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Researches on Bats of Ankara Province (Mammalia: Chiroptera)

by

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Researches on Bats of Ankara Province (Mammalia: Chiroptera)

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ABSTRACT

The aim of this study was to research the bat species and their distribution in the Ankara province from June 1974 to May 1976.

This study is based on a total of 265 specimens and related field notes. All external measurements and weights were taken in the flesh. The specimens were prepared in the field in conventional museum type.

Notes on habitat, colour and distribution of each species were recorded. The specimens were divided into three age groups: infant, juvenile and adult. The tables present only the measurement of the adult groups. The secondary sexual differences between adult males and females were examined statistically. Statistical comparisons were carried out only on the samples with adequate specimens. Keys were also prepared.

Our specimens include *Rhinolophus ferrumequinum*, *Rhinolophus hipposideros*, *Rhinolophus mehelyi*, *Myotis myotis*, *Myotis blythi*, *Pipistrellus pipistrellus*, *Pipistrellus savii*, *Eptesicus serotinus* and *Miniopterus schreibersi*.

This is the first record of *Pipistrellus savii* for Central Anatolia. However, its first record for Anatolia was from southern Turkey.

From the above species only *Rhinolophus ferrumequinum* and *Pipistrellus pipistrellus* were recorded earlier and all others are new records for the Ankara province.

INTRODUCTION

Most of the bat records of Turkey have been given from the regions near the national boundaries and the sea shores. Only a few species have been reported from the Central Anatolia. Two species are from the Ankara province (De Blase and Martin. 1974).

The aim of this study was to investigate the bats of the Ankara province properly.

MATERIAL and METHOD

The field work was made within the boundaries of the Ankara province (Fig. 1), between the june of 1974 and the May of 1976.

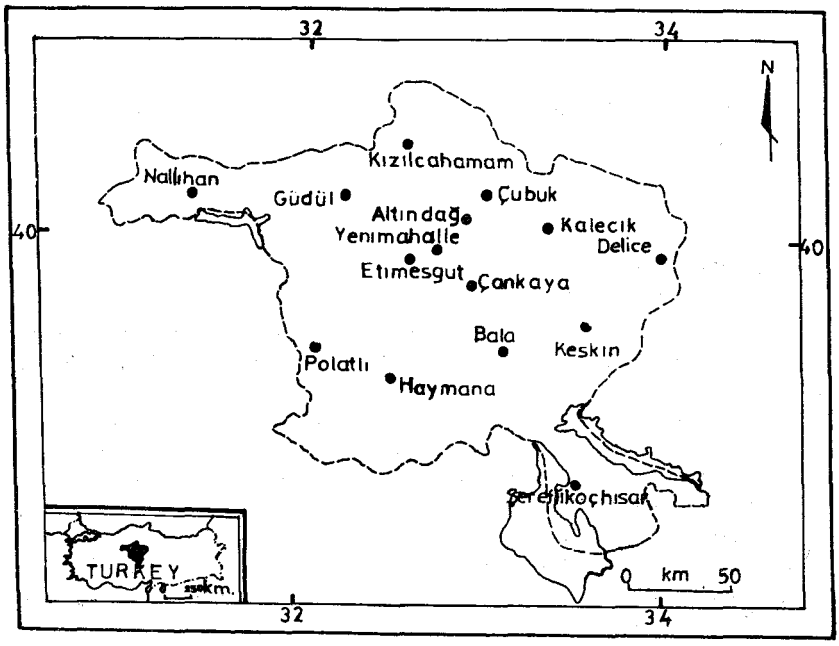

Figure 1. Map showing the Ankara province where this investigation was made.

About one hour before sunset, special bat-nets were stretched over the water and the entrances of the caves or dens. Some of the specimens in the caves were captured by using a hand net. Additionally, a few bats were obtained from the attics and the spaces between double windows of buildings.

The captured specimens were put into small special bags separately.

The specimens were prepared in the conventional museum type according to Mursaloğlu (1965) in the field.

The ectoparasites of the specimens (if present) were collected. The baculum and skulls were also preserved.

The material consists of 19 skulls without skins and 8 skins without skulls and 238 skulls with skins. All material is preserved in the mammalian collection of the Department of Biology, Faculty of Science, University of Ankara. Thus, this study is based on a total of 265 specimens of bats.

The specimens were divided into three age groups: infants, juveniles and adults, by considering the stages of fusion of epiphyses in the hand finger (Anderson, 1917; Young, 1975; Baagoe, 1977a, 1977b; Gaisler, Hanak and Dungel, 1979); the clearance of the sagittal crest in the skulls (Baagoe, 1977a, 1977b) and the degrees of wear in their molar and canine teeth (Anderson, 1917; Menzies, 1973; Gaisler, Hanak and Dungel, 1979) and finally the state of sexual maturity recorded in the field notes.

