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SPECIES OF THE GENUS *PLECOTUS* IN THE CRIMEA AND NEIGHBOURING AREAS IN THE NORTHERN BLACK SEA REGION

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Abstract: An analysis of the collected samples of *Plecotus* from different parts of the Northern Black Sea Region shown the presence of two known for Europe species of *Plecotus*, *P. auritus* and *P. austriacus*. Both species are very rare in the region, and their share in a total collected sample of bats does not exceed 0,5 %. Relatively wide distributed species in the region is *P. austriacus*, known from all parts of the studied region. Verified records of *P. auritus* come just from the mountain parts of the Crimea and Western Caucasus. Known records of *Plecotus* in a region were in autumn and winter.

Key words: *Plecotus auritus, Plecotus austriacus*, skull measurements, distribution, abundance, Black Sea region, Crimea.

INTRODUCTION

According to the modern point of view, two closed species of the genus *Plecotus* occur in Europe, *P. auritus* and *P. austriacus* (STEBBINGS 1988; KOOPMAN 1993; ZAGORODNIUK 1998). While investigations of European bat distribution are finished in a whole (ATLAS 1999), East Europe remains least investigated region. Traditionally, the long-eared bats from this territory are attributed to *P. auritus* (ABELENTSEV & POPOV 1956; KORNEYEV 1965; KURSKOV 1981; STRELKOV 1981; KRYZHANOVSKY & EMELYANOV 1985). Just after revision of STRELKOV (1988), both species were identified in the samples from the East Carpathians (ZAGORODNIUK *et al.* 1997; RUPRECHT 1998), Moldova (VASILIEV & ANDREEV 1998), Lower Danube region (FEDORCHENKO & TKACH 1998), and Podillya (PETRUSHENKO 2000).

By analysing the records of *Plecotus* from the former Soviet Union, STRELKOV (1988) describes the break between the European and Caucasian ranges of *Plecotus austriacus*, and just *P. auritus* occurs in the Crimea and adjacent areas. KONSTANTINOV *et al*. (1976) had also mentioned for the Crimea *Plecotus auritus*, but CHEREMISOV (1986; 1990) and VOLOKH & KARMYSHEV (2001) described just *P. austriacus*. DULITSKY & TOVPINETS (1997) consider data about *P. austriacus* as doubtful, and they believe just one rare species of *Plecotus* (namely *auritus*) occurs in the Crimea. No publications contain the morphological descriptions or references to modern keys, and they require revision. Our data allow us to suppose the presence of both species in the South of Eastern Europe (ZAGORODNIUK 1999). This article deals with an analysis of all available collected samples supporting such point of view.

MATERIALS AND METHODS

Collections of all main Ukrainian zoological museums were investigated: National Natural History Museum of Ukraine (UMNH, Kyiv), State Natural History Museum (SNHM, Lviv), Museums of Nature of the Kharkiv National University (MNKU), Zoological Museums of the Lviv National University (ZMLU), and Kyiv National University (ZMKU). Altogether, in these collections more than 1500 bat specimens are deposited (ZAGORODNIUK 1998a).

In general, 79 specimens of the genus *Plecotus* were analysed. Among them 51 *P. auritus* and 28 *P. austriacus* were identified using traditional criteria (RUPRECHT 1965; HANÁK 1966; STEBBINGS 1967) as well as their updated version for the East-European samples (ZAGORODNIUK *et al.* 1999). Seven specimens representing the two species of *Plecotus* were collected in the Crimea and neighbouring areas (Table 1).

As standard for comparison, samples of *P. auritus* and *P. austriacus* from the Comparing collection of the Centrum Informacji Chiropterologichnej (Krakow) were investigated. Variation of 8 external and 23 skull measurements was analysed. All original measurements were made by calliper. Diagnostic value of each skull dimension in control samples was estimated using MAYR's coefficient of divergence: $CD=(X_1–X_2)/SD$, where $SD= (SD_1+SD_2)/2$. After this procedure, list of metric characters was reduced to 8 ones with $CD>3$, and these measurements were used for the further diagnostics of the materials (Table 2).

