

Preliminary data on the status of Leisler's bat (*Nyctalus leisleri*) in the Caucasus

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Mit 1 Abbildung

S u m m a r y

The data on all earlier and 14 new records in the Caucasus are reported. *N. leisleri* is distributed here from 37 meridian in the west to the coast of Caspian Sea in the east. The northern boarder of distribution does not reach 45°N and almost coincides with the edge of mountain forests. Records of migrating animals in the Precaucasus are lacking. Most probably, the Caucasian population of *N. leisleri* is resident and more or less isolated from East-European ones. Resident status of Caucasian population is confirmed by the data on sex ratio and reproduction proofs. As much as 22 from 34 reliable records of *N. leisleri* are attributed to Russia. The most findings were made in mountain woodlands of the Western Caucasus. Up to now, *N. leisleri* is a common and quite abundant bat there. In central and eastern parts of the Russian Caucasus and in Azerbaijan single records are known. Eight reliable records of *N. leisleri* in Georgia are distributed throughout the country. Although only three findings are known in Armenia, in the national reports on implementation of the EUROBATS agreement Leisler's bat is considered as numerous. So, the present status of *N. leisleri* is intricate almost in all parts of the Caucasus. Special fieldwork is needed throughout the region to clarify the situation.

Z u s a m m e n f a s s u n g

Erste Daten zum Status des Kleinabendseglers, *Nyctalus leisleri*, im Kaukasus

Über die Daten aller früherer und 14 neuer Nachweise im Kaukasus wird berichtet. *N. leisleri* ist hier vom 37. Längengrad im Westen bis an die Küste des Kaspischen Meeres im Osten verbreitet. Die nördliche Verbreitungsgrenze reicht nicht bis 45°N und fällt fast mit dem Rand der Gebirgswälder zusammen. Nachweise von migrierenden Tieren fehlen im Vorkaukasus. Sehr wahrscheinlich ist die kaukasische Population von *N. leisleri* sedentär und mehr oder weniger von den osteuropäischen Populationen isoliert. Der Sedentärstatus der kaukasischen Population wird durch Daten über das Geschlechterverhältnis und Fortpflanzungsnachweise bestätigt. Nicht weniger als 22 von 34 verbürgten Nachweisen von *N. leisleri* werden Rußland zugeschrieben. Die meisten Funde wurden in Gebirgslandschaften im Westkaukasus gemacht. Bis jetzt kommt dort *N. leisleri* häufig und reichlich vor. In den zentralen und östlichen Teilen des russischen Kaukasus und in Aserbeidschan sind einzelne Vorkommen bekannt. Acht verbürgte Vorkommen von *N. leisleri* in Georgien sind über das ganze Land verstreut. Obschon in Armenien nur drei Funde bekannt sind, gilt der Kleinabendseglers

in den nationalen Berichten über die Umsetzung der EUROBATS-Vereinbarung als zahlreich. Der gegenwärtige Status von *N. leisleri* ist also in allen Teilen des Kaukasus recht kompliziert. Gezielte Feldarbeit in der Gesamtregion ist notwendig, um die Sachlage zu klären.

R é s u m é

Premières données sur le statut de la Noctule de Leisler, *Nyctalus leisleri*, dans le Caucase

Les données sur tous les anciens et 14 nouveaux enregistrements dans le Caucase sont exposées. *N. leisleri* est distribué ici du 37ème degré de longitude à l'ouest jusqu'à la côte de la mer caspienne à l'est. La ligne limitrophe de distribution au nord n'atteint pas 45°N et coïncide à peu près avec l'orée des forêts de montagne. Des animaux migrants n'ont pas été constatés dans le Précaucase. Très probablement la population caucasienne de *N. leisleri* est sédentaire et plus ou moins isolée de celles de l'Europe orientale. Le statut sédentaire de la population caucasienne est confirmé par les données sur le rapport des sexes et les preuves de reproduction. Pas moins de 22 sur 34 enregistrements fiables de *N. leisleri* sont attribués à la Russie. La plupart des découvertes étaient faites en paysages forestiers du Caucase de l'ouest. Jusqu'à ce jour, *N. leisleri* est là fréquent et en nombre abondant. Dans les parties centrales et orientales du Caucase russe et en Azerbaïdjan des occurrences singulières sont connues. Huit enregistrements fiables de *N. leisleri* en Géorgie sont répartis sur tout le territoire du pays. Bien que seulement trois occurrences soient connues en Arménie, la Noctule de Leisler est considérée comme espèce nombreuse dans les rapports nationaux sur la mise en application de l'accord EUROBATS. Donc, le présent statut de *N. leisleri* est complexe en presque toutes les parties du Caucase. Des travaux spécifiques en terrain sont exigés dans l'ensemble des régions afin d'éclaircir la situation.