In addition to weight (in gr.), 6 external and 9 cranial measurements (in mm.) were also taken from each specimen according to Thomas (1905) and Harrison (1964). All measurements were recorded to the tenth of a millimeter by a caliper.

The description of the measurements are as follows:

Total length: Least distance from the tip of the nose to the end of the tail.

Length of tail: The distance from the beginning of the caudal vertebrate to the end of the tail.

Length of hindfoot: The distance from the tips of the longest claw of the right foot to the end point of the heel.

Length of ear: The distance from the base of meatus to the tip of auricula.

Length of forearm: The distance from the posteriormost point of ulna to the anteriormost point of the radius.

The greatest length of skull: Least distance between two vertical lines, one touching the posteriormost part of the skull above the foramen magnum and the other touching the anteriormost part of the nasal bones or inner incisors.

Condylobasal length: Least distance on skull from a line connecting the anteriormost projections of the premaxillary bones and the posterior tips of exoccipital condyls.

Length of maxillary tooth-row: The distance from the front of the upper canine to the back of the crown of the last molar (on the right jaw).

Length of mandibular tooth-row: The distance from the front of the lower canine to the back of crown of the lower molar (on the right jaw).

Length of mandible: The distance from the anteriormost tips of the inner incisors to the posteriormost tip of the mandible condyle (on the right).

Zygomatic breadth: Greatest distance of the outermost points of the zygomatic arches at right angles to the long axis of skull.

Interorbital constriction: The distance between the nearest points of orbital cavities.

Breadth of braincase: The width of the barincase at the posterior roots of the zygomatic arches.

Mastoid breadth: The breadth between the outermost points of the mastoidal projections.

In comparisons, the measurements from groups consisting of adult individuals were used. The statistically significant secondary sexual differnces were tested.

The statistic data (number of specimens (N), mean (M), standard deviation (Sd), minimum (Min.) and maximum (Max.) have been given in the tables.

Systematic order and Latin names of the taxa have been given according to Corbet (1978).

Keys for species were prepared. The species were studied in the following order.

Firstly, the original name of the species (date of publication and author's name), type locality; secondly, valid name of the species (date of publication and author's name); finally, the habitat, colour and

measurements of each specimen, the total number and localities in alphabetic order of examined individuals, the localuities of the species recorded hitherto from Turkey are given in the choronological order following account of each species.

The abbreviations belonging to literature were made according to "World List".

RESULTS

In the Ankara province, the ordo *Chircptera* is repsresented by two families, *Rhinolophidae* and *Vespertilionidae.*

Rhinolophidae is represented by only one genus, *Rhinolophus.*

Genus *Rhinolophus* Lacépéde, 1799

1799. *Rhinolophus* Lacépéde, Bern., Tableau des divisions, sous-divis., ordres et genres des Mammiferes etc., 15.

KEY TO SPECIES OF GENUS *RHINOLOPHUS* IN ANKARA

1. The upper project of sella rounded relatively 2

— The upper project of sella pointed relatively 3

2. The length of the upper and the lower projects of sella nearly equal; the tip of the lancet sharply acuminate (Fig. 2, A); condylobasal length 19.6 to 21 mm.; zygomatic breadth 11.4 to 12.6 mm. ..... *Rhinolophus ferrumequinum*
– *The* up properject of sella longer than the lower project; the tip of the lancet gradually pointed (Fig. 2, B); condylobasal length 13.5 to 14.0 mm.; zygomatic breadth 7.0 to 7.6 mm. ..... *Rhinolophus hipposideros*

3. The upper project of sella longer than the lower project; the tip of the lancet sharply acuminate (Fig. 2.C); condylobasal length 17.2 to 17.5 mm.; zygomatic breadth 10.4 to 10.5 mm. ..... *Rhinolophus mehelyi*

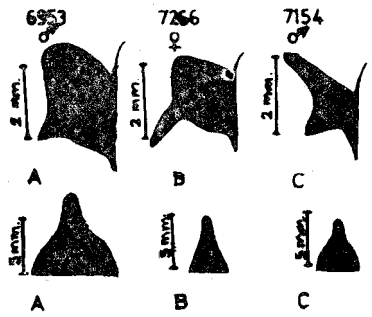

Fig 2. Above lateral view of sella, below frontal view of lancet; *Rhinolophus ferrumequinum* (A), *Rhinolophus hipposideros* (B), *Rhinolophus mehelyi* (C).

Rhinolophus ferrumequinum (Schreber, 1774)

1774. *Vespertilio ferrum-equinum* Schreber, Saugeth. 1 (53): 174. Type locality: Burgunday, France.

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

Habibat: The specimens were obtained from caves within big stone cracks and water tunnels laid by stones.

Colour: The dorsal colour of the specimens collected in April, May, July, August, October and November varies from a buff grey-brown to grayish brown. The ventral colour is lighter than that of the dorsal.