The selected metric characters with high diagnostic values are the followings. LCra — total length of skull, CBL — condylobasal length, CBL^+ — the same (including incisors), CM^3 — length of the upper teeth-row from canine to M^3, P^4M^3 — length of upper teeth-row from P^4 to M^3, Bul — length of auditory *bullae*, ManL — condylar length of mandible (incl. lower incisors), IM_3 — total length of lower teeth-row.

Table 1. Collected specimens of the genus *Plecotus* from the Crimea and neighbouring areas and their labels (except for last specimen, all samples have been collected and identified as *P. auritus*)

Museum & N col.	Skin/ skull	Locality (see FIG. 2)	Date, legit	Data from the labels								Our data	
				Sex	W	L	Ca	Pl	Au	Tr	Ra	Ra'	ID*
		Crimea:											
UMNH, 10779	y/y	Cave Shakhta Vyalova, Chatyr-Dagh Mts.	1985-Dec-14, leg. Cheremisov	F	4,8	39,7	33,0	8,0	35,3	19,8	—	40,2	*aur*
UMNH, 14319	n/y	Lenino dstr., catacombs near Simpheropol highway	1993-Feb-10, leg. Tkach	M	—	47,0	46,0	—	36,0	17,0	39,0	—	*aus*
		Neighbour areas:											
UMNH, 12016	y/y	Tuapse, Krasnodar Kray	1903-Aug-[??], leg. [unknown]	M	—	[42]	[40]	[9]	[33]	—	—	37,6	*aur*
UMNH, 9204	y/y	Odessa, Southern Ukraine	1927-Aug-[??], leg. [Brauner?]	F	—	48,0	48,0	5,0	35,0	—	43,0	41,6	*aus*
ZMKU, 1896	y/y	Kislovodsk, Stavropol Kray	1949-Aug-27, leg. Marysova	M	—	53,0	47,0	—	30,0	—	39,0	40,5	*aus*
UMNH, 12296	y/y	Kutaisi, Georgia	1973-Dec-12, leg. Iavruan	M	—	40,4	47,0	7,2	37,0	—	38,0	37,2	*aur.*
UMNH, 14476	y/y	Askania-Nova, Southern Ukraine	1998-Sep-18, leg. Polishchuk	M	8,3	52,0	—	—	38,0	18,0	39,0	—	*aus.*

* Remarks to column "ID": "*aus*" = *austriacus*, "*aur*" = *auritus*. According to notes on the labels, the same identification was proposed earlier by BOGDANOWICZ for N 9204 and by STRELKOV for N 1896; N 12016 is measured after long fixing in alcohol. Ra' is the re-measured forearm length.

RESULTS

Identification of Collected Materials

In a whole, sample of *Plecotus austriacus* is characterised by larger values of skull measurements in comparison with *P. auritus*. The main distinctions between these two species consist in the length of skull, teeth-row, and auditory *bullae* (Table 2). The meanings of diagnostic measurements in examined specimens are given in the same table, after the meanings of these measurements for the standard samples.

Except of the only specimen from Askania-Nova, all examined materials were collected and deposited as "*Plecotus auritus*". Basing on the skull measurements, these materials can be referred to the two different species. Specimens from Chatyr-Dagh, Tuapse, and Kutaisi are identical to the standard sample of *P. auritus*. Specimens from Odessa, Lenino, Askania-Nova and Kislovodsk are identified as *P. austriacus*. Their skull measurements are in a good accordance to the ranges of their variation in the standard samples.

