Acta Soc. Zool. Bohem. **75**: 159–222, 2011
ISSN 1211-376X

Bats (Mammalia: Chiroptera) of the Eastern Mediterranean and Middle East. Part 9. Bats from Transcaucasia and West Turkestan in collection of the National Museum, Prague*

Petr Benda[1,2], Vladimír Hanák[2] & Jaroslav Červený[3]

[1] Department of Zoology, National Museum (Natural History), Václavské nám. 68, CZ–115 79 Praha 1, Czech Republic; e-mail: petr_benda@nm.cz
[2] Department of Zoology, Charles University, Viničná 7, CZ–128 44 Praha 1, Czech Republic
[3] Department of Forest Protection and Game Management, Czech University of Life Sciences, Kamýcká 1176, CZ–165 21 Praha 6, Czech Republic

Received 29 September 2011; *accepted 26 October 2011*
Published 15 December 2011

Abstract. A collection of 596 bat specimens belonging to 30 species of four families housed in the zoological collection of the National Museum, Prague, is presented. The specimens originate from 60 localities of nine countries of Transcaucasia (Armenia [9 species from 7 record sites], Azerbaijan [17/18], Georgia [7/4], Russia [1/1]) and West Turkestan (S Kazakhstan [2 species from 3 record sites], Kirghizstan [15/14], Tajikistan [4/3], Turkmenistan [8/5], Uzbekistan [9/5]), i.e. from the southern part of the former Russian and Soviet realms in Asia. The collection is composed mostly of specimens collected by the staff and students of the Department of Zoology, Charles University, Prague, during numerous research trips to the respective countries in the period from the 1960s to 1980s and later presented to the Museum. Additional specimens are also included, gathered by various other collectors mostly in the 1980s. The most valuable material includes specimens of *Rhinolophus bocharicus* Kašenko et Akimov, 1918 (17 specimens from Kirghizstan and Uzbekistan), *Rhinolophus lepidus* Blyth, 1844 (9 specimens from Kirghizstan and Uzbekistan), *Myotis* (*nattereri*) *tschuliensis* Kuzâkin, 1935 (5 specimens from Azerbaijan), *Myotis bucharensis* Kuzâkin, 1950 (4 specimens from Uzbekistan), *Barbastella darjelingensis* (Hodgson, 1855) (26 specimens from Kirghizstan and Uzbekistan), and *Plecotus strelkovi* Spitzenberger, 2006 (7 specimens from Kirghizstan). Two paratype specimens of *Myotis mystacinus hajastanicus* Argiropulo, 1939 (from Armenia) and one paratype specimen of *Nyctalus noctula meklenburzevi* Kuzâkin, 1934 (from Uzbekistan) also belong to the collection. Records of *Rhinolophus lepidus* are here mentioned from accurate localities in West Turkestan for the first time (two sites in the Oš District of S Kirghizstan and one site in SE Uzbekistan). The third known record site of *Myotis bucharensis* within the species range is here presented (Toškent, Uzbekistan). Taxonomic, nomenclatural and/or biogeographic notes concerning the respective populations of *Rhinolophus lepidus*, *Myotis blythii*, *Pipistrellus pipistrellus*, and *Nyctalus noctula* are added.

Key words. Distribution, range, taxonomy, Chiroptera, catalogue, Armenia, Azerbaijan, Georgia, Kazakhstan, Kirghizstan, Russia, Tajikistan, Turkmenistan, Uzbekistan, Palaearctic Region.

INTRODUCTION

Although the territories of Transcaucasia and West Turkestan definitively became parts of the Russian Empire in the second half of the 19th century (as a whole even in 1894), the mammalian fauna of these areas was studied relatively early, mainly by Russian authors. Already from the first period of exploitation of southern vassal territories of Russia, records of bats are available, see e.g. Brandt (1851), Kolenati (1858), Severcov (1873), Fedčenko (1875), Radde & Walter (1889), Tihomirov & Korčagin (1889), Satunin (1896, 1901), Radde (1899), and many others.

* dedicated to Dr. Petr Petrovič Strelkov, St. Petersburg, who fundamentally contributed to the bat research of the respective regions, on occasion of his 80th birthday.

The bats (and other mammal groups) of Transcaucasia and westernmost parts of Russian Turkestan (Transcaspian Region) was thoroughly studied mainly by Konstantin A. Satunin (1863–1915); he was the first to review exhaustively the data on mammals (including bats) of Transcaucasia in two subsequent surveys (Satunin 1896, 1915). K. A. Satunin is also an author of descriptions of six bat taxa based on the populations mainly from then southern Russian regions (see Koževnikov & Uvarov 1917). Bats of the Russia-controlled parts of Central Asia, frequently called 'West Turkestan' or 'Russian Turkestan', and later also 'Central Asia and Kazakhstan', were originally studied rather randomly and unsystematically during various journeys and expeditions (e.g. Brandt 1851, Fedčenko 1875, Radde & Walter 1889, etc.). All then available data on bats from West Turkestan were first and very precisely reviewed by Bobrinskoj (1925).

The bat fauna of the entire Russian / Soviet Union realm including all southern territories was critically reviewed by Ognev (1927, 1928) and later by Kuzâkin (1950); both authors also markedly contributed to fauna and taxonomy of the Eurasian bat populations. However, while S. I. Ognev (1886–1951) focused mainly on the fauna of central Russia and the Russian Far East (see also Ognev 1927), A. P. Kuzâkin (1915–1987) concentrated principally on bats of West Turkestan – he is an author of nine bat taxa from southern Soviet territories (see Kuzâkin 1934, 1935, 1950, 1965; see also Strelkov & Kurskov 1990). Kuzâkin's (1950) view on biology, taxonomy and biogeography of bats was very advanced at that time and corresponded with that applied by other contemporary authors, like Ryberg (1947) and/or Ellerman & Morrison-Scott (1951).

In the following time periods until recent era, bat faunas of particular parts of Transcaucasia and West Turkestan – then groups of provinces (republics) of the Soviet Union and currently of independent states – became relatively well studied in comparison with the knowledge of fauna of the European part of the Soviet Union and/or Siberia. Such difference was undoubtedly induced by more attractive biodiversity of southern sub-tropical regions in comparison with that of the boreal habitats of central and northern zones of Russia or Soviet Union.

Mammalian fauna of the Caucasus Region was thoroughly reviewed by Vereŝagin (1959) and the particular bat faunas of Transcaucasian countries have been surveyed even recently (Georgia and Abkhazia – Ivanickij 2002a, b, 2010, Buhnikašvili et al. 2004; Azerbaijan – Rahmatulina 2005) with the only exception of Armenia, where the records of vertebrates (including bats) were listed already by Dal' (1954) and more recent bat records are scattered in various sources (cf. Âvruân et al. 2002, 2007). A similar situation is in West Turkestan, where all countries have published their detailed local faunas, viz. Kazakhstan (Strelkov 1980, Strelkov & Šajmardanov 1983, Butovskij et al. 1985), Kirghizstan (Ânuševič et al. 1972, Rybin et al. 1989), Tajikistan (Habilov 1992), Turkmenistan (Strelkov et al. 1978), and Uzbekistan (Bogdanov 1953). Most up-to-date check-lists of bat fauna and taxonomy of the entire former Russian / Soviet realm (i.e., incl. the faunas of Transcaucasia and West Turkestan) were subsequently published by Strelkov (1981) and Pavlinov & Rossolimo (1987, 1998).

Collections of bat specimens from Transcaucasia and West Turkestan are scattered throughout many museums, see e.g. Tihomirov & Korčagin (1889), Radde (1899), Thomas (1909), Satunin (1910), Bil'kevič (1918), Rossolimo & Pavlinov (1981), Buhnikašvili et al. (2004), Ševčenko & Zolotuhina (2005) or Rahmatulina (2005). A small collection of these bats is housed also in the National Museum, Prague (NMP). The collection comprises mostly specimens collected by the staff and students of the Department of Zoology, Charles University, Prague, during numerous research trips to the respective countries in the period from the 1960s to 1980s and transferred to the Museum in 2000. Additionally it covers a number of other specimens, collected during trips by various researchers to various regions of both territories and in a various extent presented to the Museum. In this contribution, the NMP collection of the Transcaucasian and West Turkestani bats is described and commented in context of the above faunal compendia.

MATERIAL AND METHODS

Material

The lists of material (arranged in alphabetical and/or chronological orders) include, for each item, the following information: (1) number of specimens with indication of sex, age and physiological condition of the collected individuals (for details see Abbreviations below) and with a reference to museum evidence and type of preparation, (2) name of the locality (each record is primarily listed by a name of the nearest settlement or notable physical feature), description of record site (for the localities see also Figs. 1, 2 and Appendix I), (3) date of collection, and (4) collector name/s (but see also the next subchapter). The same arrangement was used to list the comparative material examined (Appendix II).

Collectors

The names of collectors are mentioned complementarily at almost all item quotations, with the exception of the material collected by participants of student research trips to Azerbaijan and Uzbekistan organised by the Department of Zoology, Charles University, Prague. In these cases, acronyms of collector groups are used and the legend to abbreviations is explained below. Unfortunately, the lists of participants (both students and staff) are not complete as the trip evidences were not saved completely and were reconstructed additionally.

STA75 = Student Research Trip Azerbaijan 1975; participants: Vladimír Bejček, Milan Chvála, Karel Pivnička;
STA81 = Student Research Trip Azerbaijan 1981; participants: Petr Mácha, Petr Roth, Tomáš Scholz;
STA82 = Student Research Trip Azerbaijan 1982; participants: David Král, Petr Mácha, Petr Roth, Jana Svátková, Tomáš Scholz;
STA83 = Student Research Trip Azerbaijan 1983; participants: Karel Absolon, Svatava Bémová, Roman Hanzal, Jiří Kulich, Zdeněk Pecka, Helena Prágnerová, Petr Švácha;
STA84 = Student Research Trip Azerbaijan 1984; participants: Martin Černý, Daniel Frynta, Jan Kubečka, Julius Lukeš, Jiří Moravec, Ivan Rehák, Miroslav Švátora, Zuzana Švecová, Petr Volf, Karel Weidinger;
STA85 = Student Research Trip Azerbaijan 1985; participants: Pavla Dorničová, Petr Kodym, Jiří Moravec, Miroslav Švátora, Miroslav Trávníček;
STA86 = Student Research Trip Azerbaijan 1986; participants: Daniel Frynta, Jan Novák, Jan Plesník, Ivan Rehák;
STA87 = Student Research Trip Azerbaijan 1987; participants: Jan Buchar, Miroslav Švátora;
STA88 = Student Research Trip Azerbaijan 1988; participants: Karel Absolon, Daniel Frynta;
STU89 = Student Research Trip Uzbekistan 1989; participants: Oldřich Hovorka, Karel Hůrka, Miroslav Švátora, Milena Svobodová, Petr Vořišek, Marta Vykopalová.

Morphological analysis

For morphological comparisons, we used museum specimens in the same way as described in previous studies (see e.g. Benda & Gvoždík 2010). The specimens were measured in a standard way with the use of mechanical calliper. Horizontal dental dimensions were taken on cingulum margins. The examined museum material is mentioned in the respective species chapters, the list of comparative material is given in Appendix II. For the evaluated external and cranial measurements see Abbreviations. Statistical analyses were performed using the Statistica 6.0 software. Other methodological details or aspects are described in the respective chapters giving the statistics.

ABBREVIATIONS

Collection acronyms

AUB = American University Beirut, Lebanon; BMNH = Natural History Museum, London, United Kingdom; CUP = Department of Zoology, Charles University, Prague, Czech Republic; HSC = Hans Martin Steiner private collection, Vienna, Austria; ISEA = Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Krakow, Poland; IVB = Institute of Vertebrate Biology, Academy of Sciences of the Czech Republic, Brno, Czech Republic; MHNG = Natural History Museum, Geneva, Switzerland; MNHN = National Museum of Natural History, Paris, France; MSNG = Civil Natural History Museum Giacomo Doria, Genoa, Italy; NMNHS = National Museum of Natural History, Sofia, Bulgaria; NMP = National Museum (Natural History), Prague, Czech Republic; NMW = Natural History Museum, Vienna, Austria; RMHR = Regional Museum Ruse, Bulgaria; ZFMK = Zoological Institute and Museum Alexander Koenig, Bonn, Germany; ZIN = Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia; ZMMU = Zoological Museum of the Moscow State University, Moscow, Russia.

Measurements

External dimensions: LAt = forearm length; McIII = length of third metacarpal of the wing; $PhIII_1$ = length of proximal phalanx of the third wing finger; $PhIII_2$ = length of medial phalanx of the third wing finger; $PhIII_3$ = length of distal phalanx of the third wing finger; McIV = length of fourth metacarpal of the wing; $PhIV_1$ = length of proximal phalanx of the fourth

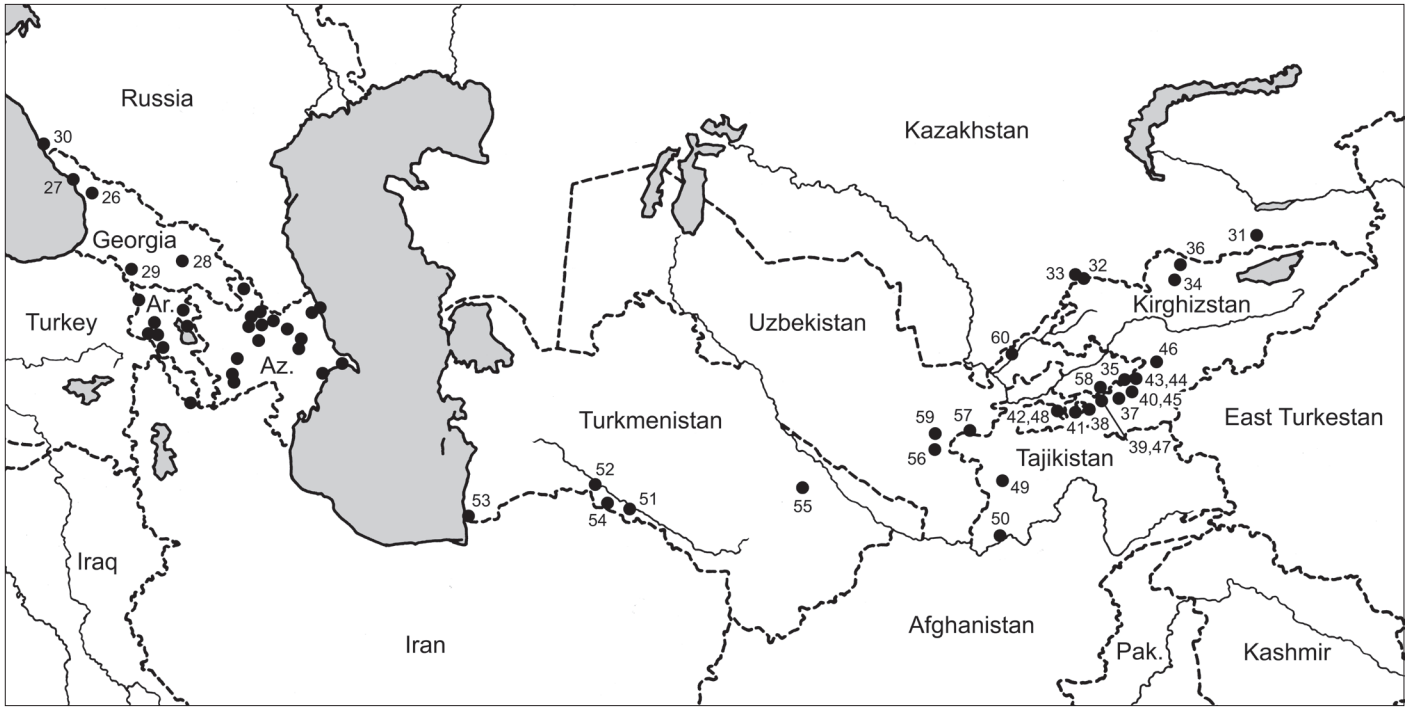

Fig. 1. Map of Transcaucasia and West Turkestan with the sites of origin of the NMP specimens. Site numbers correspond with those in Appendix I, for details concerning eastern Transcaucasia see Fig. 2 and southern Kirghizstan see Rybin et al. (1989: 422, 438). Abbreviations: Ar. = Armenia; Az. = Azerbaijan; Pak. = Pakistan.

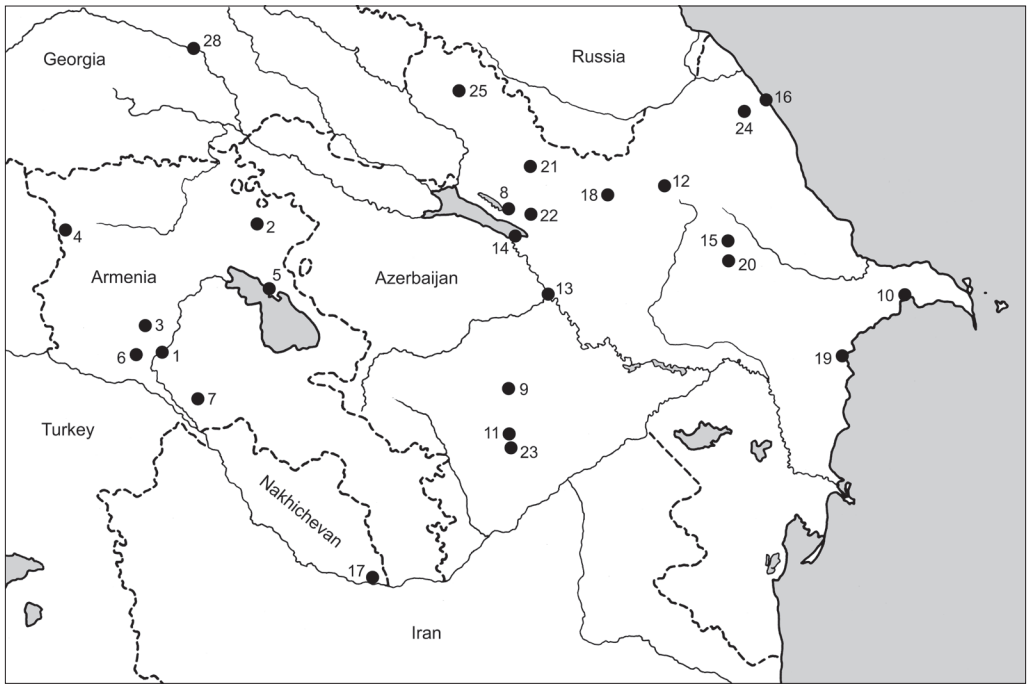

Fig. 2. Map of eastern Transcaucasia with the sites of origin of the NMP specimens; site numbers correspond with those in Appendix I.

wing finger; $PhIV_2$ = length of medial phalanx of the fourth wing finger; $PhIV_3$ = length of distal phalanx of the fourth wing finger; IIIFr = third wing finger ratio (see text for details); IVFr = fourth wing finger ratio (see text for details).
Cranial dimensions. LCr = greatest length of skull (incl. the praemaxilla in *Rhinolophus*); LOc = occipitocanine length of skull; LCb = condylobasal length of skull; LCc = condylocanine length of skull; LaZ = zygomatic width; LaI = width of interorbital constriction; LaInf = infraorbital witdth; LaN = neurocranium width; LaM = mastoidal width; ANc = neurocranium height; LBT = largest horizontal length of tympanic bulla; CC = rostral width between canines (incl.); M^3M^3 = rostral width between third upper molars (incl.); CM^3 = length of upper tooth-row between CM^3 (incl.); CP^4 = length of upper tooth-row between CP^4 (incl.); LMd = condylar length of mandible; ACo = height of coronoid process; CM_3 = length of lower tooth-row between CM_3 (incl.).

Other abbreviations
a = adult; A = alcoholic preparation; B = stuffed skin (balg); f = female; j = juvenile; m = male; M = mean; max., min. = dimension range margins; s = subadult; S = skull; SD = standard deviation, Sk = skeleton.

LIST OF SPECIES

Rhinolophus ferrumequinum (Schreber, 1774)

Material. **Azerbaijan**: 1 ma, 1 fa (NMP 91453 {AZ 190}, 91454 {AZ 191} [S+B]), Acınohur, steppe, 27 June 1986, leg. STA86, ded. V. Hanák; – 1 ma (NMP 91275 {AZ 1} [S+A]), Qobustan, rocky town, 20 June 1979, leg. & ded. V. Hanák; – 1 ma (NMP 91441 {AZ 175} [S+B]), Qobustan, rocky town, 22 June 1987, leg. STA87, ded. V. Hanák; – 1 ma, 6 fa, 1 ind. ad. (NMP 91405 {AZ 139}, 91406 {AZ 140}, 91407 {AZ 141}, 91408 {AZ 142}, 91409 {AZ 143}, 91411 {AZ 145}, 91412 {AZ 146} [S+A], 91410 {AZ 144} [S+B]), Mingəçevir, cave, 25 June 1984, leg. STA84, ded. V. Hanák; – 1 fj (NMP 91567 {SA 70} [S+B]), Ordubad, a cave ca. 13 km from the town, 22 April 1955, leg. I. S. Darevskij,

ded. V. Hanák; – 2 ma, 1 fa (NMP 91299 {AZ 30}, 91305 {AZ 36} [S+A], 91300 {AZ 31} [S+B]), Şamaxı, canyon, 26 June 1979, leg. & ded. V. Hanák. – **Georgia (Abkhazia)**: 2 ma, 12 fa (NMP 91519 {SA 16}, 91520 {SA 17}, 91521 {SA 18}, 91522 {SA 19}, 91527 {SA 25}, 91537 {SA 35}, 91542 {SA 41}, 91546 {SA 45}, 91548 {SA 47}, 91549 {SA 48}, 91553 {SA 52}, 91554 {SA 53}, 91555 {SA 54} [S+B], 93853 {SA 21} [S]), Džal, tunnel, 14 July 1964, leg. & ded. V. Hanák. – **Russia**: 2 fa, 2 inds. ad. (NMP 91485 {BB 31}, 91486 {BB 32} [S+B], 91487 {BB 33}, 91488 {BB 34} [S+K]), Macesta, 24 June 1960, leg. & ded. V. Hanák. – **Kirghizstan**: 3 ma, 1 ms (NMP 91706 {SA 253}, 91707 {SA 254}, 91708 {SA 255} [S+A], 91705 {SA 252} [S+B]), Kadamžaj, cave, 22 May 1980, leg. J. Gaisler & V. Hanák, ded. V. Hanák; – 1 ma (NMP 58328 {K 278/88} [S+A]), Kara-Kokty, mine, 13 July 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 1 ma, 1 ms (NMP 58778/1, 58778/2 [S+A]), Oš District, 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Obuch; – 3 ma (NMP 58326/1 {K 131/88}, 58326/2 {K 132/88}, 58327 {K 152/88} [S+A]), Samarkandyk, Kanigut, mine (Fig. 5), 2 July 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 4 ma, 2 fa (NMP 58325/1 {K 270/88} [A], 58325/2 {K 271/88}, 58325/3 {K 272/88}, 58325/4 {K 273/88}, 58325/5 {K 274/88}, 58325/6 {K 275/88} [S+A]), Toâ-Moûn (Fig. 9), Kolodec Fersmana mine, 12 July 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený. – **Tajikistan**: 1 ma (NMP 58328 {K 194/88} [S+A]), Čarku, mine, 3 July 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený. – **Turkmenistan**: 1 ms, 1 mj, 1 fs (NMP 91605 {SA 112}, 91606 {SA 113}, 91645 {SA 164} [S+B]), Baharly, Baharly Cave, 29 July 1964, leg. & ded. V. Hanák. – **Uzbekistan**: 1 ma, 1 fa (NMP 94093, 94094 {unnumbered} [S+A]), Aman-Kutan, mine, 1 October 1985, leg. J. Moravec, ded. V. Hanák; – 1 ma, 1 fa (NMP 91467 {BB 12}, 91468 {BB 13} [S+B]), Toškent, cave, 30 September 1963, leg. & ded. V. Hanák.

References. Hůrka (1962, 1969); Hanák (1969); Zima et al. (1991, 1992a); Rahmatulina & Gasanov (2002a); Rahmatulina (2005); Benda et al. (2006).

Remarks. *Rhinolophus ferrumequinum* belongs to the most common bat species in the southwestern part of the Palaearctic, including Transcaucasia and southern and eastern regions of West Turkestan (Kuzâkin 1950, Bogdanov 1953, Dal' 1954, Strelkov et al. 1978, Rybin et al. 1989, Habilov 1992, Ivanickij 2002a, b, 2010, Buhnikašvili et al. 2004, Rahmatulina 2005, etc.). Most of the NMP specimens originate from sites where *R. ferrumequinum* has already been known (Azerbaijan, Turkmenistan, Uzbekistan, Kirghizstan). The Russian records from the Soči region (Macesta) and from the northern slopes of the Greater Caucasus represent a part of the northern

Table 1. Basic biometric data on the examined NMP specimens of *Rhinolophus ferrumequinum* (Schreber, 1774) from Transcaucasia (TC) and West Turkestan (WT) and of *R. bocharicus* Kašenko et Akimov, 1918 from West Turkestan. For abbreviations see pp. 161, 163

	Rhinolophus ferrumequinum TC					*Rhinolophus ferrumequinum* WT					*Rhinolophus bocharicus*				
	n	**M**	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	31	**55.80**	52.6	58.8	1.708	24	**57.41**	52.3	60.6	2.208	16	**50.68**	49.4	52.5	0.991
LCr	25	**22.96**	21.79	23.94	0.571	19	**23.09**	21.72	23.82	0.535	8	**20.02**	19.72	20.48	0.279
LOc	33	**22.38**	21.34	23.31	0.463	20	**22.40**	21.46	22.96	0.384	16	**19.40**	18.92	20.02	0.285
LCc	33	**19.88**	18.98	20.67	0.457	19	**19.97**	19.11	20.56	0.385	16	**17.18**	16.88	17.82	0.227
LaZ	33	**11.68**	11.02	12.32	0.313	21	**11.45**	10.68	12.07	0.307	16	**10.18**	9.91	10.44	0.140
LaI	33	**2.49**	2.22	2.92	0.152	21	**2.59**	2.33	2.88	0.133	16	**2.44**	2.21	2.75	0.155
LaInf	33	**5.92**	5.57	6.48	0.215	21	**5.79**	5.62	6.09	0.109	16	**4.94**	4.76	5.11	0.094
LaN	33	**9.24**	8.62	9.61	0.209	21	**9.16**	8.76	9.46	0.198	16	**8.40**	8.17	8.59	0.135
LaM	33	**10.20**	9.68	10.67	0.207	20	**10.24**	9.84	10.64	0.175	16	**9.33**	9.17	9.44	0.075
ANc	33	**6.69**	6.12	7.03	0.199	20	**6.56**	6.12	6.93	0.206	16	**5.95**	5.72	6.21	0.153
LBT	31	**3.50**	3.18	4.06	0.200	21	**3.62**	3.14	4.04	0.215	15	**3.23**	2.96	3.56	0.168
CC	33	**6.19**	5.66	6.54	0.216	20	**6.13**	5.75	6.42	0.214	16	**5.06**	4.78	5.27	0.151
M^3M^3	33	**8.31**	7.79	8.74	0.229	21	**8.40**	7.89	8.65	0.184	16	**7.41**	7.18	7.56	0.119
CM^3	33	**8.22**	7.62	8.74	0.267	21	**8.27**	7.83	8.67	0.199	16	**6.84**	6.62	7.07	0.123
LMd	32	**15.10**	14.33	15.83	0.451	21	**14.93**	13.81	15.45	0.382	15	**12.64**	12.28	12.93	0.208
ACo	32	**3.71**	3.37	4.08	0.191	21	**3.61**	3.17	3.89	0.180	15	**2.77**	2.61	2.89	0.082
CM_3	32	**8.85**	8.14	9.31	0.292	21	**8.85**	8.41	9.21	0.200	15	**7.41**	7.17	7.59	0.125

margin of the species range in the Palaearctic (Vereŝagin 1959, Kuzâkin 1965, Kazakov & Ârmyš 1974, Ârmyš et al. 1980, Duvarova 1980, etc.); according to Cyculina (1999), *R. ferrumequinum* is common but not abundant in this region. The records from southern Kirghizstan come from the eastern margin of the species range in West Turkestan (Strelkov 1971, Ânuševič et al. 1972, Rybin et al. 1989), however, *R. ferrumequinum* has been also considered one of the most common bat species there (Rybin et al. 1989).

Standard karyotype characteristics of the specimen NMP 58325/1 from Kirghizstan were described by Zima et al. (1991). External and cranial dimensions of the examined NMP specimens of *R. ferrumequinum* from Transcaucasia and West Turkestan are shown in Table 1.

Rhinolophus bocharicus Kaŝenko et Akimov, 1918

Material. **Kirghizstan**: 1 ma (NMP 58445 [S+A]), Oš District, 1987, leg. & ded. J. Obuch; – 4 ma (NMP 58336/1 {K 141/88} [A], 58336/2 {K 140/88}, 58336/3 {K 162/88}, 58336/4 {K 185/88} [S+A]), Samarkandyk, Kanigut, mine (Fig. 5), 2 July 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený. – **Uzbekistan**: 4 fa (NMP 91458 {BB 3}, 91459 {BB 4}, 91460 {BB 5}, 91461 {BB 6} [S+B]), Samarqand, cave, 28 September 1963, leg. & ded. V. Hanák; – 1 ma, 7 fa (NMP 91489 {BB 35}, 91490 {BB 36}, 91491 {BB 37}, 91492 {BB 43}, 91493 {BB 44}, 91494 {BB 45}, 91495 {BB 46}, 91496 {BB 49} [S+B]), Samarqand, cave, 14 October 1963, leg. A. K. Sagitov, ded. V. Hanák.

References. Hanák (1969); Zima et al. (1991, 1992a).

Remarks. *Rhinolophus bocharicus* is an endemic of West Turkestan, only minutely reaching the adjacent regions (N Iran, N Afghanistan) (Hanák 1969, Strelkov 1971, DeBlase 1980). The NMP

Fig. 3, 4. Two views of males of *Rhinolophus bocharicus* Kaŝenko et Akimov, 1918 observed/collected in the Kanigut mine at Samarkandyk (Fig. 5), southwestern Kirghizstan (photo by J. Červený).