Measurements: See Table 1.

Table 1. The statistical data of external and cranial measurements of *R. ferrumequinum*

	N	M	Sd	Min.	Max.
Total length	30	108.2	4.00	100.0	115.0
Body length	30	73.2	1.98	7.00	77.0
Length of tail	30	35.0	3.34	28.0	42.0
Length of hindfoot	30	13.2	1.19	10.0	15.0
Length of ear	30	24.6	2.10	18.0	26.0
Length of forearm	29	54.2	1.29	51.5	56.8
Greatest length of skull	14	23.8	0.47	23.0	24.5
Condylobasal length	29	20.3	0.32	19.6	21.0
Length of maxillary tooth-row	29	8.5	0.18	8.1	8.9
Length of mandibular tooth-row	29	9.1	0.20	8.8	9.6
Length of mandible	28	15.8	0.32	15.0	16.8
Zygomatic breadth	30	12.0	0.26	11.4	12.6
Interorbital constriction	30	2.7	0.14	2.5	2.9
Breadth of braincase	30	9.1	0.21	8.6	9.5
Mastoid breadth	30	10.4	0.17	10.1	11.0
Weigth	26	21.9	4.19	14.7	28.0

There is no statistically significant differences between males and females of *R. ferrumequinum*.

Specimens examined: Total number, 47 from the following localities: Ankara: Altındağ, Etlik, 2 kilometres northwest of Ovacık village, İnler locality, 5; Keskin, Ceritkale village, Tıhraz, 1, and Kırıkkapı cave, 5, and Sulumağara, 3; Kızılcahamam, Otacıköy, Karacinkayalığı, 10, and Çeltikçi, Aşağıhöyük village, İnlihan, 14; Yenimahalle, 1 kilometers West of Kesiktaş Station, 1, and 4 kilometers South-West of Yenikent, 8.

The localities of *R. ferrumequinum* hitherto recorded in Turkey: İzmir (Doria, 1887); Anatolia (Cheesman, 1921); Şile and Agva near İstanbul (Strinati, 1959); Niksar near Tokat, Narlıca village near Antakya (Kahmann and Çağlar, 1960); Karadağ southeast of Konya and Scalita south of Trabzon (Osborn, 1963); Mount Habibinecar near Antakya, Saklı village near Beykoz, Şile near İstanbul, Rize, Akropolis near Bergama, Taşucu near Silifke, Karaçam village near Adapazarı, Çaykışla near Afyon, Sarıkaya near Gerede, Farilya village and Filyos near Zonguldak, Havran near Balıkesir (Çağlar, 1965); Haruniye near Adana, Yenikışla village near Tarsus (Lehmann, 1966); Çatalar, Yalnız and Finike near Antalya (Corbet and Morris, 1967); Ceylanpınar near Urfa (Lehmann, 1969); Gümüldür near İzmir (Spitzenberger, 1973); 8 kilometers east of Lake Eymir near Ankara and the Tower of Fort Rummel Hisar at İstanbul (De Blase and Martin, 1974); Eskipazar near Çankırı, 10 kilometers North of Bolu, Kuşini, cave at İnkaya near Bursa, Ilıca Farm and Havran near Balıkesir, Yüksek Çobanisa near Manisa and Ahmetbeyli, Bergama, Bornova and Gümüldür near İzmir, Anamas near Isparta, Kaya near Fethiye (Felten, Spitzenberger and Storch, 1977).

Rhinolophus hipposideros (Bechstein, 1800)

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

Type locality: France

1857. *Rhinolophus hipposideros*, Blasius, Saugeth., Deutschlands, 29.

Habitat: Only three specimens were obtained from a water tunnel laid by stones.

Colour: The dorsal colour of the specimens collected in August is slightly smoky, grayish-brown. The ventral colour is lighter dirty grayish-brown.

Measurements: See Table 2.

In Table 2, the statistical data of three males are given.

Table 2. The statistical data of external and cranial measurements of *R. hipposideros*

	N	M	Sd	Min.	Max.
Total length	3	72.0	2.65	70.0	75.0
Body length	3	43.3	1.53	42.0	45.0
Length of tail	3	28.7	1.16	28.0	30.0
Length of hindfoot	3	8.0	0.00	8.0	8.0
Length of ear	3	16.7	0.58	16.0	17.0
Length of forearm	3	36.5	0.78	36.0	37.4
Greatest length of skull	3	16.1	0.36	15.8	16.5
Condylobasal length	3	17.3	0.25	13.5	14.0
Length of maxillary tooth-row	3	5.3	0.12	5.2	5.4
Length of mandibular tooth-row	3	5.5	0.00	5.5	5.5
Length of mandible	3	9.9	0.06	9.9	10.0
Zygomatic breadth	3	7.3	0.31	7.0	7.6
Interorbital constriction	3	1.5	0.15	1.4	1.7
Breadth of braincase	3	6.2	0.15	6.1	6.4
Mastoid breadth	3	7.4	0.21	7.2	7.6
Weight	3	4.3	0.29	4.0	4.5

Specimens examined: Total number, 3 from the following localities: Ankara: Yenimahalle, 4 kilometers southwest of Yeniket, 3.