Table 2. Variation of morphometric characters with high diagnostic values in the standard samples of *Plecotus* and in examined specimens from the Crimea and neighbour areas (mm)

Skull dimension	Limits in the standard samples, average ± standard deviation			UMNH N 10779	UMNH N 14319	UMNH N 9204	UMNH N 14476	ZMKU N 1896	UMNH 12016	UMNH 12296
(with CD>3,0)	*Plecotus auritus*	CD	*Plecotus austriacus*	Chatyr-Dagh	Lenino	Odessa	Askania Nova	Kislovodsk	Tuapse	Kutaisi
LCra	15,3–16,6		17,0–18,0							
	16,14±0,39	3,19	17,40±0,40	16,2	17,2	17,4	17,9	17,3	[16]*	15,5
CBL	14,2–15,4		15,9–16,7							
	14,97±0,34	4,28	16,21±0,24	15,0	16,3	16,7	16,8	15,8	[15]*	14,3
CBL^{+}	14,4–15,5		16,2–17,0							
	15,17±0,33	3,91	16,46±0,33	15,3	16,4	16,8	17,0	16,1	[15]*	14,4
CM^3	5,1–5,5		5,6–6,1							
	5,31±0,14	3,33	5,86±0,19	5,4	5,9	6,1	6,2	5,8	5,1	4,8
P^4M^3	3,7–4,2		4,3–4,6							
	3,93±0,16	3,46	4,38±0,10	4,1	4,3	4,5	4,4	4,2	3,7	3,6
Bul	3,7–4,3		4,5–4,8							
	4,03±0,21	3,81	4,64±0,11	4,2	4,7	4,9	4,9	4,8	3,8	3,9
ManL	10,1–10,9		11,2–11,6							
	10,47±0,22	4,65	11,33±0,15	10,7	11,3	11,6	11,7	11,2	10,0	9,8
IM_3	6,4–7,1		7,0–7,5							
	6,66±0,17	3,37	7,25±0,18	6,8	7,1	7,4	7,5	7,1	6,5	6,1
Identity	(n=14)		(n=6)	*aur.*	*aust.*	*aust.*	*aust.*	*aust.*	*aur.*	*aur.*

* — Braincase of specimen N 12016 (Tuapse) is destroyed, and its length was measured inaccurately.

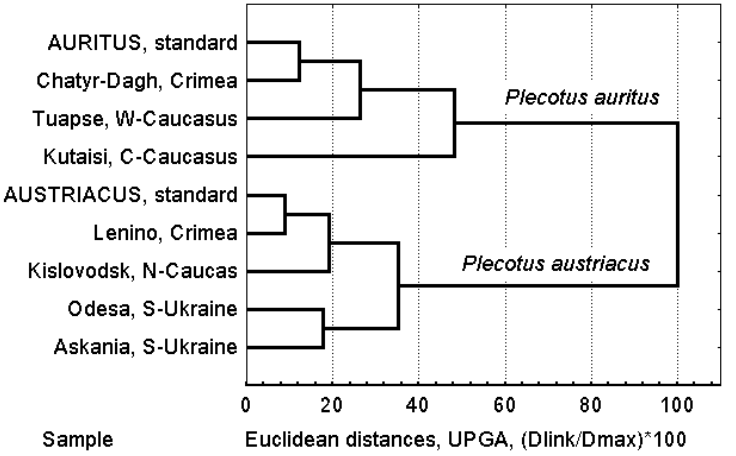

Fig. 1. Pattern of similarity of standard and analysed samples of *Plecotus* based on the data from the Table 2. Control samples are designated by species names, and analysed samples are named after the localities.

A pattern of similarity between the standard and analysed samples is represented in the diagram calculated after the data from the Table 2. We can see, investigated specimens form the two compact clusters (Fig. 1). Both Crimean samples are closest to the control samples from Europe than to the Caucasian ones: sample from the Chatyr-Dagh is the closest to *auritus*-standard, and sample from Lenino is the most related to the standard sample of *P. austriacus*. Skull size in specimens from the Caucasus is a little smaller in comparison with the control samples that indicates on some geographical variation of diagnostic characters.

Relative Abundance of *Plecotus* in the Region

Similarly to all previous researches, our data show that *Plecotus* is a very rare group of bats in the Crimea and nearest parts of the Eastern Europe. In the scale of bat abundance in the Crimea, *Plecotus* occupies the last position. So, in collections there are only 2 specimens of *Plecotus* among 417 bats from the Crimea, that makes just 0,5 % (Table 3).

