

## The Status of *Barbastella barbastellus* in the Caucasus

### Die Bestandssituation von *Barbastella barbastellus* im Kaukasus

### Statut de *Barbastella barbastellus* dans le Caucase

By IRINA K. RAKHMATULINA, Baku

#### Summary

The data is given on the *Barbastella barbastellus*' distribution and some ecological observations in the Caucasus. Only single specimens were revealed on the whole territory and in all seasons from the end of the 19th century. Most animals have been verified by the author on the N-E and S-E of Transcaucasia. The *Barbastella* bats is encountered from the sea level to 2000 m and more.

In the region under study *Barbastella barbastellus* is met mainly in the lowland and mountain forests. They were found in the various man-made constructions in the warm period and in the cold one in the caves and chinks of buildings.

#### Zusammenfassung

Die Daten geben Auskunft zur Verbreitung von *Barbastella barbastellus* und zu einigen ökologischen Beobachtungen dieser Art im Kaukasus. Seit Ende des 19. Jahrhunderts wurden im gesamten Gebiet zu allen Jahreszeiten nur einzelne Exemplare entdeckt. Die Verfasserin konnte die meisten Exemplare im N-O und S-O des Transkaukasus nachweisen. Mopsfledermäuse werden in Höhen zwischen 0 und 2000 m NN angetroffen.

Im Untersuchungsgebiet lebt die Mopsfledermaus hauptsächlich im Flachland und in Gebirgswäldern. In der warmen Periode wurde sie in verschiedensten von Menschen geschaffenen Bauwerken, in der kalten in Höhlen und Gebäudespalten gefunden.

#### Résumé

Les données renseignent sur la répartition de *Barbastella barbastellus* et fournissent quelques observations sur l'écologie de l'espèce dans le Caucase. Depuis la fin du 19e siècle, seuls des individus isolés y ont été observés. L'auteur a effectué la plupart des observations au nord-ouest et au sud-ouest de la Transcaucasie. Les *Barbastelles* ont été rencontrées entre 0 et 2000 m d'altitude. Dans la zone d'étude, la *Barbastelle* vit principalement dans les forêts de plaine et de montagne. Pendant la saison chaude, elle se rencontre dans différentes constructions humaines,

et pendant l'hiver, dans les grottes et les fissures de bâtiments.

#### Introduction

The end of the south-eastern part of the *Barbastella barbastellus*' area passes through Transcaucasia. This species is known to the south only from the eastern Pontic Region of Turkey (STEINER, GAISLER, 1994). It may also occur in Iranian Azerbaijan and the Elbruz (DEBLASE, 1980).

It is one of the rare bats of the Caucasian Isthmus. The goal of this article is to give all data about *Barbastella barbastellus* in the region.

#### Material and Methods

The work is a result of generalization of different literary information (monographs, journals and other publications), collections of the basic museums of the former USSR, and the author's own material gathered on the territory of Eastern Transcaucasia since 1966 (RAKHMATULINA, 1996).

The standard methods of field observation, collecting and working upon bats were used (KUZYAKIN, 1950). Only adult individuals were collected in the Isthmus. The degree of an authenticity (P) was estimated according to SNEDEKOR (1961). The difference is authentic P lesser than 0.05.

#### Results and discussion

*Barbastella barbastellus* is known for the Caucasus since the 19th century (SATUNIN 1915). Single specimens had been discovered on the whole territory, except for Eastern Transcaucasia (SATUNIN 1915, VERESHAGIN 1959). This species was unknown for Armenia and Azerbaijan till my researches (DAL 1954, VERESHAGIN

1959). When I was examining a collection of the Georgian State Museum I found out that three specimens were erroneously named as *Myotis emarginatus* (from Ter-Ter) and *Pipistrellus pipistrellus* (from Adzhikend and Yerevan Province).

Thus, *Barbastella barbastellus* had been practically revealed in all the Caucasus till the thirties of the 20th century. In the second part of this period the number of findings significantly increased, especially in Eastern Transcaucasia (RAKHMATULINA 1988, 1989).