I n t r o d u c t i o n

Leisler's bat is considered a rare species in the Caucasus (RAKHMATULINA 1999). Intensive investigations of the bat fauna in the last years led to many new records throughout the region (TSYTSULINA 1999; GAZARYAN & BAKHTADZE 2002), but there are no special studies on distribution or other aspects of the species' status.

The present paper aims to estimate present state of knowledge on *N. leisleri* in different parts of the Caucasus. It surveys the data on all earlier and several new records with some remarks on species' ecology and possible threats. Due to insufficient information from other parts of the region, an attempt to evaluate a relative frequency of records was made only for the Western Caucasus.

Materials and methods

A long-term fieldwork was carried out in the different parts of the Caucasus in all seasons during 1998-2003. Observations included censuses of underground roosts and tree hollows, capturing of bats in foraging areas by mist-nets and mobile trap (BORISSENKO 1999), and surveys with Batbox III and D-200 heterodyne detectors. Successful surveys of bats were conducted in more than 200 localities in the territories of the Russian Federation and Georgia.

For the analysis of geographic distribution, collections of the State Museum of Georgia (SMG), the Faculty of Biogeography (FBU) and the Zoological Museum (ZMU) of Moscow State University, the Zoological Institute of Russian Academy of Science (St. Petersburg) (ZIN), Daghestan, Stavropol, Rostov-on-Don (RSU) and Abkhazia universities were

revised. All available literature sources were also used.

Geographic coordinates were determined using the Russian military topographic maps with "Pulkovo-1942" grid.

Results and discussion

N. leisleri is distributed in the Caucasus from the Black Sea coast in the west to Caspian Sea in the east (Fig. 1). Marginal western and northern records almost coincide with the edge of forest zone and do not reach 37° W and 45° N. There are about 300 km between the northernmost Caucasian record and the southernmost East-European one (Rostov-on-Don, 47°16'N 39°43'E). Almost equal distance separates the nearest Caucasian and Crimean record localities (KONSTANTINOV et al. 1976). More or less, the Caucasian part of the range is isolated on north and west by the steppes of Precaucasus and the Crimea; but it could interrelate with the Turkish and Iranian parts of the range in the south.

It was in the Russian literature (e.g. STRELKOV & ILYIN 1990; ILYIN et al. 1998) that the Caucasus is a hibernation area and a place of summer concentration of adult males of *N. leisleri*. We refute this proposition for the following reasons:

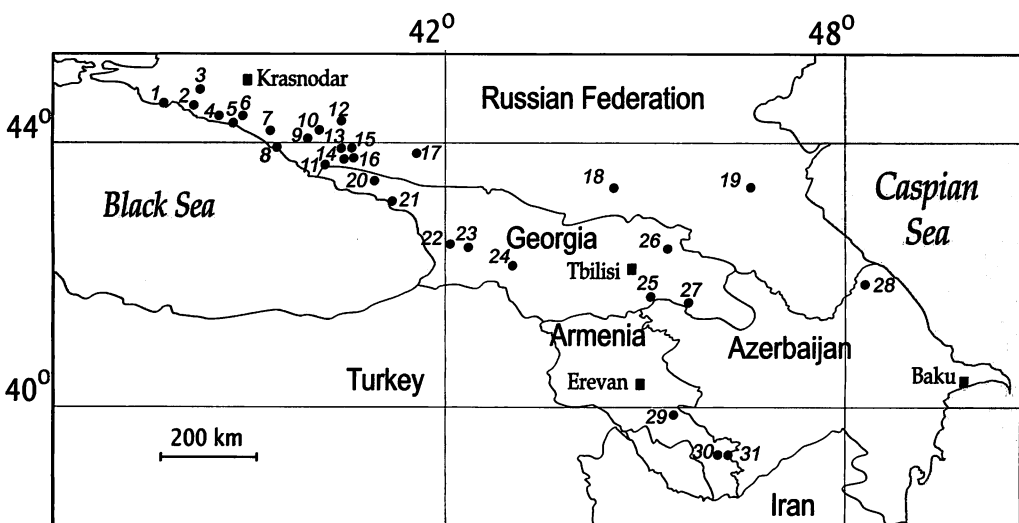


Fig. 1. Records of *N. leisleri* in the Caucasus. For explanations see Tables 1-4.