The similar results follow from the articles of DULITSKY (1974), KONSTANTINOV *et al.* (1976), DULITSKY *et al.* (1986), and CHEREMISOV (1990). BESKARAVAJNY (1988) didn't found *Plecotus* in Karadagh, VOLOKH and KARMYSHEV (2001) have mentioned just 1 specimen of *Plecotus (austriacus)* among 130 bats ringed during 1984–1989.

During winter expedition of the Ukrainian Centre of Bat Protection (UCEBA) in the Crimean caves in February of 2001, we have found only one specimen of *Plecotus* (species not identified) among about 450 bats registered during this census.

The same share of *Plecotus* is in the areas nearest to the Crimea. So, KAZAKOV & YARMYSH (1974) indicate just 2 records of *Plecotus* for a long time of their investigations in the Pre-Caucasus. TSYTSULINA (1999) does not mention this genus among observed and collected bats from Western Caucasus. ZUBKO (1937), VOLYANSKY (1967), BERESTENNIKOV (1977), and SELYUNINA (1998) consider this genus very rare in the Northwestern Black Sea Region (i. e. Odessa, Mykolajiv and Kherson provinces). FEDORCHENKO & TKACH (1998) have registered just one specimen of *Plecotus* ("*P. austriacus*") during more than 10 years.

Thus, all available data had shown that *Plecotus* is a very rare group of bats in the Crimea and neighbour areas of the Northern Black Sea region as a whole.

Table 3. Abundance of different groups of bats from the Crimea in main zoological collections*

Species (in order of abundance)	UMNH	SNHM	ZMLU	ZMKU	MNKU	Total	%
Plecotus auritus	1	0	0	0	0	1	0,2
Plecotus austriacus	1	0	0	0	0	1	0,2
Pipistrellus kuhlii	1	0	0	0	0	1	0,2
Pipistrellus nathusii	1	0	0	0	0	1	0,2
Hypsugo savii	1	0	0	1	0	2	0,5
Myotis "mystacinus"	3	0	0	0	0	3	0,7
Barbastella barbastellus	5	0	0	0	0	5	1,2
Nyctalus noctula	9	0	0	0	0	9	2,2
Pipistrellus pipistrellus	7	1	0	2	0	10	2,4
Vespertilio murinus	12	0	0	0	0	12	2,9
Myotis emarginatus	11	0	0	3	0	14	3,4
Rhinolophus hipposideros	18	0	0	1	0	19	4,6
Miniopterus schreibersii	9	4	0	26	0	39	9,4
Rhinolophus ferrumequinum	112	2	0	15	0	129	30,9
Myotis blythii	60	36	0	75	0	171	41,0
Total	251	43	0	123	0	417	100,0

* 4 other species known for the Crimea are absent in the studied collections: *Myotis nattereri, Nyctalus lasiopterus, N. leisleri, Eptesicus serotinus*.

List of Records and Species Distribution

There are just 19 records of the long-eared bats in the Crimea and adjacent areas. List of *Plecotus* records in the studied region is followings (from the West to the East).

1. Mainland part of the Northern Black Sea Region

1. Vylkiv, Danube biosphere reserve, Odessa province, Ukraine (FEDORCHENKO & TKACH 1998). Remarks: about 1985, 1 specimen, *P. austriacus*. Comment: identification is preliminary (skull was in private collection and is lost now: Fedorchenko, pers. com.).
2. Bilgorod-Dnistrovsky and Bilyaivka distr., Odessa province, Ukraine (STRELKOV 1988). Remarks: Strelkov mentioned 6 *P. austriacus*. Comment: probably, there is a sample collected by Brauner and revised by Strelkov[1] (sample is absent in studied collections).
3. Odessa, Odessa province, Ukraine (this article). Remarks: captured in Aug–1927, 1 specimen, *P. austriacus*. Comment: skull and skin in UMNH (see: Table 1–2).
4. Gola Prystan, Chornomorsky biosphere reserve, Kherson province, Ukraine (BERESTENNIKOV 1977). Remarks: date unknown, mentioned as rare species, "*P. auritus*". Comment: doubtful identification, without references or collected samples; earlier ZUBKO (1937) and, later, SELYUNINA (1996, 1998) did not observed *Plecotus* on this territory.
5. Askania-Nova, "Askania-Nova" biosphere reserve, Kherson province, Ukraine (this article). Remarks: captured 18–Sep–1998, 1 specimen (male), *P. austriacus*. Comment: skull in UMNH, leg. I. Polishchuk (see: Table 1–2). That is the only collected specimen of *Plecotus* that was identified initially as "*P. austriacus*".
6. Melitopol, Zaporizhzhya province, Ukraine (this article). Remarks: captured about August 1998–1999, 1 specimen, *P. austriacus* (?). Comment: identification after photo by amateur, comm. by Dr. A. Volokh (first record of *Plecotus* in the Northern Azov region for 15 years).

