 2 rooms located in a garden with fruit trees. Birthing occurs from the first week of July in this species. They are delicate animals with a slow-moving way of flying.

Specimens examined (5) and localities: Artvin, Yusufeli, Kılıçkaya Beldesi, 3 ♀♀ (3 July 1993), 2 ♂♂ (3 July 1993).

Myotis myotis (Borkhausen, 1797)

1797. *Vespertilio myotis* Borkhausen, Deutsche Fauna, 1: 80.

Type locality: Germany

1897. *Myotis myotis*, Miller, Ann. Mag. Nat. Hist., 20(6): 383.

Ecological features: They form colonies in large caves. The species is the biggest representative of its family in Turkey. They move out of the cave 30 min after twilight. They fly slowly, and show sympatry with *Myotis blythii* and *Miniopterus schreibersii*. All individuals in the nursing colony hang upside down using their hindfeet. At other times they hang on the ceiling of the cave in a dispersed position of one by one or small groups of a few individuals, or they hide in crevices.

Specimens examined (4) and localities: Ordu, Yaraşlı village, 1 ♀ (6 August 1994); Artvin, Ardanuç, Cehennemderesi, 3 ♀♀, (15 September 1994).

Pipistrellus pipistrellus (Schreber, 1774)

1774. *Vespertilio pipistrellus* Schreber, Säugethiere, 1: 167

Type locality: France

1897. *Pipistrellus pipistrellus*, Miller, Ann. Mag. Nat. Hist., 6(20): 384-385.

Ecological features: During summer, colonies of 20-100 female individuals were encountered in the spaces between buildings very close to each other, and under roofs and window mouldings. They sometimes live solitarily. They give birth to twins once a year. They start flying out at twilight. They carry the bat flea *Ischnopsyllus octactenus* as an ectoparasite.

Specimens examined (6) and localities: Ordu, Gököy, Ahmetli village, 1 ♀ (28 July 1993); Artvin, Ardanuç, 1 ♀ (31 August 1994); Ardanuç, Şeytan Köprüsü, 1 ♀ (31 August 1994); Giresun, Bulancak, Talipli village, 2 ♀♀ (8 September 1994), 1 ♀ (16 September 1994).

Pipistrellus kuhlii (Kuhl, 1817)

1817. *Vespertilio kuhlii* Kuhl Ann. Wetterau. Ges. Naturk., 4(2): 199-202.

Type locality: Trieste, Italy

1900. *Pipistrellus kuhlii*, Méhely, Monogr. Chiropt. Hungariae, Budapest, 261.

Ecological features: They live under the roofs of buildings and in tree hollows. They give birth to twins each year. They emerge at twilight. They may be encountered in summer when they prey on insects around street lights.

Specimen examined (1) and locality: Artvin, Borçka, Camili village, 1 ♂ (15 September 1994).

Nyctalus leisleri (Kuhl, 1817)

1817. *Vespertilio leisleri* Kuhl, Ann. Wetterau. Gesselch. Naturk., IV (=Neue Ann., I), pt. 1, p. 46.

Type locality: Hanau, Hessen, Germany

1910. *Nyctalus leisleri* Trouessart, Faune Mamm. d'Europe, p. 19.

Ecological features: A solitary specimen was encountered behind an open window shutter of a wooden village house in a peanut garden surrounded by broadleaved trees.

Specimen examined (1) and locality: Rize, Çamlıhemşin, Şenyuva village, 1 ♂ (22 September 1992).

Plecotus auritus (Linnaeus, 1758)

1758. *Vespertilio auritus* Linnaeus, Syst. Nat., I, 10th ed., p. 32.

Type locality: Sweden

1818. *Plecotus auritus* Geoffrey, Description de l'Égypte, 11, p. 118.

Ecological features: A specimen was encountered, hanging upside down on the ceiling of a wooden village house in a peanut garden with broadleaved trees. They are not very sensitive to light and sound. This is a slow-flying and delicate species.

Specimen examined (1) and locality: Rize, Hemşin, Akyamaç, 1 ♀ (6 September 1994).

Miniopterus schreibersii (Kuhl, 1817)

1817. *Vespertilio schreibersii* Kuhl, Ann. Wetterau. Ges. Naturk., 4(2): 185.

Type locality: Kolumbacs Cave, near Coronini, Banat, Rumania

1857. *Miniopterus schreibersii*, Blasius, Säugeth., Deutschland, 46-48.

Ecological features: They have nursing colonies formed of hundreds of individuals during summer. They generally live sympatrically with *Myotis myotis* and *M. blythii*. When in the colony, they give off sounds similar to that of a chicken. They give birth to a single offspring each year. They host a rich composition of ectoparasites. *Nycteribia* (*Nycteribia*) *latreillii*, *Nycteribia* (*Nycteribia*) *s.schmidlii*, *Nycteribia* (*Acrocholidia*) *vexata* and *Basilia* (*Basilia*) *mongolensis nudior* were frequently encountered as bat fleas.

Specimens examined (14) and localities: Trabzon, Maçka, Bağışlı village, 6 ♀♀ (2 November 1993); Ordu, Yaraşlı village, 2 ♀♀, 4 ♂♂ (6 August 1994); Artvin, Borçka, Camili village, 1 ♀, 1 ♂ (15 September 1994).

Discussion

Helversen (1989) used a detector in his work for identifying species and recorded *Rhinolophus ferrumequinum*, *Myotis blythii*, *M. nattereri*, *Hypsugo savii*, *Eptesicus serotinus*, *Barbastella barbastellus*, *Miniopterus schreibersii*, *Tadarida teniotis* from the study area. Albayrak (1990) reported *Rhinolophus hipposideros*, *R. euryale*, *Myotis myotis*, *M. blythii*, *M. bechsteini*, *M. brandtii*, *Eptesicus serotinus*, *Pipistrellus pipistrellus* and *Miniopterus schreibersii* from the same area. Steiner collected the following bats between 1967 and 1969 from the same area and published the results with Gaisler 26 years later (Steiner and Gaisler, 1994): *Rhinolophus ferrumequinum*, *R. hipposideros*, *R. euryale*, *Myotis myotis*, *M. brandtii*, *Pipistrellus pipistrellus*, *Eptesicus serotinus*, *Nyctalus leisleri*, *Plecotus auritus*, *Barbastella barbastellus* and *Miniopterus schreibersii*. Benda and Horáček (1998) also recorded *Rhinolophus euryale*, *Myotis mystacinus*, *Eptesicus serotinus*, *Hypsugo savii*, *Pipistrellus pipistrellus*, *Pipistrellus kuhlii*, *Plecotus austriacus* and *Tadarida teniotis* in the same area. A total of 20 bat species have been recorded from the study area to date. The targeted species in this study, *Myotis schaubi*, *Eptesicus nilssonii* and *Eptesicus bottae ognevi*, were not encountered in the research area. However, a further extended study is needed to obtain more results about the occurrence of these species.

It is a well known fact that bats are disappearing due to habitat destruction. Some species that were recorded in previous studies were not encountered during this study.

It seems to be crucial that proper fences allowing only bats to enter and exit caves and dens as well as some shelters should be made available on the outer surfaces of buildings for bats.

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