Abb. 1. Nachweise von *N. leisleri* im Kaukasus. Erläuterungen siehe Tabellen 1-4.

Fig. 1. Enregistrements de *N. leisleri* dans le Caucase. Pour explications voir tableaux 1-4.

Table 1. Records of *N. leisleri* in the Russian part of the Caucasus.Tab. 1. Nachweise von *N. leisleri* im russischen Teil des Kaukasus.Table 1. Enregistrements de *N. leisleri* dans la partie russe du Caucase.

Number	Name of locality	Coordinates	Date of record	Method of capturing or recording	Number, sex and age (if censored)	Literature source and (or) museum collection	Number in Fig. 1
1.	Maykop district	About 44°N40°E	1894	Shot	1 male, <i>ad</i>	ZIN	10.
2.	Ashe vil.	44°00'N 39°20'E	20.07. 1913	Shot	1 female, <i>ad</i>	ZIN	8.
3.	Mikhailov's pereval vil.	43°40'N 38°12'E	2-5.07. 1966	Shot	3 females, <i>ad (lact.)</i>	KAZAKOV, YARMYSH 1974; RSU	2.
4.	Nikel vil.	44°10'N 40°11'E	23.06. 1972	Shot	1 female, <i>ad (lact.)</i>	KAZAKOV, YARMYSH 1974; RSU	10.
5.	Ibid.	-	4.06. 1975	Shot	1 female, <i>ad</i>	RSU	10.
6.	Ibid.	-	July 2000	Subfossil	7 specimens	GAZARYAN & BAKHTADZE 2002	10.
7.	Zmeyskaya vil.	43°20'N 44°10'E	May 1974	Didn't mention	1 male	KURYATNIKOV et al. 1987	18.
8.	Aksay river	43°20'N 46°25'E	Didn't mention	Didn't mention	1 male	UNKUROVA 1989	19.
9.	Teberda river valley	43°53'N 41°34'E	10.06. 1994	Netted	7 males, <i>ad</i>	ILYIN et al. 1998; ZIN	17.
10.	Laura cordon	43°42'N 40°16'E	31.07. 1996	Netted	1 female, <i>subad</i>	TSYTSULINA 1999; ZIN	11.
11.	Tretiya Rota cordon	43°56'N 40°41'E	8.08. 1996	Netted	2 males, <i>subad</i>	TSYTSULINA 1999; ZIN	16.
12.	Tchernoretc hie cordon	43°53'N 40°42'E	21.06. 1997	Netted	1 female, <i>ad</i> ; 1 male, <i>ad</i>	TSYTSULINA 1999; ZIN	15.
13.	Okhotnichiy a cave	44°06'N 40°01'E	Summer 1998	Subfossil	3 specimens	Own data	9.
14.	Il river valley	44°46'N 38°30'E	12.07. 2000	Netted	1 male, <i>ad</i>	Own data	3.
15.	Kizinka river	44°15'N 40°31'E	29.04. 2001	Netted	1 female, <i>ad</i>	Own data	12.
16.	Topolinaya tzhel near Maly Utrish settlement	44°42'N 37°28'E	11-12. 07.2001	Netted	1 female, <i>ad (lact.)</i> , 1 male, <i>ad</i> ; 1 male, <i>subad</i>	E.I. KOZHURINA pers. comm.	1.
17.	Bzhid river valley	44°20'N 38°40'E	6.08. 2001	Captured by mobile trap	1 male, <i>ad</i>	Own data	5.
18.	Vulan river valley	44°24'N 38°30'E	6.08. 2001	Captured by mobile trap	1 male, <i>ad</i> ; 1 male, <i>subad</i>	A.V. BORISSENKO pers. comm.	4.
19.	Babaylov cave	43°56'N 40°34'E	16.08. 2001	Subfossil	1 specimen	Own data	14.
20.	Forest near Defanovka vil.	44°28'N 38°46'E	20.10. 2001	Bat detector	> 10 animals	Own data	6.
21.	Tuapse river valley	44°15'N 39°14'E	14.07. 2002	Bat detector	1 animal	Own data	7.
22.	Dodogatch river valley	43°57'N 40°31'E	16.07. 2003	Found on the ground	1 female, <i>ad</i> , (<i>postlact.</i>)	Own data	13.