2. Crimean Peninsula

7. Aj-Todor (4 km SEE of Ternivka), Crimea, Ukraine (BRAUNER 1912; cited without reference by STRELKOV 1988). Remarks: 2 specimens, "*P. auritus*". Comment: records are accompanied with morphological descriptions, but identification is doubtful (2 males with FA=40 mm). Probably, 2 specimens of *P. auritus* (s. str.) from "Aj-Petri" (see: loc. 8 and Table 4) are from this area.

[1] Strelkov mentioned first locality as "Akkerman", that is an old name of Bilgorod in the time of Brauner.

8. Simpheropol (8a), and Burulcha (=Tsvetochne; 8b), Crimea, Ukraine (BRAUNER 1912; these records are cited without reference by STRELKOV 1988). Remarks: 3 specimens, "*P. auritus*". Comment: records are accompanied with descriptions (FA=38 and 39,5 in males and 39,5 in female), and Dr. Strelkov inform me about 3 Brauner's specimens of *P. auritus* (s. str.) in collection of ZIN, all females!: 1 from Burulcha (=N8b) and 2 from "Aj-Petri" (?=N7) (Table 4).
9. Cave Shakhta Vyalova, Chatyr-Dagh Mts., Crimea, Ukraine (this article). Remarks: captured 14–Dec–1985, 1 female, *P. auritus*. Comment: skull & skin in UMNH, leg. A. CHEREMISOV (see: Table 1–2). Over 5 years after the mentioned date, CHEREMISOV (1990) inform about ringing of 4 hibernated specimens of "*austriacus*" in "Crimean caves" (loc. N 9a on the map).
10. Cave Nomerna, near Lju-Khasar, Yajla Dovgorukivska[1], Crimea, Ukraine (VOLOKH & KARMYSHEV 2001). Remarks: observation and ringing of 1 living specimen during 1984–'89, *P. austriacus* (mentioned as "grey long-eared bat" without scientific name). Comment: Identification was not supported by references to diagnostic characters or collected samples. Probably, CHEREMISOV (1990) ringed "grey long-eared bat" in this locality as well as in previous one.
11. Alushta, Crimea, Ukraine (KONSTANTINOV *et al*. 1976; the same (?) record is cit without reference by STRELKOV 1988). Remarks: captured in summer, 1 specimen, "*P. auritus*". Comment: record without comments and descriptions, species identification is doubtful.
12. Theodosia, Crimea, Ukraine (DULITSKY *et al*. 1986). Remarks: date unknown, 3 specimens, *P. auritus*, leg. A. Dulitsky. Comment: Record without morphological description, identification doubtful. Earlier the same identification was proposed for the specimen from "Crimean reserve" (not marked here on the map) (STENKO *et al*. 1986).
13. Akmonayski quarries, Kamenskoje (=Ak-Monay), Lenino distr., Crimea, Ukraine (this article). Remarks: 1 specimen, *Plecotus* sp., 18–Feb–2001. Comment: distantly observed, light tragus (probably *auritus*), winter expedition of UCEBA (leg. L. Godlevska & Ya. Petrushenko).
14. Catacomb near the Simpheropol–Kerch highway, Lenino distr., Crimea, Ukraine (this article). Remarks: 1 specimen (male), *P. austriacus* (initially as *auritus*), captured 10–Feb–1993. Comment: skull in UMNH, leg. V. Tkach (for details see: Table 1–2).
15. Kalaravski quarries, North of Chistopole, Lenino distr., Crimea, Ukraine (this article). Remarks: 1 male, *P. austriacus*, observed 22–Jul–2001. Comment: living specimen, Ra=40 mm, summer expedition of UCEBA (leg. L. Godlevska & Ya. Petrushenko).