Fig. 5. Landscape at the Kanigut mine near Samarkandyk, southwestern Kirghizstan (photo by J. Červený); the Turkestanskij hrebet Range (the highest peak above 5,500 m a. s. l.) in the background. Site of evidence of seven bat species, viz. *Rhinolophus ferrumequinum*, *R. bocharicus*, *Myotis blythii*, *Eptesicus bottae*, *Hypsugo savii*, *Barbastella darjelingensis*, and *Plecotus strelkovi*.

specimens from the Batken and Oš Provinces, S Kirghizstan (Figs. 3, 4), originate from the easternmost extent of the species distribution range (Strelkov 1971, Ânuševič et al. 1972). However, *R. bocharicus* is not an extremely rare species in this region, Rybin et al. (1989) rank it among accessorial species of the bat fauna of southern Kirghizstan. The NMP series from Uzbekistan was collected at a site, where *R. bocharicus* was recorded more times (Kašenko & Akimov 1918, Bobrinskoj 1925, Ognev 1928, Bogdanov 1953, cf. Fedčenko 1875), including the individual giving basis for the species description – there is one specimen from Samarqand in the type series (composed of 50 specimens) which otherwise originates mostly from Termez (= Termiz), S Uzbekistan (Kašenko & Akimov 1918; type locality: Samarqand and Termiz). The NMP series from Samarqand thus represents topotypical material.

Since specimens of *R. bocharicus* are not a frequent material in zoological collections (see Strelkov 1971), the two NMP series seem to be very valuable. Standard karyotype characteristics of the specimens NMP 58336/1 and 58336/2 from Kirghizstan (Figs. 3, 4) were described by Zima et al. (1991, 1992a). External and cranial dimensions of the examined NMP specimens of *R. bocharicus* are shown in Table 1.

Rhinolophus hipposideros (Borkhausen, 1797)

Material. **Azerbaijan**: 1 fa (NMP 91697 {SA 236} [S+B]), Suçma, 25 April 1976, leg. I. K. Rahmatulina, ded. V. Hanák. – **Kirghizstan**: 1 fa (NMP 58323 {K 120/88} [S+A]), Kyzyl-Kiâk, cave, 30 June 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 1 fa (NMP 58324/2 {K 268/88} [S+A]), Toâ-Moûn (Fig. 9), Kolodec Fersmana mine, 12 July 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený.

Remarks. *Rhinolophus hipposideros* is one of the most frequent bat species in the southwestern Palaearctic, including Transcaucasia and the southern part of West Turkestan. In Azerbaijan, Rahmatulina (2005) showed it to be a regularly found bat, 45 localities are available mainly in upper altitudes (foothils and lower parts of mountains), but the species is almost absent from the (arid) lowlands. Rybin et al. (1989: 429) considered *R. hipposideros* (most probably incl. *R. lepidus*, see below) to belong to the group of frequent species and to represent "a regular species recorded both in the medium-altitude and lowland zone". The record from the Kolodec Fersmana [= "Fersman's Well"] mine in southern Kirghizstan (Oš Province) represents one of the easternmost findings within the whole Turkestani distribution range of the species (Fig. 6; cf. Kuzâkin 1965, Ânuševič et al. 1972, Rybin et al. 1989, Habilov 1992). More eastwards situated

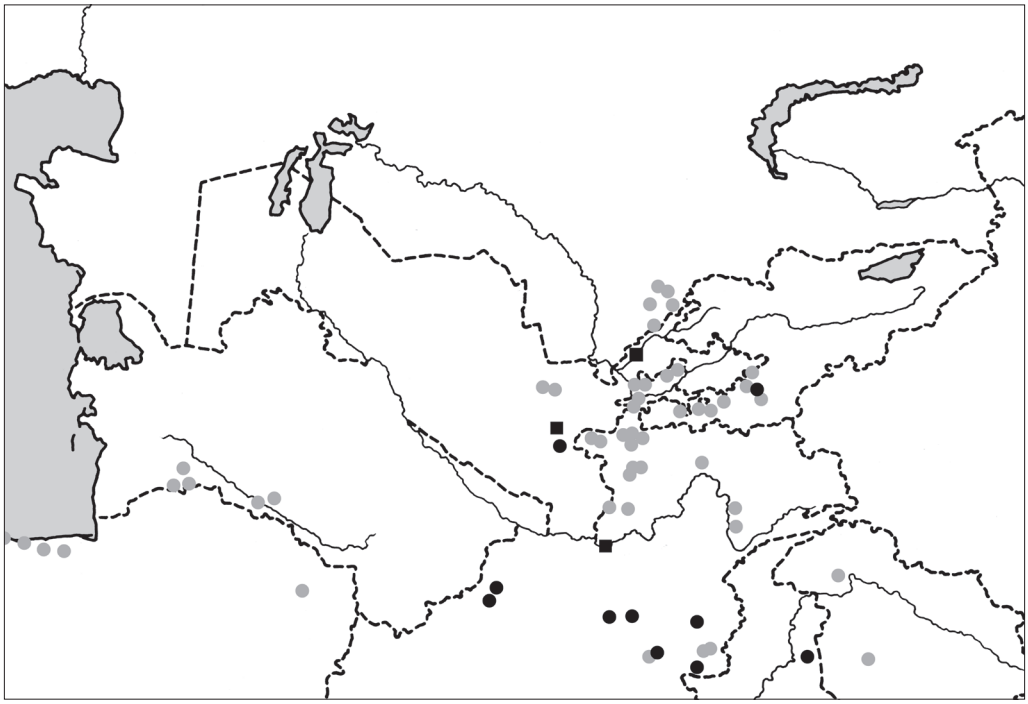

Fig. 6. Records of small-sized horseshoe bats (*Rhinolophus* Lacépède, 1799) and *Myotis bucharensis* Kuzâkin, 1950 in West Turkestan and adjacent parts of southwestern Asia. Explanations: black dots = records referred to *Rhinolophus lepidus* Blyth, 1844; gray dots = records referred to *R. hipposideros* (Borkhausen, 1797); black squares = records of *Myotis bucharensis*. Based on the data by Kuzâkin (1950), Bogdanov (1953, 1960, 1968), Aellen (1959), Gaisler (1970), Sinha (1973), Topál (1974), Felten et al. (1977), Strelkov et al. (1978), DeBlase (1980), Rybin et al. (1989), Habilov (1992), Roberts (1997), Šajmardanov (2001), Csorba et al. (2003), and own data. In some cases, one symbol represents more than one site.

Table 2. Basic biometric data on the examined NMP specimens of *Rhinolophus hipposideros* (Borkhausen, 1797) from Transcaucasia and West Turkestan (see text for details) and comparative samples from the SW Palaearctic. For abbreviations see pp. 161, 163

NMP	58324/2	58323	91697	Middle East					southeastern Europe				
				n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	38.9	40.1	37.2	56	**37.47**	35.2	39.4	1.037	64	**38.16**	34.9	40.3	1.129
LCr	15.64	15.88	16.27	33	**15.90**	15.12	16.31	0.277	55	**16.11**	15.03	16.76	0.322
LOc	14.89	15.06	15.36	45	**15.12**	14.47	15.57	0.257	57	**15.39**	14.75	15.98	0.215
LCc	13.33	13.43	13.51	46	**13.46**	12.82	13.96	0.236	70	**13.67**	13.02	14.14	0.215
LaZ	7.31	7.33	7.65	46	**7.32**	6.94	7.66	0.156	66	**7.52**	7.23	8.10	0.163
LaI	1.77	1.64	1.66	46	**1.56**	1.37	1.91	0.117	75	**1.60**	1.38	2.00	0.109
LaInf	3.42	3.51	3.56	46	**3.53**	3.31	3.75	0.097	59	**3.55**	3.28	3.81	0.089
LaN	6.53	6.31	6.40	46	**6.41**	6.13	6.73	0.139	75	**6.57**	6.21	6.89	0.147
LaM	7.28	7.48	7.44	46	**7.29**	7.01	7.51	0.127	59	**7.47**	7.18	7.75	0.135
ANc	4.67	4.60	4.87	46	**4.58**	4.23	4.93	0.153	71	**4.65**	4.31	4.93	0.119
CC	–	3.28	3.67	44	**3.45**	3.18	3.72	0.124	71	**3.42**	2.98	3.88	0.126
M^3M^3	5.21	5.42	5.48	46	**5.28**	5.02	5.58	0.140	75	**5.36**	4.93	5.64	0.123
CM^3	5.27	5.37	5.28	46	**5.30**	4.98	5.62	0.138	75	**5.32**	5.08	5.53	0.108
LMd	9.59	9.73	9.64	46	**9.53**	9.13	10.24	0.213	75	**9.73**	9.25	10.10	0.183
ACo	1.84	1.93	2.07	46	**2.00**	1.75	2.19	0.115	76	**1.99**	1.67	3.07	0.169
CM_3	5.49	5.59	5.38	46	**5.46**	5.05	5.93	0.156	75	**5.46**	5.17	5.72	0.123

records within the whole distribution range are only those coming from Kashmir (Fig. 6; Sinha 1973, Topál 1974).

Results of molecular genetic analysis by Guillén Servent et al. (2003) suggested close phylogenetic position of the Kirghizstani populations of *R. hipposideros* to the European ones. Morphometric comparison showed closer proximity of the samples from Kirghizstan to the samples from the Levant and Europe than to those from Iran (Figs. 7, 8; Table 2 and Benda et al. 2006: 62, Table 6).

Rhinolophus lepidus Blyth, 1844

Rhinolophus hipposideros (Borkhausen, 1797): Rybin et al. 1989: 423–429, 433, 438–440 [partim]; Zima et al. 1991: 31, 33; Zima et al. 1992a: 230, 232–235 [partim]; Zima 2004: 114–116 [partim].
Rhinolophus kirgisorum Horáček, Hanák et Gaisler, 2000: 19–21, 47, 101, 156. [nomen nudum]
Rhinolophus lepidus Blyth, 1844: Horáček et al. 2000: 156.
Rhinolophus aff. *lepidus* Blyth, 1844: Horáček et al. 2000: 101.

Material. **Kirghizstan**: 3 ma, 2 fa (NMP 60517 {G 2323}, 60518 {G 2324}, 58896/1 {K 104/90}, 58896/3 {K 111/90} [S+A], 58896/2 {K 110/90} [A]), Kara-Kokty, mine, 28 May 1990, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 2 ma (NMP 58324/1 {K 267/88}, 58324/3 {K 269/88} [S+A]), Toâ-Moûn (Fig. 9), Kolodec Fersmana mine, 12 July 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený. – **Uzbekistan**: 2 fa (NMP 94095, 94096 {unnumbered} [S+A]), Aman-Kutan, mine, 1 October 1985, leg. J. Moravec, ded. V. Hanák; –

References. Zima et al. (1991, 1992a); [Horáček & Zima (1996)]; [Zima (2004)].

Remarks. Aellen (1959), Gaisler (1971), Felten et al. (1977), Bates & Harrison (1997) and Csorba et al. (2003) demonstrated sympatric occurrence of two species of small-sized horseshoe bats, *Rhinolophus hipposideros* and *R. lepidus*, in northwestern parts of the Indian Region (Afghanistan, N Pakistan and Kashmir). As it emerged from the data reported here, a similar sympatric occurrence exists also in the adjacent mountain region of the eastern part of West Turkestan. The

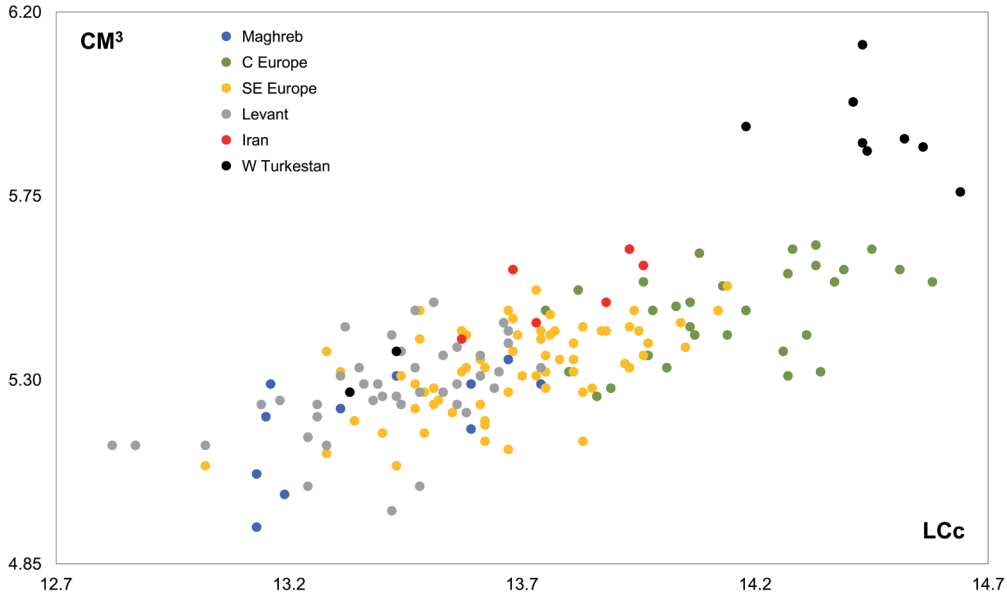

Fig. 7. Bivariate plot of the examined West Turkestani and comparative samples of small-sized representatives of the genus *Rhinolophus* Lacépède, 1799 from the western Palaearctic [*R. hipposideros* (Borkhausen, 1797) and *R. lepidus* Blyth, 1844]: condylocanine length of skull (LCc) against length of upper tooth-row (CM^3).

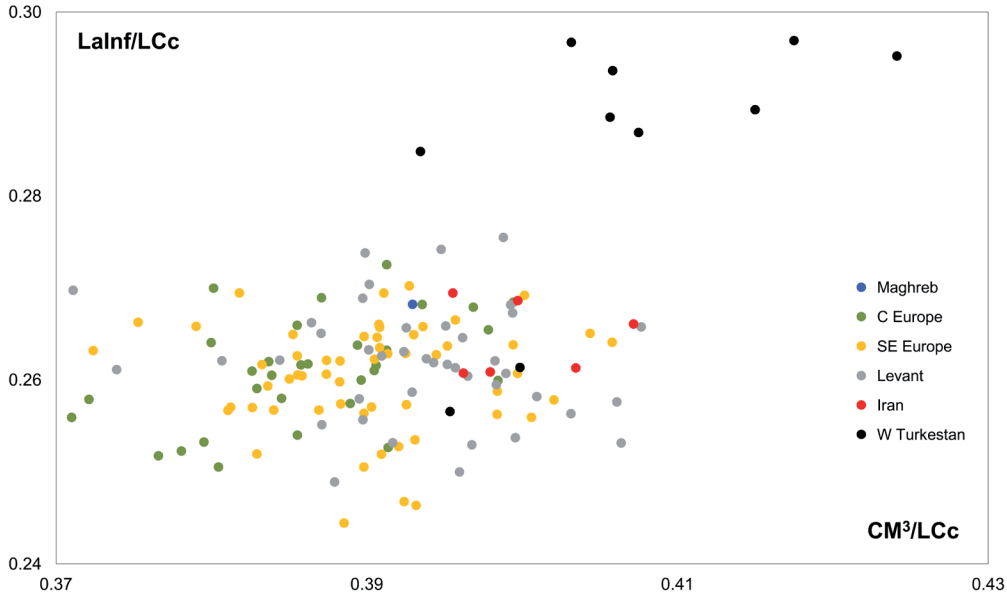

Fig. 8. Bivariate plot of the examined West Turkestani and comparative samples of small-sized representatives of the genus *Rhinolophus* Lacépède, 1799 from the western Palaearctic [*R. hipposideros* (Borkhausen, 1797) and *R. lepidus* Blyth, 1844]: relative length of rostrum (CM^3/LCc) against relative width of rostrum (LaInf/LCc).

Fig. 9. The Dangi Valley (ca. 1,100 m a. s. l.) under the Toâ-Moûn Massif in southern Kirghizstan, an area with numerous natural and artificial undergroud spaces rich in bat fauna (photo by J. Červený). At least six bat species were documented in the area (*Rhinolophus ferrumequinum*, *R. hipposideros*, *R. lepidus*, *Myotis blythii*, *Hypsugo savii*, and *Tadarida teniotis*; see also Rybin et al. 1989).

dimensions of seven Kirghizstani and two Uzbekistani specimens of small-sized horseshoe bats correspond to the data given by Felten et al. (1977) for samples of *R. lepidus* from Afghanistan (Table 3); therefore, we refer these small-sized West Turkestani horseshoe bats to *R. lepidus* sensu Felten et al. (1977). Hence, we consider *R. lepidus* to represent a new species for the bat fauna of Kirghizstan and Uzbekistan, and West Turkestan as well (as already suggested by Horáček et al. 2000, see below).

R. lepidus was found in two very close sites on the northern slope of the Pamir-Alai Mts., S Kirghizstan, and in the westernmost extension of this mountains in Uzbekistan (Fig. 6); in one of these sites, at the Kolodec Fersmana mine in the Toâ-Moûn Massif (Fig. 9), both *R. lepidus* and *R. hipposideros* were collected during one netting session on 12 July 1988 (two and one individuals were caught, respectively). It gives evidence of syntopic occurrence of both species in the respective region (the sympatric occurrence was already noted in the Jalalabad region of Afghanistan, see Fig. 6; Aellen 1959, Gaisler 1970, Felten et al. 1977).

First indications of the occurrence of *R. lepidus* in West Turkestan were given in the karyologic studies by Zima et al. (1991, 1992a); the authors reported findings of small-sized horseshoe bats (under *R. hipposideros*) from southern Kirghizstan with chromosome number 2n=62, the number typical for Oriental representatives of the genus *Rhinolophus* (Zima et al. 1992a). Horáček

& Zima (1996) briefly remarked morphologic differences between the respective small-sized Kirghizstani horseshoe bats and *R. hipposideros* s.str. Horáček et al. (2000) suggested possible separate taxonomic position of the Turkestani horseshoe bats and mentioned their close affinity to *R. lepidus*. In various parts of their paper, Horáček et al. (2000) used two names related to the respective population, *R. lepidus* (incl. *R.* aff. *lepidus*) and *R. kirgisorum* (see the synonymy above). However, they did not give any description of the species named by the latter name, which thus apparently represents a nomen nudum. I. Horáček collected the specimens reported as a 'possible new species' during his trips to southern Kirghizstan in 1984 and 1987 (Horáček, ad verb.), the NMP specimens were caught during a trip to Uzbekistan by J. Moravec in 1985 and two trips by J. Červený and his group to Kirghizstan in 1988 and 1990. Also the specimens whose standard karyotype characteristics were described by Zima et al. (1991, 1992a), viz. NMP 60517 and 60518, come from the latter trip in 1990.

Since the collection of individuals of *R. lepidus* is here specifically (unique specimens from unique localities) reported for the first time from West Turkestan (and also out of the Oriental Region), morphologic comparison of these specimens with *R. hipposideros* is given, i.e., with the only small-sized congener formerly reported to occur in the region (Satunin 1910, 1914, Ognev 1927, 1928, Bobrinskoj 1925, Kuzâkin 1950, 1965, Bogdanov 1953, 1974, Strelkov 1963, 1981, Rybin 1980, Habilov 1992, Rybin et al. 1989, etc.). Externally, these species differ in size, noseleaf morphology, and relative dimensions of wing finger segments, and they also differ in skull shape and tooth characters (see also Sinha 1973 and Bates & Harrison 1997).

Table 3. Basic biometric data on the examined NMP specimens of *Rhinolophus lepidus* Blyth, 1844 from West Turkestan and comparative literature data from Afghanistan and Kashmir. For abbreviations see pp. 161, 163

	West Turkestan					Afghanistan (Felten et al. 1977)				*monticola* (Andersen 1905)
	n	**M**	min	max	SD	n	M	min	max	BMNH 79.11.21.151.
LAt	9	**41.47**	38.6	43.1	1.300	16	**41.88**	40.5	43.5	37.5
Mc III	9	**30.51**	28.8	31.9	0.968	16	**30.04**	29.2	30.4	28.7
Ph III_1	9	**12.07**	11.6	12.7	0.444	16	**12.57**	11.6	13.3	–
Ph III_2	9	**15.01**	14.6	15.7	0.310	16	**16.51**	15.6	17.7	–
Ph III_3	9	**3.06**	2.6	3.9	0.368	–	–	–	–	–
Mc IV	9	**31.89**	30.2	32.9	0.805	16	**31.38**	30.1	32.5	28.8
Ph IV_1	9	**9.22**	8.6	9.4	0.254	16	**9.10**	8.5	9.8	–
Ph IV_2	9	**10.30**	9.2	11.1	0.534	16	**11.33**	10.5	12.6	–
Ph IV_3	9	**1.47**	1.2	1.8	0.173	–	–	–	–	–
LCr	6	**17.09**	16.84	17.27	0.152	–	–	–	–	16.8
LOc	8	**16.33**	16.21	16.44	0.088	16	**16.40**	16.1	16.6	–
LCc	8	**14.45**	14.18	14.64	0.135	15	**14.50**	14.0	14.8	–
LaZ	8	**8.15**	8.04	8.24	0.072	15	**8.10**	7.8	8.3	8.2
LaI	8	**1.95**	1.88	2.02	0.051	16	**2.15**	2.0	2.3	–
LaInf	8	**4.21**	4.14	4.32	0.058	16	**4.30**	3.9	4.4	–
LaN	8	**7.17**	7.04	7.32	0.092	–	–	–	–	7.7
LaM	8	**8.02**	7.94	8.08	0.058	16	**8.05**	7.9	8.2	8.1
ANc	8	**5.02**	4.67	5.19	0.159	16	**5.05**	4.8	5.2	–
LBT	8	**2.77**	2.58	2.99	0.144	–	–	–	–	–
CC	7	**4.07**	3.88	4.39	0.183	16	**4.10**	3.8	4.3	–
M^3M^3	8	**6.04**	5.94	6.12	0.059	16	**6.00**	5.8	6.2	–
CM^3	8	**5.91**	5.76	6.10	0.105	16	**5.95**	5.8	6.0	6.3
LMd	8	**10.49**	10.36	10.78	0.138	–	–	–	–	11.0
ACo	8	**2.31**	2.24	2.42	0.063	–	–	–	–	–
CM_3	8	**6.18**	6.07	6.33	0.085	–	–	–	–	6.8

Table 4. Selected wing segment measurements of the examined NMP specimens of *Rhinolophus lepidus* Blyth, 1844 and *R. hipposideros* (Borkhausen, 1797) from West Turkestan (WT) and Iran (IR). For abbreviations see pp. 161, 163

coll. No.	origin	sex	LAt	McIII	PhIII^1	PhIII^2	PhIII^3	McIV	PhIV^1	PhIV^2	PhIV^3	IIIFr	IVFr
Rhinolophus lepidus													
NMP 60517	WT	f	42.4	30.8	12.3	15.0	3.2	32.5	9.4	11.1	1.2	1.010	1.181
NMP 60518	WT	f	42.4	31.3	12.0	15.1	3.0	32.4	9.3	10.2	1.3	1.040	1.097
NMP 58896/1	WT	m	40.7	29.2	11.6	14.8	3.2	31.2	9.2	10.3	1.5	0.986	1.120
NMP 58896/2	WT	m	38.6	28.8	11.6	14.8	2.9	30.2	8.6	9.2	1.4	0.983	1.070
NMP 58896/3	WT	m	41.3	30.4	12.4	14.9	2.6	31.6	9.1	10.3	1.5	1.017	1.132
NMP 58324/1	WT	m	41.2	30.6	11.6	14.6	3.0	32.0	9.3	10.1	1.4	1.048	1.086
NMP 58324/3	WT	m	41.9	30.7	11.8	15.1	2.9	32.2	9.3	10.9	1.6	1.030	1.172
NMP 93844	WT	f	43.1	31.9	12.7	15.7	2.8	32.9	9.4	10.4	1.8	1.022	1.106
NMP 93845	WT	f	41.6	30.9	12.6	15.1	3.9	32.0	9.4	10.2	1.5	0.978	1.085
Rhinolophus hipposideros													
NMP 58324/2	WT	f	38.9	26.9	13.0	18.0	1.7	30.4	6.8	13.1	0.8	0.823	1.926
NMP 58323	WT	f	40.1	26.9	13.3	19.3	1.6	30.6	7.5	13.1	0.8	0.787	1.747
NMP 48439	IR	m	38.1	26.2	11.7	18.7	1.5	29.4	6.7	12.5	1.0	0.821	1.866
NMP 48096	IR	m	38.4	26.4	12.7	19.2	1.6	30.4	6.7	12.8	0.9	0.788	1.910
NMP 48097	IR	m	39.4	27.0	13.1	18.7	1.7	30.2	7.2	12.2	0.8	0.806	1.694
NMP 48117	IR	f	38.9	25.8	12.9	18.3	1.1	29.3	6.8	12.5	0.9	0.799	1.838

The examined specimens of *R. lepidus* were larger than the samples of *R. hipposideros* from Kirghizstan, Middle East and the European Mediterranean in almost all compared dimensions (Tables 2, 3), these two sample groups clearly differed in mean values, although sligthly overlapping in their dimension ranges. The connecting process of the noseleaf is more prominent in *R. lepidus* than in *R. hipposideros* (Fig. 10), where it is almost absent, thus representing an efficient

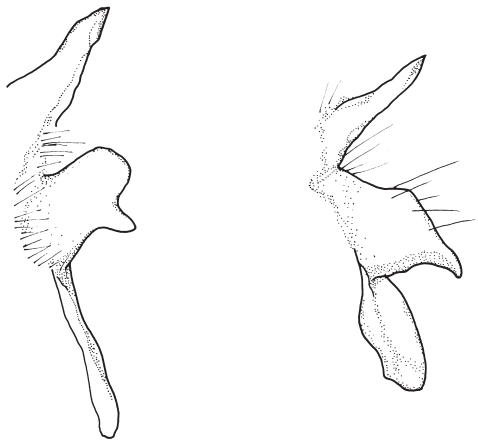

Fig. 10. Schematical drawings of noseleafs (in a lateral view) of the small-sized representatives of the genus *Rhinolophus* Lacépède, 1799 from the Kolodec Fersmana mine in the Toâ-Moûn Massif, southern Kirghizstan; *R. lepidus* Blyth, 1844 (male, NMP 58324/3) on the left, *R. hipposideros* (Borkhausen, 1797) (female, NMP 58324/2) on the right. Scale bar – 3 mm.

distinguishing character. On the other hand, the tip of sella is shorter in *R. lepidus* than in *R. hipposideros* (Fig. 10). Apart from the noseleaf shape, the most reliable external trait discriminating both species seem to be the third and fourth finger ratia. The ratio between the metacarpal and total length of the digit (i.e. sum of lengths of all three phalangi) of the third wing finger clearly separated the two groups of specimens (Table 4). While in *R. lepidus* this ratio (IIIFr) was in the range 0.98–1.05 (mean 1.013), in *R. hipposideros* from Kirghizstan and Iran it was 0.79–0.82 (mean 0.804). A very similar relation is obvious from the comparison of this ratio counted from the fourth wing digit (IVFr; Table 4).

The skulls of *R. lepidus* had absolutely and relatively more massive (longer, higher and wider) rostra and broader braincases than the skulls of *R. hipposideros* (Figs. 7, 8 and 11), the two species thus represent clearly distinct cranial morphotypes. These morphotypes also differ in dentition, the upper canines are more massive in *R. lepidus* than in *R. hipposideros*, while the small upper premolars are absolutely and relatively more gracile in *R. lepidus* than in *R. hipposideros* (Fig. 12).

Perhaps due to confusions with *R. hipposideros* (see Figs. 13, 14), the only other horseshoe bat very similar in size occurring in the region, *R. lepidus* remained until now overlooked within the Turkestani bat fauna. Further revisions of available museum specimens of small-sized horseshoe bats originally assigned to *R. hipposideros* that were collected in southern Kirghizstan, eastern Uzbekistan and in Tajikistan, could bring new distribution data on *R. lepidus* from West Turkestan. The gap in distribution, now obvious between Afghanistani, Uzbekistani and Kirghizstani

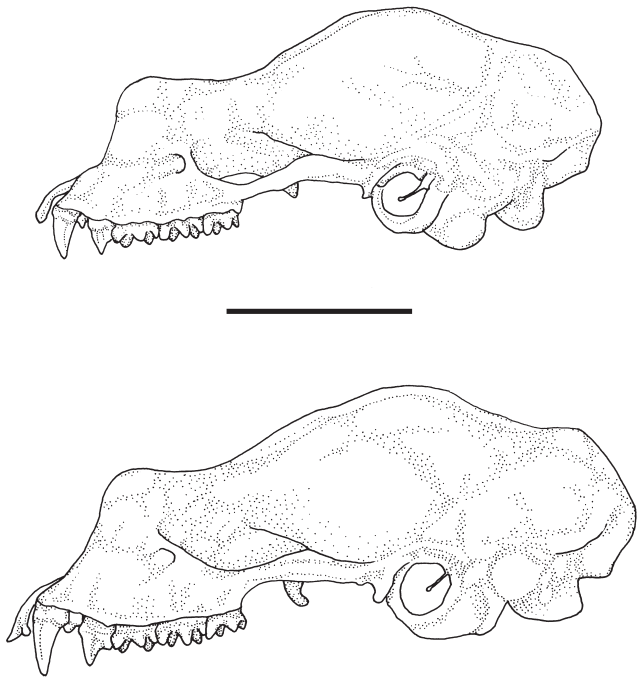

Fig. 11. Skulls of the small-sized representatives of the genus *Rhinolophus* Lacépède, 1799 from the Kolodec Fersmana mine in the Toâ-Moûn Massif, southern Kirghizstan; *R. hipposideros* (Borkhausen, 1797) (female, NMP 58324/2) at the top, *R. lepidus* Blyth, 1844 (male, NMP 58324/1) at the bottom. Scale bar – 5 mm.

occurrence spots (Fig. 6), could then be faded. The northernmost and perhaps also easternmost extensions of the Turkestani part of the distribution range of *R. lepidus* could be expected on the southern slope of the Far'gona Basin in Kirgizstan. From the adjacent upper plateaus of the Chinese East Turkestan, no records of horseshoe bats are available, nor from western Tibet (Zhang et al. 1997, Wilson 2008). Aellen (1959) and Felten et al. (1977) assigned the Afghanistani specimens of *R. lepidus* to *R. l. monticola* Andersen, 1905; skull dimensions of the type given by Andersen

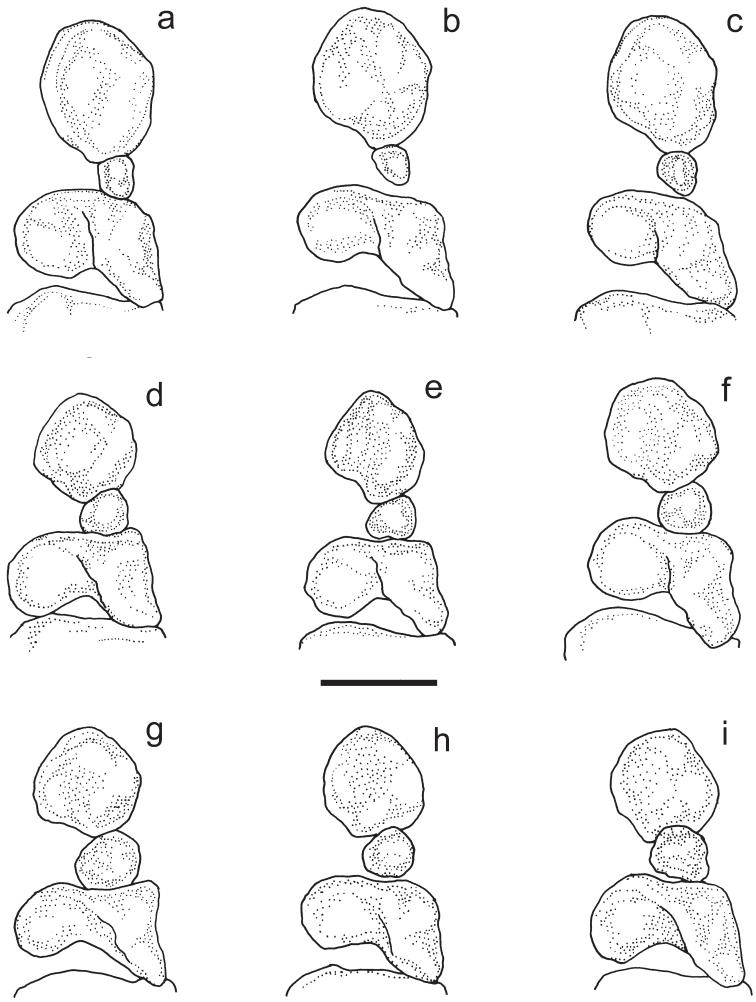

Fig. 12. Upper unicuspidal tooth-rows of the small-sized representatives of the genus *Rhinolophus* Lacépède, 1799 from the SW Palaearctic. a–c – *R. lepidus* Blyth, 1844 from Kirghyzstan: a – NMP 58324/1; b – NMP 58896/1; c – NMP 308/2007/2. d–i – *R. hipposideros* (Borkhausen, 1797) from various parts of SW Asia: d – NMP 58324/2 (S Kirghizstan); e – NMP 58323 (S Kirghizstan); f – NMP 48117 (SE Iran); g – NMP 93552 (Lebanon); h – NMP 92508 (Jordan); i – NMP 48097 (Central Iran). Scale bar – 1 mm.