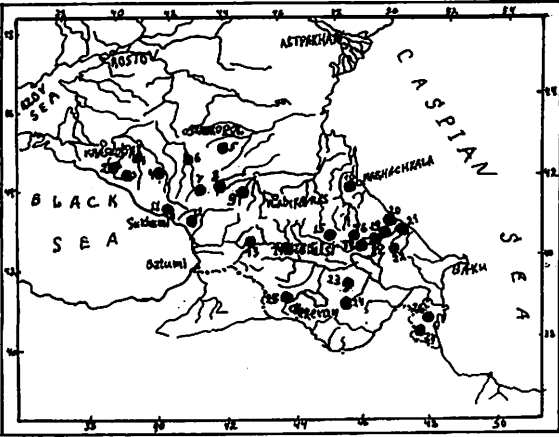


Figure 1. Points of *Barbastella barbastellus* findings in the Caucasus

Abb. 1. Nachweise von *Barbastella barbastellus* im Kaukasus

Graph. 1. Observations de *Barbastella barbastellus* dans le Caucase

N°	Localities	Altitude (m a.s.l.)	Sources
1.	Krasnodar district, Maykop region, Khodzokh village	500-700	KASAKOV & GARLIKOVA, 1973; VERESHAGIN, 1959
2.	Krasnodar dis., Lago-Naki reg.	1.600	DUVAROVA, 1980
3.	Caucasian Reserve	about 1.000	KORMILITZINA, 1982
4.	Psebay of Krasnodar dist.	about 1.000	DUVAROVA, 1980; SATUNIN, 1915
5.	Vicinity of Pyatigorsk	500-700	TEMBOTOV, 1972
6.	The place of confluence of the Big and Lesser Laba rivers of Krasnodar dist.	500-600	VERESHAGIN, 1959
7.	Upper of the Laba river	above 2.000	TEMBOTOV, 1972
8.	Kabardino-Balkariya, Verkhniy Chegem vil.	about 1.500	Collection of Zoology Museum of Moscow University
9.	North Osetia, Alagir, Dzivgis vil., the valley of Fiagdon river	about 1.500	KURYATNIKOV et. al., 1987; VERESHAGIN, 1959
10.	Vicinity of Makhachkala	0-500	VERESHAGIN, 1959
11.	Sukhumi, vicinity	0-500	SATUNIN, 1915; Collection of Georgian State Museum
12.	Mzinty of the former Chernomorsk Province		Collection of Zoology Museum of Moscow University
13.	Borzhomi vicinity		SATUNIN, 1915; Collection of Georgian State Museum
14.	Tbilisi vicinity		SATUNIN, 1915; Collection of Georgian State Museum
15.	Zakatala, Dzhari village	550	Author's own data
16.	Kabala	800	Author's own data
17.	Kabala region, Khasra vil.	450	Author's own data
18.	Ismaily reg., Kaladzhik vil.	1.200	Author's own data
19.	Kuba reg., Rustov vil.	800	Author's own data
20.	Khachmas reg., vic. Yalama station	0	Author's own data
21.	Khachmas reg. Nabran vil.	0	Author's own data
22.	Shemakha reg., Kaladarya vil.	800	Author's own data
23.	Adzhikend	700	Collection of Georgian State Museum
24.	Shusha, Ter-Ter	1.300	Collection of Georgian State Museum
25.	Yerevan	1.000	Collection of Georgian State Museum
26.	Lenkoran reg., Haftoni vil.	60	Author's own data
27.	Lerik reg., Nyuvedi, Gosmalyan, Amburdarya villages	1.500	Author's own data

Table 1. Points of *Barbastella barbastellus* findings

Tab. 1. Lokalitäten der Nachweise von *Barbastella barbastellus*

Tableau 1. Localisations des observations de *Barbastella barbastellus*.

In my opinion, this phenomenon is connected with the increase of mammalian investigation in the Caucasus and with extending of the species area.

As it is seen from Figure 1 and Table 1, 5 localities have been revealed in the North of the Caucasus (Numbers 1, 2, 4-6) and in the Centre (3, 7-10). Most part of findings (more than 17 points) were made in Transcaucasia, especially in the north-east and south-east of the territory. Apparently, the penetration and settlement of this typical European forest species took place along the Black and Caspian Seas' coasts. The least number of *Barbastella* bats were revealed in the Lesser Caucasus (only in the Shusha Ter-

Ter in 1894 by SATUNIN and in Adzhikend in 1912 by SHELKOVNIKOV) and in the Transcaucasian Upland (Yerevan Province in 1916 by MITRPHANOV).

The bats have been discovered both on lowlands and plains, so in the mountains on the elevation up to 2000 m and above, but more often between 500-800 m (Table 1). They attach mainly to the lowland and mountain forests, seldom to the mountain xerophytic belt.

It is interesting, that on the north and centre of the Caucasus most bats have been found in the cold months (DUVAROVA 1980; KASAKOV & GARLIKOVA 1973, KURYATNIKOV et. al. 1987). In the southern regions they were revealed in all seasons, but more often in spring and autumn during their movements, since they were absent in these roosts in summer and winter. These differences are explained, most probably, by cave abundance in the first areas, where hibernations of many bat species have been marked (DUVAROVA 1980, KOMAROV & KUCHIYEV 1982, KORMILITZINA 1982, KURYATNIKOV 1982, TOPI-LINA 1982). In winter some *Barbastelle* bats were found in the caves of Abkhasiya (personal collection of A. P. KUZ'YAKIN). The largest number of the hibernating animals reached 13 specimens (DUVAROVA 1980).

In Eastern Transcaucasia *Barbastelle* bats were found in winter only in two localities (Table 1): 17 (in a deep chink of the stone mausoleum) and 22 (in a chink of a stone wall of the old Bugur-Kala fortress). Probably, in the territory without caves they hibernate in such crevices of rocks and buildings. In the warm period these bats were discovered mainly in various man-made constructions (under tar papers of roofs, in chinks of walls, under the door and window frames). They settled usually one by one or in a distance from each other. The air temperature in shelters more often was 1-2°C above than outside or equal. In October this difference was sometimes 5-9°C.