[1] "Jajla" is the name used in the Crimea for a designation of the plain tops of mounts without forest.

Table 4. BRAUNER's specimens of *Plecotus auritus* (s. str.) from the Crimea in the collection of ZIN, St.-Petersburg, and measurements of their skulls (Strelkov, pers. com.) (See: locus 8 in text).

Museum, N	Locality	Date	Sex	CBL	HCr	Zyg	Bul	CM^3	CM_3	ManL	IM^3
ZIN-8692	Burulcha	26.06.1900	F	14,5	7,4	8,5	4,0	5,3	5,7	no	6,3
ZIN 82991	Aj-Petri	no data	F	15,0	7,6	8,9	4,1	5,3	5,7	10,3	6,3
ZIN 82990	Aj-Petri	no data	F	15,0	7,5	8,9	4,1	5,3	5,9	10,5	6,2

3. North-Western Part of the Caucasus

16. Abrau-Dyurso, Anapa distr., Krasnodar Kray, Russian Federation (KAZAKOV & YARMYSH 1974). Remarks: 1 male, *P. auritus*, 29–May–1972. Comment: identification is doubtful.
17. Tuapse, Krasnodar Kray, Russian Federation (this article). Remarks: 1 male, *P. auritus*, captured Aug–1903. Comment: skull & skin in UMNH, leg. unknown (Table 1–2).
18. Nikel, Maikop distr., Adygeia, Russian Federation (KAZAKOV & YARMYSH 1974). Remarks: 1 male, *P. auritus*, captured 5–Nov–1972. Comment: identification is doubtful.
19. Kislovodsk, Stavropol Kray, Russian Federation (this article). Remarks: 1 male, *P. austriacus*, captured 27–Aug–1949. Comment: skull & skin in ZMKU, leg. I. Marysova (Table 1–2).
20. Kutaisi, Georgia (this article). Remarks: 1 male, *P. auritus*, captured 12–Dec–1973. Comment: skull & skin in UMNH, leg. E. Iavruan (Table 1–2).

Ranges of Species Distribution

All the listed above records are shown on a map (Fig. 2) where the verified and doubtful data are marked using different symbols. One can see that the distribution of *Plecotus austriacus* is wider than that of *P. auritus* in the studied region.

In the mainland Northern Black Sea Region, there are 6 records, 5 of them are verified as *P. austriacus*, and 1 is doubtful identification of *P. auritus*. In the Crimean peninsula there are 9 records, 4 of them are *P. austriacus*, 2 is *P. auritus*, and 4 records with doubtful species identification ("*auritus*" auct.). Among specimens collected in the nearest parts of Western Caucasus, there are 2 specimens of *P. auritus* and 1 of *P. austriacus*.

Totally, in the studied area we have 9 records of *P. austriacus*, 4 of *P. auritus*, and 7 records with doubtful identification of species ("*auritus*" auctorum). *Plecotus austriacus* is evidently more abundant species of this genus in the Northern Black Sea Region in comparison with *P. auritus*.