Figs. 13, 14. Two views of a male *Rhinolophus lepidus* Blyth, 1844 collected in the Kolodec Fersmana mine in the Toâ-Moûn Massif, southern Kirghizstan (photo by J. Červený).

(1905) are similar to those given by Felten et al. (1977) for the samples from Afghanistan and the samples here presented from West Turkestan (only the forearm length is smaller; see Table 3). This dimensional proximity suggests possible taxonomic affiliation of the Turkestani populations (but see Horáček et al. 2000).

Rhinolophus euryale Blasus, 1853

Material. **Armenia**: 1 ind. ad. (NMP 91581 {SA 86} [S+B]), Armenia (no details on the site are available), date and collector unlisted, ded. V. Hanák. – **Georgia (Abkhazia)**: 2 ma, 2 ms, 13 fa (NMP 91518 {SA 15}, 91523 {SA 20}, 91524 {SA 22}, 91525 {SA 23}, 91526 {SA 24}, 91529 {SA 27}, 91530 {SA 28}, 91531 {SA 29}, 91532 {SA 30}, 91533 {SA 31}, 91534 {SA 32}, 91538 {SA 36}, 91539 {SA 37}, 91543 {SA 42}, 91544 {SA 43}, 91556 {SA 55} [S+B], 91545 {SA 44} [B]), Džal, tunnel, 14 July 1964, leg. & ded. V. Hanák.

Reference. Hůrka (1969).

Remarks. *Rhinolophus euryale* ranks among common bats in northwestern Transcaucasia, while in the southern and eastern parts of this region, it is a rather rare bat (Dal' 1954, Buhnikašvili et al. 2004, Ivanickij 2002a, Rahmatulina 2005). Ivanickij (2002a, 2010) and Gazarân & Ivanickij (2005) reported this species as a widespread bat in Abkhazia; in northwestern Transcaucasia around 20 record sites are available. These records along with the recent finding from the Fanagorijskaâ Cave at Gorâčij Klûč, S Russia (Gazarân 2007), represent the northern margin of the species dis-

Table 5. Basic biometric data on the examined NMP specimens of *Rhinolophus euryale* Blasius, 1853 and *R. mehelyi* Matschie, 1901 from Transcaucasia, and of *R. blasii* Peters, 1866 from West Turkestan. For abbreviations see pp. 161, 163

	Rhinolophus euryale					*Rhinolophus mehelyi*					*Rhinolophus blasii*				
	n	**M**	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	18	**47.51**	45.9	48.9	0.827	4	**50.95**	49.8	52.6	1.204	4	**46.20**	45.4	46.8	0.668
LCr	15	**18.95**	18.47	19.66	0.322	3	**20.31**	19.89	20.68	0.397	1	**18.54**	–	–	–
LOc	15	**18.27**	17.91	18.90	0.282	4	**19.86**	19.44	20.29	0.397	3	**18.63**	18.08	18.92	0.477
LCc	15	**15.98**	15.46	16.58	0.288	4	**17.33**	16.96	17.76	0.396	3	**16.33**	15.75	16.68	0.506
LaZ	15	**9.19**	8.83	9.63	0.198	4	**10.25**	10.09	10.38	0.123	2	**8.56**	8.44	8.67	0.163
LaI	15	**2.21**	2.01	2.39	0.101	4	**2.44**	2.28	2.58	0.125	3	**2.41**	2.31	2.54	0.118
LaInf	17	**4.57**	4.42	4.82	0.107	4	**5.19**	4.97	5.39	0.186	3	**4.31**	4.11	4.44	0.176
LaN	15	**8.14**	7.92	8.36	0.119	4	**8.59**	8.24	8.76	0.236	3	**8.08**	7.98	8.18	0.100
LaM	15	**9.25**	9.08	9.68	0.146	4	**9.77**	9.63	9.98	0.165	3	**8.83**	8.72	9.01	0.157
ANc	15	**5.66**	5.39	6.11	0.168	4	**6.13**	5.73	6.43	0.304	3	**5.83**	5.67	5.91	0.139
LBT	16	**2.90**	2.61	3.14	0.159	4	**3.13**	3.07	3.24	0.076	3	**3.26**	3.18	3.31	0.068
CC	15	**4.37**	4.16	4.62	0.122	4	**5.00**	4.62	5.27	0.293	3	**4.05**	3.91	4.14	0.123
M^3M^3	16	**6.41**	6.08	6.74	0.173	4	**7.14**	6.94	7.39	0.200	3	**6.11**	6.04	6.18	0.070
CM^3	17	**6.15**	5.92	6.54	0.142	4	**6.80**	6.68	6.91	0.099	3	**6.56**	6.41	6.67	0.135
LMd	17	**11.52**	11.27	12.04	0.236	4	**12.83**	12.70	12.97	0.124	3	**11.54**	11.32	11.68	0.193
ACo	17	**2.42**	2.08	2.64	0.117	4	**2.89**	2.81	2.98	0.074	3	**2.33**	2.24	2.41	0.085
CM_3	17	**6.59**	6.38	6.82	0.110	4	**7.24**	7.16	7.33	0.083	3	**6.92**	6.81	6.98	0.095

tribution range at the European-Asian transition. A large part of the series of the NMP specimens originates from Džal, Abkhazia, which represents a new locality of *R. euryale* in NW Georgia.

Based on the study of the archive of the Laboratory of Karstology in Tbilisi (Georgia), Buhnikašvili et al. (2004) reported a record of *Rhinolophus mehelyi* from Džal. Since V. Hanák originally identified his series from Džal under the latter species, it cannot be excluded that the archive record is based on his unpublished preliminar report. However, Gazarân & Ivanickij (2005) considered the occurrence of *R. meheyi* in Džal as doubtful and suggested the actual species affiliation of the respective old record to *R. euryale*. The evidence available from NMP specimens indicates such suspicion to be justifiable and supports the opinion by Gazarân & Ivanickij (2005). Anyway, while the occurrence of *R. euryale* in Džal is confirmed (see also Table 5), the presence of *R. mehelyi* in Abkhazia remains doubtful.

Satunin (1912) described a separate subspecies of *R. euryale* from Abkhazia, *R. e. nordmanni* Satunin, 1912 based on a dark coloured specimen from Pavlovskoe (Suhum Dist.). In accordance with older authors (Kuzâkin 1950, 1965, Strelkov 1963, 1981) and based on the results of their own comparisons, Gazarân & Ivanickij (2005) considered this name a junior synonym of the nominotypical form from the rest of the species distribution range. The sufficiently extensive NMP series from Džal represents almost a topotypical material of *nordmanni*, however, both pelage colouration and dimensions of these bats do not differ from the samples originating from other parts of the species range (see Table 5 and the data by Benda et al. 2006 for metric comparison). This result also supports the opinion by Gazarân & Ivanickij (2005).

***Rhinolophus mehelyi* Matschie, 1901**

Material. **Armenia**: 3 inds. ad. (NMP 91578 {SA 83}, 91579 {SA 84}, 91580 {SA 85} [S+B]), Armenia (no details on the site are available), date and collector unlisted, ded. V. Hanák. – **Azerbaijan**: 1 ms (NMP 91303 {AZ 34} [S+A]), Şamaxı, canyon, 26 June 1979, leg. & ded. V. Hanák.

Reference. Rahmatulina (2005).

Remarks. Besides the Middle East, *Rhinolophus mehelyi* is distributed in Palaearctic Asia only in Transcaucasia (Strelkov 1981, Horáček et al. 2000, Benda et al. 2006). Although *R. mehelyi* is a rather rare species in this region, in its southern part it is the most frequent species from the group of the medium-sized horseshoe bats (Kuzâkin 1950, Dal' 1954, Rahmatulina 2005). In Azerbaijan, the species occurs mostly in the Upper Karabakh and Nakhichevan regions (Rahmatulina 2005). The site of origin of the NMP specimen (Şamaxı) represents the only known locality from the Azerbaijani part of the Greater Caucasus; however, from this area *R. mehelyi* was reported already by Kuzâkin (1950). External and cranial dimensions of the examined NMP specimens of *R. mehelyi* are shown in Table 5.

Rhinolophus blasii Peters, 1866

Material. **Turkmenistan**: 1 ms, 2 fs, 1 fj (NMP 91598 {SA 104}, 91599 {SA 105}, 91600 {SA 106}, 91644 {SA 163} [S+B]), Baharly, Baharly Cave, 29 July 1964, leg. & ded. V. Hanák.

Remarks. In Turkestan, *Rhinolophus blasii* is known only from four sites in the Kopetdagh Mts. of Turkmenistan (Kuzâkin 1965, Strelkov et al. 1978, Kovaleva & Ŝerbak 1990). The series of the NMP specimens was collected at a classical site, the Baharly Cave (formerly Durunskaâ or Bahardenskaâ Cave), where one specimen of this species was collected already by Radde & Walter (1889) in 1886. Later, it was documented there by Bil'kevič (1918) and subsequently by numerous other authors, see Strelkov et al. (1978). According to the latter authors, in the Baharly Cave the only maternity colony of *R. blasii* in Turkmenistan was known, another one was found by Kovaleva & Ŝerbak (1990) in a cave in the Kyrkyz gorge in 1988. External and cranial dimensions of the examined NMP specimens of *R. blasii* are shown in Table 5.

Myotis blythii (Tomes, 1857)

Material. **Armenia**: 2 inds. juv. (NMP 91582 {SA 87}, 91583 {SA 88} [S+B]), environs of Erewan, date and collector unlisted, ded. V. Hanák; – 1 ma (NMP 91749 {SA 333} [S+B]), Armenia (no details on the site are available), date unlisted, leg. D. Frynta, ded. V. Hanák. – **Azerbaijan**: 1 ind. ad. (NMP 91423 {AZ 157} [S+B]), Qobustan, rocky town, 20 June 1986, leg. STA86, ded. V. Hanák; – 1 ma (NMP 91436 {AZ 170} [S+B], Qobustan, rocky town, 22 June 1987, leg. STA87, ded. V. Hanák; – 5 inds. ad. (NMP 91427 {AZ 161}, 91428 {AZ 162}, 91429 {AZ 163}, 91430 {AZ 164}, 91431 {AZ 165} [S+B]), Şamaxı, castle corridor, 5 July 1986, leg. STA86, ded. V. Hanák; – 3 ma (NMP 91298 {AZ 29}, 91301 {AZ 32}, 91302 {AZ 33} [S+A]), Şamaxı, canyon, 26 June 1979, leg. & ded. V. Hanák; – 3 ma (NMP 91308 {AZ 39}, 91309 {AZ 40}, 91310 {AZ 41} [S+A]), Şamaxı, canyon, 28 June 1979, leg. & ded. V. Hanák. – **Georgia**: 2 ma (NMP 91511 {SA 8}, 91512 {SA 9} [S+B]), Mcheta, Svetichoveli, 11 July 1964, leg. & ded. V. Hanák. – **Kirghizstan**: 3 ma, 1 ms (NMP 58320/13 {K 257/88}, 58436/1 {K 259/88}, 58436/2 {K 260/88}, 58453 {K 258/88} [S+A]), Aravan, Sasyk Ungur Cave (Fig. 20), 11 July 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 1 fs (NMP 58455 {K 39/88} [S+A]), Čauvaj, 1200 m, 26 June 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 17 fa (NMP 58310/1 {K 47/88}, 58310/2 {K 50/88}, 58310/3 {K 51/88}, 58310/4 {K 54/88}, 58310/5 {K 58/88}, 58310/6 {K 61/88}, 58320/1 {K 45/88}, 58320/2 {K 44/88}, 58320/3 {K 49/88}, 58320/4 {K 52/88}, 58320/5 {K 56/88}, 58320/7 {K 59/88}, 58320/8 {K 60/88}, 58446 {K 55/88}, 58454 {K 48/88}, 58456 {K 53/88} [S+A], 58320/6 {K 57/88} [A]), Kadamžaj, cave, 27 June 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 3 ma (NMP 58340/1 {K 279/88}, 58340/2 {K 280/88}, 58340/3 {K 281/88} [S+A]), Kara-Kokty, mine, 13 July 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 3 fa (NMP 58310/8 {K 124/88}, 59324 {K 123/88} [S+A], 58310/7 {K 122/88} [A]), Kyzyl-Kiâk, cave, 30 June 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 1 ma (NMP 2007/174 [A]), Oš District, 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 7 ma (NMP 58310/9 {K 145/88}, 58310/10 {K 149/88}, 58320/10 {K 146/88}, 58320/11 {K 147/88}, 58320/12 {K 148/88}, 58320/14 {K 142/88}, 58437 {K 144/88} [S+A]), Samarkandyk, Kanigut, mine (Fig. 5), 2 July 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený. – **Tajikistan**: 1 ma (NMP 58472 {K 189/88} [S+A]), Čarku, mine, 3 July 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený. – **Turkmenistan**: 5 ms, 1 mj, 5 fa, 8 fs (NMP 91587 {SA 93}, 91601 {SA 107}, 91602 {SA 108}, 91603 {SA 110}, 91604 {SA 111}, 91623 {SA 131}, 91624 {SA 132}, 91625 {SA 133}, 91626 {SA 134},

Table 6. Basic biometric data on the examined type specimens of *Myotis blythii* (Tomes, 1857) from Asia. For abbreviations see pp. 161, 163

	altaicus ZIN 45656	*ancilla* BMNH 10.5.2.4.	*blythii* BMNH 49.8.16.22.	*risorius* BMNH 20.2.9.18.	*omari* BMNH 5.10.4.14.
sex	f	m	–	m	m
LAt	58.4	60.3	56.1	–	58.8
LCr	21.52	22.30	–	22.48	22.40
LCb	–	21.22	–	20.96	21.62
LaZ	–	14.29	–	14.15	14.80
LaI	5.13	5.02	5.04	5.37	5.35
LaInf	5.88	6.27	5.78	5.63	5.93
LaN	9.73	9.87	–	10.12	10.02
LaM	10.32	10.28	–	10.42	10.35
ANc	7.52	7.98	–	7.78	7.78
CC	5.88	6.17	5.42	5.68	6.02
M^3M^3	9.30	9.75	8.74	9.15	9.22
CM^3	8.78	9.38	8.48	9.38	9.44
CP^4	3.73	3.92	3.86	4.28	4.22
LMd	16.40	16.74	15.75	17.06	17.24
ACo	5.48	5.52	5.12	5.38	5.74
CM^3	9.43	9.87	8.22	10.24	10.13
CC/LCb	–	0.291	–	0.271	0.278
CP^4/LCb	–	0.185	–	0.204	0.195

91627 {SA 135}, 91628 {SA 138}, 91629 {SA 139}, 91630 {SA 140}, 91631 {SA 141}, 91632 {SA 142}, 91633 {SA 143}, 91634 {SA 144}, 91635 {SA 145}, 91636 {SA 146} [S+B]), Baharly, Baharly Cave, 29 July 1964, leg. & ded. V. Hanák. – **Uzbekistan**: 2 ma (NMP 94097, 94098 {unnumbered} [S+A]), Aman-Kutan, mine, 1 October 1985, leg. J. Moravec, ded. V. Hanák; – 4 ma (NMP 91743 {SA 327}, 91744 {SA 328}, 91745 {SA 329}, 91746 {SA 330} [S+B]), Aman-Kutan, mine, 9 June 1989, leg. STU89, ded. V. Hanák; – 1 ma, 1 fa (NMP 91456 {BB 1}, 91457 {BB 2} [S+B]), Samarqand, cave, 28 September 1963, leg. & ded. V. Hanák.

References. Hůrka (1969, 1984a); Benda & Horáček (1995); Rahmatulina & Gasanov (2002a); Rahmatulina (2005); Benda et al. (2006).

Remarks. *Myotis blythii* is one of the most common bat species in the southwestern part of the Palaearctic, including Transcaucasia and southern and eastern regions of West Turkestan (Bogdanov 1953, Dal' 1954, Strelkov et al. 1978, Rybin et al. 1989, Habilov 1992, Buhnikašvili et al. 2004, Rahmatulina 2005, etc.). Most of the NMP specimens originate from sites where *M. blythii* has already been known (Georgia, Armenia, Azerbaijan, Turkmenistan). The specimens from Samarqand and Aman-Kutan perhaps come from new record sites in Uzbekistan (cf. Bogdanov 1953). A remarkable record comes from the attic of the Svetichoveli cathedral in Mcheta, Georgia. The colony of *M. blythii* in this roost was known already in the 1860s, Satunin (1901) reported that the monks tried to push the bats away from the attic in this period. However, the colony survived there at least until 1975 (Perov 1980, Buhnikašvili et al. 2004).

Taxonomic note. Originally, only one species of the large-sized *Myotis* bats was recognised in the territory of the former Russian Empire and Soviet Union, *Myotis myotis* (Borkhausen, 1797) (Satunin 1896, 1910, 1914, 1915, Bianki 1917, 1918, Bobrinskoj 1925, Ognev 1928, Meklenburcev 1935, etc.). As a species separated from the species content of *M. myotis*, *M. blythii* in the former Russian/Soviet realm was originally considered to belong to *M. oxygnathus* (Monticelli,

Table 7. Basic biometric data on the examined NMP specimens of *Myotis blythii* (Tomes, 1857) from Transcaucasia and West Turkestan and certain comparative samples from other parts of Asia. For abbreviations see pp. 161, 163

	n	**M**	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
			altaicus					N China					NE Kazakhstan		
LAt	11	**58.63**	55.8	60.2	1.177	1	60.3	–	–	–	6	**58.65**	57.5	60.2	1.009
LCr	21	**21.82**	21.27	22.48	0.330	6	**22.13**	21.33	22.57	0.448	12	**21.27**	20.97	21.68	0.213
LCb	20	**20.80**	20.25	21.40	0.320	7	**21.00**	20.09	21.55	0.547	12	**20.35**	19.83	20.80	0.262
LaZ	18	**14.14**	13.70	14.42	0.219	2	**14.39**	14.29	14.48	0.134	10	**13.79**	13.37	14.17	0.220
LaI	21	**5.11**	4.87	5.52	0.131	7	**5.10**	4.93	5.23	0.101	12	**4.96**	4.82	5.18	0.129
LaInf	21	**5.93**	5.37	6.25	0.201	7	**6.00**	5.67	6.27	0.230	12	**5.77**	5.37	6.08	0.198
LaN	21	**9.73**	9.47	10.11	0.160	7	**9.93**	9.66	10.12	0.162	12	**9.57**	9.42	9.82	0.145
LaM	21	**10.36**	10.14	10.62	0.123	7	**10.34**	10.03	10.52	0.181	12	**10.14**	9.87	10.45	0.160
ANc	21	**7.60**	7.35	7.95	0.171	7	**7.69**	7.37	7.98	0.201	12	**7.29**	7.06	7.53	0.139
CC	21	**6.02**	5.82	6.40	0.141	7	**6.15**	5.83	6.32	0.155	12	**5.86**	5.62	6.11	0.157
M^3M^3	21	**9.38**	9.00	9.75	0.198	7	**9.58**	9.27	9.75	0.190	12	**9.17**	8.77	9.52	0.219
CM^3	21	**8.99**	8.78	9.34	0.161	7	**9.23**	8.95	9.43	0.205	12	**8.84**	8.62	9.15	0.152
CP^4	21	**3.89**	3.62	4.21	0.134	7	**4.02**	3.92	4.25	0.125	12	**3.87**	3.63	4.05	0.123
LMd	21	**16.69**	16.37	17.18	0.220	7	**16.76**	16.37	17.28	0.373	12	**16.24**	15.73	16.87	0.307
ACo	20	**5.29**	5.02	5.60	0.145	7	**5.42**	4.97	5.77	0.242	12	**5.15**	5.03	5.27	0.068
CM_3	21	**9.68**	9.43	10.02	0.166	7	**9.89**	9.49	10.27	0.309	12	**9.57**	9.35	9.89	0.179
			Transcaucasia					SW Turkmenistan					Kirghizstan & Uzbekistan		
LAt	16	**58.06**	52.6	61.4	2.477	18	**58.27**	55.9	60.6	1.605	42	**57.24**	53.7	60.7	1.468
LCr	15	**22.17**	21.68	22.75	0.347	18	**21.50**	20.75	22.75	0.584	40	**21.11**	20.02	21.95	0.418
LCb	15	**21.15**	20.58	21.78	0.389	18	**20.48**	19.78	21.55	0.544	40	**20.03**	18.92	20.87	0.429
LaZ	13	**14.12**	13.55	14.70	0.280	12	**13.52**	12.88	14.15	0.352	38	**13.62**	12.83	19.89	1.089
LaI	15	**5.21**	4.92	5.37	0.117	18	**4.86**	2.07	5.32	0.712	40	**4.89**	4.55	5.27	0.166
LaInf	15	**5.83**	5.60	6.22	0.216	18	**5.63**	5.43	5.94	0.177	40	**5.60**	5.21	5.95	0.198
LaN	15	**9.84**	9.47	10.42	0.261	18	**9.40**	9.00	9.85	0.238	40	**9.51**	9.02	10.00	0.191
LaM	15	**10.26**	9.76	10.75	0.299	18	**9.73**	9.32	10.20	0.237	40	**9.88**	9.49	10.47	0.202
ANc	15	**7.77**	7.51	8.27	0.220	18	**7.36**	6.80	7.95	0.272	40	**7.32**	6.94	7.80	0.196
LBT	15	**3.75**	3.44	4.09	0.169	18	**3.76**	3.56	4.02	0.123	39	**3.59**	3.36	4.14	0.152
CC	14	**5.88**	5.55	6.18	0.218	18	**5.72**	5.40	6.15	0.221	40	**5.61**	5.15	6.12	0.224
M^3M^3	15	**9.23**	8.60	9.56	0.226	18	**8.85**	8.43	9.58	0.340	40	**8.79**	8.27	9.75	0.260
CM^3	16	**9.30**	8.88	9.55	0.202	18	**8.97**	8.63	9.52	0.246	40	**8.69**	7.95	9.27	0.262
CP^4	16	**4.09**	3.63	4.28	0.190	18	**3.95**	3.63	4.27	0.169	40	**3.82**	3.42	4.34	0.196
LMd	16	**17.01**	16.32	17.50	0.374	18	**16.50**	15.85	17.30	0.438	39	**15.96**	15.08	16.86	0.385
ACo	16	**5.47**	5.02	5.87	0.230	18	**5.08**	4.65	5.42	0.229	39	**5.09**	4.82	5.44	0.159
CM_3	16	**9.76**	5.36	10.27	1.185	18	**9.81**	9.55	10.32	0.222	39	**9.43**	8.84	10.92	0.338

1885), then a species of its own, see e.g. Ognev (1927), Kuzâkin (1935, 1944, 1950), Dal' (1954), Geptner (1956), Vereŝagin (1959), Strelkov (1963), or Alekperov (1966). Kuzâkin (1965) first used the name *M. blythii* for designation of this species, however, he did not accept any taxonomic (subspecific) division of the species and regarded it as monospecific. The solution of systematic affiliation of the respective populations was almost concurrently suggested by Topál (1971) and Strelkov (1972); they recognised four subspecies within the *M. blythii* species geographical extent: *M. b. blythii* (Tomes, 1857), *M. b. oxygnathus* (Monticelli, 1885), *M. b. omari* Thomas, 1905, and *M. b. ancilla* Thomas, 1910. They referred two of these subspecies to the respective territories of the former Soviet Union; *M. b. blythii* to the eastern part of West Turkestan (i.e., Tajikistan, Kirghizstan, Kazakhstan, and eastern parts of Uzbekistan and Turkmenistan, and extralimitally

Table 8. Comparison of cranial indices (relative width of rostrum across canines, CC/LCb; relative length of unicuspidal tooth-row, CP^4/LCb) of comparative samples of *Myotis blythii* (Tomes, 1857) from Asia (see also Fig. 16)

	n	**M**	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
		altaicus					N China					NE Kazakhstan			
CC/LCb	20	**0.290**	0.278	0.300	0.006	7	**0.293**	0.285	0.308	0.007	12	**0.288**	0.278	0.298	0.007
CP^4/LCb	20	**0.187**	0.178	0.197	0.005	7	**0.191**	0.185	0.198	0.005	12	**0.190**	0.176	0.201	0.006
		West Turkestan					Indian Region					Kopetdagh Mts.			
CC/LCb	138	**0.281**	0.251	0.305	0.009	10	**0.287**	0.265	0.302	0.011	62	**0.281**	0.261	0.301	0.009
CP^4/LCb	138	**0.192**	0.179	0.216	0.007	11	**0.195**	0.188	0.207	0.005	62	**0.195**	0.174	0.218	0.008
		Transcaucasia					C & S Iran					Levant			
CC/LCb	14	**0.277**	0.265	0.295	0.009	30	**0.277**	0.265	0.291	0.006	52	**0.280**	0.255	0.303	0.009
CP^4/LCb	15	**0.193**	0.176	0.205	0.008	31	**0.193**	0.179	0.206	0.007	56	**0.197**	0.181	0.230	0.008

also to Afghanistan, India, Kashmir, and East Turkestan) and *M. b. omari* to the Caucasus, Transcaucasia and SW Turkmenistan (and also to the Middle East and Crete). This arrangement was subsequently accepted by many other authors (Felten et al. 1977, Corbet 1978, Strelkov 1981, Koopman 1994, Benda & Horáček 1995, Dzeverin 1995, Arlettaz et al. 1997, Horáček et al. 2000, Simmons 2005, Benda et al. 2006, Dzeverin & Strelkov 2008, etc.).

Strelkov (1972, 1981) suggested possible existence of another, third subspecies, an unnamed form from the Russian part of the Altai Mts. This population remains known to occur only in a small

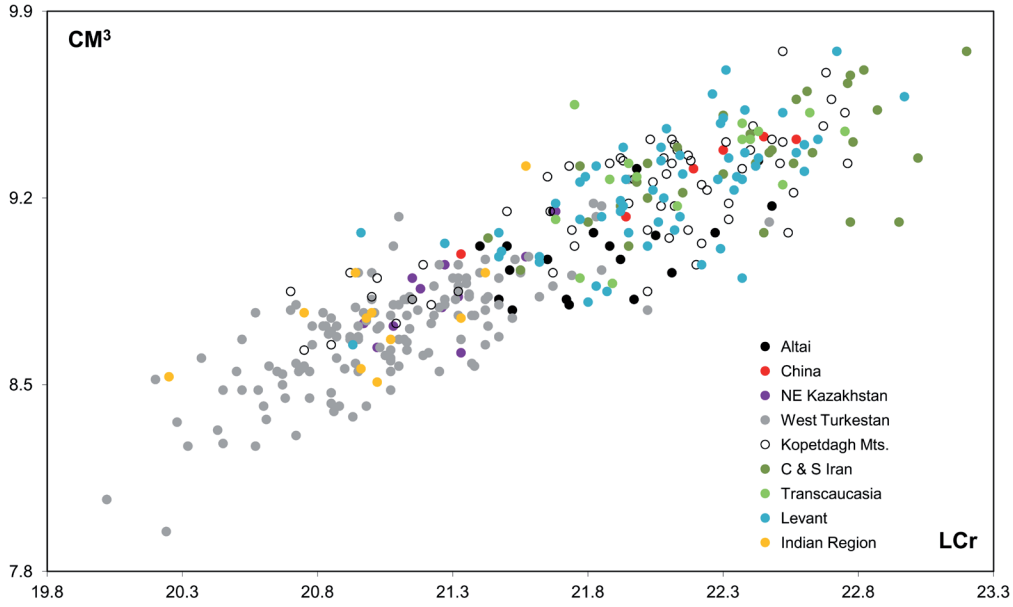

Fig. 15. Bivariate plot of comparative samples of *Myotis blythii* (Tomes, 1857) from Asia: greatest length of skull (LCr) against length of upper tooth-row (CM^3).