The localities of *R. hipposideros* hitherto recorded in Turkey: İzmir (Doria, 1887); Van (Anderson, 1905); Şile near İstanbul (Strinati, 1959); Sivrikale and Lamgo village near Rize, Kemalpaşa near İzmir, Kirazlıyayla-Uludağ near Bursa Farilya village near Bodrum, Saz village near Zonguldak, Çankırı, Trabzon, Van (Çağlar, 1965); Haruniye near Adana (Lehmann, 1966); Ahmetbeyli and Bornova near İzmir, Dereköy near Denizli, İçmepınarı at Arak village of Şarkikaraağaç near Isparta, Konya (Felten, Spitzenberger and Storch, 1977).

Rhinolophus mehelyi Matschie, 1901

1901. *Rhinolophus mehelyi* Matschie, Sitz. Ber. Ges. Natf. Frde, Berlin, 225.

Type locality: Bucharest, Roumania.

Habitat: The specimens were obtained from a deep natural well and found together with *Myotis myotis* and *Miniopterus schreibersi*.

Colour: The dorsal colour of the specimens collected in July and October varies from very slightly straw brown to very light grayish brown. The ventral colour varies from almost whitish cream-buff to only cream-buff.

Measurements: See Table 3.

In Table 3, the statistical data of three males are given.

Table 3. The statistical data of external and cranial measurements of *R. mehelyi*.

	N	M	Sd	Min.	Max.
Total length	3	95.7	11.60	88.0	109.0
Body length	3	64.3	4.04	60.0	68.0
Length of tail	2	26.5	2.12	25.0	28.0
Length of hidnfoot	3	12.7	1.53	11.0	14.0
Length of ear	3	24.3	1.53	23.0	26.0
Length of forearm	3	49.2	0.81	48.6	50.1
Greatest length of skull	3	20.3	0.29	20.0	20.5
Condylobasal length	3	17.3	0.15	17.2	17.5
Length of maxillary tooth-row	3	6.9	0.06	6.8	6.9
Length of mandibular tooth-row	3	7.2	0.06	7.1	7.2
Length of mandible	3	13.0	0.15	12.9	13.2
Zygomatic breadth	3	10.5	0.06	10.4	10.5
Interorbital constriction	3	2.6	0.10	2.5	2.7
Breadth of braincase	3	8.7	0.06	8.7	8.8
Mastoid breadth	3	9.8	0.06	9.7	9.9
Weight	2	10.6	0.53	10.2	11.0

Specimens examined: Total number, 3 from the following localities: Ankara: Kalecik, 4 kilometers South-East of Çandır, 2; Keskin, Sulumağara, 1.

The localities of *R. mehelyi* hitherto recorded in Turkey: Narlıca village near Antakya, İnceğiz near İstanbul (Kahmann and Çağlar, 1960); Harbiye near Antakya (Kahmann, 1962); Gökçeli near Çatalca and Yarımburgaz near İstanbul, Senpiyer near Antakya, Havran near Balıkesir, Emirdağ near Afyon (Çağlar, 1965); Ilıca Farm near Balıkesir, Dereköy near Denizli, İnsuyu cave in Burdur (Felten, Spitzenberger and Storch, 1977).

Genus *Myotis* Kaup, 1829

1829. *Myotis* Kaup, Skizz. Europ. Thierw., 1: 106.

KEY TO SPECIES OF GENUS *MYOTIS* IN ANKARA

1 (2). Condylobasal length 23.5 to 24.7 mm.; zygomatic breadth 15.4 to 15.9 mm.; length of maxillary tooth-row 10.2 to 10.6 mm.; length of mandibular toothrow 10.8 to 11.5 mm.; mastoid breath 11.0 to 11.2 mm,; length of lower jaw 18.9 to 19.5 mm. ..... *Myotis myotis*

2 (1). Condylobasal length 20.1 to 22.0 mm.; zygomatic breadth 13.1 to 14.3 mm.; length of maxillary tooth-row 8.6 to 9.4 mm.; length of mandibular tooth-row 9.1 to 10.0 mm.; mastoid breadth 9.8 to 10.6 mm.; length of lower jaw 15.9 to 17.7 mm. ..... *Myotis blythi*

Myotis myotis (Borkhausen, 1797)

1797. *Vespertilio myotis* Borkhausen, Deutsche Faune, 1: 80. Type locality: Germany.

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

Habitat: The specimens were obtained from caves and a deep well. The flights of this species began nearly one half hour after dusk.