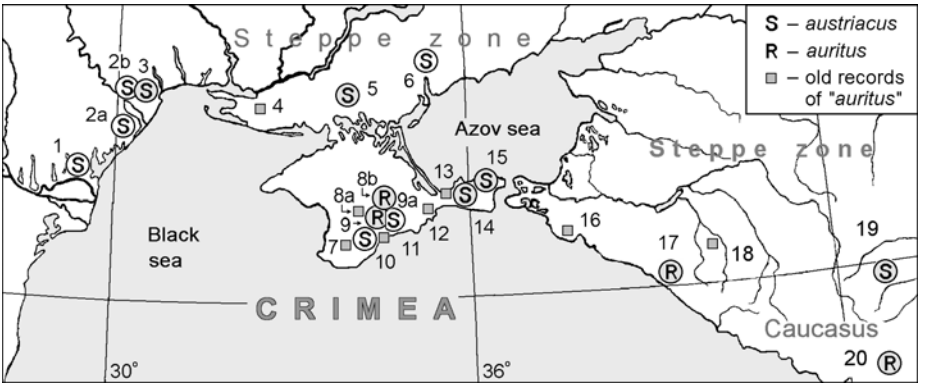

Fig. 2. Geographic position of the known records of both *Plecotus* species in the Crimea and neighbouring areas (after data listed in the text). Verified data are designated as closed circles, literary data as open circles. Old records of *Plecotus* ("*Plecotus auritus*") are designated by small squares.

All previous conclusions about wide distribution of "*Plecotus auritus*" should be attributed to the genus *Plecotus* in a whole, not to species *Plecotus auritus* (s. str.).

Distribution the later species in the northern part of the Black Sea Region is restricted by the mountain forests of the Crimea and adjacent parts of the Caucasus. The Steppe zone of the Eastern Europe separates this part of species range from the northern range of this species. Contrary to this species, range of *Plecotus austriacus* is wider. That is the only species of a genus *Plecotus* distributed in the seaside part of the mainland, from the Danube Delta to the Dnipro. This part of species range seems a secondary range, which appeared after the expansion of *Plecotus austriacus* from the South in the north-western direction.

DISCUSSION

Many zoologists don't list *Plecotus* for the Crimea. So, in the Karadagh Nature Reserve, which is the most investigated territory of the Crimea, *Plecotus* does not mentioned (BESKARAVAJNY 1988). According to the review of KONSTANTINOV *et al*. (1976), for last century just one record of *Plecotus* (mentioned as "*Plecotus auritus*") is known: vicinity of Alushta. Later, DULITSKY and TOVPINETS (1997) mentioned *Plecotus auritus* as very rare species and *Plecotus austriacus* as possibly presented species in the Crimea. Our data support the distribution of both species of *Plecotus* in the studied region.

All non-numerous records of *Plecotus* in the Crimea are from the southern part of this peninsula, which is relatively humid, woody and mountainous. As a whole, such pattern of distribution depends from the biogeographical peculiarities of the pen-

insula. It is surrounded by steppe regions and the forest zone is limited to the small mountain part of this peninsula. The fauna of the Crimea Mountains is most similar to nearest parts of the Caucasus, but differs from the adjacent steppe areas of the East Europe (ZAGORODNIUK 1999a). This conclusion mainly is correct for the species *Plecotus auritus*, which represents the forest community. In case of *Plecotus austriacus* we can see wider geographical range, which covers adjacent steppe areas. Therefore, STRELKOV's (1988) conclusion about break between European and Caucasian part of *austriacus* range should be replaced by the view on continuous distribution of *Plecotus austriacus* in the South of Eastern Europe and Palaearctics as a whole.

KONSTANTINOV *et al*. (1976) considers that *Plecotus* is absent in the Crimea in winter, and VOLYANSKY (1967) did not found a hibernated specimens in Odessa catacombs. However, CHEREMISOV (1990) observed *Plecotus* hibernated in the caves of the Mountain Crimea. Data summed in Table 5 support the idea, that *Plecotus* is known in the Crimea and adjacent areas mainly after the autumn and winter records. Probably these are migrant specimens from the North. An accessible data shown that *Plecotus* is absent here in breeding season.

Table 5. Distribution of records of *Plecotus* for a year (based on the records given in the text)*

Species	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
P. auritus	—	—	—	—	—	1	—	—	—	2	—	—
P. austriacus	—	—	—	—	1	2	1	—	—	—	2?	1
P. sp.	—	—	1	—	1?	—	—	—	1	—	—	1
Total	—	—	1	—	2?	3	1	—	1	2	2?	2

* — Mark "?" is used for records with not exact date (mentioned as "summer" or "winter").