The evening activity began 20-30 minutes before the darkness. Non rarely they were hunting together with *Pipistrellus* bats (*Pipistrellus pipistrellus*, *Pipistrellus nathusii*), flying not higher than treetops. In dull days they were often gliding above the land. They were returning in roosts at midnight. *Hydropsyche*,

small *Noctuidae*, *Geometridae* predominated in the places of their feeding in autumn; *Simuliidae*, *Culicidae*, *Muscidae*, *Hydropsyche*, *Arctiidae*, and a few *Ichneumonidae* did in spring.

Testes of all examined males were strongly increased in mid-October. The mating, perhaps, took place lately, since none of the females examined was inseminated.

All females caught in spring were pregnant. In one specimen dissected on 20th April 1975 the embryo had just begun to develop (the female mass was 10.6 g); 25th April 1983 embryos of two females (8.3 - 9.2 g) weighed (in membranes) 7.0 - 10.0 mg and their length was 3.5 - 4.2 mm, width - 2.3 - 2.5 mm; 8th May 1982 also in two specimens (7.3 - 8.2 g) correspondingly 13.0 - 16.0 mg, 3.3 - 4.0 and 2.0 - 3.0 mm. Only one embryo was in the right uterus horn in all females dissected. Non-breeding and yearling specimens composed

Indexes, mm	Sex	n	min	max	M	m	t	P
Length of: head & body	♀	12	45	53	49.6	0.7	0.16	0.5
	♂	10	44	54	49.4	1.02		
tail	♀	12	40	51.5	47.2	0.9	1.5	0.1
	♂	10	40	47	45.2	1.07		
forearm	♀	13	39.5	42	40.7	0.25	3.3	0.005
	♂	10	38	41	39.4	0.3		
ear	♀	12	15	18	16.1	0.2	1.31	0.1
	♂	10	14	18	15.5	0.41		
tragus	♀	12	8	10	9	0.17	0.27	0.5
	♂	10	7.4	11	8.9	0.33		
Greatest length of skull	♀	8	14.6	15.5	15	0.1	5.22	0.001
	♂	8	14	14.6	14.3	0.09		
Condylabasal length	♀	8	13.5	14.5	13.9	0.12	2.6	0.005
	♂	8	13	14	13.4	0.15		
Zygomatic width	♀	8	7.5	8.3	7.9	0.09	0.88	0.2
	♂	8	7.5	8	7.8	0.07		
Breadth of braincase	♀	8	8.5	8.8	8.6	0.04	0.37	0.5
	♂	8	8	8.5	8.3	0.8		
Interorbital constriction	♀	8	3.8	4.2	4	0.06	0	0
	♂	8	3.6	4	4	0.09		
Maxillary tooth-row length	♀	8	4.7	5	4.85	0.04	3.5	< 0.05
	♂	8	4.4	4.9	4.6	0.06		

Table 2. External and cranial measurements of *Barbastella barbastellus* from Eastern Transcaucasia

Tab: 2. Äußere Maße und Schädelmaße von *Barbastella barbastellus* im östlichen Transkaukasus

Tableau 2. Mensurations externes et crâniennes de *Barbastella barbastellus* de l'est de la Transcaucasie

66,7% of 12 females studied. Most animals were in the age of about one year.

As in spring, so in autumn *Barbastelle* bats were very well-fed and had a large reserve of fat. The mass of 12 females varied in limits 7.3 - 9.2 g (8.3 0.4), 7 males - 6.8 - 11.0 (8.6 0.4), on 21st January 2 lasts weighed 10.3 g.

External and cranial measurements of *Barbastelle* bats from Azerbaijan show sex dimorphism on all signs and authentically on the length of forearm, greatest and condylobasal length of skull, maxillary tooth-row length (Table 2). Individuals from Eastern Transcaucasia are larger than the ones from Turkey on such indexes, as forearm length, greatest length of skull, zygomatic width, interorbital construction, and are equal as to the condylobasal length and maxillary tooth-row length (STEINER & GAISLER, 1994). The differences between them are practically minimum as to the most important measurements. Probably, it accounts for the same ways and period of *Barbastella barbastellus*' penetration into the Caucasus and Minor Asia.

Hairs of Azerbaijanian animals are black-brown-coloured on the upper body side and lighter on the lower part. Their tops are grey-whitish (less on the back).

## Conclusion

On the basis of the survey it is seen that the data about *Barbastella barbastellus* of the Caucasus are very scanty. The ecological information concerns only bats from Azerbaijan. The increase of the species findings in Eastern Transcaucasia and particularly in the Lenkoran natural region, where none of numerous mammalogists found these bats till the sixties, points to expansion of their area. To get in the Lenkoran region *Barbastelle* bats had to overcome the vast arid massif of the Kura-Araks Lowland. In my opinion, they now must be in the Gilan and Mazandaran Provinces of Iran.

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Note: Almost all literature is in Russian.

## Author's address:

Prof. IRINA K. RAKHMATULINA  
Institute of Zoology  
Azerbaijan Ac. Sci.  
Passage 1128 Block 504  
370602 Baku  
AZERBAIJAN

S. Askerova st. 127  
370014 Baku  
AZERBAIJAN