Colour: The dorsal colour of the specimens collected in May, July, Augus and October varies from a pale yellowish, brownishgray to smoky-gray. The ventral colour is ligth dirty-whitish or lighter yellowish dirty-whitish.

Measurements: See Table 4.

There is no statistically significant differences between males and females of *M. myotis*

Specimens examined: Total number, 34 from the following localities: Ankara: Polatlı, Uzunbeyli village, 4; Kalecik, 4 kilometers southeast of Çandır, 23; Çubuk, Ballık, Miyriköy, Miyrendağı, 4; Kızılcahamam, Pazar, Otacıköy, Karacinkayalığı, 3.

Table 4. The statistical data of external and cranial measurements of *M. myotis*.

	N	M	Sd	Min.	Max.
Total length	12	136.3	7.45	123.0	145.0
Body length	12	87.2	6.52	76.0	96.0
Length of tail	12	49.2	2.21	46.0	53.0
Length of hindfoot	12	16.7	1.07	15.0	18.0
Length of ear	12	27.5	0.90	26.0	29.0
Length of forearm	12	61.8	1.30	60.0	63.6
Greatest length of skull	12	25.6	0.33	25.0	26.0
Condylobasal length	12	24.1	0.29	23.5	24.7
Length of maxillary tooth-row	12	10.4	0.14	10.2	10.6
Length of mandibular tooth-row	12	11.1	0.18	10.8	11.5
Length of mandible	11	19.2	0.23	18.9	19.5
Zygomatic breadth	11	15.6	0.18	15.4	15.9
Interorbital constriction	12	5.2	0.12	5.1	5.5
Breadth of braincase	12	10.4	0.15	10.0	10.5
Mastoid breadth	12	11.1	0.10	11.0	11.2
Weight	8	28.3	2.78	24.0	32.0

The localities of *M. myotis* hitherto recorded in Turkey: Aralık near Ararat (Satunin, 1912); Anadolu (Zimmermann, 1953); Harbiye near Antakya, Küçükçekmece and Gökçeli near İstanbul, Birecik near Urfa (Kahmann and Çağlar, 1960); Yarımburgaz near İstanbul, Saklı village near Beykoz, Kireçhane and Akçaabat near Trabzon, Bilecik, Havran near Balıkesir, Zeytinlik village near Denizli, Emirdağ near Afyon Ortaköy near Yalova (Çağlar, 1965); Kızıltabya in Mersin (Lehmann, 1966); Finike near Antalya (Corbet and Morris, 1967); Teleferik pit near Bursa (Çağlar, 1969); Halkalı and Küçükçekmece near İstanbul (DeBlase and Martin, 1974); İnsuyu cave in Burdur, Anamas near Isparta, Konaklı, Kaş and İncekum near Antalya (Felten, Spitzenberger and Storch, 1977).

Myotis blythi (Tomes, 1857)

1857. *Vespertilio blythi* Tomes, Proc. Zool Soc., London, 53. Type locality: Nasirabat, Rajputana, India.

1951. *Myotis blythi*, Ellerman and Morrison-Scott, Checklist of Palaearctic and Indian Mammals 1758 to 1946. Brit. Mus. (Nat. Hist.), London, 145.

Habitat: The specimens were mostly obtained from caves and deep wells.

Colour: The dorsal colour of the specimens collected in May, July and October is yellowish gray brown. The ventral colour is dirty white and sometimes with a grayish admixture.

Measurements: See Table 5.

There is no statistically significant differences between males and females of *M. blythi*.

Table 5. The statistically data of external and cranial measurements of *M. blythi*.

	N	M	Sd	Min.	Max.
Total length	27	123.0	4.94	109.0	132.0
Body length	27	73.3	3.92	64.0	83.0
Length of tail	26	50.1	2.35	45.0	54.0
Length of hindfoot	27	15.1	0.83	14.0	17.0
Length of ear	27	23.5	1.12	22.0	26.0
Length of forearm	26	56.1	2.25	52.0	59.6
Greatest length of skull	30	22.3	0.47	21.6	23.6
Condylobasal length	30	21.0	0.43	20.1	22.0
Length of maxillary tooth-row	30	9.0	0.22	88.6	9.4
Length of mandibular tooth-row.	30	9.6	0.24	9.1	10.0
Length of mandible	29	16.7	0.41	15.9	17.7
Zygomatic breadth	26	13.9	0.28	13.1	14.3
Interorbital constriction	30	5.3	0.16	4.9	5.6
Breadth of braincase	30	9.8	0.20	9.5	10.2
Mastoid breadth	30	10.2	0.20	9.8	10.6
Weiht	5	23.9	4.66	16.3	28.0

Specimens examined: Total number, 45 from the following localities: Ankara: Çubuk, Ballık, Miyriköy, Miyrendağı, 25; Kalecik, 4 kilometers southeast of Çandır, 4; Kızılcahamam, Pazar, Otacıköy, Karacinkayalığı, 16.