At last, there are many disagreements in the identification of samples from the South of Eastern Europe. Contrary to all previous investigators, CHEREMISOV (1990) listed *Plecotus austriacus* among hibernated bats of the Crimea. However, during our investigation of known collected samples, the only specimen of *Plecotus* collected by CHEREMISOV (Table 1) was identified as *Plecotus auritus* (s. str.). CHEREMISOV's point of view was accepted in the last publication of VOLOKH and KARMYSHEV (2001). On the other hand, STRELKOV (1988) attributed all Crimean records to *P. auritus*, but he appeals to the old articles published in the period when both *Plecotus* species were not distinguished.

The best diagnostics of bat material is based on the cranial dimensions. *Plecotus austriacus* has generally larger skull measurements than *P. auritus*. Using two most popular dimensions in craniometry, i. e. condylobasal length of skull (CBL) and length of auditory *bullae* (BUL), their diagnostic relation is shown on Figure 3.

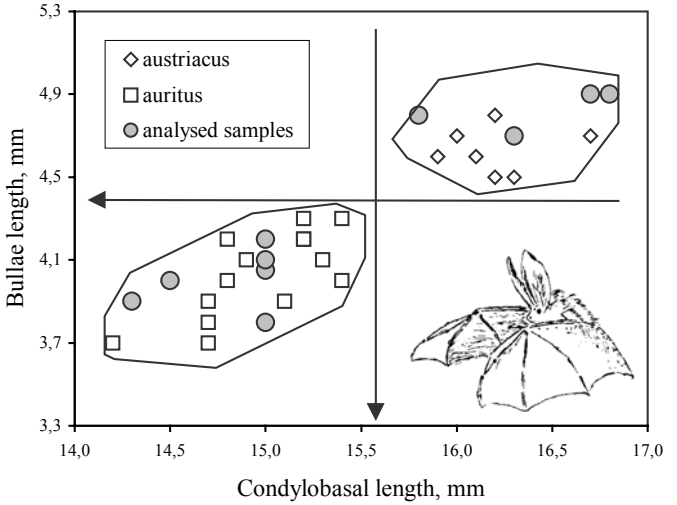

Fig. 3. Dispersion of two diagnostically significant skull measurements in standard samples of *Plecotus* and in analyzed specimens from the Crimea and neighbouring areas. Plot includes data about 3 specimens of *P. auritus* from the Crimea deposited in ZIN and measured by Dr. Strelkov.

This graph can be used for species identification of studied sibling species. In comparison with *P. auritus*, *Plecotus austriacus* has condylobasal length (CBL) of the skull more than 15 mm, and length of *bullae* (BUL) not less than 4,5 mm (in *auritus* limits is 3,7–4,3 mm). External characters are very variable and we over lack of skins in most specimens we can not compare their diagnostic significance on the studied samples from the Crimea and adjacent areas.

CONCLUSION

1. Genus *Plecotus* is very rare group of bats in the Crimea and adjacent areas of the Northern Black Sea Region. In faunal descriptions this group commonly is not listed or mentioned as very rare; its portion in the known zoological collections does not exceed 1 %.
2. The former concept on distribution of a single species of *Plecotus* (*P. auritus*) in the Crimea and adjacent areas should be changed. Long-eared bats are presented in studied region by two different species, *P. auritus* and *P. austriacus*.

3. The two mentioned species occur together in the mountain areas of the Crimea and Western Caucasus. Range of *Plecotus auritus* is limited by mountain forest, and *P. austriacus* has wider distribution in the adjacent plain areas of the Northern Black Sea Region.
4. All the known records of *Plecotus* from this territory occurred in the autumn and winter seasons, i.e. in the non-breeding period. Probably, all the observed and collected specimens are the migrants from the adjacent countries.
5. The Crimean and nearest South-Ukrainian samples of two studied species are characterized by the same values of the body and skull measurements as standard samples from the Central Europe. Studied Western Caucasian specimens had smallest sizes of body and skull.

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