1. Reproduction of *N. leisleri* was established in many localities through the Caucasus (Tables 1-3).

2. 9 adult females and 12 adult males have been recorded in the Western Caucasus between the end of spring and beginning of autumn migration seasons (last decades of May and August). So, the sex ratio in the summer did not significantly differ from 1:1.

3. Records of migrating animals are absent in the alluvial Plain of Precaucasus.

Consequently, it seems that most of Leisler's bats do not leave the Caucasus in the summer. At the moment, 34 reliable records of *N. leisleri* are known in the region (Tables 1-4). *N. leisleri* has been recorded 20 times in the Russian part of the Western Caucasus (Krasnodar territory, Adig and Karachaevo-Cherkesk republics), but was found only twice in Russian parts of the Central and Eastern Caucasus (in Zmeyskaya village and Aksay river). This species was not reported from the Stavropol territory, Kabardino-Balkar, Chechen and Ingush republics of Russia. Lack

of records is related rather with insufficient studies of bats in these areas than with real state of things. Thus, most of recent records in the Western Caucasus were made by mist-nets and bat detectors, but this equipment never was used in the Central or Eastern Caucasus.

As in Russia, in Georgia application of modern fieldwork techniques in the several latest years leads to a growth in the number of records (Table 2). *N. leisleri* was found there from the mountains of Abkhazia (Dzyshra karst massif) to the valley of Yori river in Eastern Georgia (Dal's reservoir). Several additional places of findings in Georgia have been mentioned in literature (e.g. DZHANASHVILI 1953) but have not been confirmed by specimens and look doubtful.

Three known Armenian records of Leisler's bat are quite old (Table 3). New information on the occurrence of *N. leisleri* in Armenia is absent in literature. However, in the National Report of Armenia (2001) on implementation of the EUROBATS agreement E. Yavruyan considered *N. leisleri* as numerous. So, the situation in Armenia is very intricate.

Table 2. Records of *N. leisleri* in Georgia.

Tab. 2. Nachweise von *N. leisleri* in Georgien.

Table 2. Enregistrements de *N. leisleri* en Géorgie.

Number	Name of locality	Coordinates	Date of record	Method of capturing or recording	Number, sex and age (if censored)	Literature source and (or) museum collection	Number in Fig. 1
1.	Tskhakaya (Novo-Senaki) town	42°16'N 42°03'E	Aug. 1903	Shot	1 male, ad	ZIN	22.
2.	Kutaisi town	42°17'N 42°43'E	3.05. 1904	Shot	1 specimen, ad	ZIN	23.
3.	Sukhumi town	43°00'N 41°00'E	July 1953	Unknown	2 males, 1 female, subad	FBU	21.
4.	Birkiani vil.	42°12'N 45°19'E	July 1960	Unknown	1 specimen	RAKHMATULINA 1999	26.
5.	Akhaldaba vil.	41°56'N 43°29'E	July 2000	Visually	1 animal	Own data	24.
6.	Dal's reservoir	41°20'N 45°50'E	Oct. 2000	Bat detector	1 animal	Own data	27.
7.	Gardabani Protected Area	41°23'N 45°04'E	7.05. 2001	Bat detector	2 animals	Own data	25.
8.	Forest in the slope of Dzyshra mountain	43°21'N 40°42'E	11.08. 2003	Bat detector	1 animal	Own data	20.

Table 3. Records of *N. leisleri* in Armenia.Tab. 3. Nachweise von *N. leisleri* in Armenien.Table 3. Enregistrements de *N. leisleri* en Arménie.