The localities of *M. blythi* hitherto recorded in Turkey: Antakya (Harrison, 1964); Narlıca village and Dermaçta village-Harbiye near Antakya, Yarımburgaz, Gökçeli, Çatalca near İstanbul, Akslepion-Bergama near İzmir, Miletus, Söke near Aydın, Çermik near Diyarbakır, Gebze near İzmit (Çağlar, 1965); Van, Tatvan near Bitlis, Halkalı and Küçükçekmece near İstanbul (DeBlase and Martin, 1974); Anamas near Isparta Lake Manyas near Balıkesir, Kaş near Antalya (Felten, Spitzenberger and Storch, 1977).

Genus *Pipistrellus* Kaup, 1829

1829. *Pipistrellus* Kaup, Skizz. Europ. Thierw. 1: 98.

KEY TO SPECIES OF GENUS *PIPISTRELLUS* IN ANKARA

1 (2). Upper first premolars developed visible in side; canines contact with first premolar; condylobasal length 11.5 to 11.7 mm.; length of maixllary tooth-row 4.1 to 4.3 mm.; length of mandibular tooth-row 4.4 to 4.5 mm.; mastoid breadth 6.5 to 6.7 mm.; length of lower jaw 8.0 to 8.4 mm.; body length 72.0 to 81.0 mm. .... *Pipistrellus pipistrellus*

2 (1). Upper first premolars very rudimentary and invisible in side; canines contact with second premolars; condylobasal length 12.9 to 13.8 mm.; length of maxillary tooth-row 4.5 to 4.8 mm.; length of mandibular tooth-row 4.8 to 5.2 mm.; mastoid breadth 7.1 to 7.5 mm.; length of lower jaw 9.2 to 9.9 mm.; body length 83.0 to 105.0 mm. .... *Pipistrellus savii*

Pipistrellus pipistrellus (Schreber, 1774)

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

Type locality: France

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

Habitat: The specimens were obtained in a space between the double windows in some buildings.

Colour: The dorsal colour of the specimens collected in February, May, June, August and September varies from dark brown to brown.

The ventral colour is smoky or light brown.

Measurements: See Table 6.

There is no statistically significant differences between only one male and females of *P.pipistrellus*

Table 6. The statistical data of external and cranial measurements of *P. pipistrellus*.

	N	M	Sd	Min.	Max.
Total length	5	77.2	3.70	72.0	81.0
Body length	5	46.4	2.10	42.0	50.0
Length of tail	5	30.8	1.64	29.0	33.0
Length of hindfoot	5	6.8	0.84	6.0	8.0
Lenth of ear	5	10.3	0.67	9.5	11.0
Length of forearm	6	29.1	0.65	28.0	29.8
Greatest length of skull	4	12.1	0.10	12.0	12.2
Condylobasal length	4	11.6	0.10	11.5	11.7
Length of maxillary tooth-row	5	4.2	0.07	4.1	4.3
Length of mandibular tooth-row	4	4.4	0.05	4.4	4.5
Lenth of mandible	5	8.2	0.16	8.0	8.4
Zygomatic breadth	1	7.2	0.00	7.2	7.2
Interorbital constriction	5	3.4	0.11	3.2	3.5
Breadth of braincase	5	6.0	0.18	5.8	6.2
Mastoid breadth	4	6.6	0.10	6.5	6.7
Weight	4	3.9	1.03	2.5	5.0

Specimens examined: Total number, 6 from the following localities: Ankara: Çankaya, 1; Beşevler, University of Ankara, Faculty of Science, 4; Güdül, 1.

The localities of *P. pipistrellus* hitherto recorded in Turkey: Anatolia (Zimmermann, 1953); Bebek near İstanbul (Osborn, 1963); Çatalca, Vaniköy, Vezneciler, Tuzla and Zekeriya village near İstanbul, Fethiye near Muğla, Serik near Antalya, Gelibolu near Çanakkale, Başkarcı near Denizli, Pınarhisar near Kırklareli, İzmir, Çankırı (Çağlar, 1965); Bedirge near Antakya (Lehmann, 1966); Finike near Antalya (Corbet and Morris, 1967); Ankara (DeBlase and Martin, 1974).

Pipistrellus savii (Bonaparte, 1837)

1837. *Vespertilio savii* Bonaparte, Faun. Ital., 1 (20). Type locality: Pisa, Italy

1910. *Pipistrellus savii* and *Pipistrellus savii ochromixtus*, Trouessart, Faune des Mammiferes d'Europe, Berlin, 13–14.

Habitat: As with the *P. pipistrellus*, the specimens were also obtained between the double windows of some buildings.

Colour: The dorsal colour of the specimens collected in March, May, June, August and September is a ligth yellowish smoky-brown or dull brownish cream-buff. The ventral colour is smoky or whitish gray.

Measurements: See Table 7.