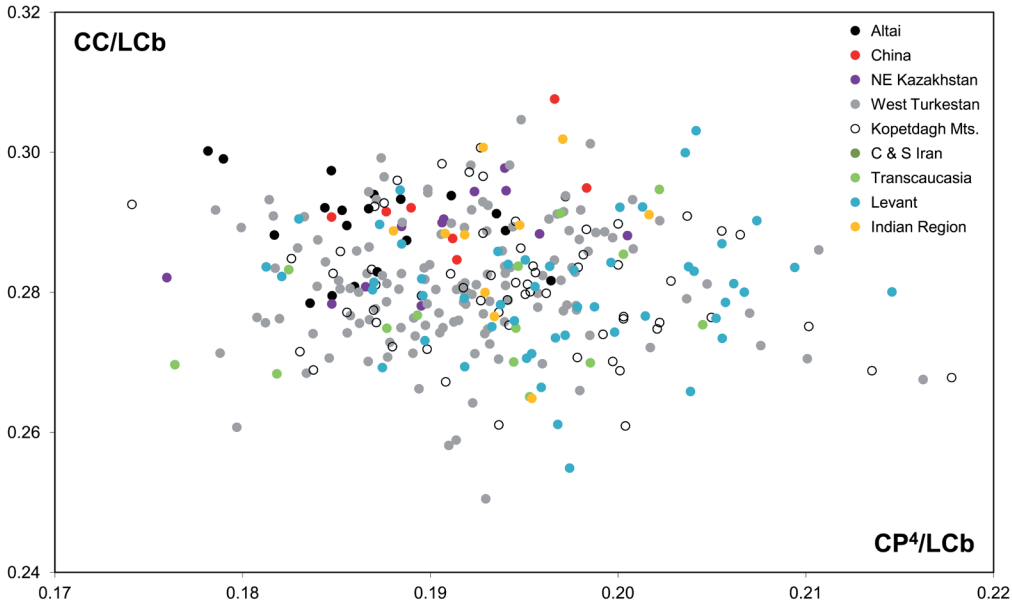

Fig. 16. Bivariate plot of comparative samples of *Myotis blythii* (Tomes, 1857) from Asia: relative length of unicuspidal tooth-row (CP^4/LCb) against relative width of rostrum across upper canines (CC/LCb).

karst area in the Čaryš (Чарыш) river valley in the Altajskij Region of SW Siberia, Russia (Strelkov 1968, Goretovskaâ et al. 2002, cf. Kuzâkin 1944), and represents the northernmost spot within the species distribution range, reaching 51° 26' N (Strelkov 1972). Solution of this taxomomic task has been suggested first recently, when Dzeverin & Strelkov (2008) described this population as a new subspecies, *M. blythii altaicus* Dzeverin et Strelkov, 2008. Although for the responsible evaluation of taxonomic position of the Altaic bats, Strelkov (1972) stressed the necessity of the comparison of this population with specimens of *M. b. ancilla*, a subspecies living in northern China, Dzeverin & Strelkov (2008) defined their new subspecies only against the west-Asian and European populations (i.e., *M. b. blythii*, *M. b. omari* and *M. b. oxygnathus*).

Since we had an opportunity to examine a relatively high number of specimens of *M. blythii* from various collections, we compared the series (incl. the complete type series) of *M. b. altaicus* with more than 360 samples of other Asian populations, including the east-Palaearctic *M. b. ancilla* (cf. Thomas 1910, Bobrinskoj 1929) and all the respective type material (see Table 6 and Appendix II).

The comparison of body and skull dimensions showed the Altaic samples to be intermediate in size between two size-groups of *M. blythii* samples from Asia (Fig. 15, Table 7 and Benda et al. 2006: 106–107, Table 17), represented by the smaller E West Turkestani and Indian *M. b. blythii* and larger Middle Eastern, Caucasian and W Turkmenistani *M. b. omari*. In this comparison, the Altaic samples largely overlapped with the range of samples from N China, incl. the type series of *M. b. ancilla*. In the comparison of relative dimensions of rostrum (relative width of rostrum across upper canines and relative length of the upper unicuspidal tooth-row; Fig. 16), the Altaic and N Chinese samples extensively overlapped with each other, while other samples from Asia grouped apart and only partly overlapped with the former two groups; in this comparison, the samples from

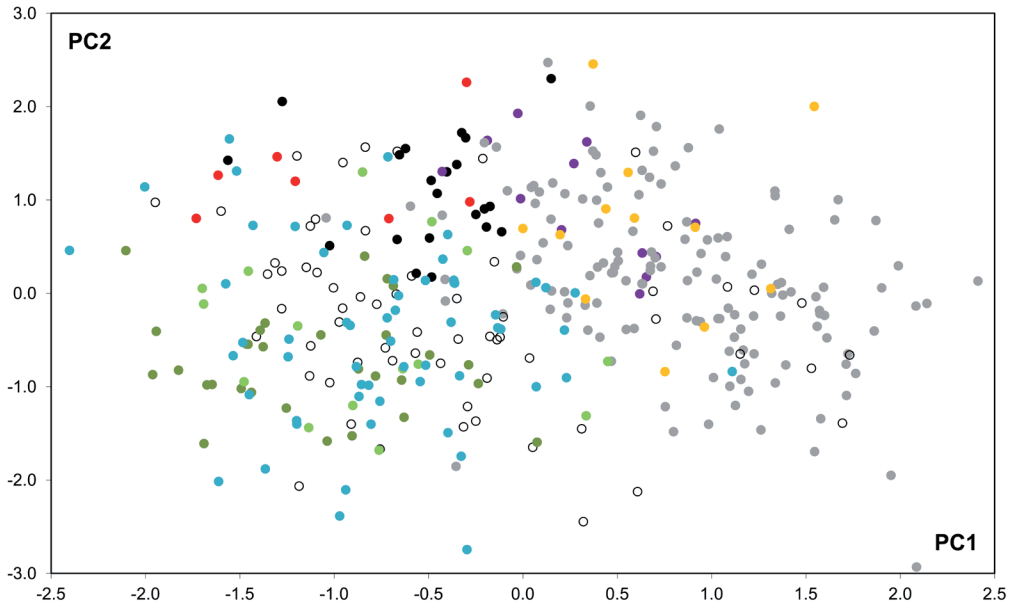

Fig. 17. Bivariate plot of comparative samples of *Myotis blythii* (Tomes, 1857) from Asia: results of principal component analysis of all examined skull dimensions. For legend see Fig. 15 and/or 16.

E Kazakhstan (Kabanbaj, NE Almaty Prov.) were positioned closely to these groups. The results of principal component analysis of all examined skull dimensions (Fig. 17; PC1=60.61% of variance; PC2=12.79%) separated the Altaic and N Chinese groups of samples in the same order as in the former comparison, but the E Kazakhstani samples were positioned apart from these groups. This simple morphometric analysis showed close proximity of the Altaic and N Chinese samples in all comparisons, these samples were showed to be very similar in their skull characters, both in absolute and relative dimensions, thus representing very close morphotypes.

The extremely short upper unicuspidal tooth-row was mentioned by Dzeverin & Strelkov (2008) as the main character of their newly described Altaic *M. b. altaicus*. However, in this and also other metric characters (Tables 7, 8) the Altaic samples are very similar to N Chinese representatives of *M. b. ancilla*. Since we did not find any marked trait that would differentiate between the Altaic and N Chinese samples, we regard appropriate to consider the Altaic populations a part of the latter E Palaearctic taxon and the name *M. blythii altaicus* Dzeverin et Strelkov, 2008 to represent a junior synonym of *M. myotis ancilla* Thomas, 1910 (= *M. blythii ancilla*).

Nevertheless, the taxonomy of the E Asian populations of *M. blythii* could be finally solved probably only by a molecular genetic comparison. However, such analysis is difficult due to the unavailability of genetic samples from the respective populations and thus remains more complicated than the comparison of morphological traits. Anyway, existence of an E Palaearctic bat taxon (*M. b. ancilla*) in the Altai Mts. is not surprising, this region is known as the westernmost part of the distribution ranges of numerous E Palaearctic bat forms, namely *Myotis ikonnikovi* Ognev, 1912, *M. frater* Allen, 1923, *M. petax* Hollister, 1912, *Plecotus ognevi* Kishida, 1927, and *Murina leucogaster* Milne-Edwards, 1872 (see Kožurina 2009).

Myotis (*nattereri*) *tschuliensis* Kuzâkin, 1935

Material. **Azerbaijan**: 1 fa (NMP 91690 {SA 229} [B]), Boyuk Taglar, 26 September 1967, leg. I. K. Rahmatulina, ded. V. Hanák; – 1 ma (NMP 91688 {SA 224} [S+B]), Tuğ, 28 August 1968, leg. I. K. Rahmatulina, ded. V. Hanák; – 1 fa (NMP 91689 {SA 225} [S+B]), Tuğ, 30 August 1968, leg. I. K. Rahmatulina, ded. V. Hanák; – 1 fa (NMP 91304 {AZ 35} [S+B]), Şamaxı, canyon, 26 June 1979, leg. & ded. V. Hanák; – 1 fa (NMP 91311 {AZ 42} [S+B]), Şamaxı, canyon, 28 June 1979, leg. & ded. V. Hanák.

References. Hůrka (1984a, b); [Horáček & Hanák (1984)]; Benda & Horáček (1995); Rahmatulina (2005); Benda et al. (2006).

Remarks. *Myotis* (*nattereri*) *tschuliensis* is a form distributed in the Kopetdagh Mts. of Turkmenistan, N Iraq, and the Caucasus region, incl. NE Turkey (Horáček & Hanák 1984, Benda et al. 2006), potentially representing a separate species (Jones et al. 2006). *M.* (*n.*) *tschuliensis* ranks among uncommon species in Azerbaijan, only seven sites of occurrence are known from higher altitudes of the country, incl. those of the NMP specimens (Rahmatulina 2005). External and cranial dimensions of the examined NMP specimens of *M.* (*n.*) *tschuliensis* are shown in Table 9.

Myotis emarginatus (Geoffroy, 1806)

Material. **Azerbaijan**: 1 ma (NMP 91691 {SA 230} [S+B]), Boyuk Taglar, 26 September 1967, leg. I. K. Rahmatulina, ded. V. Hanák; – 9 fa (NMP 91395 {AZ 129}, 91397 {AZ 131}, 91398 {AZ 132}, 91399 {AZ 133}, 91400 {AZ 134}, 91401 {AZ 135} [S+A], 91396 {AZ 130} [A], 91393 {AZ 127}, 91394 {AZ 128} [S+B]), Mingəçevir, cave, 25 June 1984, leg. STA84, ded. V. Hanák; – 3 fa (NMP 91402 {AZ 136}, 91403 {AZ 137}, 91404 {AZ 138} [S+A]), Mingəçevir, cave, 26 June 1984, leg. STA84, ded. V. Hanák; – 1 ind. juv. (NMP 91424 {AZ 158} [S+B]), Mingəçevir, 3 July 1986, leg. STA86, ded. V. Hanák. – **Georgia**: 7 fa (NMP 91528 {SA 26}, 91536 {SA 34}, 91541 {SA 39}, 91547 {SA 46}, 91550 {SA 49}, 91551 {SA 50}, 91552 {SA 51} [S+B]), Džal, tunnel, 14 July 1964, leg. & ded. V. Hanák; – 2 fa (NMP 91508 {SA 1}, 91510 {SA 3} [S+B]), Mcheta, Svetichoveli, 11 July 1964, leg. & ded. V. Hanák.

References. Rahmatulina (2005).

Table 9. Basic biometric data on the examined NMP specimens of *Myotis* (*nattereri*) *tschuliensis* Kuzâkin, 1935 and *M. emarginatus* (Geoffroy, 1806) from Transcaucasia, and of *M. bucharensis* Kuzâkin, 1950 from West Turkestan. For abbreviations see pp. 161, 163

	Myotis (*n.*) *tschuliensis*					*Myotis emarginatus*					*Myotis bucharensis*				
	n	**M**	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	5	**41.02**	39.2	41.9	1.096	22	**41.36**	40.1	42.9	0.875	4	**41.23**	40.4	42.7	1.024
LCr	4	**16.13**	15.62	16.62	0.410	20	**16.24**	15.73	16.74	0.275	4	**14.65**	14.57	14.76	0.080
LCb	4	**15.16**	14.72	15.58	0.360	19	**15.32**	14.88	16.06	0.264	4	**14.41**	14.22	14.71	0.214
LaZ	–	–	–	–	–	18	**10.00**	9.53	10.28	0.221	3	**9.46**	9.23	9.68	0.225
LaI	4	**3.59**	3.49	3.71	0.097	21	**3.70**	3.43	3.93	0.123	4	**4.15**	4.04	4.26	0.092
LaInf	4	**4.00**	3.93	4.08	0.077	21	**3.96**	3.76	4.08	0.096	4	**4.11**	4.03	4.21	0.078
LaN	4	**7.85**	7.69	8.02	0.158	21	**7.47**	7.08	7.74	0.185	4	**7.62**	7.47	7.75	0.124
LaM	4	**7.97**	7.79	8.19	0.166	20	**8.11**	7.68	8.42	0.206	4	**8.18**	7.98	8.37	0.159
ANc	4	**5.60**	5.24	5.93	0.290	19	**5.88**	5.59	6.14	0.166	4	**5.68**	5.58	5.78	0.088
LBT	4	**3.06**	2.83	3.23	0.185	21	**2.91**	2.68	3.06	0.109	4	**3.27**	3.11	3.42	0.144
CC	4	**4.10**	4.06	4.13	0.035	21	**4.14**	3.85	4.32	0.129	4	**4.24**	4.16	4.34	0.076
M^3M^3	4	**6.54**	6.35	6.64	0.130	21	**6.40**	6.08	6.63	0.157	4	**6.14**	6.05	6.24	0.085
CM^3	4	**6.42**	6.29	6.59	0.126	21	**6.50**	6.18	6.74	0.127	4	**5.63**	5.53	5.76	0.100
LMd	4	**11.93**	11.78	12.07	0.144	21	**12.04**	11.84	12.35	0.150	4	**10.81**	10.69	10.98	0.125
ACo	4	**3.41**	3.27	3.59	0.141	21	**3.62**	3.41	3.81	0.128	4	**3.09**	2.93	3.21	0.132
CM^3	4	**6.82**	6.74	6.97	0.109	21	**6.94**	6.61	7.07	0.101	4	**6.09**	5.88	6.23	0.153

Remarks. *Myotis emarginatus* is not a common species in Transcaucasia, only some twenty records are available in total (Dal' 1954, Buhnikašvili et al. 2004, Rahmatulina 2005). All record sites of the NMP specimens of this species were already reported in literature (Buhnikašvili et al. 2004, Rahmatulina 2005), except for Džal, which represents a new locality of *M. emarginatus* in Abkhazia (Ivanickij 2002a, 2010). External and cranial dimensions of the examined NMP specimens of *M. emarginatus* are shown in Table 9.

Myotis mystacinus morpho-group

Myotis mystacinus (Kuhl, 1817)

Material. **Azerbaijan**: 1 mj (NMP 48541 {SA 227} [S+B]), Ağdam, 27 July 1974, leg. I. K. Rahmatulina, ded. V. Hanák; – 1 ma (NMP 48540 {SA 226} [S+B]), Xaçmaz District, 24 June 1975, leg. I. K. Rahmatulina, ded. V. Hanák; – 1 ind. sad. (NMP 48520 {AZ 45} [S+B]), Qəbələ, house, 7 August 1935, leg. N. K. Vereŝagin, ded. V. Hanák.

Myotis aurascens Kuzâkin, 1935

Material. **Azerbaijan**: 1 ma (NMP 48519 {AZ 44} [S+B]), Göyçay river valley, 1460 m a. s. l., 29 August 1975, leg. STA75, ded. V. Hanák.

Myotis nipalensis (Dobson, 1871)

Material. **Azerbaijan**: 1 fa (NMP 49237 {AZ 192} [S+B]), Acınohur, steppe, 27 June 1986, leg. STA86, ded. V. Hanák; – 1 fs (NMP 48521 {AZ 46} [S+B]), Şəki District, 29 April 1976, leg. I. K. Rahmatulina, ded. V. Hanák. – **Kirghizstan**: 1 ma (NMP 91570 {unknown} [S]), Ala-Arča NP, 1987, leg. I. Horáček, ded. V. Hanák. – **Turkmenistan**: 1 fa (NMP 48539 {SA 221} [S+B]), Esenguly, July 1964, leg. & ded. V. Hanák; – 1 ma (NMP 48538 {SA 219} [S+B]), Germab, 16 July 1964, leg. & ded. V. Hanák. – **Uzbekistan**: 1 ma (NMP 91747 {SA 331} [S+B]), Džum-Džum, 13 June 1989, leg. STU89, ded. V. Hanák; – 1 ma (NMP 48522 [S+B]), Toškent, zoological garden, 21 September 1939, leg. A. P. Kuzâkin, ded. V. Hanák.

References. Zima et al. (1989); Benda & Tsytsulina (2000); [Tsytsulina (2000)]; Benda & Karataş (2005); Rahmatulina (2005); Benda et al. (2006).

Remarks. Bats of the *Myotis mystacinus* morpho-group belong to the most common faunal types in the southern parts of the former Russian/Soviet realm in Asia and probably represent the most common bats of the genus *Myotis* in the respective regions (see Strelkov 1983). According to Benda & Tsytsulina (2000), solely *M. nipalensis* seems to occur in West Turkestan, while in Transcaucasia up to five species of the group could be met (see also Benda & Tsytsulina 2000: 357, Fig. 45).

The NMP specimens thus do not represent any significant contribution to the knowledge of the distribution pattern of the complex, most of them were already examined by Benda & Tsytsulina (2000). In Azerbaijan, the *mystacinus* group is widespread and altogether 56 record sites are available from all parts and vegetation zones of the country (Rahmatulina 2005). The same is valid for the West Turkestani part of the *M. nipalensis* species range, the bats were recorded both in desert lowlands and relatively fertile mountains (cf. Strelkov 1983), see Bogdanov (1953), Ânuševič et al. (1972), Strelkov et al. (1978), Strelkov & Šajmardanov (1983), Rybin et al. (1989), Habilov (1992), etc. Some of localities of the NMP specimens pertain to classical record sites of bats of the *mystacinus* group in the respective countries; e.g., from Gasan-Kuli (= Esenguly) (Turkmenistan), "*M. mystacinus*" was reported by Samorodov (1953), Strelkov et al. (1978), and Strelkov (1983); from Germab (Turkmenistan) by Satunin (1910), Bil'kevič (1918), Ogneff & Heptner (1928), and Strelkov (1983); and from Toškent (Uzbekistan) by Satunin (1910), Kuzâkin (1934), Meklenburcev (1935), and Bogdanov (1953). The NMP specimens from the latter two sites represent topotypical material of two subspecies, *Myotis mystacinus transcaspicus* Ogneff et

Heptner, 1928 (type locality: Germab, Turkmenistan) and *Myotis mystacinus sogdianus* Kuzâkin, 1934 (t.l.: Toškent, Uzbekistan).

Standard karyotype characteristics of the *M. nipalensis* specimen NMP 91570 from N Kirghizstan were described by Zima et al. (1989). For external and cranial dimensions of the examined NMP specimens of the *M. mystacinus* morpho-group from Transcaucasia and West Turkestan see Benda & Karataş (2005: 16–18, Table 2).

Myotis hajastanicus Argiropulo, 1939

Material. **Armenia**: 2 fa (NMP 48536 {SA 67}, 48537 {SA 68} [S+B]), Šorža, 25 June 1928, leg. A. B. Šelkovnikov, ded. V. Hanák.

References. Argiropulo (1939); Hanák (1965); Benda & Tsytsulina (2000); [Tsytsulina (2000)]; Benda & Karataş (2005).

Remarks. Benda & Tsytsulina (2000) reported *Myotis hajastanicus* to be an endemic of the Sevan Lake basin of Armenia (see also Âvruân et al. 2002). Besides the two NMP specimens reported here, Benda & Tsytsulina (2000) mentioned only 15 other known specimens of this species, all deposited in the collection of the Zoological Institute of the Russian Academy of Sciences in St. Petersburg, Russia (ZIN).

The two available NMP specimens represent a part of the type series of *Myotis mystacinus hajastanicus* Argiropulo, 1939; the series was originally composed of 25 specimens (Argiropulo 1939) deposited at the Armenian Branch of the Academy of Sciences of the USSR in Yerevan (AFAN) – 23 alcoholic specimens (including the holotype) and two mounted skins (the number of extracted skulls is not clear from the description). V. Hanák obtained two of the alcoholic specimens from the type series during his visit at AFAN in 1964. When Hanák's collection was moved from the Charles University to NMP in 2000, the skins were already mounted, skulls extracted and mandibles lost (see also Mlíkovský et al. 2011). Whereabouts of the rest of the type series, originally deposited at AFAN, remains unknown (during examination of the AFAN collection in 2009, the type series of *M. m. hajastanicus* was not localised; S. Gazarân in litt). For external and cranial dimensions of the NMP specimens of *M. hajastanicus* see Benda & Karataş (2005: 12, Table 1).

Myotis bucharensis Kuzâkin, 1950

Material. **Uzbekistan**: 1 ma, 2 fa (NMP 91462 {BB 7}, 91464 {BB 9} [S+B] , 91463 {BB 8} [S+Sk+B]), Samarqand, 28 September 1963, leg. A. P. Kuzâkin, ded. V. Hanák; – 1 fa (NMP 91687 {SA 223} [S+B]), Toškent, June 1959, leg. J. V. Staněk, ded. V. Hanák.

References. Hůrka (1962); Horáček et al. (2000).

Remarks. *Myotis bucharensis* is an endemic of West Turkestan, it is a very rare bat species, only two record sites have been known so far (Tsytsulina & Strelkov 2001). Kuzâkin (1950) described this taxon on the basis of a single female specimen obtained from Ajvaç [Айваджк], SW Tajikistan, close to the border with Afghanistan and Uzbekistan. Later on, Bogdanov (1960) reported on a finding of a large maternity colony in a mine at Samarqand, Uzbekistan, situated some 310 km northwest of the type locality. Three of the NMP specimens also originate from this colony.

Another NMP specimen here reported, the female collected at Toškent, Uzbekistan, gives evidence of the third available locality of the species and also of geographical prolongation of the species distribution range of about 270 km to the northeast. This record, however, was already indirectly published by Hůrka (1962), who mentioned a finding of the bat fly *Penicillidia dufouri*

(Westwood, 1835) from *M. bucharensis* (under *M. longicaudatus* Ognev, 1927 = *M. frater* Allen, 1923) from Toškent. All three occurrence sites, lying in some 500 km long belt directed more or less in the north-south aspect (Fig. 6), are situated on the arid western foothills of the Tien Shan / Pamir-Alai / Pamir mountain complex.

Since all the known records of *M. bucharensis* were made before 1965 and no more recent finding is available (and the Samarqand colony roost was destroyed; Strelkov 1974, Habilov 1992), Horáček et al. (2000) considered this species possibly extinct. In that case, the four NMP specimens are quite valuable; Tsytsulina & Strelkov (2001) based their taxonomic revision on ten collection specimens of *M. bucharensis* only. External and cranial dimensions of the examined NMP specimens of *M. bucharensis* are shown in Table 9.

Eptesicus serotinus (Schreber, 1774)

Material. **Armenia**: 1 ind. ad., 1 ind. juv. (NMP 91576 {SA 81}, 91577 {SA 82} [S+B]), environs of Erewan, 10 July 1947, collector unlisted. – **Azerbaijan**: 8 ma, 1 ms (NMP 91276 {AZ 2}, 91277 {AZ 3}, 91278 {AZ 4}, 91279 {AZ 5}, 91280 {AZ 6}, 91281 {AZ 7}, 91282 {AZ 8}, 91286 {AZ 13}, 91287 {AZ 14} [S+A]), Qobustan, rocky town, 20 June 1979, leg. & ded. V. Hanák; – 4 ma, 1 ms (NMP 91292 {AZ 23}, 91293 {AZ 24}, 91294 {AZ 25}, 91295 {AZ 26}, 91296 {AZ 27} [S+A]), Qobustan, rocky town, 21 June 1979, leg. & ded. V. Hanák; – 5 ma (NMP 91314 {AZ 48}, 91315 {AZ 49}, 91316 {AZ 50}, 91317 {AZ 51}, 91318 {AZ 52} [S+B]), Qobustan, rocky town, 19 June 1981, leg. STA81, ded. V. Hanák; – 4 ma (NMP 91319 {AZ 53}, 91320 {AZ 54}, 91321 {AZ 55}, 91322 {AZ 56} [S+B]), Qobustan, rocky town, 20 June 1981, leg. STA81, ded. V. Hanák; – 1 ma, 1 ms (NMP 91331 {AZ 65}, 91336 {AZ 70} [S+B]), Qobustan, rocky town, 18 June 1982, leg. STA82, ded. V. Hanák; – 1 ms (NMP 91338 {AZ 72} [S+B]), Qobustan, rocky town, 19 June 1982, leg. STA82, ded. V. Hanák; – 1 ma (NMP 91359 {AZ 93} [S+B]), Qobustan, rocky town, 20 June 1982, leg. STA82, ded. V. Hanák; – 1 ind. ad. (NMP 91377 {AZ 111} [S+B]), Qobustan, rocky town, 20 June 1983, leg. STA83, ded. V. Hanák; – 1 ind. ad. (NMP 91413 {AZ 147} [S]), Qobustan, rocky town, 7 June 1985, leg. STA85, ded. V. Hanák; – 1 ind. ad. (NMP 91418 {AZ 152} [S+B]), Qobustan, rocky town, 20 June 1986, leg. STA86, ded. V. Hanák; – 1 ma (NMP 91432 {AZ 166} [S+B]), Qobustan, rocky town, 22 June 1987, leg. STA87, ded. V. Hanák; – 3 ma (NMP 91442 {AZ 177}, 91443 {AZ 178}, 91444 {AZ 179} [S+B]), Qobustan, rocky town, 23 June 1987, leg. STA87, ded. V. Hanák. – **Georgia**: 4 mj, 3 fa (NMP 91557 {SA 56}, 91558 {SA 57}, 91559 {SA 58}, 91560 {SA 59}, 91561 {SA 60}, 91562 {SA 62}, 91563 {SA 63} [S+B]), Džal, behind wooden cover of a house, 14 July 1964, leg. & ded. V. Hanák; – 2 inds. juv. (NMP 93854, 93855 [A (mummies)]), Varžia, cave monastery, 28 July 2011, leg. & ded. J. Robovský.

References. Gaisler (1970); Rahmatulina & Gasanov (2002a); Rahmatulina (2005); Benda et al. (2006).

Remarks. *Eptesicus serotinus* is not an unusual bat species in Transcaucasia, it is reported to be locally common in some regions (Dal' 1954, Buhnikašvili et al. 2004, Rahmatulina 2005). Ivanickij (2002a) reported this bat to be rather rare in Abkhazia, only two occurrence sites are available and the NMP specimens from Džal represent a third record from this country. On the other hand, in Georgia s.str. and Azerbaijan, *E. serotinus* ranks among the most common bats; Buhnikašvili et al. (2004) enumerated 52 localities from the whole Georgia, which are concentrated especially in lowland regions. Rahmatulina (2005) mentioned 89 occurrence sites from Azerbaijan in total, mostly from the northern part of the country, including Qobustan, where also a large series of the NMP specimens was collected. Although they come from an arid region of the country, pelage of all these bats is dark coloured, as in typical representatives of the species from Europe and northern Turkey; the body and skull dimensions are also close to those of the European samples (see Spitzenberger 1994, Benda 2006). External and cranial dimensions of the examined NMP specimens of *E. serotinus* from Transcaucasia are shown in Table 10.

Eptesicus turcomanus (Eversmann, 1840)

Material. **Kazakhstan**: – 1 fa (NMP 91694 {SA 233} [S+B]), Almaty, Voznesenskij church, 5 July 1929, leg. Kolabrykov, ded. V. Hanák; – 4 ma, 2 fa (NMP 91737 {SA 310}, 91738 {SA 311}, 91739 {SA 312}, 91740 {SA 313}, 91741 {SA 314} [S+A], 91736 {SA 309} [S+B]), Grodikovo, attic of a house, 3 June 1980, leg. J. Gaisler & V. Hanák, ded.

Table 10. Basic biometric data on the examined NMP specimens of *Eptesicus serotinus* (Schreber, 1774) from Transcaucasia, *E. turcomanus* (Eversmann, 1840) from West Turkestan and *Pipistrellus kuhlii* (Kuhl, 1817) from Transcaucasia. For abbreviations see pp. 161, 163

	Eptesicus serotinus					*Eptesicus turcomanus*					*Pipistrellus kuhlii*				
	n	**M**	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	36	**51.81**	48.5	54.9	1.516	19	**49.57**	45.2	53.5	2.043	54	**34.83**	32.6	36.8	0.993
LCr	37	**20.50**	19.53	21.62	0.516	19	**19.77**	18.52	21.08	0.618	58	**13.36**	12.66	13.97	0.240
LCb	36	**19.68**	18.87	20.48	0.431	19	**19.14**	18.22	20.34	0.560	58	**12.88**	12.03	13.52	0.253
LaZ	38	**13.94**	13.16	14.68	0.358	19	**13.03**	11.47	14.04	0.668	45	**8.68**	8.38	9.11	0.167
LaI	38	**4.29**	4.03	4.51	0.119	19	**4.20**	3.92	4.52	0.175	58	**3.40**	2.98	3.92	0.134
LaInf	38	**6.45**	6.07	6.96	0.219	19	**6.33**	5.67	6.89	0.313	58	**3.93**	3.63	4.18	0.112
LaN	38	**9.50**	9.03	10.03	0.215	19	**8.99**	8.08	9.51	0.387	58	**6.66**	6.28	7.49	0.179
LaM	36	**10.93**	10.28	11.64	0.304	18	**10.31**	9.28	10.76	0.450	58	**7.71**	7.18	8.08	0.177
ANc	36	**6.79**	6.34	7.27	0.240	19	**6.33**	5.55	6.82	0.354	58	**4.71**	4.43	5.02	0.127
LBT	36	**3.88**	3.32	4.23	0.176	19	**3.90**	3.41	4.23	0.234	53	**3.05**	2.27	3.38	0.154
CC	38	**6.63**	6.31	6.95	0.171	19	**6.22**	5.53	7.08	0.373	58	**4.17**	3.86	4.38	0.122
M^3M^3	38	**8.46**	7.83	8.94	0.255	19	**8.15**	7.47	8.81	0.359	56	**5.65**	5.41	5.98	0.130
CM^3	38	**7.72**	7.33	8.17	0.189	19	**7.46**	7.02	8.11	0.221	58	**4.92**	4.71	5.11	0.096
LMd	38	**15.20**	14.57	15.97	0.360	19	**14.47**	14.00	15.19	0.357	58	**9.55**	8.42	9.98	0.235
ACo	38	**5.58**	5.22	6.03	0.190	19	**5.22**	4.73	5.76	0.270	57	**2.98**	2.71	3.21	0.094
CM_3	38	**8.58**	8.20	9.52	0.261	19	**8.15**	7.56	8.88	0.267	58	**5.28**	5.10	5.48	0.094

V. Hanák; – 1 fa (NMP 91734 {SA 306} [S+B]), Taraz, hotel, 2 June 1980, leg. J. Gaisler & V. Hanák, ded. V. Hanák. – **Kirghizstan**: 1 ma (NMP 91722 {SA 283} [S+B]), Biškek, at a swimming pool, 28 May 1980, leg. J. Gaisler & V. Hanák, ded. V. Hanák. – **Turkmenistan**: 1 ms, 1 fa, 1 fs (NMP 91584 {SA 90}, 91585 {SA 91}, 91586 {SA 92} [S+B]), Aşgabat, open air cinema building, 28 July 1964, leg. & ded. V. Hanák; – 1 ms, 3 fa, 2 fs (NMP 91663 {SA 183}, 91664 {SA 184}, 91665 {SA 185}, 91666 {SA 189}, 91667 {SA 190}, 91668 {SA 192} [S+B]), Aşgabat, open air cinema building, 30 July 1964, leg. & ded. V. Hanák; – 1 fa (NMP 91682 {SA 215} [S+B]), Repetek, behind wooden cover of a roof, 2 August 1964, leg. & ded. V. Hanák.