Number	Name of locality	Coordinates	Date of record	Method of capturing or recording	Number, sex and age (if censored)	Literature source and (or) museum collection	Number in Fig. 1
1.	Shurnukh vil.	39°24'N 46°23'E	10.10. 1961	Not mentioned	1 female	GUSYAN & DANIELYAN 1963 (after RAKHMATULINA 1999)	31.
2.	Tatev vil.	39°24'N 46°15'E	19.05. 1972	Not mentioned	1 female	YAVRUYAN 1974 (after RAKHMATULINA 1999)	30.
3.	Geger vil.	39°47'N 45°32'E	24.09. 1971	Not mentioned	2 females	YAVRUYAN 1974 (after RAKHMATULINA 1999)	29.

One known record in Azerbaijan (Table 4) is also very old. Today's presence of Leisler's bat in the fauna of the country must be confirmed. In spite of lack of new records it's hard to suppose that *N. leisleri* can become extinct here. Many suitable habitats still remain in the country, especially in the Greater Caucasus and in the Samur-Divitchi Lowland. That's why we hope to find *N. leisleri* in the delta of Samur River both in Russia and Azerbaijan during future fieldwork.

In all localities *N. leisleri* was recorded only in warm seasons. Hibernation roosts are not known yet in the Caucasus. We never found *N. leisleri* in underground hibernacula but revealed subfossil remains in Okhotnichiya and Babaylov caves in the Western Caucasus (Table 1). Perhaps, main hibernation roosts are situated in tree hollows and in deep crevices of limestone rocks. The data on summer roosts is also insufficient. Only once living Leisler's bats have been found inhabiting the maple's hollow (Table 4). In other cases they have been shot, captured or observed outside a shelter. Many times we have seen them when they appeared from tree crowns in

the dusk but their roosts were found inaccessible. Anyway, in the Caucasus *N. leisleri* is a tree-dwelling species. Therefore, it is most common in the Western Caucasus where large areas of ancient woodlands remain. *N. leisleri* is especially abundant there in low-mountain and medium-mountain zones and obviously related with river valleys. Unlike *N. noctula* Leisler's bats do not penetrate into the Plain of Precaucasus. As compared with other bat species, *N. leisleri* occurs in warm seasons in the Western Caucasus more frequently than *Myotis bechsteinii*, *M. nattereri*, *M. emarginatus*, *M. brandtii*, *M. mystacinus*, *M. aurasceus*, *Plecotus auritus*, *Barbastella barbastellus*, *Pipistrellus nathusii*, *Hypsugo savii*, *Vespertilio murinus* and *N. lasiopterus*. Only 9 species, namely *Rhinolophus hipposideros*, *R. ferrumequinum*, *P. pipistrellus*, *P. kuhlii*, *Eptesicus serotinus*, *M. blythii*, *M. daubentonii*, *N. noctula* and *Miniopterus schreibersii* are more frequent in this area. Meanwhile, *N. leisleri* is more frequent and abundant than all other species besides *P. pipistrellus* if we consider only the records directly in woods of the Western Caucasus.

Table 4. Record of *N. leisleri* in Azerbaijan.Tab. 4. Nachweis von *N. leisleri* in Aserbeidschan.Table 4. Enregistrement de *N. leisleri* en Azerbaïdjan.

Number	Name of locality	Coordinates	Date of record	Method of capturing or recording	Number, sex and age (if censored)	Literature source and (or) museum collection	Number in Fig. 1
1.	Kusary town	41°26'N 48°26'E	3.09. 1939	Extracted from tree hollow	2 females, 1 male	KUZUYAKIN 1950	28.

Conclusion

N. leisleri is widely distributed in the Caucasus but has the uncertain status. Up to now, *N. leisleri* is still common and abundant in deciduous forests of the Western Caucasus, but the situation in other parts of the Caucasus is unclear. Future research activity is needed to estimate the present status and trends. Fieldwork programs must contain mist-netting and ultrasound surveys throughout the region.

Acknowledgements

Authors would like to thank our colleagues E.I. Kozurina and A.V. Borissenko (Russia), who kindly provided own unpublished data, and I. Natradze, A.S. Kandaurov and A.N. Ivanitsky, who participate in our fieldwork. We are grateful to Hermann J.C.A. Limpens (Netherlands) for his help during the workshop on work with bat detectors (Georgia, 4.05.2000).

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