In this species, the females are significantly larger than the males in the length of the forearm statistically.

Table 7. The statistical data of external and cranial measurements of *P. savii.*

♂♂	N	M	Sd	Min.	Max.
Total length	12	90.5	4.01	83.0	99.0
Body lenght	12	56.2	2.44	52.0	61.0
Length of tail	12	34.3	2.49	30.0	38.0
Length of hindfoot	11	8.3	0.98	7.0	9.0
Length of ear	12	12.0	1.81	7.0	14.0
Length of forearm	15	31.9	0.78	30.2	33.1
Greatest length of skull	11	13.8	0.22	13.4	14.1
Condylobasal length	11	13.4	0.30	12.9	13.8
Length of maxillary tooth-row	11	4.7	0.09	4.5	4.8
Length of mandibular tooth-row	11	5.0	0.09	4.8	5.1
Length of mandible	11	9.6	0.19	9.2	9.8
Zygomatic breadth	9	8.6	0.21	8.1	8.8
Interorbital constriction	11	3.6	0.12	3.4	3.8
Breadth of braincase	11	6.6	0.14	6.4	6.9
Mastoid breadth	11	7.3	0.12	7.0	7.4
Weight	11	5.6	0.92	4.0	7.0

Specimens examinend: Total number, 25 from the following localities: Ankara: University of Ankara, Faculty of Science, 25.

The localities of *P. savii* hitherto recorded in Turkey: Tarsus (Osborn, 1963).

This is the first record of the *P. savii* for Central Anatolia.

Genus *Eptesicus* Rafinesque, 1820

1820. *Eptesicus*, Rafinesque, Annals of Nature, 2.

The *Eptesicus* is represented in the Ankara province by only one species, *Eptesicus serotinus.* According to Miller (1912), Harrison (1964) and Corbet (1978), one specimen obtained from Ankara belongs to *E. serotinus.*

Eptesicus serotinus (Scherber, 1774)

1774. *Vespertilio serotinus* Schreber, Saugeth., 1 (53): 167.

Type locality: France

1900. *Eptesicus serotinus*, Mehely, Monogr. Chiropt. Hungariae, Budapest, 209.

Table 8. The statistical data of external and cranial measurements of *P. savii*

♀♀	N	M	Sd	Min.	Max.
Total length	5	94.8	6.57	89.0	105.0
Body length	5	60.0	5.34	55.0	69.0
Lenth of tail	5	34.8	2.39	31.0	37.0
Length of hindfoot	5	8.6	0.65	8.0	9.5
Length of ear	5	12.5	1.12	11.0	14.0
Length of forearm	5	33.3	0.44	32.8	33.8
Greatest length of skull	5	13.9	0.41	13.3	14.3
Condylobasal length	5	13.4	0.29	13.0	13.7
Length of maxillary tooth-row	5	4.7	0.04	4.7	4.8
Length of mandibular tooth-row	5	5.0	0.16	4.8	5.2
Length of mandible	5	9.7	0.17	9.5	9.9
Zygomatic breadth	3	8.7	0.15	8.6	8.9
Interorbital constriction	5	3.5	0.17	3.4	3.8
Breadth of braincase	5	6.6	0.17	6.5	6.9
Mastoid breadth	5	7.4	0.17	7.1	7.5
Weight	5	5.4	1.08	4.5	7.0

Habitat: This single specimen was obtained in the attic of a house.

Colour: The dorsal colour of the only one specimen collected in July is brown. The ventral colour is brown with a light buff.

Measurements: See Table 9.

Specimen examined: Total number, 1 from the following local-ities: Ankara: Bahçelievler, 1.

The localities of *E. serotinus* hitherto recorded in Turkey: İsafakir near Yozgat (Danford and Alston, 1877); Karsgebeit (Satunin. 1912);

Table 9. The external and cranial measurements of one male specimen are as follow

Total length	110.0
Body length	70.0
Length of tail	40.0
Length of hindfoot	11.0
Length of ear	19.0
Length of forearm	59.8
Greatest length of skull	20.5
Condylobasal lenght	19.2
Length of maxillary tooth-row	7.5
Length of mandibular tooth-row	8.2
Length of mandible	15.0
Zygomatic breadth	12.8
Interorbital constriction	4.4
Breadth of braincase	9.3
Mastoid breadth	10.4
Weight	—

Karsgebeit (Bobrinski and et al., 1944); İstanbuldere billage near Adapazarı (Çağlar, 1965).

Genus *Miniopterus*, Bonaparte, 1837

1837. *Miniopterus* Bonaparte, Iconogr. Fauna Ital., 1 (20).

The *Miniopterus* is represented in the Palaearctic Region by only one species, *Miniopterus schreibersi*.

Miniopterus schreibersi (Kuhl, 1819)

1819. *Vespertilio schreibersi* Kuhl, Ann. Wetterau Ges. Naturk., 4 (2): 185.