References. Gaisler (1970); Hůrka (1984b); Benda et al. (2006).

Remarks. *Eptesicus turcomanus* is here considered a separate species in accordance with the results of the revision by Juste et al. (2010); it is an endemic of the arid areas of West Turkestan and some adjacent regions (E Ciscaucasia, N Iran, W East Turkestan, S Mongolia) (Strelkov 1963, 1981, Benda et al. 2006, Dolch et al. 2007, Wilson 2008).

In all countries of West Turkestan, *E. turcomanus* is considered a common bat species, mainly in the arid lowland and submontane regions. Strelkov & Šajmardanov (1983) as well as Butovskij et al. (1985) reported it to be one of the most common bats of southern Kazakhstan. Numerous records are available from the Taraz region (Strelkov & Šajmardanov 1983), where also a series of the NMP specimens was collected (Taraz, Grodikovo). Ânuševič et al. (1972) and Rybin et al. (1989) depicted numerous records from Kirghizstan, Rybin et al. (1989) assessed *E. turcomanus* as a frequent bat species in southern Kirghizstan. Strelkov et al. (1978) reported many records from the whole Turkmenistan; concerning the sites of origin of the NMP specimens this bat was found already by Bil'kevič (1918), Ognev & Geptner (1929) and Strelkov et al. (1978) (Ašgabat) and Bil'kevič (1918) (Repetek). The NMP specimens of *E. turcomanus* thus do not represent any remarkable records from the biogeographical point of view, all sites lie within the known distribution range of this bat species.

External and cranial dimensions of the examined NMP specimens of *E. turcomanus* are shown in Table 10.

Eptesicus bottae (Peters, 1869)

Material. **Azerbaijan**: 3 ma (NMP 91283 {AZ 10}, 91284 {AZ 11}, 91285 {AZ 12} [S+B]), Qobustan, rocky town, 20 June 1979, leg. & ded. V. Hanák; – 4 ma, 1 fa (NMP 91288 {AZ 16}, 91289 {AZ 17}, 91290 {AZ 18}, 91291 {AZ 19}, 91297 {AZ 28} [S+B]), Qobustan, rocky town, 21 June 1979, leg. & ded. V. Hanák; – 1 ma (NMP 91313 {AZ 47} [S+B]), Qobustan, rocky town, 19 June 1981, leg. STA81, ded. V. Hanák; – 1 ma (NMP 91323 {AZ 57} [S+B]), Qobustan, rocky town, 20 June 1981, leg. STA81, ded. V. Hanák; – 2 ma (NMP 91324 {AZ 58}, 91325 {AZ 59} [S+B]), Qobustan, rocky town, 22 June 1981, leg. STA81, ded. V. Hanák; – 1 ma (NMP 91326 {AZ 60} [S+B]), Qobustan, rocky town, 23 June 1981, leg. STA81, ded. V. Hanák; – 5 ma (NMP 91330 {AZ 64}, 91332 {AZ 66}, 91333 {AZ 67}, 91334 {AZ 68}, 91335 {AZ 69} [S+B]), Qobustan, rocky town, 18 June 1982, leg. STA82, ded. V. Hanák; – 2 ma, 1 fa (NMP 91337 {AZ 71}, 91340 {AZ 74}, 91341 {AZ 75} [S+B]), Qobustan, rocky town, 19 June 1982, leg. STA82, ded. V. Hanák; – 1 ma (NMP 91357 {AZ 91} [S+B]), Qobustan, rocky town, 20 June 1982, leg. STA82, ded. V. Hanák; – 1 ind. ad. (NMP 91373 {AZ 107} [S+B]), Qobustan, rocky town, 18 June 1983, leg. STA83, ded. V. Hanák; – 1 ind. ad. (NMP 91392 {AZ 126} [S+B]), Qobustan, rocky town, 20 June 1984, leg. STA84, ded. V. Hanák; – 2 inds. ad. (NMP 91419 {AZ 153}, 91420 {AZ 154} [S+B]), Qobustan, rocky town, 20 June 1986, leg. STA86, ded. V. Hanák; – 1 fa (NMP 91440 {AZ 174} [S+B]), Qobustan, rocky town, 22 June 1987, leg. STA87, ded. V. Hanák. – **Kirghizstan**: 2 ma (NMP 58899/1 {K 140/90}, 58899/2 {K 141/90} [S+A]), Aravan, Sasyk Ungur Cave (Fig. 20), 30 May 1990, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 1 ma (NMP 58901 {K 65/90} [A]), Samarkandyk, Kanigut, mine (Figs. 5, 18), 18 May 1990, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený. – **Turkmenistan**: 1 ma, 2 fa (NMP 91683 {SA 216}, 91684 {SA 217} [S+B], 93856 {SA 218} [S]), Repetek, at a swimming pool, 2 August 1964, leg. & ded. V. Hanák.

References. Hanák & Gaisler (1971); Hůrka (1984b); Rahmatulina & Gasanov (2002a); Rahmatulina (2005); Benda et al. (2006).

Remarks. *Eptesicus bottae ognevi* Bobrinskoj, 1918, the Central Asian form of *E. bottae*, is a bat distributed in the southern part of West Turkestan, with minor range extensions into adjacent areas; Transcaucasia (Armenia, Azerbaijan), N Iran, and Kashmir (Hanák & Gaisler 1971, Nader & Kock 1990, Benda et al. 2006). In its whole range, *E. b. ognevi* remains a rather uncommon bat representative.

Fig. 18. A lethargic male *Eptesicus bottae* (Peters, 1869) observed in the Kanigut mine at Samarkandyk (Fig. 5), south-western Kirghizstan (photo by J. Červený).

Table 11. Basic biometric data on the examined NMP specimens of *Eptesicus bottae* (Peters, 1869) from Transcaucasia (TC) and West Turkestan (WT), and of *Tadarida teniotis* (Rafinesque, 1814) from West Turkestan. For abbreviations see pp. 161, 163

	Eptesicus bottae TC					*Eptesicus bottae* WT					*Tadarida teniotis*	
	n	**M**	min	max	SD	n	**M**	min	max	SD	NMP 58321	NMP 58322
LAt	27	**41.72**	39.0	44.2	1.387	5	**43.58**	41.5	45.1	1.310	62.1	62.0
LCr	26	**16.40**	15.42	17.20	0.395	5	**16.65**	16.43	17.01	0.270	23.88	24.68
LCb	26	**16.15**	15.07	16.87	0.387	5	**16.39**	16.13	16.76	0.260	23.32	23.68
LaZ	27	**10.96**	10.25	11.55	0.280	5	**11.36**	11.28	11.46	0.078	14.02	14.43
LaI	27	**3.70**	3.42	3.90	0.119	5	**3.72**	3.58	3.77	0.079	4.61	4.63
LaInf	26	**5.17**	4.77	5.49	0.180	5	**5.23**	5.08	5.39	0.140	4.95	4.93
LaN	26	**7.90**	7.57	8.28	0.175	5	**7.81**	7.74	7.88	0.055	11.39	11.68
LaM	26	**8.74**	8.42	9.17	0.189	5	**8.88**	8.67	9.03	0.150	12.58	13.03
ANc	26	**5.59**	5.32	6.10	0.207	5	**5.60**	5.50	5.72	0.090	7.40	7.29
LBT	25	**3.49**	3.18	3.91	0.156	5	**3.69**	3.54	3.94	0.152	5.51	5.33
CC	27	**5.21**	4.28	5.45	0.240	5	**5.31**	5.24	5.38	0.050	5.48	5.51
M^3M^3	27	**7.05**	6.57	7.34	0.207	5	**7.18**	6.98	7.33	0.127	9.65	9.32
CM^3	27	**6.17**	5.72	6.53	0.178	5	**6.30**	6.17	6.37	0.079	9.19	9.19
LMd	27	**12.00**	11.63	12.42	0.222	5	**12.28**	12.18	12.47	0.119	16.96	17.33
ACo	27	**4.02**	3.72	4.27	0.119	5	**4.31**	4.22	4.40	0.072	4.26	4.19
CM_3	27	**6.74**	6.42	7.02	0.170	5	**6.88**	6.81	6.95	0.065	9.76	9.92

The western margin of the distribution range of this bat lies in Armenia and Azerbaijan; Rahmatulina (2005) reported five sites of occurrence of *E. b. ognevi* in Azerbaijan, all in the lowland (rather arid) part of the country (including Qobustan where the NMP specimens were collected). The eastern margin of its range in the Palaearctic is situated in eastern Kazakhstan (Butovskij et al. 1985). From Kirghizstan, Ânuševič et al. (1972) mentioned only one finding from Frunze (= Biškek), while Rybin et al. (1989) reported more records from the southern part of the country, and considered it an accessorial, but not a rare species. However, the NMP specimens represent new localities of this bat in southern Kirghizstan (see also Benda et al. 2006). Strelkov et al. (1978) reported more records of *E. b. ognevi* scattered throughout the whole area of Turkmenistan; in Repetek, where also three NMP specimens were collected, it was found already by Vinogradov & Stal'makova (1938).

External and cranial dimensions of the examined NMP specimens of *E. b. ognevi* are shown in Table 11. For details concerning the close morphometric similarity of the populations from E Transcaucasia and West Turkestan see Benda et al. (2006).

Hypsugo savii (Bonaparte, 1837)

Material. **Azerbaijan**: 2 ma (NMP 91339 {AZ 73}, 91342 {AZ 76} [B]), Qobustan, rocky town, 19 June 1982, leg. STA82, ded. V. Hanák; – 2 ma (NMP 91356 {AZ 90}, 91358 {AZ 92} [S+B]), Qobustan, rocky town, 20 June 1982, leg. STA82, ded. V. Hanák; – 1 ind. ad. (NMP 91374 {AZ 108} [S+B]), Qobustan, rocky town, 19 June 1983, leg. STA83, ded. V. Hanák; – 2 inds. ad. (NMP 91375 {AZ 109} [B], 91376 {AZ 110} [S+B]), Qobustan, rocky town, 20 June 1983, leg. STA83, ded. V. Hanák; – 1 ind. ad. (NMP 91414 {AZ 148} [S]), Qobustan, rocky town, 7 June 1985, leg. STA85, ded. V. Hanák; – 2 inds. ad. (NMP 91421 {AZ 155}, 91422 {AZ 156} [S+B]), Qobustan, rocky town, 20 June 1986, leg. STA86, ded. V. Hanák; – 5 ma, 1 fa (NMP 91433 {AZ 167}, 91434 {AZ 168}, 91435 {AZ 169}, 91437 {AZ 171}, 91438 {AZ 172}, 91439 {AZ 173} [S+B]), Qobustan, rocky town, 22 June 1987, leg. STA87, ded. V. Hanák. – **Kirghizstan**: 1 mj, 1 fa, 2 fj (NMP 58330/1 {K 261/88}, 58330/2 {K 262/88}, 58330/3 {K 263/88}, 58330/4 {K 264/88} [A]), Aravan, Sasyk Ungur Cave (Figs. 19, 20), 11 July 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 1 ma (NMP 93857 {SA 246} [S+B]), Kadamžaj, above a creek, 21 May 1980, leg. J. Gaisler & V. Hanák, ded. V. Hanák; – 2 ma

Fig. 19. Group of *Hypsugo savii* (Bonaparte, 1837) found in a fissure of the Sasyk-Ungur Cave at Aravan (Fig. 20), southern Kirghizstan (photo by J. Červený).

(NMP 58331/1 {K 276/88}, 58331/2 {K 277/88} [S+A]), Kara-Kokty, mine, 13 July 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 1 ma (NMP 58333 {K 121/88} [S+A]), Kyzyl-Kiâk, cave, 30 June 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 2 ma (NMP 58332 {K 164/88}, 60570 {G 283; K 179/88} [S+A]), Samarkandyk, Kanigut, mine (Fig. 5), 2 July 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený.

Table 12. Basic biometric data on the examined NMP specimens of *Hypsugo savii* (Bonaparte, 1837) from Transcaucasia (TC) and West Turkestan (WT) and of *Nyctalus noctula* (Schreber, 1774) from West Turkestan. For abbreviations see pp. 161, 163

	Hypsugo savii TC					*Hypsugo savii* WT					*Nyctalus noctula* WT				
	n	**M**	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	15	**33.36**	31.6	35.3	0.982	7	**34.21**	33.5	35.4	0.758	9	**56.02**	53.6	57.4	1.237
LCr	12	**13.29**	12.84	13.83	0.314	6	**13.17**	12.93	13.43	0.204	8	**19.32**	18.83	19.61	0.287
LCb	12	**12.81**	12.38	13.21	0.272	6	**12.66**	12.44	12.94	0.229	9	**19.44**	18.72	19.92	0.381
LaZ	12	**8.60**	8.18	9.02	0.295	6	**8.26**	7.98	8.58	0.224	8	**13.67**	13.29	13.98	0.245
LaI	12	**3.51**	3.34	3.73	0.129	6	**3.43**	3.32	3.61	0.107	9	**5.26**	5.08	5.42	0.130
LaInf	12	**4.43**	4.04	4.73	0.185	6	**4.24**	4.12	4.42	0.116	9	**7.83**	7.43	8.21	0.245
LaN	12	**6.71**	6.28	7.05	0.249	6	**6.59**	6.42	6.76	0.168	9	**10.28**	9.67	10.59	0.265
LaM	12	**7.18**	6.75	7.44	0.223	6	**7.10**	6.91	7.32	0.153	9	**12.37**	11.58	12.76	0.374
ANc	10	**4.51**	4.28	4.74	0.148	6	**4.46**	4.33	4.72	0.143	9	**7.09**	6.83	7.26	0.138
LBT	12	**3.04**	2.82	3.18	0.107	6	**3.07**	2.93	3.16	0.095	9	**4.89**	4.66	5.14	0.177
CC	12	**4.16**	3.88	4.41	0.156	6	**4.00**	3.78	4.31	0.198	9	**7.65**	7.08	7.89	0.251
M^3M^3	12	**5.63**	5.44	5.86	0.125	6	**5.50**	5.29	5.73	0.184	9	**9.04**	8.84	9.36	0.181
CM^3	12	**4.53**	4.39	4.82	0.112	6	**4.46**	4.31	4.62	0.127	9	**7.57**	7.18	7.76	0.186
LMd	12	**9.26**	8.92	9.54	0.207	6	**9.05**	8.75	9.28	0.207	9	**14.94**	14.53	15.53	0.318
ACo	12	**2.74**	2.61	3.04	0.132	6	**2.69**	2.60	2.87	0.101	9	**4.83**	4.65	4.94	0.093
CM_3	12	**4.87**	4.69	5.04	0.102	6	**4.79**	4.61	4.93	0.137	9	**8.08**	7.79	8.33	0.210

References. [Horáček & Hanák (1986)]; Zima et al. (1991); Rahmatulina & Gasanov (2002a); Rahmatulina (2005); Benda et al. (2006).

Remarks. *Hypsugo savii* is a relatively rare bat species both in Transcaucasia and West Turkestan. In Azerbaijan it is known only from eight sites, localised mostly in the mountainous western part of the country (Rahmatulina 2005). The locality of the NMP specimens origin, the rocky town of Qobustan, is the only one known from the eastern lowland part of the country; Rahmatulina (2005) mentioned also the NMP bats. Ânuševič et al. (1972) and Rybin et al. (1989) reported *H. savii* to be rather uncommon in Kirghizstan, however, the latter authors considered it to be a non-rare but accessorial species of the regional fauna, being "probably a regular species in all rocky regions" (Rybin et al. 1989: 430) of the southern part of the country (where also the NMP specimens were collected).

Standard karyotype characteristics of the specimen NMP 60519 from Kirghizstan were described by Zima et al. (1991). External and cranial dimensions of the examined NMP specimens of *H. savii* from Transcaucasia and West Turkestan are shown in Table 12. The specimens from both populations, the Transcaucasian and West Turkestani ones, have very pale dorsal pelage and whitish ventral pelage (Fig. 19, see also Benda et al. 2006: 185, Fig. 115c), and are traditionally considered to belong to one taxon, *H. s. caucasicus* (Satunin, 1902).

Fig. 20. Entrance position of the Sasyk-Ungur Cave at Aravan, southern Kirghizstan (photo by J. Červený). In this cave system, seven bat species were found, viz. *Rhinolophus ferrumequinum*, *Myotis blythii*, *Eptesicus bottae*, *Hypsugo savii*, *Pipistrellus pipistrellus*, *Otonycteris leucophaea*, and *Tadarida teniotis* (see also Rybin et al. 1989).

Pipistrellus pipistrellus (Schreber, 1774) s. l.

Material. **Armenia**: 1 ind. ad. (NMP 91573 {SA 78} [S+B]), Ogĵi, 25 August 1947, collector unlisted, ded. V. Hanák; – 1 ind. sad. (NMP 91571 {SA 74} [S+B]), Vedi, rocky fissure, 31 July 1955, leg. I. S. Darevskij, ded. V. Hanák. – **Azerbaijan**: 2 fa (NMP 91306 {AZ 37}, 91307 {AZ 38} [S+B]), Nağaraxana, at fishpond, 27 June 1979, leg. & ded. V. Hanák; – 1 ma (NMP 91445 {AZ 180} [S+B]), Zaqatala, 28 June 1987, leg. STA87, ded. V. Hanák. – **Georgia**: 1 ma (NMP 91509 {SA 2} [S+B]), Mcheta, Svetichoveli, 11 July 1964, leg. & ded. V. Hanák. – **Kazakhstan**: 2 ma (NMP 91730 {SA 298}, 91731 {SA 299} [S+B]), Almaty, at a fountain, 29 May 1980, leg. J. Gaisler & V. Hanák, ded. V. Hanák; – 1 ma (NMP 91732 {SA 300} [S+A]), Almaty, at a swimming pool, 30 May 1980, leg. J. Gaisler & V. Hanák, ded. V. Hanák; – 1 ma (NMP 91742 {SA 323} [S+A]), Grodikovo, school courtyard, 3 June 1980, leg. J. Gaisler & V. Hanák, ded. V. Hanák; – 1 ma (NMP 91735 {SA 308} [S+B]), Taraz, hotel, 2 June 1980, leg. J. Gaisler & V. Hanák, ded. V. Hanák; – 1 ma (NMP 91733 {SA 305} [S+B]), Taraz, at a swimming pool, 31 May 1980, leg. J. Gaisler & V. Hanák, ded. V. Hanák. – **Kirghizstan**: 6 ma (NMP 91714 {SA 261} [S+A], 91709 {SA 256}, 91710 {SA 257}, 91711 {SA 258}, 91712 {SA 259}, 91713 {SA 260} [S+B]), Biškek, at a swimming pool, 25 May 1980, leg. J. Gaisler & V. Hanák, ded. V. Hanák; – 5 ma, 2 fa (NMP 91725 {SA 293}, 91726 {SA 294}, 91727 {SA 295}, 91728 {SA 296}, 91729 {SA 297} [S+A], 91723 {SA 291}, 91724 {SA 292} [S+B]), Biškek, at a swimming pool, 28 May 1980, leg. J. Gaisler & V. Hanák, ded. V. Hanák; – 1 ma (NMP 58335 {K 63/88} [S+A]), Žijdelik, at a swimming pool, 27 June 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 1 ma, 2 fa (NMP 58334/1 {K 282/88}, 58334/2 {K 283/88} [S+A], 58334/3 {K 284/88} [A]), Uzgen, at fishponds, 14 July 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený. – **Tajikistan**: 1 ind. ad. (NMP 91701 {SA 240} [S+M]), Dušanbe, 22 April 1979, collector unlisted, ded. V. Hanák; – 4 fa (NMP 50894/1–50894/4 [A]), Dusti, Pânž Valley, June 1989, leg. & ded. B. Pražan. – **Turkmenistan**: 1 ma, 1 fa (NMP 91685 {SA 220}, 91686 {SA 222} [S+B]), Germab, 16 July 1964, leg. & ded. V. Hanák; – 1 ind. ad. (NMP 91696 {SA 235} [S+B]), Repetek, 8 April 1952, leg. G. P. Dement'ev, ded. V. Hanák; – 6 ma, 1 ms, 5 fa, 1 fs (NMP 91669 {SA 199}, 91670 {SA 200}, 91671 {SA 201}, 91672 {SA 202}, 91673 {SA 203}, 91674 {SA 204}, 91675 {SA 205}, 91676 {SA 206}, 91677 {SA 207}, 91678 {SA 208}, 91679 {SA 209}, 91680 {SA 211}, 91681 {SA 212} [S+B]), Repetek, behind window of a garage, 1 August 1964, leg. & ded. V. Hanák. – **Uzbekistan**: 1 ma (NMP 91748 {SA 332} [S+B]), Džum-Džum, 13 June 1989, leg. STU89, ded. V. Hanák; – 2 ma (NMP 91703 {SA 242}, 91704 {SA 243} [S+B]), Farg'ona, 21 May 1980, leg. J. Gaisler & V. Hanák, ded. V. Hanák; – 2 ma, 9 fa (NMP 91497 {BB 54}, 91498 {BB 55}, 91499 {BB 56}, 91500 {BB 57}, 91501 {BB 59}, 91502 {BB 60}, 91503 {BB 61}, 91504 {BB 62}, 91505 {BB 63}, 91506 {BB 64}, 91507 {BB 65} [S+B]), Samarqand, cave, 14 October 1963, leg. A. K. Sagitov, ded. V. Hanák.

References. Hůrka (1984b); Zima et al. (1991); Rahmatulina (2005).

Remarks. *Pipistrellus pipistrellus* s.l. is a very common bat form in all countries of Transcaucasia and West Turkestan, well represented also in museum collections (see e.g. Ševčenko & Zolotuhina 2005). While in Turkestan the *pipistrellus* species complex is perhaps represented only by *P. pipistrellus* s.str. (see Hulva et al. 2010), in Transcaucasia two species were evidenced, *P. pipistrellus* s.str. and *P. pygmaeus* (Leach, 1825) (see Rahmatulina & Gasanov 2002b, Rahmatulina 2005, and Kruskop 2007).

All localities of the NMP specimens from Transcaucasia were already mentioned by authors of local surveys (Dal' 1954, Buhnikašvili et al. 2004, Rahmatulina 2005). With the exception of high mountain areas, *P. pipistrellus* (s.str.) is widespread in all parts of West Turkestan as far as in easternmost Kazakhstan (Šajmaranov & Murzov 1990); the NMP specimens originate from the regions, where this species was reported as very frequent and numerous records are available (Bogdanov 1953, Ânuševič et al. 1972, Butovskij 1974, Strelkov et al. 1978, Strelkov & Šajmardanov 1983, Rybin et al. 1989, Habilov 1992). From several NMP localities, records of this bat are known as early as from the 1870s, viz. Germab (Radde & Walter 1889), Farg'ona (Fedčenko 1875, Satunin 1910), and Samarqand (Tihomirov & Korčagin 1889, Thomas 1909).

Standard karyotype characteristics of the specimen NMP 58334/1 from Kirghizstan were described by Zima et al. (1991). External and cranial dimensions of the examined NMP specimens of *P. pipistrellus* s.l. are shown in Table 13.

Taxonomic note. The pale coloured Turkestani and Middle Eastern populations of *Pipistrellus pipistrellus* have frequently been considered a taxon separated from the European and Mediter-

ranean dark coloured populations regarded as nominotypical; originally as a species of its own (Thomas 1905, Satunin 1905, 1910, 1914) and later as a subspecies (Thomas 1909, Bianki 1917, Bobrinskoj 1925, 1929, Ognev 1927, 1928, Ogneff & Heptner 1928, Kuzâkin 1944, 1950, 1965, Ellerman & Morrison-Scott 1951, Strelkov 1963, 1981, Neuhauser & DeBlase 1971, Corbet 1978, Strelkov et al. 1978, DeBlase 1980, Albayrak 1987, Koopman 1994, Taake & Vierhaus 2004, Simmons 2005, etc.). Most frequently, two names are discussed considering this taxon, *Pipistrellus aladdin* Thomas, 1905 (type locality: Darband, Lorestan, Iran) and *Pipistrellus bactrianus* Satunin, 1905 (t.l.: Tejen, SE Turkmenistan). Since both names were created in the same year, the former one was suggested later as a senior synonym (Neuhauser & DeBlase 1971, Corbet 1978, Koopman 1994, Horáček et al. 2000, Simmons 2005, Kruskop 2007, Wilson 2008). However, this conclusion has not been accepted by some authors who considered the name *bactrianus* appropriate for the West Turkestani populations (Strelkov et al. 1978, Strelkov 1981, Butovskij et al. 1985, Bates & Harrison 1997).

Nevertheless, at least three other names exist, which are mentioned under synonymy of *Pipistrellus aladdin* and *P. bactrianus* (see e.g. Rossolimo & Pavlinov 1987 or Simmons 2005; Fig. 21) and were created earlier than Thomas' (1905) and Satunin's (1905) names, they could thus potentially represent their senior synonyms; viz. *Vespertilio lacteus* Temminck, 1838; *Vesperugo akokomuli almatensis* Severcov, 1873; and *Vespertilio oxianus* Bogdanov, 1882.

***Vespertilio lacteus* Temminck, 1838**

Temminck (1835–1841 [= 1838]: 245)* gave a clear (= valid) description of this taxon, rather enigmatic though: the type locality was not clearly defined ("On ne peut indiquer avec certitude la patrie, mais il est probable que c'est l'Amerique méridionale") and the description was probably based on the examination of juvenile specimens ("qu'ils sont dans le jeune âge, probablement des jeunes de quelques mois"). Hence, the geographical origin of type specimens is unknown and the characters could not be fully identical with those of adult animals and thus, the availability of the description is somewhat relativised.

However, Dobson (1878) revised the type specimens of *V. lacteus* and found them to agree in all respects with the samples of *P. pipistrellus* from Turkestan. Based on this comparison, Thomas (1909) regarded the name *lacteus* to be a senior synonym of the names *aladdin* and *bactrianus*. Therefore, Satunin (1914) mentioned *lacteus* as a species name for the populations of Turkestan (and *bactrianus* as its junior synonym) and similarly also Thomas (1909) and Bianki (1917) as a subspecies name (*P. pipistrellus lacteus*).

---

*Temminck (1838: 245): "Vespertilion lacté. – *Vespertilio lacteus*.

Taille et formes de la *pipistrelle*; organes du vol peu étendues et faibles en rapport du volume du corps; base de l'interfémorale velue; oreilles courtes, tragus très court en fer de lance. Dents incisives 4 par paire en haut, et 6 en bas. Les molaires n'ont pu être observées.

Pelage long, très touffu et lisse, d'un blanc pur partout. tous les poils des parties supérieures de deux couleurs, brun-noirâtre à la base, et d'un blanc pur à la pointe; les parties inférieures d'un brunrougeâtre à la base des poils, et d'un blanc pur à la pointe; membranes jaunes. la robe de cette espèce est entièrement blanche lorsque les poils sont couchés et bien couverts, mais elle parait bigarrée de brun-noirâtre et de blanc, lorsque ces poils sont plus ou moins écartés, leur bout seul étant d'un blanc pur.

Longeur totale 2 pouces 8 ligues, queue 1 pounce; envergure 7 pouces; antibrachium 1 pouce: sur un jeune.
Cette espèce est nouvelle. Elle ne peut être regardée comme variété albine, deux sujets semblables en tout point ayant été observés. Une autre raison s'oppose à cette idée; car si les individus étoient des albinos, la blancheur des poils serait générale, au lieu que le pelage de cette espèce est moité noirâtre, et que seulement le bout des poils est blanc. On ne peut indiquer avec certitude la patrie, mais il est probable que c'est l'Amerique méridionale; les individus du musée des Pays-Bas ont été trouvés dans une collection faite dans cette partie du monde. L'examen de ces deux sujets prouve, qu'ils sont dans le jeune âge, probablement des jeunes de quelques mois; la forme des ailes et le peu de consistance des os de l'humérus et de l'antibrachium servent à constater cette remarque; l'adulte aurait conséquemment *des dimensions beaucoup plus fortes*."

Ognev (1927)* suggested the name *bactrianus* to be rather used instead of *lacteus* (which he considered unavailable) and this conclusion was subsequently accepted by other authors (Bobrinskoj 1925 [who quoted Ognev's manuscript], 1929, Ogneff & Heptner 1928, Ognev 1928, Kuzâkin 1934, 1944, 1950, 1965, Meklenburcev 1935, Strelkov 1963). Ellerman & Morrison-Scott (1951) reported the name *lacteus* as a senior synonym of *P. pipistrellus bactrianus* with a question mark and a note "locality unknown" (so, actually as a nomen dubium). Corbet (1978) and Koopman (1993) did not mention the name *lacteus* within synonymy of any taxon. Strelkov (1981), Pavlinov & Rossolimo (1987, 1998), Borisenko & Pavlinov (1995), and Simmons (2005) listed *lacteus* under the synonymy of *pipistrellus*, but mostly with the question mark and/or the note 'nomen dubium'.

In conclusion, regarding the circumstances stated in the description (Temminck 1835–1841) and also the prevailing opinion by competent authors (see above), the name *Vespertilio lacteus* should be considered a nomen dubium as it fits well the definition of "a name of unknown or doubtful application" (ICZN 1999: 111). Hence, since (at least) the origin of the type specimens of *Vespertilio lacteus* is undoubtedly clarified, the name remains unavailable for the appellation of any taxon.

***Vesperugo akokomuli almatensis* Severcov, 1873**

Severcov (1873: 79)† gave a clear (= valid) description of this taxon in his book on the distribution of animals in then Russian Turkestan and later again in an almost verbatim translation (Severtzoff 1876)†; it was originally described as a variety of *Vespertilio akokomuli* Temminck, 1838 (a bat described from Japan). Jentink (1880) examined the type specimens of *V. akokomuli* and found them to represent an identical taxon with *Vespertilio abramus* Temminck, 1838 (= *Pipistrellus abramus*), also described from Japan (Temminck 1835–1841). This taxonomic revision was accepted by most of the subsequent authors (Trouessart 1904, Ellerman & Morrison-Scott 1951, Corbet 1978, Borisenko & Pavlinov 1995, Koopman 1993, Simmons 2005, etc.) with an exception of Strelkov (1981), who mentioned the name *akokomuli* under the synonymy of *pipistrellus* Schreber, 1774.