Type locality: Kulmbazer cave, South Banat Mountains, Hungariae.

1857. *Miniopterus schreibersii*, Blasius Saugeth. Deutschland, 46–48.

Habitat: These specimens were obtained from a big colony in a deep well.

Colour: The dorsal colour of the specimens collected in May, July and September is very light grayish-brown or smokybrown. The ventral colour is smoky gray with a light brownish or gray.

Measurements: See Table 10.

There is no statistically significant differences between males and females of *Miniopterus schreibersi*.

Specimens examined: Total number, 101 from the following localities: Ankara: Çubuk, Ballık, Miyriköy, Miyrendağı, 13; Kalecik, 4 kilometers southeast of Çandır, 62; Kızılcahamam, Otacıköy, Karacinkayalığı, 26.

The localities of *M. schreibersi* hitherto recorded in Turkey: Şile near İstanbul, İnkaya near Bursa (Strinati, 1959); Narlıca village near Antakya, Küçükçekmece near Zonguldak (Kahmann and Çağlar, 1960); Yarımburgaz, Gökçeli-Çatalca near İstanbul ,Harbiye near Antakya, Kireçhane and Akçaabat near Trabzon, Anamur near Mersin Bilecik, Havran near Balıkesir, Demirköy near Kırklareli, Zeytinlik and Fındık

Table 10. The statistical data of external and cranial measurements of *M. schreibersi*.

	N	M	Sd	Min.	Max.
Total length	34	115.1	5.85	104.0	124.0
Body length	34	65.6	6.24	51.0	78.0
Length of tail	34	49.5	2.84	42.0	55.0
Length of hindfoot	34	11.2	0.88	10.0	13.0
Length of ear	33	10.5	0.83	8.0	12.0
Length of forearm	31	44.0	0.60	42.8	45.0
Greatest length of skull	35	15.5	0.16	15.2	15.9
Condylobasal length	35	15.0	0.17	14.6	15.3
Length of maxillary tooth-row	36	6.0	0.08	5.8	6.2
Length of mandibular tooth-row	36	6.4	0.12	6.1	6.6
Length of mandible	35	11.0	0.13	10.7	11.3
Zygomatic breadth	24	8.6	0.10	8.4	8.7
Interorbital constriction	35	3.7	0.09	3.5	4.0
Breadth of braincase	36	7.9	0.12	7.7	8.1
Mastoid breadth	30	8.7	0.13	8.4	9.0
Weight	27	10.8	1.58	8.5	15.0

mountain near Denizli, Farilya village near Bodrum, İnkaya village near Bursa (Çağlar, 1965); Haruniye near Adana (Lehmann, 1966); Finike near Antalya (Corbet and Morris, 1967); Çayırdere-Ergani near Diyarbakır, İstanbul (DeBlase and Martin, 1974).

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ÖZET

ANKARA İLİ YARASALARI ÜZERİNE ARAŞTIRMALAR

Türkiye'den şimdiye kadar 25 tür yarasa kaydı verilmesine karşılık Orta Anadolu Bölgesinden çok az, Ankara ilinden ise sadece iki yarasa türü kaydedilmişti. Bu nedenle Ankara il sınırları içindeki yarasa türlerini tesbit etmek üzere bu çalışma yapılmıştır.

Bu çalışmada, kolleksiyonda bulunan 99 örnekle birlikte, 146 sı 1974 ve 1976 yılları arasında, 20 si de 1976 dan sonra tarafımdan toplanmış toplam 265 yarasa örneği incelenmiştir.

Her örnekten, arazide dört standart ölçü ile birlikte ağırlık kaydedilmiştir. Ektoparazitler alanırak örnekler standart müze araştırma örneği tipinde hazırlanmışlardır. Baş iskeletleri ve baculumları da muhafaza edilmiştir.

Örnekler yavru, genç ve ergin olmak üzere üç yaş grubuna ayrılmıştır. Her türde ergin grubun erkek ve dişileri arasında istatistiki önemde bir farklılığın olup olmadığı araştırılarak karşılaştırmalar ona göre yapılmış, istatistiki veriler tablolar halinde düzenlenmiştir.

Araştırma sonuçlarına göre Ankara il sınırları içinde 9 yarasa türü; *Rhinolophus ferrumequinum*, *R. hipposideros*, *R. mehelyi*, *Myotis myotis*, *M. blythi*, *Pipistrellus pipistrellus*, *P. savii*, *Eptesicus serotinus* ve *Miniopterus schreibersi*'nin yaşadığı tesbit edilmiştir.

Bu türlerden ikisi, *R. ferrumequinum* ve *P. pipistrellus* daha önce kaydedilmişlerdi. Bir tür yarasa, *P. savii* Orta Anadolu Bölgesi, diğer kalan altı tür yarasa da Ankara lii için ilk kayıtlardır.

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