The name *almatensis* Severcov, 1872 was created based on a specimen originating from Vernyj (= Almaty, Kazakhstan) where the only bat roughly corresponding in characters to *Pipistrellus abramus* is known to occur: *P. pipistrellus*. Perhaps for this reason Thomas (1909) considered

*Ognev (1927: 150):
"I keep to this name [*bactrianus* Satunin], because Satunin gives the exact locality. O. Thomas (Ann. and Mag., Nat. Hist., 1909, p. 58) affirms that the correct name of this must be *P. p. lacteus* Temm., but in the Monographie de Mammalogie (1838) Temminck brings forward a very questionable consideration, namely, that the type species [= specimens] of *Vespertilio lacteus* came from South America."

†Severcov (1873: 79):
"3. *Vesperugo akokomuli*, Temm, var. *almatensis*, Sev. Самецъ добытый въ Верномъ въ мае 1865, по своей короткой морде более похожъ на *V. abramus*, Temm; но цветъ, форма ушей и все прочіе признакы совершенно типичного *V. akokomuli*, уши у корня весьма разширены, брюхо къ хвосту бело и эта белизна въ виде полумесяца, кзади выпуглаго. Живетъ въ домахъ; замечательно-западное распространеніе этой японской формы. Но обстоятельство отчасти смешанныхъ признаковъ двухъ японских формъ у экземпляра изъ Вернаго указываетъ, что коренная форма, отъ которой произошли обе японскія, весьма близкія между собой, есть среднеазіатская."

The description was translated almost verbatim by F. Carl Craemers in the paper by Severtzoff (1876: 42): "*Vesperugo akokomuli*, Temm[inck, 1838], var. *almatensis*, Sev[ercov, 1873]. [...] A male specimen, obtained at Vernoe [= Vernyj = Almaty, Kazakhstan] in May 1865, somewhat resembles *V.*[*esperugo* = *Pipistrellus*] *abramus*, Temm[inck, 1838], in the shortness of its muzzle; but the colour, the form of the ears, and all other characters are like those of *Vesperugo akokomuli* [= *Pipistrellus abramus*]. The ears are very wide at the base; the belly towards the tail is white, forming a semilunar white patch [convex posteriorly]. It mostly inhabits the houses. Very remarkable is the distribution of this Japanese form; but the circumstances of the characters of two Japan species being found in one specimen from Vernoe shows that the original race from which the two Japanese forms [closely similar to each other] have their origin is a Central Asian species."

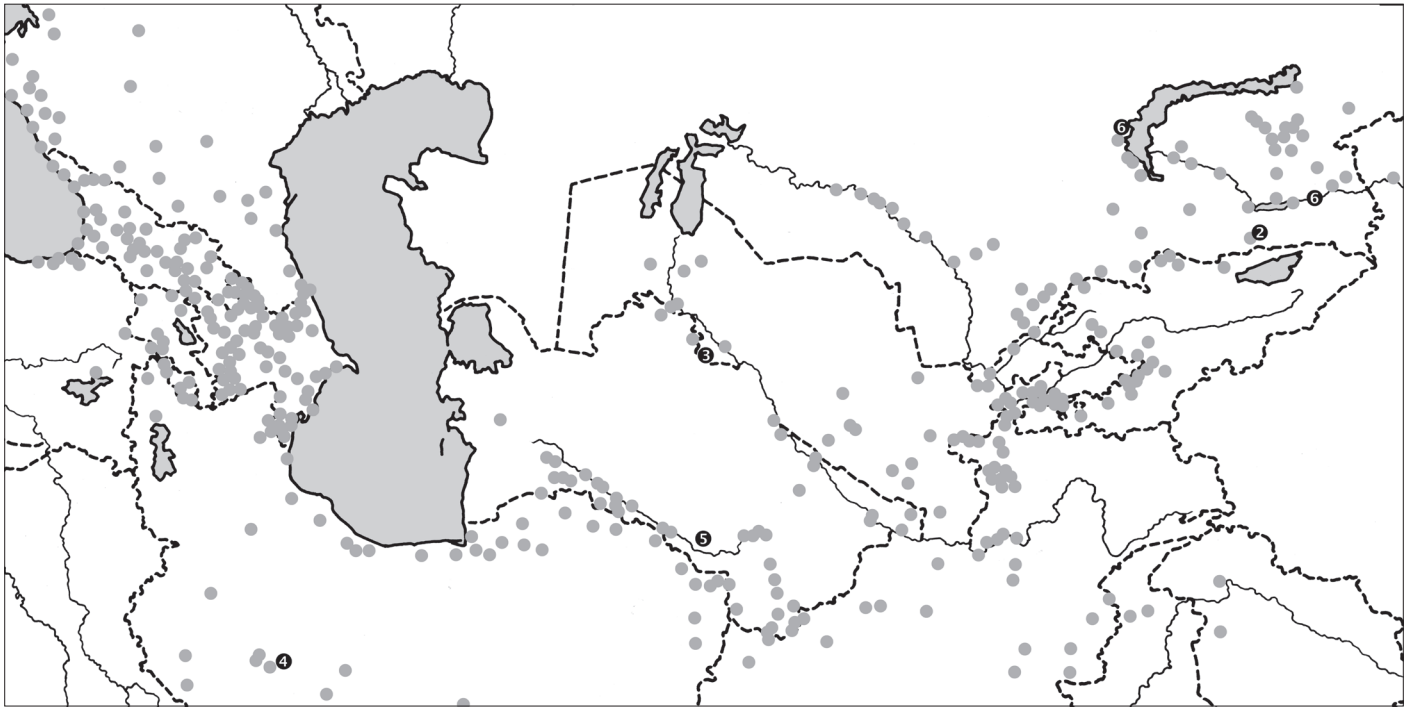

Fig. 21. Map of records of bats of the *Pipistrellus pipistrellus* group in SW Asia (grey dots) with denoted type localities of the group (black dots). Explanations: [1 – *lacteus* Temminck, 1838 (locality unknown)]; 2 – *almatensis* Severcov, 1873 (Almaty, Kazakhstan); 3 – *oxianus* Bogdanov, 1882 (Hiva, Uzbekistan); 4 – *aladdin* Thomas, 1905 (Darband, Iran); 5 – *bactrianus* Satunin, 1905 (Tejen, Turkmenistan); 6 – *kusjakini* Korelov, 1947 (Saryšagan & Ili valley, Kazakhstan); [7 – *fulvus* Korelov, 1947 (Tien-Shan foothils of Uzbekistan, Kirghizstan & Kazakhstan)]. Based on the data by Dal' (1954), Gaisler (1970), Ânuševič et al. (1972), Kazakov & Ârmyš (1974), Strelkov et al. (1978), Amirhanov (1980), DeBlase (1980), Šagoân et al. (1980), Strelkov & Šajmardanov (1983), Butovskij et al. (1985), Rossolimo & Pavlinov (1987), Strelkov (1988), Rybin et al. (1989), Strelkov et al. (1990), Habilov (1992), Bates & Harrison (1997), Roberts (1997), Benda & Horáček (1998), Buhnikašvili et al. (2004), Gazarân & Džamirzoev (2005), Rahmatulina (2005), Šajmardanov (2006), Kruskop (2007), and own data. In some cases, one symbol represents more than one site.

Table 13. Basic biometric data on the examined NMP specimens of *Pipistrellus pipistrellus* (Schreber, 1774) s.l. from Transcaucasia (TC) and West Turkestan (WT), and of *P. nathusii* (Keyserling et Blasius, 1839) from Transcaucasia. For abbreviations see pp. 161, 163

	Pipistrellus pipistrellus TC					*Pipistrellus pipistrellus* WT					*Pipistrellus nathusii*	
	n	**M**	min	max	SD	n	**M**	min	max	SD	91698	91391
LAt	6	**30.83**	29.8	31.8	0.850	58	**31.18**	29.4	33.9	0.855	31.9	31.7
LCr	5	**11.73**	11.42	12.01	0.285	50	**11.90**	10.98	12.42	0.270	13.28	13.09
LCb	5	**11.19**	10.84	11.61	0.306	48	**11.34**	10.64	11.74	0.258	12.68	12.62
LaZ	4	**7.36**	7.13	7.64	0.226	34	**7.49**	7.13	7.88	0.194	–	8.11
LaI	5	**3.19**	3.12	3.28	0.059	52	**3.32**	2.97	3.63	0.110	3.74	3.68
LaInf	5	**3.51**	3.42	3.63	0.089	51	**3.54**	3.17	3.87	0.139	3.97	3.96
LaN	5	**6.17**	5.98	6.37	0.153	51	**6.20**	5.78	6.61	0.187	6.81	6.88
LaM	5	**6.63**	6.41	6.87	0.165	51	**6.70**	6.42	6.98	0.161	7.28	7.34
ANc	5	**4.10**	3.93	4.21	0.112	47	**4.30**	4.05	4.58	0.115	4.54	4.62
LBT	5	**2.98**	2.83	3.17	0.128	50	**2.93**	2.64	3.28	0.126	3.02	3.13
CC	5	**3.42**	3.32	3.51	0.075	50	**3.49**	3.17	3.87	0.139	3.93	3.86
M^3M^3	5	**4.76**	4.53	4.97	0.157	48	**4.90**	4.43	5.33	0.174	5.21	5.08
CM^3	5	**4.09**	3.96	4.32	0.138	52	**4.21**	3.97	4.43	0.095	4.44	4.21
LMd	5	**8.20**	7.93	8.54	0.226	49	**8.21**	7.65	8.48	0.176	9.07	9.14
ACo	5	**2.28**	2.18	2.46	0.110	49	**2.33**	2.17	2.56	0.082	2.07	2.41
CM_3	5	**4.36**	4.19	4.61	0.157	49	**4.54**	3.96	8.28	0.556	4.17	4.73

almatensis as a junior synonym of *lacteus* Temminck, 1838 and a senior synonym of *bactrianus* Satunin, 1905. Similarly, Bobrinskoj (1925) mentioned *almatensis* as a senior synonym of *bactrianus*. While Ognev (1927) did not list the name *almatensis* either, Ognev (1928) considered this name a nomen nudum; he explained this opinion with a reference to an 'unclear' description by Severcov (1873). Other authors (Kuzâkin 1950, Corbet 1978, Koopman 1993) did not mention the name *almatensis* within synonymy of any taxon.

Ellerman & Morrison-Scott (1951), Pavlinov & Rossolimo (1987), Borisenko & Pavlinov (1995), and Simmons (2005) reported *almatensis* within the synonymy of *Pipistrellus pipistrellus*, but considered it as a nomen nudum. On the other hand, Strelkov (1981) and Pavlinov & Rossolimo (1998) also mentioned *almatensis* within the synonymy of *Pipistrellus pipistrellus*, but without any note on its unavailability. However, as a name for the Turkestani populations (subspecies) they consistently reported *P. p. bactrianus*.

To be summarised, the name *Vesperugo akokomuli almatensis* Severcov, 1873 certainly does not constitute a nomen nudum, since the author of this name attached a clear description, available for determination of the animal (in accordance with Thomas 1909 and contra Ognev 1928, Ellerman & Morrison-Scott 1951, Pavlinov & Rossolimo 1987, Borisenko & Pavlinov 1995, Simmons 2005). Since the name *lacteus* Temminck, 1838 is considered to represent a nomen dubium (see above), the name *almatensis* Severcov, 1873 evidently represents a prior name usable for subspecific naming of Asian populations of *Pipistrellus pipistrellus* (Schreber, 1774). However, although *almatensis* is undoubtedly the senior synonym of *aladdin* and *bactrianus*, it is a nomen oblitum in the sense of the Article 23.9.2. by ICZN (1999) and thus becomes unavailable.

Since the name *Vesperugo akokomuli almatensis* Severcov, 1873 was found not to represent a nomen nudum, the availability of another name from the synonymy of the *pipistrellus* group originating from West Turkestan, *Vespertilio oxianus* Bogdanov, 1882 (a nomen nudum according to Ognev 1928 or Rossolimo & Pavlinov 1987) has not been examined.

However, the comparison of various genetic markers within the *P. pipistrellus* complex from its whole distribution range (Hulva et al. 2004, 2010) showed the Middle Eastern and Turkestani samples of *P. pipistrellus* s.str. to belong to an identical clade as the European and Caucasian populations of this species. This result does not support the subspecific division of the continental Eurasian populations of the species (contra Thomas 1909 and numerous subsequent authors) and thus, it is appropriate to consider the Turkestani as well as the other Asian populations as constituents of the nominotypical form.

Pipistrellus nathusii (Keyserling et Blasius, 1839)

Material. **Azerbaijan**: 1 ma (NMP 91698 {SA 237} [S+B]), Xaçmaz District, 14 October 1975, leg. I. K. Rahmatulina, ded. V. Hanák; – 1 ind. ad. (NMP 91391 {AZ 125} [S+B]), Kür and Tərtər rivers confluence, 25 June 1984, leg. STA84, ded. V. Hanák.

Reference. Rahmatulina (2005).

Remarks. *Pipistrellus nathusii* is a bat typical for the zone of European mixed forests, it occurs from West Europe eastwards to the Perm' and Kurgan Regions of Russia (Horáček et al. 2000, Emel'ânov 2001, Belousov et al. 2004); in Asia Minor and Transcaucasia it reaches the southern margins of its distribution range in Asia (Hanák & Gaisler 1976, Benda & Horáček 1998), and the species was never recorded in Iran (Karami et al. 2008). Despite the occurrence at the absolute margin of the known distribution range of *P. nathusii*, Rahmatulina (2005) reported this species as a rather frequent bat in Azerbaijan. She reported altogether 28 record sites mainly from the NE and SE regions of the country (incl. some records from the Xaçmaz Dist., incl. the NMP specimen), while only one finding from the central lowland (Sabirabad). The record of the NMP specimen at the Kür and Tərtər rivers confluence represents another summer evidence of the species from a fertile part of the latter region. External and cranial dimensions of the examined NMP specimens of *P. nathusii* are shown in Table 13.

Pipistrellus kuhlii (Kuhl, 1817)

Material. **Armenia**: 1 ma (NMP 91564 {SA 64} [S]), Erewan, 1948, leg. S. K. Dal', ded. V. Hanák; – 1 fs (NMP 91565 {SA 66} [S+B]), Vaġaršapat, 8 April 1955, leg. I. S. Darevskij, ded. V. Hanák. – **Azerbaijan**: 1 ma (NMP 91455 {AZ 193} [S+B]), Acınohur, steppe, 27 June 1986, leg. STA86, ded. V. Hanák; – 3 ma (NMP 91327 {AZ 61}, 91328 {AZ 62}, 91329 {AZ 63} [S+B]), Bakı, 17 June 1982, leg. STA82, ded. V. Hanák; – 6 ma, 1 fa (NMP 91360 {AZ 94}, 91361 {AZ 95}, 91362 {AZ 96}, 91363 {AZ 97}, 91364 {AZ 98}, 91365 {AZ 99}, 91366 {AZ 100} [S+B]), Bakı, 24 June 1982, leg. STA82, ded. V. Hanák; – 1 fa (NMP 91312 {AZ 43} [S+B]), Nağaraxana, at fishpond, 29 June 1979, leg. & ded. V. Hanák; – 13 ma (NMP 91343 {AZ 77}, 91344 {AZ 78}, 91345 {AZ 79}, 91346 {AZ 80}, 91347 {AZ 81}, 91348 {AZ 82}, 91349 {AZ 83}, 91350 {AZ 84}, 91351 {AZ 85}, 91352 {AZ 86}, 91353 {AZ 87}, 91354 {AZ 88}, 91355 {AZ 89} [S+B]), Qobustan, rocky town, 20 June 1982, leg. STA82, ded. V. Hanák; – 6 ma (NMP 91367 {AZ 101}, 91368 {AZ 102}, 91369 {AZ 103}, 91370 {AZ 104}, 91371 {AZ 105}, 91372 {AZ 106} [S+B]), Mingəçevir, 1 July 1982, leg. STA82, ded. V. Hanák; – 1 ind. ad. (NMP 91378 {AZ 112} [S+B]), Mingəçevir, chalet, 25 June 1983, leg. STA83, ded. V. Hanák; – 2 inds. ad. (NMP 91379 {AZ 113}, 91380 {AZ 114} [S+B]), Mingəçevir, chalet, 26 June 1983, leg. STA83, ded. V. Hanák; – 1 ind. ad. (NMP 91381 {AZ 115} [S+B]), Mingəçevir, chalet, 27 June 1983, leg. STA83, ded. V. Hanák; – 2 fa, 4 inds. ad. (NMP 91386 {AZ 120}, 91387 {AZ 121}, 91389 {AZ 123} [S+A], 91384 {AZ 118}, 91385 {AZ 119}, 91388 {AZ 122} [S+B]), Mingəçevir, camp, 24 June 1984, leg. STA84, ded. V. Hanák; – 1 ind. ad. (NMP 91390 {AZ 124} [S+B]), Mingəçevir, camp, 29 June 1984, leg. STA84, ded. V. Hanák; – 3 inds. ad. (NMP 91415 {AZ 149}, 91416 {AZ 150}, 91417 {AZ 151} [S]), Mingəçevir, chalet, 18 June 1985, leg. STA85, ded. V. Hanák; – 1 ma, 5 fa (NMP 91446 {AZ 183}, 91447 {AZ 184}, 91448 {AZ 185}, 91449 {AZ 186}, 91450 {AZ 187}, 91451 {AZ 188} [S+B]), Mingəçevir, touristic lodge, 30 June 1988, leg. STA88, ded. V. Hanák; – 1 ma (NMP 91452 {AZ 189} [S+B]), Mingəçevir, touristic lodge, 1 July 1988, leg. STA88, ded. V. Hanák; – 1 fa (NMP 91383 {AZ 117} [S+B]), Niyazoba, 12 October 1975, leg. I. K. Rahmatulina, ded. V. Hanák; – 2 inds. ad. (NMP 91425 {AZ 159}, 91426 {AZ 160} [S+B]), Şamaxı, canyon, 5 July 1986, leg. STA86, ded. V. Hanák; – 1 fa (NMP 91382 {AZ 116} [S+B]), Suçma, 23 April 1976, leg. I. K. Rahmatulina, ded. V. Hanák.

Reference. Gaisler (1970); Hůrka (1984b); Rahmatulina (2005).

Remarks. In times, when the NMP specimens of *Pipistrellus kuhlii* were collected in Armenia (viz. Erewan, 1948; Vaġaršapat, 1955), this Mediterranean bat was a rare species in Transcaucasia and the southern part of Armenia, then representing the northernmost part of its distribution range in Asia (Argiropulo 1939, Dal' 1954, Vereŝagin 1959). In the 1970s and 1980s, this bat became very common in Armenia (cf. Šagoân & Âvruân 1974, Šagoân 1980), and its distribution range spread extensively to the north (Strelkov 1973, Strelkov et al. 1985, Strelkov & Sosnovceva 1994, Sachanowicz et al. 2006). *P. kuhlii* is recently considered absolutely the most common bat species in Azerbaijan, 185 record sites are available from the country in total, mostly from its lowland parts (Rahmatulina 1983, 2005). All records of the NMP specimens from Azerbaijan were mentioned already by Rahmatulina (2005). External and cranial dimensions of the examined NMP specimens of *P. kuhlii* are shown in Table 10.

Nyctalus noctula (Schreber, 1774)

Material. **Armenia**: 1 fa (NMP 91566 {SA 69} [S+K]), Iĵewan, 24 May 1956, leg. P. P. Gambarân, ded. V. Hanák. – **Kirghizstan**: 7 ma (NMP 91715 {SA 275} [S+B], 91716 {SA 276}, 91717 {SA 277}, 91718 {SA 278}, 91719 {SA 279}, 91720 {SA 280}, 91721 {SA 281} [S+A]), Biškek, city park, squirell box, 28 May 1980, leg. J. Gaisler & V. Hanák, ded. V. Hanák. – **Uzbekistan**: 1 ma (NMP 91702 {SA 241} [S+B]), Farg'ona, 20 May 1980, leg. J. Gaisler & V. Hanák, ded. V. Hanák; – 1 fa (NMP 91692 {SA 231} [S+B]), Toškent, 14 September 1932, leg. A. P. Kuzâkin, ded. V. Hanák.

References. Kuzâkin (1934); Hůrka (1984b); Mlíkovský et al. (2011).

Remarks. *Nyctalus noctula* is not a common bat in the southern part of its Asian distribution range, i.e. in the Levant, Transcaucasia, Iran and West Turkestan (cf. Simmons 2005, Benda et al. 2006). Dal' (1954) characterised it as a rare bat species in Armenia, occurring only seasonally there. Ânuševič et al. (1972) considered the Kirghizstani part of the species range to represent its eastern margin (the Issyk-köl Basin), however, he reported it also from the city of Frunze (= Biškek), from where also a NMP series of seven male specimens originates (together with the IVB series [see Appendix II], it was collected from a squirell box in the city park and perhaps represented individuals from a sedentary city population). Bogdanov (1953) reviewed nume-

Table 14. Basic biometric data on the comparative sample sets of *Nyctalus noctula* (Schreber, 1774). For abbreviations see pp. 161, 163

	West Turkestan					Europe & SW Asia					ANOVA	
	n	**M**	min	max	SD	n	**M**	min	max	SD	F	p
LAt	17	**55.70**	53.6	57.4	1.006	41	**53.06**	49.3	56.8	1.629	38.439	0.000
LCr	16	**19.19**	18.58	19.61	0.341	79	**18.50**	17.52	19.53	0.400	42.182	0.000
LCb	17	**19.38**	18.72	19.92	0.345	82	**18.70**	17.54	19.76	0.406	42.058	0.000
LaZ	15	**13.59**	13.19	13.98	0.270	58	**13.20**	12.59	13.89	0.318	18.454	0.000
LaI	17	**5.20**	5.02	5.42	0.122	83	**5.10**	4.69	5.44	0.151	6.073	0.015
LaN	17	**10.28**	9.64	10.93	0.311	83	**10.02**	9.21	10.76	0.289	11.573	0.001
ANc	17	**7.09**	6.82	7.26	0.139	81	**6.74**	6.28	7.27	0.191	49.171	0.000
CC	17	**7.59**	7.08	7.89	0.236	82	**7.27**	6.71	7.67	0.197	33.071	0.000
M^3M^3	17	**8.98**	8.65	9.36	0.206	83	**8.73**	8.28	9.18	0.208	20.951	0.000
CM^3	17	**7.55**	7.18	7.76	0.169	83	**7.33**	6.93	7.68	0.155	26.514	0.000
LMd	17	**14.91**	14.53	15.53	0.268	80	**14.30**	13.43	15.18	0.319	52.959	0.000
ACo	17	**4.82**	4.60	5.11	0.122	77	**4.53**	4.19	5.42	0.191	35.939	0.000
CM_3	17	**8.05**	7.78	8.33	0.185	80	**7.75**	7.32	8.17	0.169	44.400	0.000

rous records of *N. noctula* from Toškent (Bobrinskij 1925, Kuzâkin 1934, Meklenburcev 1935, Bogdanov 1953; see also below), however, he did not mention any record from the area east of Toškent. Here presented record from Farg'ona thus perhaps represents an extension of the range in Uzbekistan. External and cranial dimensions of the examined NMP specimens of *N. noctula* are shown in Table 12.

The female specimen NMP 91692 from Toškent, Uzbekistan, undoubtedly represents a paratype specimen of the name *Nyctalus noctula meklenburzevi* Kuzâkin, 1934. This bat was collected by A. P. Kuzâkin on 14 September 1932; on the same day, Kuzâkin collected there the type series of *Nyctalus n. meklenburzevi* composed of five specimens (holotype and four "cotypes" [= paratypes], see Kuzâkin 1934). The NMP specimen, which was handed over by R. N. Meklenburcev from the Toškent Museum to V. Hanák in 1963, apparently represents one of the four paratypes. The holotype was deposited in the Zoological Museum of the Moscow State University (Kuzâkin 1934: ZMMU S6817), where it still should be present (Bogdanov 1953, Rossolimo & Pavlinov 1979, Borisenko et al. 2001); the whereabouts of the remaining three paratypes are unknown (see also Mlíkovský et al. 2011).

Taxonomic note. *Nyctalus noctula meklenburzevi* Kuzâkin, 1934 is considered a valid name for the populations living in the West and East Turkestan and NE Kazakhstan (Strelkov 1981, Koopman 1994, Simmons 2005, Benda et al. 2006, Wilson 2008). This subspecies was primarily described on the basis of pale colouration of pelage in the samples from Central Asia (Kuzâkin 1934). Although both pale and dark coloured individuals were found to occur in the respective area (Strelkov & Šajmardanov 1983), these populations were found (1) larger in body and skull dimensions than the samples from Europe and the Middle East (Strelkov et al. 2002, Benda et al. 2006), and (2) geographically isolated from the European and Middle Eastern populations by vast areas of Central Asian deserts (Strelkov & Šajmardanov 1983, Strelkov 2002).

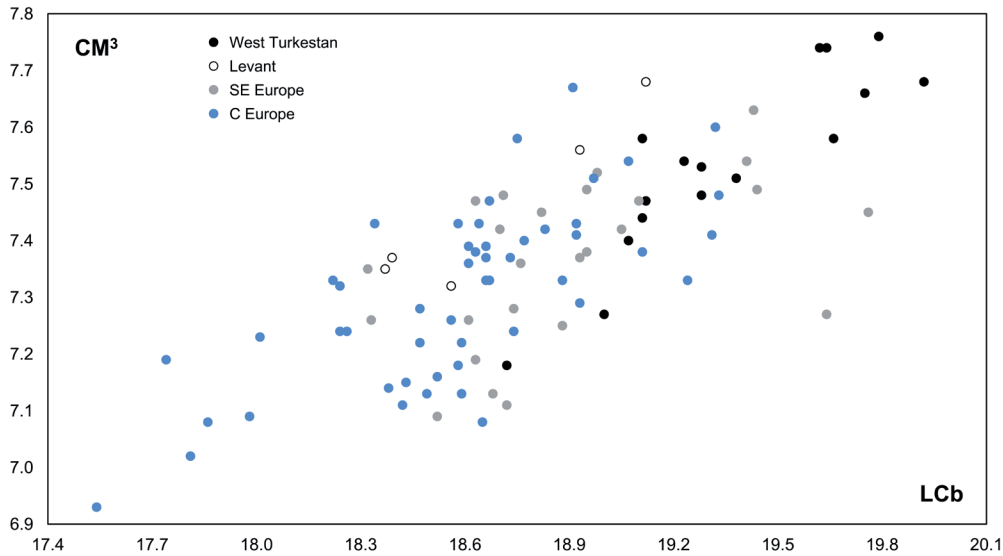

Fig. 22. Bivariate plot of the West Turkestani and comparative samples of *Nyctalus noctula* (Shreber, 1774): condylocanine length of skull (LCb) against length of upper tooth-row (CM^3).

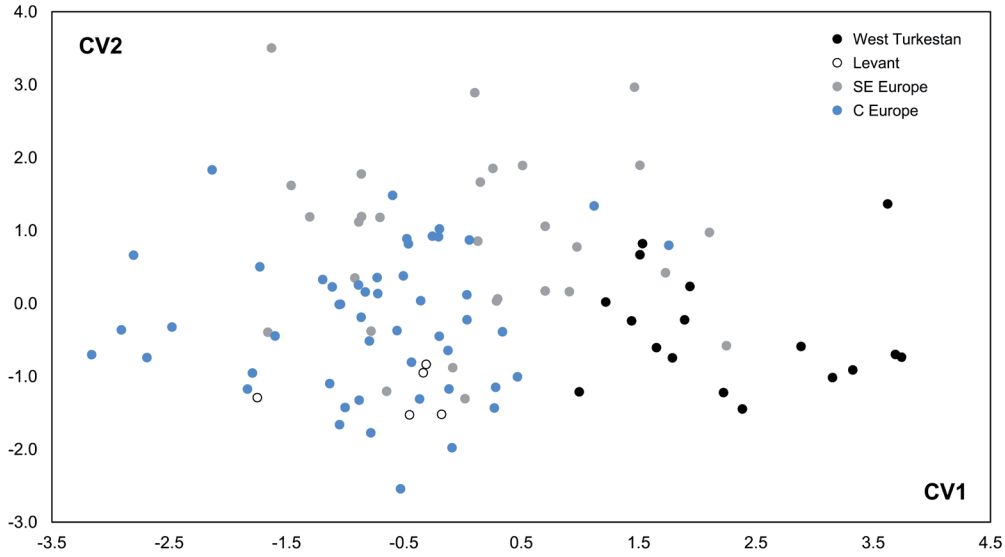

Fig. 23. Bivariate plot of the West Turkestani and comparative samples of *Nyctalus noctula* (Shreber, 1774): results of canonical discriminant analysis of all examined skull dimensions.

Hence, the recognition of the Turkestani populations as a separate subspecies seems to be well substantiated both from the morphological and biogeographical points of view. The comparison of available samples from the two separated parts of the species range in the W Palaearctic showed rather slight size differences (Fig. 22), but highly significant in a simple statistical analysis (Table 14). The separate position of Turkestani samples within the W Palaearctic set of specimens was showed also by the results of canonical discriminant analysis of all examined skull dimensions (Fig. 23; CV1=67.10% of variance; CV2=19.04%). These findings support the subspecies delimitation of *N. n. meklenburzevi* Kuzâkin, 1934.

Otonycteris leucophaea (Severcov, 1873)

Material. **Kirghizstan**: 1 ma (NMP 58444 {K 42/88} [S+A]; Fig. 24), Čauvaj, mine, 26 June 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený.

References. Zima et al. (1991, 1992b).

Remarks. *Otonycteris leucophaea* is a species defined taxonomically very recently and its distribution is only approximately known (Benda & Gvoždík 2010). However, it certainly ranks among endemics of the arid and mountainous regions of Central Asia (West Turkestan, NE Iran, Afghanistan, Pakistan, Kashmir). In southern Kirghizstan it reaches the eastern margin of its distribution range in West Turkestan (Ânuševič et al. 1972, Rybin et al. 1989, Horáček 1991). Rybin et al. (1989) reported it to represent an accesorial element in the S Kirghizstani bat fauna, probably occupying all suitable sites within the lowland and medium-altitude zones, but no roost record was available from this region. The NMP specimen was collected from a roost in a rock fissure at Čauvaj (Fig. 24); this site represents a new locality from southern Kirghizstan and the first finding of a roost in this country (cf. Ânuševič et al. 1972, Rybin et al. 1989). The karyotype

Fig. 24. Portrait of a male *Otonycteris leucophaea* (Severcov, 1873) discovered in a mine at Čauvaj, southern Kirghizstan (photo by J. Červený).

characteristics of the respective NMP specimen were described by Zima et al. (1991, 1992b), its external and cranial dimensions are shown in Table 15.

Table 15. Basic biometric data on the examined NMP specimens of *Otonycteris leucophaea* (Severcov, 1873) from West Turkestan, *Barbastella barbastellus* (Schreber, 1774) from Transcaucasia, and of *B. darjelingensis* (Hodgson, 1855) and *Plecotus strelkovi* Spitzenberger, 2006 from West Turkestan. For abbreviations see pp. 161, 163

	Otonycteris leucophaea	*Barbastella barbastellus*	*Barbastella darjelingensis*					*Plecotus strelkovi*				
	NMP 58444	NMP 91699	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	61.1	39.6	26	**42.08**	40.5	44.2	0.898	7	**42.71**	41.3	44.9	1.175
LPl	–	5.5	26	**5.88**	5.3	6.4	0.332	7	**7.54**	6.8	8.2	0.469
LCr	22.26	14.29	22	**15.07**	14.52	15.42	0.217	6	**16.73**	16.17	17.19	0.346
LCb	21.46	13.57	22	**14.07**	13.44	14.52	0.248	6	**15.57**	15.30	15.96	0.252
LaZ	14.66	7.68	22	**8.03**	7.74	8.38	0.155	6	**8.83**	8.73	8.98	0.093
LaI	4.52	3.54	22	**3.68**	3.51	3.91	0.089	6	**3.32**	3.19	3.45	0.105
LaInf	5.76	4.14	22	**4.26**	4.09	4.45	0.094	6	**4.18**	4.08	4.31	0.090
LaN	9.73	7.56	22	**7.65**	7.47	7.81	0.099	6	**8.37**	8.21	8.52	0.137
LaM	11.23	8.39	22	**8.82**	8.48	9.31	0.174	6	**9.20**	8.98	9.31	0.137
ANc	7.03	5.27	22	**5.54**	5.18	5.88	0.161	6	**5.16**	5.02	5.39	0.163
LBT	5.14	3.22	22	**3.24**	2.93	3.51	0.135	6	**4.51**	4.33	4.74	0.149
CC	6.12	3.83	22	**3.99**	3.68	4.17	0.131	6	**3.76**	3.73	3.84	0.043
M^3M^3	9.44	5.64	22	**5.94**	5.76	6.18	0.113	6	**6.27**	6.17	6.44	0.096
CM^3	8.45	4.65	22	**4.86**	4.68	5.02	0.093	6	**5.54**	5.42	5.71	0.115
LMd	15.91	9.15	22	**9.67**	9.38	10.04	0.155	6	**10.66**	10.47	10.82	0.136
ACo	6.47	2.49	22	**2.64**	2.44	2.75	0.077	6	**3.08**	2.93	3.20	0.092
CM_3	9.31	5.04	22	**5.36**	5.14	5.54	0.089	6	**6.04**	5.87	6.20	0.115

Barbastella barbastellus (Schreber, 1774)

Material. **Azerbaijan**: 1 fa (NMP 91699 {SA 238} [S+B]), Xaçmaz District, 17 October 1975, leg. I. K. Rahmatulina, ded. V. Hanák.

References. Rahmatulina (2005); Benda et al. (2008).

Remarks. *Barbastella barbastellus* is a typical bat of the zone of European mixed forests, while in the southern parts of Europe and SW Asia it is found rather rarely (Horáček et al. 2000). The southeasternmost records in Asia are known from Turkey, Azerbaijan and N Iran (Benda & Horáček 1998, Rahmatulina 2005, Benda et al. 2008). Despite the extreme extension of its distribution range in Azerbaijan, *B. barbastellus* is not a rare bat species in this country (as well as in other parts of the Greater Caucasus; Gazaryan 2003); Rahmatulina (2005) reported 17 record localities in total, including that of the NMP specimen. It comes from the Greater Caucasus region, from where most of the Azerbaijani record sites are known (10). External and cranial dimensions of the examined NMP specimen are shown in Table 15.

Barbastella darjelingensis (Hodgson, 1855)

Material. **Kirghizstan**: 17 ma (NMP 56762 {K 130/88}, 58337/2 {K 167/88}, 58337/3 {K 168/88}, 58337/4 {K 169/88}, 58337/5 {K 170/88}, 58337/6 {K 171/88}, 58337/7 {K 172/88}, 58338/1 {K 127/88}, 58338/2 {K 134/88}, 58338/4 {K 155/88}, 58338/5 {K 156/88}, 58338/6 {K 182/88}, 58338/7 {K 136/88}, 58447 {K 180/88}, 58448 {K 165/88} [S+A], 58337/1 {K 166/88}, 58338/3 {K 138/88} [A]), Samarkandyk, Kanigut, mine (Fig. 5), 2 July 1988, leg. J. Červený,

Fig. 25. An individual of *Barbastella darjelingensis* (Hodgson, 1855) observed in the Kanigut mine at Samarkandyk (Fig. 5), southwestern Kirghizstan (photo by J. Červený).

A. Červená & J. Obuch, ded. J. Červený; – 2 ma (NMP 58898/1 {K 20/90}, 58898/2 {K 23/90} [S+A]), Samarkandyk, Kanigut, mine, 17 May 1990, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 1 ma (NMP 58900 {K 44/90} [S+A]), Samarkandyk, Kanigut, mine, 18 May 1990, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený. – **Tajikistan**: 4 ma (NMP 58339/1 {K 190/88}, 58339/3 {K 192/88}, 58339/4 {K 195/88} [S+A], 58339/2 {K 191/88} [A]), Čarku, mine, 3 July 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený. – **Uzbekistan**: 1 ma, 1 ms (NMP 91465 {BB 10} [B], 91466 {BB 11} [S+Sk+B]), Toškent, cave, 30 September 1963, leg. & ded. V. Hanák.

References. Zima et al. (1991); Benda et al. (2008).

Remarks. *Barbastella darjelingensis* is distributed in the Palaearctic Asia in a belt of mountain and submountain habitats stretching from Azerbaijan via S Turkmenistan and N Iran to E Uzbekistan and Kirghizstan. In southern Kirghizstan, the species reaches the northeastern margin of its Palaearctic range (cf. Ânuševič et al. 1972), more eastwards it is distributed in the Oriental region up to Taiwan (Zhang et al. 2007, Benda et al. 2008).

Ânuševič et al. (1972) reported *B. darjelingensis* to be widespread in southern Kirghizstan (in foothils of the Turkestanskij, Alajskij and Ferganskij mountain ranges), with the easternmost occurrence point at Uzgen. Rybin et al. (1989) characterised the S Kirghistani distribution of the species in a similar way, they reported it to be a member of the group of very common species in the region. All record sites of the NMP specimens were already mentioned by Rybin et al. (1989).

Bogdanov (1953) reviewed numerous records of *B. darjelingensis* from Toškent, Uzbekistan (Tihomirov & Korčagin 1889, Bobrinskij 1925, Kuzâkin 1934, Meklenburcev 1935, Bogdanov 1953), from where also two of the NMP specimens originate (they were collected from a small temporary loess cave). Toškent is the only site of repeated records of the species in Uzbekistan, perhaps only two other sites are available from the country (Bogdanov 1953).

Standard karyotype characteristics of one individual from the pair of the specimens NMP 58338/4 and 58338/5 from Kirghizstan were described by Zima et al. (1991). External and cranial dimensions of the examined NMP specimens of *B. darjelingensis* are shown in Table 15.

Plecotus strelkovi Spitzenberger, 2006

Material. **Kirghizstan**: 1 fs (NMP 58859 {K 146/90} [S+A]), Oš, Bir-Uâ Cave, 31 May 1990, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 2 ma, 1 fa (NMP 58858/1 {K 84/90}, 58858/2 {K 87/90}, 58897 {K 85/90} [S+A]), Hajdarkan, Gauân Cave, 22 May 1990, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený; – 3 fa (NMP 58857/1 {K 59/90}, 58857/2 {K 62/90}, 58857/3 {K 63/90} [S+A]), Samarkandyk, Kanigut, mine (Fig. 5), 18 May 1990, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený.

Remarks. *Plecotus strelkovi* is an endemic of mountainous regions of Central Asia, its records come mainly from West Turkestan and individual records are available also from NE Kazakhstan, East Turkestan, W Mongolia, Afghanistan and Iran (Spitzenberger et al. 2006, Dolch et al. 2007). However, since the separate species status of this form has been suggested only recently (Spitzenberger et al. 2006), the limits of its distribution range are known rather tentatively.

According to the data available, *P. strelkovi* is the only *Plecotus* species evidenced from the eastern mountainous part of West Turkestan, and the region of southern Kirghizstan – the area of origin of the NMP specimens – lies in the geographical centre of the whole species range; the species was described based on the material from NE Kirghizstan (type locality: Teploklûčenka, E bank of the Issyk-köl Lake; Spitzenberger et al. 2006). While Ânuševič et al. (1972) reported the *Plecotus* bats to be widespread in Kirghizstan, Rybin et al. (1989) evaluated them as only an accessorial element in the bat fauna of southern Kirghizstan. All three record localities of the NMP specimens represent new occurrence sites of *P. strelkovi* in the respective region (see Ânuševič et al. 1972, Rybin et al. 1989, Spitzenberger et al. 2006). External and cranial dimensions of the examined NMP specimens of *P. strelkovi* are shown in Table 15.

Miniopterus schreibersii (Kuhl, 1817)

Material. **Georgia (Abkhazia)**: 2 ma, 3 fa (NMP 91515 {SA 12}, 91516 {SA 13}, 91517 {SA 14}, 91535 {SA 33}, 91540 {SA 38} [S+B]), Džal, tunnel, 14 July 1964, leg. & ded. V. Hanák; – 1 ma, 1 fa (NMP 91513 {SA 10}, 91514 {SA 11} [S+B]), Gumist'a, cave at fortress, 13 July 1964, leg. & ded. V. Hanák.

Reference. Hůrka (1969).

Remarks. *Miniopterus schreibersii* is a relatively common species in the northwestern part of the Caucasus region (Gazarân 1999, Ivanickij 2002a, b, 2010). Ivanickij (2002a, 2010) mentioned a series of records from Abkhazia, particularly from the western part of the country. The finding site of the NMP specimens at Džal represents a new locality of *M. schreibersii* in Georgia (Buhnikašvili et al. 2004, Ivanickij 2010). External and cranial dimensions of the examined NMP specimens of *M. schreibersii* are shown in Table 16.

Miniopterus pallidus Thomas, 1907

Material. **Armenia**: 1 ind. ad. (NMP 91572 {SA 75} [S+B]), Karbi, 25 January 1956, collector unlisted, ded. V. Hanák. – **Azerbaijan**: 3 inds. ad., 1 ind. sad. (NMP 91568 {SA 71}, 91569 {SA 72}, 91574 {SA 79}, 91575 {SA 80} [S+B]), Ordubad, a cave ca. 13 km from the town [Kilitskaâ Cave], 22 April 1955, leg. I. S. Darevskij, ded. V. Hanák. – **Turkmenistan**: 12 ma, 3 ms, 34 fa, 1 ms (NMP 91588 {SA 94}, 91589 {SA 95}, 91590 {SA 96}, 91591 {SA 97}, 91592 {SA 98}, 91593 {SA 99}, 91594 {SA 100}, 91595 {SA 101}, 91596 {SA 102}, 91597 {SA 103}, 91607 {SA 114}, 91608 {SA 116}, 91609 {SA 117}, 91610 {SA 118}, 91611 {SA 119}, 91612 {SA 120}, 91613 {SA 121}, 91614 {SA 122}, 91615 {SA 123}, 91616 {SA 124}, 91618 {SA 126}, 91619 {SA 127}, 91620 {SA 128}, 91621 {SA 129}, 91622 {SA 130}, 91637 {SA 147}, 91638 {SA 148}, 91639 {SA 149}, 91640 {SA 150}, 91641 {SA 155}, 91642 {SA 156}, 91643 {SA 162}, 91646 {SA 165}, 91647 {SA 166}, 91648 {SA 167}, 91649 {SA 168}, 91650 {SA 169}, 91651 {SA 170}, 91652 {SA 171}, 91653 {SA 172}, 91654 {SA 173}, 91655 {SA 174}, 91656 {SA 175}, 91657 {SA 176}, 91658 {SA 177}, 91659 {SA 178}, 91660 {SA 179}, 91661 {SA 180}, 91662 {SA 181} [S+B], 91617 {SA 125} [S]), Baharly, Baharly Cave, 29 July 1964, leg. & ded. V. Hanák.

References. Hůrka (1969); Gaisler (1970); Rahmatulina (2005).

Remarks. *Miniopterus pallidus* is a species defined in its taxonomic position very recently (Furman et al. 2009, 2010b) and the limits of its distribution range are not clearly demarcated. The known range covers central and southern Turkey, SE Transcaucasia, Iran, and NW Jordan (Furman et al. 2009, 2010a, Šrámek 2010). According to the available data, it occurs in parapatry with its sibling species, *M. schreibersii* and in some areas along the geographical boundary between the two ranges these species share identical roosts (Maraci et al. 2010).

However, in West Turkestan, the *Miniopterus* bats live solely in the Kopetdagh Mts. (Kuzâkin 1965, Strelkov et al. 1978, Strelkov 1981, Kovaleva & Ŝerbak 1990) and taxonomic identity of the populations from this range was elucidated by Šrámek (2010), who found the samples from the Iranian side of the mountains to belong to *M. pallidus* (moreover, the type locality of *M. pallidus* lies very close to the Turkmenistani border in the Caspian region of Iran; Thomas 1907, Lay 1967). Thus, the species affiliation of the NMP series originating from SW Turkmenistan seems to be clear.

This series comes from a classical site, the Baharly Cave (formerly Durunskaâ or Bahardenskaâ Cave), where "a significant number" of specimens of this species was collected already by Radde & Walter (1889) in 1886. Colonies of *Miniopterus* in the cave were repeatedly recorded and/or reported by many authors (see the reviews by Babaev 1974 and Strelkov et al. 1978). According to Babaev (1974), *Miniopterus* remained the last bat occupying the cave in the early 1970s, while in the 1930s–1960s up to six bat species in total numbers of up to 40,000 individuals were found to roost there (see Radde & Walter 1889, Kuzâkin 1950). During the visit of this cave by V. Hanák in the summer 1964, specimens of four bat species were collected there.

Table 16. Basic biometric data on the examined NMP specimens of *Miniopterus schreibersii* (Kuhl, 1817) from Transcaucasia and of *M. pallidus* Thomas, 1907 from Transcaucasia (TC) and West Turkestan (WT). For abbreviations see pp. 161, 163

	Miniopterus schreibersii TC					*Miniopterus* cf. *pallidus* TC					*Miniopterus pallidus* WT				
	n	**M**	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	7	**45.73**	45.2	46.2	0.411	5	**45.20**	43.0	47.2	1.548	49	**46.79**	45.1	48.6	0.782
LCr	7	**14.97**	14.62	15.22	0.225	5	**15.22**	14.98	15.53	0.214	47	**15.35**	14.75	15.87	0.260
LCb	7	**14.49**	14.02	15.02	0.326	5	**14.64**	14.39	14.83	0.203	47	**14.84**	14.12	15.54	0.321
LaZ	6	**8.26**	7.96	8.38	0.162	5	**8.40**	8.19	8.62	0.196	35	**8.62**	8.08	9.02	0.231
LaI	7	**3.54**	3.38	3.84	0.145	5	**3.53**	3.42	3.61	0.073	47	**3.53**	3.31	4.14	0.131
LaInf	7	**3.91**	3.83	4.03	0.074	5	**3.99**	3.93	4.09	0.063	46	**3.91**	3.66	4.19	0.148
LaN	7	**7.76**	7.68	7.97	0.099	5	**7.88**	7.75	8.08	0.129	47	**7.99**	7.74	8.36	0.148
LaM	7	**8.55**	8.48	8.68	0.068	5	**8.53**	8.25	8.67	0.174	47	**8.76**	8.42	9.18	0.169
ANc	7	**6.23**	6.13	6.42	0.108	5	**6.29**	6.14	6.41	0.098	46	**6.31**	5.93	6.58	0.140
LBT	7	**3.05**	2.74	3.23	0.158	3	**3.11**	3.03	3.19	0.080	45	**3.16**	2.96	3.43	0.117
CC	6	**4.36**	4.21	4.48	0.104	5	**4.47**	4.40	4.54	0.062	43	**4.51**	4.18	4.76	0.137
M^3M^3	7	**5.95**	5.81	6.18	0.137	5	**6.20**	6.09	6.36	0.121	43	**6.29**	5.73	6.64	0.212
CM^3	7	**5.80**	5.64	6.03	0.127	5	**5.81**	5.62	5.94	0.125	48	**5.98**	5.68	6.21	0.118
LMd	7	**10.61**	10.46	10.78	0.120	4	**10.52**	10.37	10.66	0.142	48	**10.97**	10.48	11.59	0.242
ACo	7	**2.44**	2.36	2.54	0.056	4	**2.42**	2.38	2.48	0.045	48	**2.48**	2.29	2.66	0.076
CM_3	7	**6.29**	6.12	6.49	0.117	4	**6.24**	6.14	6.34	0.107	48	**6.40**	6.18	6.59	0.089

Concerning the taxonomic affiliation of the *Miniopterus* populations, the situation in Trans- caucasia is more complicated. Based on genetic data, Furman et al. (2009, 2010a) showed the samples from NW Georgia to pertain to *M. schreibersii*, while those from the Upper Karabakh to *M. pallidus*. Therefore, we tentatively regard the NMP specimens from Abkhazia as *M. schreibersii* (see above) and those from SE Transcaucasia as *M. pallidus*. Unlike the situation in Georgia (Buhnikašvili et al. 2004), the bats of the genus *Miniopterus* are rather rare in Armenia and Azerbaijan, they occur only in the mountainous region of the Lesser Caucasus; less than ten record sites are available in literature (Dal' 1954, Alekperov 1966, Rahmatulina 2005). However, in the Kilitskaâ Cave E of Ordubad in the Nakhichevan (Naxçıvan) region – from where also some of the NMP samples originate – the *Miniopterus* bats were registered already in August 1893 (Satunin 1896) and repeatedly recorded later (Rahmatulina 1980, 2005).

Gazarân (2005) compared metrical data on the *Miniopterus* bats from a large part of the Palaearctic portion of the distribution range. He found a noticeable geographic variation within that range, where the bats from the Carpathians and western Caucasus were on average smallest, the bats from Crimea and Turkmenistan the largest among the compared samples, and the bats from the Balkans and E Transcaucasia were medium-sized. Thus, existence of two clines in size variation was suggested, the increase of body and skull size from Central Europe to Crimea and from the western Caucasus to West Turkestan. A similar type of size variation is also evident from metric comparison of the NMP samples (Table 16); the Turkmenistani bats are markedly larger in forearm length and skull size than the bats from Abkhazia and SE Transcaucasia.

Tadarida teniotis (Rafinesque, 1814)

Material. **Kirghizstan**: 2 fa (NMP 58321 {K 253/88}, 58322 {K 254/88} [S+A]), Aravan, Sasyk Ungur Cave (Fig. 20), 11 July 1988, leg. J. Červený, A. Červená & J. Obuch, ded. J. Červený.

Reference. Zima et al. (1991).

Fig. 26. A female *Tadarida teniotis* (Rafinesque, 1814) netted at the entrance to the Sasyk-Ungur cave at Aravan, southern Kirghizstan (photo by J. Červený).

Remarks. While Ânuševič et al. (1972) mentioned *Tadarida teniotis* from Kirghizstan to occur only in the surroundings of Oš, Rybin et al. (1989) reported it to be one of the most widespread and also most common bats of the southern part of Kirghizstan. Anyway, southern Kirghizstan is a region where this species reaches the eastern margin of its range in the whole West Turkestan. The NMP specimens originate from a site, where a large colony of several tens of individuals was recorded in August 1984 (Rybin et al. 1989).

Standard karyotype characteristics of the respective NMP specimens of *T. teniotis* were described by Zima et al. (1991), their external and cranial dimensions are shown in Table 11.

CONCLUSIONS

The NMP collection contains 596 bat specimens from Transcaucasia and West Turkestan belonging to 30 species of four families (Table 17). The specimens originate from nine countries, in total from 60 record localities (see Appendix I); viz. Armenia (9 species from 7 sites), Azerbaijan (17/18), Georgia (7/4), Transcaucasian Russia (1/1), S Kazakhstan (2/3), Kirghizstan (15/14), Tajikistan (4/3), Turkmenistan (8/5), and Uzbekistan (9/5). Most of the specimens belong to common species, which could be frequently found in other collections containing material from the respective regions (see e.g. Rossolimo & Pavlinov 1981, Ševčenko & Zolotuhina 2005). However, since Transcaucasia and West Turkestan represent zones of a certain level of endemism concerning the fauna of bats, some of the species series have an undoubted significance for zoological research. The most valuable NMP material includes the specimens of *Rhinolophus bocharicus* Kaŝenko et Akimov, 1917 (17 specimens from Kirghizstan and Uzbekistan), *Rhinolophus lepidus* Blyth, 1844 (nine specimens from Kirghizstan and Uzbekistan), *Myotis* (*nattereri*) *tschuliensis* Kuzâkin,

1935 (five specimens from Azerbaijan), *Myotis bucharensis* Kuzâkin, 1950 (four specimens from Uzbekistan), *Barbastella darjelingensis* (Hodgson, 1855) (26 specimens from Kirghizstan and Uzbekistan), and *Plecotus strelkovi* Spitzenberger, 2006 (seven specimens from Kirghizstan). Also type specimens of the taxa described by Soviet authors (see also Mlíkovský et al. 2011) belong to the collection; two paratype specimens of *Myotis mystacinus hajastanicus* Argiropulo, 1939 from Šorža (Armenia) and one paratype specimen of *Nyctalus noctula meklenburzevi* Kuzâkin, 1934 from Tošken (Uzbekistan). The series of 12 specimens of *Rhinolophus bocharicus* from Samarqand (Uzbekistan) represents topotypical material of the species. The specimens of *M. nipalensis* from Germab and Tošken represent topotypical material of two taxa, *Myotis mystacinus transcaspicus* Ogneff et Heptner, 1928 and *Myotis mystacinus sogdianus* Kuzâkin, 1934, respectively.

As already stressed, most of the NMP specimens from Transcaucasia and West Turkestan belong to common and widespread species, their records thus do not represent any significant contribution to the biogeography of the respective regions or to the knowledge of distribution of

Table 17. Review of the NMP bat specimens from Transcaucasia and West Turkestan. Abbreviations: AR = Armenia, AZ = Azerbaijan, GE = Georgia (incl. Abkhazia), TC = Transcaucasia, KA = Kazakhstan, KI = Kirghizstan, TJ = Tajikistan, TM = Turkmenistan, UZ = Uzbekistan, WT = West Turkestan

species \ country	AR	AZ	GE	RU	**TC**	KA	KI	TJ	TM	UZ	**WT**	total
Rhinolophus ferrumequinum	–	16	14	4	**34**	–	16	1	3	4	**24**	60
Rhinolophus bocharicus	–	–	–	–	–	–	5	–	–	12	**17**	17
Rhinolophus hipposideros	–	1	–	–	**1**	–	2	–	–	–	**2**	3
Rhinolophus lepidus	–	–	–	–	–	–	7	–	–	2	**9**	9
Rhinolophus euryale	1	–	17	–	**18**	–	–	–	–	–	–	18
Rhinolophus mehelyi	3	1	–	–	**4**	–	–	–	–	–	–	4
Rhinolophus blasii	–	–	–	–	–	–	–	–	4	–	**4**	4
Myotis blythii	3	13	2	–	**18**	–	36	1	19	8	**64**	82
Myotis (*n.*) *tschuliensis*	–	5	–	–	**5**	–	–	–	–	–	–	5
Myotis emarginatus	–	14	9	–	**23**	–	–	–	–	–	–	23
Myotis mystacinus	–	3	–	–	**3**	–	–	–	–	–	–	3
Myotis aurascens	–	1	–	–	**1**	–	–	–	–	–	–	1
Myotis nipalensis	–	2	–	–	**2**	–	1	–	2	2	**5**	7
Myotis hajastanicus	2	–	–	–	**2**	–	–	–	–	–	–	2
Myotis bucharensis	–	–	–	–	–	–	–	–	–	4	**4**	4
Eptesicus serotinus	2	34	9	–	**45**	–	–	–	–	–	–	45
Eptesicus turcomanus	–	–	–	–	–	8	1	–	10	–	**19**	19
Eptesicus bottae	–	27	–	–	**27**	–	3	–	3	–	**6**	33
Hypsugo savii	–	16	–	–	**16**	–	10	–	–	–	**10**	26
Pipistrellus pipistrellus s.l.	2	3	1	–	**6**	6	17	5	16	14	**58**	64
Pipistrellus nathusii	–	2	–	–	**2**	–	–	–	–	–	–	2
Pipistrellus kuhlii	2	56	–	–	**58**	–	–	–	–	–	–	58
Nyctalus noctula	1	–	–	–	**1**	–	7	–	–	2	**9**	10
Otonycteris leucophaea	–	–	–	–	–	–	1	–	–	–	**1**	1
Barbastella barbastellus	–	1	–	–	**1**	–	–	–	–	–	–	1
Barbastella darjelingensis	–	–	–	–	–	–	20	4	–	2	**26**	26
Plecotus strelkovi	–	–	–	–	–	–	7	–	–	–	**7**	7
Miniopterus schreibersii	–	–	7	–	**7**	–	–	–	–	–	–	7
Miniopterus pallidus	1	4	–	–	**5**	–	–	–	50	–	**50**	55
Tadarida teniotis	–	–	–	–	–	–	2	–	–	–	**2**	2
No. of species	9	17	7	1	**21**	2	15	4	8	9	**18**	30
No. of specimens	17	198	59	4	**279**	14	141	5	107	50	**317**	596
No. of sites	7	18	4	1	**30**	3	14	3	5	5	**30**	60

the particular bat species. The NMP specimens of *Rhinolophus lepidus* and *Myotis bucharensis* are probably the most noteworthy from the biogeographical point of view.

The NMP specimen of *Myotis bucharensis* collected at Toškent (Uzbekistan) gives evidence of the third locality of the species. This site represents geographical prolongation of the species distribution range by almost 300 km to the northeast along the western foothills of the Tien Shan / Alai mountain complex. The nine NMP specimens of *Rhinolophus lepidus* refer to the first accurate localities of this species from Turkestan, although some of them were indirectly mentioned already by Zima et al. (1991, 1992a), Horáček & Zima (1996), Horáček et al. (2000), and Zima (2004). This undoubted evidence proved a new species and faunal element in West Turkestan, belonging to the fauna of the Oriental Region and representing prolongation of the species range by at least 580 km to the north (Fig. 6) into the inner parts of the Palaearctic. Similar faunal elements are very rare in the fauna of Turkestan, being represented by three other species only; the endemic *Myotis bucharensis*, which pertains to the Oriental / East Palaearctic *M. frater* group, and by *Myotis nipalensis* and *Barbastella darjelingesis*, both distributed from E Transcaucasia via West Turkestan to N India and China. Other Turkestani bat species represent local endemics (*Rhinolophus bocharicus*, *M.* (*n.*) *tschuliensis*, *Eptesicus turcomanus*, *E. gobiensis*, *E. bobrinskoi*, *Otonycteris leucophaea*, *Plecotus turkmenicus*, *P. strelkovi*, *P. kozlovi*), West Palaearctic (Mediterranean) species (*Rhinolophus hipposideros*, *R. euryale*, *R. blasii*, *Myotis emarginatus*, *M. capaccinii*, *Eptesicus bottae*, *Hypsugo savii*, *Pipistrellus pipistrellus*, *P. kuhlii*, *Nyctalus noctula*, *Miniopterus pallidus*, *Tadarida teniotis*), or Eupalaearctic faunal elements (*R. ferrumequinum*, *Myotis blythii*, *Vespertilio murinus*, *Eptesicus nilssonii*).

Acknowledgements

We wish to thank all of the collectors who contributed to the extent of the collection (see also Collectors in Material and Methods chapter). Special thanks belong to Alena Červená (Praha, Czech Republic), Jiří Gaisler (Brno, Czech Republic) Jiří Moravec (Praha, Czech Republic), Ján Obuch (Blatnica, Slovakia), Irina K. Rahmatulina (Bakı, Azerbaijan), and A. K. Sagitov (Samarqand, Uzbekistan).

We also thank Miroslav Švátora (Praha, Czech Republic) for the help with reconstruction of the participant lists of the particular student research trips to Azerbaijan and Uzbekistan. We thank Miloš Anděra (Praha, Czech Republic) for kind access to the NMP specimens from Kirghizstan under his responsibility and Suren Gazarân for valuable comments on the manuscript.

The preparation of this review was supported by grants of the Czech Science Foundation (project # 206/09/0888) and the Ministry of Culture of the Czech Republic (## DE06P04OMG008, MK00002327201).

REFERENCES

Aellen V. 1959: Contribution à l'étude de la faune d'Afghanistan 9. Chiroptères. *Revue Suisse de Zoologie* **66**: 353–386.

Albayrak İ. 1987: A new record of Pipistrellus pipistrellus aladidn for Turkey. *Communications de la Faculté des Sciences de l'Université d'Ankara*, *Séries C* **5**: 31–37.

Alekperov H. M. 1966: *Млекопитающие юго-западного Азербайджана* [*Mammals of Southwestern Azerbaijan*]. Baku: Izdatel'stvo Akademii nauk Azerbajdžanskoj SSR, 148 pp (in Russian).

Amirhanov Z. M. 1980: Размещение рукокрылых в Дагестане [Distribution of bats in Daghestan]. Pp.: 63–69. In: Kuzâkin A. P. & Panûtin K. K. (eds.): *Вопросы териологии*. *Рукокрылые* (*Chiroptera*) [*Questions in Theriology*. *Bats* (*Chiroptera*)]. Moskva: Nauka, 320 pp (in Russian).

Andersen K. 1905: On some bats of the genus Rhinolophus, with remarks on their mutual affinities, and descriptions of twenty-six new forms. *Proceedings of the Zoological Society of London* **1905**(2): 75–145.

Ânuševič A. I., Ajzin B. M., Kydyraliev A. K., Umrihina G. S., Fedânina T. F., Šukurov È. D., Grebenûk R. V. & Tokobaev M. M. 1972: *Млекопитающие Киргизии* [*Mammals of Kirghizstan*]. Frunze: Izdatel'stvo Ilim, 463 pp (in Russian).

Argiropulo A. I. 1939: К распространению и экологии некоторых млекопитающих Армении [To the distribution and ecology of some mammals of Armenia]. *Trudy Biologičeskogo Instituta* **3**, *Zoologičeskij Sbornik* **1** [Erevan]: 27–66 (in Russian, with a summary in German).

Arlettaz R., Ruedi M., Ibañez C., Palmeirim J. & Hausser J. 1997: A new perspective on the zoogeography of the sibling mouse-eared bat species Myotis myotis and Myotis blythii: morphological, genetical and ecological evidence. *Journal of Zoology*, *London* **242**: 45–62.

Ârmyš N. N., Kazakov B. A., Sonina I. Û. & Usvajskaâ A. A. 1980: Новые находки рукокрылых на Северном Кавказе [New records of bats in the northern Caucasus]. Pp.: 72–77. In: Kuzâkin A. P. & Panûtin K. K. (eds.): *Вопросы териологии*. *Рукокрылые* (*Chiroptera*) [*Questions in Theriology*. *Bats* (*Chiroptera*)]. Moskva: Nauka, 320 pp (in Russian).

Âvruân È. G., Ajrapetân V. T. & Gzrarân N. V. 2002: Новые виды рукокрылых (Chiroptera) фауны Южного Кавказа [New species of bats (Chiroptera) of the fauna of the southern Caucasus]. *Plecotus et al*. **pars specialis**: 91–92 (in Russian, with a summary in English).

Âvruân È. G., Papov G. Û. & Kazarân A. S. 2007: К фауне рукокрылых Армении и Нагорного Карабаха [To the bat fauna of Armenia and the Upper Karabakh]. *Plecotus et al*. **10**: 51–54 (in Russian, with a summary in English).

Babaev H. B. 1974: О некоторых факторах контролирующих численность рукокрылых в Туркмении [On some factors determining the abundance of bats in Turkmenistan]. Pp.: 78–81. In: Strelkov P. P. & Kuzâkin A. P. (eds.): *Материалы первого Всесоюзного совещания по рукокрылым* (*Chiroptera*) [*Proceedings of the First Pan-Union Symposium on Bats* (*Chiroptera*)]. Leningrad: Zoologičeskij Institut Akademii nauk SSSR, 184 pp (in Russian).

Bates P. J. J. & Harrison D. L. 1997: *Bats of the Indian Subcontinent*. Sevenoaks: Harrison Zoological Museum, xvi+258 pp.

Belousov A. S., Mûlling E. V. & Šurakov S. A. 2004: Находка лесного нетопыря (Pipistrellus nathusii) в Пермской области [A record of Nathusius' bat (Pipistrellus nathusii) in the Perm' Region]. *Plecotus et al*. **7**: 96 (in Russian, with a summary in English).

Benda P. & Gvoždík V. 2010: Taxonomy of the genus Otonycteris (Chiroptera: Vespertilionidae: Plecotini) as inferred from morphological and mtDNA data. *Acta Chiropterologica* **12**: 83–102.

Benda P. & Horáček I. 1995: Geographic variation in three species of Myotis (Mammalia: Chiroptera) in South of the Western Palearctics. *Acta Societatis Zoologicae Bohemicae* **59**: 17–39.

Benda P. & Horáček I. 1998: Bats (Mammalia: Chiroptera) of the Eastern Mediterranean. Part 1. Review of distribution and taxonomy of bats in Turkey. *Acta Societatis Zoologicae Bohemicae* **62**: 255–313.

Benda P. & Karataş A. 2005: On some Mediterranean populations of bats of the Myotis mystacinus morpho-group (Chiroptera: Vespertilionidae). *Lynx*, *n. s*. **36**: 9–38.

Benda P. & Tsytsulina K. A. 2000: Taxonomic revision of Myotis mystacinus group (Mammalia: Chiroptera) in the western Palearctic. *Acta Societatis Zoologicae Bohemicae* **64**: 331–398.

Benda P., Andreas M., Kock D., Lučan R. K., Munclinger P., Nová P., Obuch J., Ochman K., Reiter A., Uhrin M. & Weinfurtová D. 2006: Bats (Mammalia: Chiroptera) of the Eastern Mediterranean. Part 4. Bat fauna of Syria: distribution, systematics, ecology. *Acta Societatis Zoologicae Bohemicae* **70**: 1–329.

Benda P., Dietz C., Andreas M., Hotový J., Lučan R. K., Maltby A., Meakin K., Truscott J. & Vallo P. 2008: Bats (Mammalia: Chiroptera) of the Eastern Mediterranean and Middle East. Part 6. Bats of Sinai (Egypt) with some taxonomic, ecological and echolocation data on that fauna. *Acta Societatis Zoologicae Bohemicae* **72**: 1–103.

Bianki V. 1917: Предварительныя заметки о летучихъ мышахъ (Chiroptera) Россіи [Preliminary notes on bats (Chiroptera) of Russia]. *Ežegodnik Zoologičeskago Muzeâ Akademii Nauk'* **21**: 73–82 (in Russian).

Bianki V. 1918: Діагностика летучихъ мышей (Chiroptera) Европейской Россіи [Diagnostics of bats (Chiroptera) of the European Russia]. *Ežegodnik Zoologičeskago Muzeâ Akademii Nauk'* **22**: 200–217 (in Russian).

Bil'kevič S. N. 1918: Каталог Закаспийского музея. Млекопитающие (Mammalia) [Catalogue of the Transcaspian Museum. Mammals (Mammalia)]. *Izvestiâ Zakaspijskogo Muzeâ* **1**: 1–12 (in Russian; non vidi, ex Bobrinskoj 1925).

Bobrinskoj N. A. 1918: Заметки о летучих мышах, добытых в Бухарском ханстве летом 1914 г. [Notes on the bats collected on the territory of the Kingdom of Bukhara in the summer 1914]. *Materialy k Poznaniû Fauny i Flory Rossii*, *Otdel Zoologičeskij* **15**: 1–22 (in Russian).

Bobrinskoj N. A. 1925: Материалы для фауны летучих мышей Туркестанского края. (Западный Туркестан с Семиреченской и Закаспийской областями, Хива и Бухара) [Materials on the bat fauna of the Turkestan Region (West Turkestan with the Regions of Semirechie and of Transcaspia, Khiva and Bukhara).]. *Bûlleten' Moskovskogo Obŝestva Izpytatelej Prirody*, *Otdel Biologičeskij*, *n. s*. **34**: 330–374 (in Russian, with a summary in English).

Bobrinskoj N. 1929: Bats of Central Asia. *Ežegodnik Zoologičeskogo Muzeâ Akademii Nauk SSSR* **1929**: 217–244.

Bogdanov O. P. 1953: *Фауна Узбекской ССР. Том III. Млекопитающие. Вып. 2. Рукокрылые* [*Fauna of the Uzbek Soviet Socialist Republic. Volume III. Mammals. No. 2. Bats*]. Taškent: Izdatel'stvo Akademii Nauk UzSSR, 159 pp (in Russian).

Bogdanov O. P. 1960: К распространению и экологии длиннохвостой ночницы (Myotis longicaudatus Ognev) [On the distribution and ecology of the long-tailed bat (Myotis longicaudatus Ognev)]. *Zoologičeskij Žurnal* **39**: 1895–1896 (in Russian, with a summary in English).

Bogdanov O. P. 1968: Новые данные по распространению рукокрылых в Средней Азии (горы Нуратау) [New data on the distribution of bats in Central Asia (Nuratau Mts.)]. *Zoologičeskij Žurnal* **47**: 643–644 (in Russian, with a summary in English).

Bogdanov O. P. 1974: Особенности распространения и показатели численности рукокрылых Средней Азии [Distribution patterns and abundance indices of bats in Central Asia]. Pp.: 77–78. In: Strelkov P. P. & Kuzâkin A. P. (eds.): *Материалы первого Всесоюзного совещания по рукокрылым* (*Chiroptera*) [*Proceedings of the First Pan-Union Symposium on Bats* (*Chiroptera*)]. Leningrad: Zoologičeskij Institut Akademii nauk SSSR, 184 pp (in Russian).

Borisenko A. V. & Pavlinov I. Â. 1995: Подотряд Microchiroptera [Sub-Order Microchiroptera]. Pp.: 72–120. In: Pavlinov I. Â., Borisenko A. V., Kruskop S. V. & Jahontov E. L. (eds.): Млекопитающие Евразии. II. Non-Rodentia. Систематико-географический справочник [Mammals of Eurasia. II. Non-Rodentia. Systematical-geographical Review]. *Sbornik Trudov Zoologičeskogo Muzeâ MGU* **23**: 1–334 (in Russian).

Borisenko A. V., Vasil'eva E. D., Verigina I. A., Dunaev E. A., Kalâkin M. V., Koblik E. A., Kruskop S. V., Orlova V. F., Pavlinov I. Â., Red'kin Â. A., Sazonov Û. I., Spasskaâ N. N. & Tomkovič P. S. 2001: Типы позвоночных в Зоологическом музее Московского университета [Types of vertebrates in the Zoological Museum of the Moscow State University]. *Sbornik Trudov Zoologičeskogo Muzeâ MGU* **41**: 5–251 (in Russian, with notes in English).

Brandt J. F. 1851: Beiträge zur der nähern Kenntniss der Säugethiere Russlands. Zweite Abhandlunge. Die Handflügler des Europäischen und Asiatischen Russland's mit besonderer Beziehnung auf die Geschichte ihrer Entdeckung, ihre Synonymie und geographische Verbreitung. *Mémoires des Sciences Naturelles* **7**: 25–42.

Buhnikašvili A. K., Kandaurov A. S. & Natradze I. M. 2004: Находки рукокрылых в Грузии за последние 140 лет [Records of bats in Georgia over the last 140 years]. *Plecotus et al*. **7**: 41–57 (in Russian, with a summary in English).

Butovskij P. M. 1974: Нашествия нетопырей-карликов (Pipistrellus pipistrellus Schreb.) в г. Алма-Ата во второй половине лета [Invasions of common pipistrelles (Pipistrellus pipistrellus Schreb.) in the city of Alma-Ata in the second half of summer]. Pp.: 101–103. In: Strelkov P. P. & Kuzâkin A. P. (eds.): *Материалы первого Всесоюзного совещания по рукокрылым* (*Chiroptera*) [*Proceedings of the First Pan-Union Symposium on Bats* (*Chiroptera*)]. Leningrad: Zoologičeskij Institut Akademii nauk SSSR, 184 pp (in Russian).

Butovskij P. M., Šajmardanov R. T. & Strelkov P. P. 1985: Отряд рукокрылые – Chiroptera Blumenbach, 1779 [Order Bats – Chiroptera Blumenbach, 1779]. Pp.: 125–260. In: Bekenov A., Butovskij P. M., Kasabekov B. B., Lankin P. M., Strelkov P. P., Stogov I. I., Fedosenko A. K., Šajmardanov R. T. & Šubin I. G. (eds.): *Млекопитающие Казахстана в четырех томах*. *Том четвертый*. *Насекомоядные и рукокрылые* [*Mammals of Kazakhstan in Four Volumes*. *Volume Four*. *Insectivores and Bats*]. Alma-Ata: Nauka Kazahskoj SSR, 280 pp (in Russian, English subtitle).

Csorba G., Ujhelyi P. & Thomas N. 2003: *Horseshoe Bats of the World* (*Chiroptera*: *Rhinolophidae*). Bishop's Castle, UK: Alana Books, xxxii+160 pp.

Corbet G. B. 1978: *The Mammals of the Palaearctic Region*: *A Taxonomic Review*. London & Ithaca: British Museum (Natural History) & Cornell University Press, 314 pp.

Cyculina E. A. 1999: Новые находки рукокрылых (Chiroptera) на Западном Кавказе [New records of bats (Chiroptera) in the western Caucasus]. *Plecotus et al*. **2**: 79–83 (in Russian, with a summary in English).

Dal' S. K. 1954: *Животный мир Армянской ССР*. *Том I. Позвоночные животные* [*Animal World of the Armenian Soviet Socialist Republic*. *Volume I. Vertebrates*]. Erevan: Izdatel'stvo Akademii nauk Armânskoj SSR, 414 pp (in Russian).

DeBlase A. F. 1980: The bats of Iran: systematics, distribution, ecology. *Fieldiana Zoology*, *n. s*. **4**: i–xvii+1–424 pp.

Dobson G. E. 1878: *Catalogue of the Chiroptera in the Collection of the British Museum*. London: by order of the Trustees of the British Museum, xlii+567 pp. [xxx plates].

Dolch D., Batsaikhan N., Thiele K., Scheffler I., Kiefer A., Mayer F., Samjaa R., Stubbe A., Stubbe M., Krall L. & Steinhauser D. 2007: Contributions to the Chiroptera of Mongolia with first evidences on species communities and ecological niches. *Erforschung Biologischer Ressourcen der Mongolei* **10**: 407–458.

Duvarova A. S. 1980: О зимовках рукокрылых Краснодарского края [On the hibernation of bats in the Krasnodar Region]. Pp.: 70–71. In: Kuzâkin A. P. & Panûtin K. K. (eds.): *Вопросы териологии*. *Рукокрылые* (*Chiroptera*) [*Questions in Theriology*. *Bats* (*Chiroptera*)]. Moskva: Nauka, 320 pp (in Russian).

Dzeverin I. I. 1995: Краниометрическая изменчивость остроухих ночниц Myotis blythi (Chiroptera, Vespertilionidae) [Craniometrical variation in the lesser mouse-eared bats Myotis blythi (Chiroptera, Vespertilionidae)]. *Zoologičeskij Žurnal* **74**: 82–95 (in Russian, with a summary in English).

Dzeverin I. I. & Strelkov P. P. 2008: Таксономический статус остроухих ночниц (Myotis blythii, Chiroptera, Vespertilionidae) с Алтая [Taxonomic status of Myotis blythii (Chiroptera, Vespertilionidae) from the Altai]. *Zoologičeskij Žurnal* **87**: 973–982 (in Russian, with a summary in English).

Ellerman J. R. & Morrison-Scott T. C. S. 1951: *Checklist of Palaearctic and Indian Mammals 1758 to 1946*. London: British Museum (Natural History), 810 pp.

Emel'ânov A. A. 2001: Находки рукокрылых в Курганской области [Records of bats in the Kurgan Region]. *Plecotus et al*. **pars specialis**: 71–74 (in Russian, with a summary in English).
Fedčenko A. P. 1875: Путешествие въ Туркестанъ [Journey to Turkestan]. *Izvestiâ Imperatorskago Obŝestva Lûbitelej Estestvoznaniâ, Antropologii i Ètnografii* **11**(7): 1–160 (in Russian).
Felten H., Spitzenberger F. & Storch G. 1977: Zur Kleinsäugerfauna West-Anatoliens. Teil IIIa. *Senckenbergiana Biologica* **58**: 1–44.
Furman A., Çoraman E., Bilgin R. & Karataş A. 2009: Molecular ecology and phylogeography of the bent-wing bat complex (Miniopterus schreibersii) (Chiroptera: Vespertilionidae) in Asia Minor and adjacent regions. *Zoologica Scripta* **38**: 129–141.
Furman A., Öztunç T. & Çoraman E. 2010a: On the phylogeny of Miniopterus schreibersii schreibersii and Miniopterus schreibersii pallidus from Asia Minor in reference to other Miniopterus taxa (Chiroptera: Vespertilionidae). *Acta Chiropterologica* **12**: 61–72.
Furman A., Postawa T., Öztunç T. & Çoraman E. 2010b: Cryptic diversity of the bent-wing bat, Miniopterus schreibersii (Chiroptera: Vespertilionidae), in Asia Minor. *BioMed Central Evolutionary Biology* **10**(121): 1–12.
Gaisler J. 1970: The bats (Chiroptera) collected in Afghanistan by the Czechoslovak Expeditions of 1965–1967. *Acta Scientiarum Naturalium Academiae Scientiarum Bohemoslovacae Brno*, *n. s*. **4**(6): 1–56.
Gaisler J. 1971: Systematic review and distinguishing characters of the bats (Chiroptera) hitherto recorded in Afghanistan. *Zoologické Listy* **20**: 97–110.
Gazarân S. V. 1999: Новые данные по обитанию длиннокрылов (Miniopterus schreibersi) в пещерах Западного Кавказа [New data on the occurrence of bent-winged bats (Miniopterus schreibersi) in caves of the western Caucasus]. *Plecotus et al*. **2**: 88–93 (in Russian, with a summary in English).
Gazarân S. V. 2005: Географическая изменчивость длиннокрылов Miniopterus schreibersii (Chiroptera) на территории восточной Европы и северо-западной Азии [Geographical variation in bent-winged bats Miniopterus schreibersii (Chiroptera) on the territory of eastern Europe and northwestern Asia]. *Zoologičeskij Žurnal* **84**: 1136–1143 (in Russian, with a summary in English).
Gazarân S. V. 2007: Новые находки южного подковоноса Rhinolophus euryale в России [New records of the Mediterranean horseshoe bat Rhinolophus euryale in Russia]. *Plecotus et al*. **10**: 47–50 (in Russian, with a summary in English).
Gazarân S. V. & Džamirzoev G. S. 2005: Итоги и перспективы изучения хироптерофауны Дагестана [Results and perspectives of the knowledge of the bat fauna of Daghestan]. Pp.: 49–57. In: Rožnov V. V. & Tembotova F. A. (ed.): *Млекопитающие горных территорий. Материалы международной конференции. 4–9 сентября 2005 г.* [*Mammals of Mountainous Territories. Proceedings of International Conference. 4–9 September 2005*]. Moskva: Tovariŝestvo naučnyh izdanij KMK, 215 pp (in Russian).
Gazarân S. V. & Ivanickij A. N. 2005: К вопросу о фаунистическом и таксономическом статусе южного подковоноса Rhinolophus euryale в Западном Закавказье [To the question of the faunal and taxonomic status of the Mediterranean horseshoe bat Rhinolophus euryale in the western Transcaucasia]. *Plecotus et al*. **8**: 54–61 (in Russian, with a summary in English).
Gazaryan S. V. 2003: On the status of Barbastella barbastellus (Schreber, 1774) in the Caucasus. *Studia Chiropterologica* **3–4**: 11–20.
Geptner V. P. 1956: *Фауна позвоночных животных Бадхыза* (*Южная Туркмения*) [*Vertebrate Fauna of the Badhyz* (*southern Turkmenistan*)]. Ašhabad: Izdatel'stvo Turkmenskoj Akademii Nauk, 234 pp (in Russian).
Goretovskaâ O. S., Ryžkov D. V. & Burmistrov M. V. 2002: Изучение фауны рукокрылых на территории Алтайского края [The knowledge of the bat fauna on the territory of the Altai Region]. *Plecotus et al*. **pars specialis**: 106–108 (in Russian, with a summary in English).
Guillén Servent A., Francis C. M. & Ricklefs R. E. 2003: Phylogeny and biogeography of the horseshoe bats. Pp.: xii–xxiv. In: Csorba G., Ujhelyi P. & Thomas N. (eds.): *Horseshoe Bats of the World* (*Chiroptera*: *Rhinolophidae*). Bishop's Castle, UK: Alana Books, xxxii+160 pp.
Habilov T. K. 1992: *Фауна Республики Таджикистан. Том XX. Часть VII. Млекопитающие. Рукокрылые* [*Fauna of the Republic of Tajikistan. Volume XX. Part VII. Mammals. Bats*]. Dušanbe: Izdatel'stvo Doniš, 352 pp (in Russian).
Hanák V. 1965: Zur Systematik der Bartfledermaus Myotis mystacinus Kuhl, 1819 und über das Vorkommen von Myotis ikonnikovi Ognev, 1912 in Europa. *Věstník Československé Společnosti Zoologické* **29**: 353–367.
Hanák V. 1969: Zur Kenntnis von Rhinolophus bocharicus Kastchenko et Akimov, 1917 (Mammalia: Chiroptera). *Věstník Československé Společnosti Zoologické* **33**: 315–327.
Hanák V. & Gaisler J. 1971: The status of Eptesicus ognevi Bobrinskii, 1918, and remarks on some other species of this genus (Mammalia: Chiroptera). *Věstník Československé Společnosti Zoologické* **35**: 11–24.
Hanák V. & Gaisler J. 1976: Pipistrellus nathusii (Keyserling et Blasius, 1839) (Chiroptera: Vespertilionidae) in Czechoslovakia. *Věstník Československé Společnosti Zoologické* **40**: 7–23.
Horáček I. 1991: Enigma of Otonycteris: ecology, relationship, classification. *Myotis* **29**: 17–30.

Horáček I. & Hanák V. 1984: Comments on the systematics and phylogeny of Myotis nattereri (Kuhl, 1818). *Myotis* **21–22**: 20–29.
Horáček I. & Hanák V. 1986: Generic status of Pipistrellus savii and comments on classification of the genus Pipistrellus (Chiroptera, Vespertilionidae). *Myotis* **23–24**: 9–16.
Horáček I. & Zima J. 1996: Evolutionary divergence in the lesser horseshoe bat. P.: 26. In: Lina P. & Smeenk C. (eds.): *VIIth European Bat Research Symposium*. *12–16 August 1996*, *Veldhoven*, *The Netherlands*. *Programme*, *Abstracts*, *List of Participants*. Veldhoven: Bat Research Agency, [ix]+112 pp.
Horáček I., Hanák V. & Gaisler J. 2000: Bats of the Palearctic region: a taxonomic and biogeographic review. Pp.: 11–157. In: Wołoszyn B. W. (ed.): *Proceedings of the VIIIth European Bat Research Symposium*. *Vol. I. Approaches to Biogeography and Ecology of Bats*. Kraków: Chiropterological Information Center, Institute of Systematics and Evolution of Animals PAS, 280 pp
Hulva P., Horáček I., Strelkov P. P. & Benda P. 2004: Molecular architecture of Pipistrellus pipistrellus / Pipistrellus pygmaeus complex (Chiroptera: Vespertilionidae): further cryptic species and Mediterranean origin of the divergence. *Molecular Phylogenetics and Evolution* **32**: 1023–1035.
Hulva P., Fornůsková A., Chudárková A., Evin A., Allegrini B., Benda P. & Bryja J. 2010: Mechanisms of radiation in a bat group from the genus Pipistrellus inferred by phylogeography, demography and population genetics. *Molecular Ecology* **19**: 5417–5431.
Hůrka K. 1962: Beitrag zur Nycteribien- und Streblidenfauna Albaniens nebst Bemerkungen zur Fauna von Bulgarien, Ungarn und UdSSR. *Časopis Československé Společnosti Entomologické* **59**: 156–164.
Hůrka K. 1969: Basilia (Basilia) rybini sp. n. and notes on the Nycteribiidae of the Caucasus and Central Asia (Diptera, Pupipara). *Acta Entomologica Bohemoslovaca* **66**: 387–398.
Hůrka K. 1984a: New taxa and new records of Palearctic Nycteribiidae and Streblidae (Diptera: Pupipara). *Věstník Československé Společnosti Zoologické* **48**: 90–101.
Hůrka K. 1984b: Notes on the taxonomy and distribution of Ischnopsyllidae (Siphonaptera), with description of a new species from Vietnam. *Acta Entomologica Bohemoslovaca* **81**: 204–211.
ICZN (= International Commission on Zoological Nomenclature) 1999: *International Code of Zoological Nomeclature*. *Fourth Edition*. London: International Trust for Zoological Nomenclature, 182 pp.
Ivanickij A. N. 2002a: К фауне рукокрылых (Chiroptera) Абхазии [On the fauna of bats (Chiroptera) of Abkhazia]. *Plecotus et al*. **5**: 57–62 (in Russian, with a summary in English).
Ivanickij A. N. 2002b: Рукокрылые пещеры Уаз-Абаа (Сухумский район, Абхазия) [Bats of the Uaz-Abaa Cave (Suhum District, Abkhazia)]. *Plecotus et al*. **pars specialis**: 88–91 (in Russian, with a summary in English).
Ivanickij A. N. 2010: Новые данные по фауне рукокрылых (Chiroptera) Абхазии [New data on bat fauna (Chiroptera) of Abkhazia]. *Plecotus et al*. **13**: 59–68 (in Russian, with a summary in English).
Jentink F. A. 1880: Note VI. On Vespertilio akokomuli and Vespertilio erythrodactylus, types of Temminck. *Notes from the Leyden Museum* **2**: 37–40.
Jones G., Parsons S., Zhang S., Stadelmann B., Benda P. & Ruedi M. 2006: Echolocation calls, wing shape, diet and phylogenetic diagnosis of the endemic Chinese bat Myotis pequinius. *Acta Chiropterologica* **8**: 451–463.
Juste J., Benda P., Garcia-Mudarra J. L. & Ibáñez C. 2010: Molecular phylogeny and systematics of Old World serotine bats (Eptesicus, Vespertilionidae). Pp.: 189–190. In: Horáček I. & Benda P. (eds.): *15th IBRC – the Conference Manual*: *Programme*, *Abstracts*, *List of Participants*. *Volume of Abstracts of the 15th International Bat Research Conference*, *held in Prague*, *23–27 August 2010*. Kostelec nad Černými lesy: Lesnická práce s.r.o., 381 pp.
Karami M., Hutterer R., Benda P., Siahsarvie R. & Kryštufek B. 2008: Annotated check-list of the mammals of Iran. *Lynx*, *n. s*. **39**: 63–102.
Kašenko N. F. & Akimov M. P. 1918: Rhinolophus bocharicus sp. n. *Ežegodnik Zoologičeskago Muzeâ Akademii Nauk'* **22**: 221–223 (in Russian).
Kazakov B. A. & Ârmyš N. N. 1974: О фауне рукокрылых Предкавказья [On the bat fauna of Ciscaucasia]. Pp.: 69–72. In: Strelkov P. P. & Kuzâkin A. P. (eds.): *Материалы первого Всесоюзного совещания по рукокрылым* (*Chiroptera*) [*Proceedings of the First Pan-Union Symposium on Bats* (*Chiroptera*)]. Leningrad: Zoologičeskij Institut Akademii nauk SSSR, 184 pp (in Russian).
Koopman K. F. 1993: Order Chiroptera. Pp.: 137–241. In: Wilson D. E. & Reeder D. M. (eds.): *Mammal Species of the World*. *A Taxonomic and Geographic Reference*. Washington & London: Smithsonian Institution Press, 1206 pp.
Koopman K. F. 1994: Chiroptera: Systematics. Pp.: 1–217. In: Niethammer J., Schliemann H. & Starck D. (eds.): *Handbuch der Zoologie*. *Band VIII*. *Mammalia*. *Teilband 60*. Berlin & New York: Walter de Gruyter, vii+224 pp.
Kolenati F. A. 1858: *Reiseerinnerungen*. *Erster Theil*. *Die Bereisung Hocharmeniens und Elisabethpols*, *der Schekinschen Provinz und des Kasbek im Central-Kaukasus*. Dresden: Rudolf Kuntze, 289 pp.
Kovaleva I. M. & Ŝerbak N. N. 1990: О находке новой обитаемой рукокрылыми пещеры в горах западного Копетдага (Туркмения) [On a record of new cave dwelled by bats in mountains of the western Kopetdagh Mts. (Turkmenistan)]. Pp.: 57–58. In: Il'in V. Û., Strelkov P. P. & Rodionov V. A. (eds.): *Рукокрылие*. *Материалы пятого Всесоюзного*

совещания по рукокрылым (*Chiroptera*) [*Bats*. *Proceedings of the Fifth Pan-Union Symposium on Bats* (*Chiroptera*)]. Penza: Penzenskij Gosudarstvennyj Pedagogičeskij Institut Imeni V. G. Belinskogo, 174 pp (in Russian).

Koževnikov G. & Uvarov B. P. 1917: Константинъ Алексеевичъ Сатунинъ. (Некрологъ). [Konstantin" Alekseevič" Satunin". (Obituary).]. *Izvestiâ Kavkazskago Muzeâ* **10**: i–xxxii (in Russian).

Kožurina E. I. 2009: Конспект фауны рукокрылых России: систематика и распространение [Conspectus of the Russian bat fauna: systematics and distribution]. *Plecotus et al*. **11–12**: 71–105 (in Russian, with a summary in English).

Kruskop S. V. 2007: К распространению нетопырей комплекса Pipistrellus pipistrellus / pygmaeus (Chiroptera, Vespertilionidae) в России [To the distribution of pipistrelles of the Pipistrellus pipistrellus / pygmaeus complex (Chiroptera, Vespertilionidae) in Russia]. *Plecotus et al*. **10**: 36–46 (in Russian, with a summary in English).

Kuzâkin A. P. 1934: Летучие мыши г. Ташкента и систематические заметки о некоторых формах Chiroptera с Кавказа, Бухары и Туркмении [Bats of the city of Toškent and systematical remarks on some Chiroptera from the Caucasus, Bukhara and Turkmenistan]. *Bûlleten' Moskovskogo Obŝestva Ispytatelej Prirody*, *Otdel Biologičeskij*, *n. s.* **43**: 316–330 (in Russian, with a summary in English).

Kuzâkin A. P. 1935: Новые данные по систематике и географическому распространению летучих мышей (Chiroptera) в СССР [New data on systematics and geographical distribution of bats (Chiroptera) in the Soviet Union]. *Bûlleten' Moskovskogo Obŝestva Ispytatelej Prirody*, *Otdel Biologičeskij*, *n. s.* **44**: 428–438 (in Russian, with a summary in German).

Kuzâkin A. P. 1944: II. Отряд Рукокрылые. Ordo Chiroptera [II. Order Bats. Ordo Chiroptera]. Pp.: 59–108. In: Bobrinskij N. A., Kuznecov B. A. & Kuzâkin A. P. (eds.): *Определитель млекопитающих СССР* [*Key to Identification of Mammals of the Soviet Union*]. Moskva: Sovetskaâ Nauka, 440 pp (in Russian).

Kuzâkin A. P. 1950: *Летучие мыши* (*Систематика*, *образ жизни и польза для сельского и лесного хозяйства*) [*Bats* (*Systematics*, *Life History and Utility in Agriculture and Forestry*)]. Moskva: Sovetskaâ Nauka, 444 pp (in Russian).

Kuzâkin A. P. 1965: Отряд Рукокрылые. Ordo Chiroptera [Order Bats. Ordo Chiroptera]. Pp.: 79–116. In: Bobrinskij N. A., Kuznecov B. A. & Kuzâkin A. P. (eds.): *Определитель млекопитающих СССР* [*Key to Identification of Mammals of the Soviet Union*]. Moskva: Prosveŝenie, 384 pp (in Russian).

Lay D. M. 1967: A study of the mammals of Iran resulting from the Street Expedition of 1962–63. *Fieldiana*: *Zoology* **54**: 1–282.

Maraci Ö., Bilgin R., Lučan R. K., Bartonička P., Hulva P. & Horáček I. 2010: The sympatry of Miniopterus schreibersii schreibersii and Miniopterus s. pallidus in three caves: The smoking gun for their elevation to full species status. Pp.: 220–221. In: Horáček I. & Benda P. (eds.): *15th IBRC – the Conference Manual*: *Programme*, *Abstracts*, *List of Participants*. *Volume of Abstracts of the 15th International Bat Research Conference*, *held in Prague*, *23–27 August 2010*. Kostelec nad Černými lesy: Lesnická práce s.r.o., 381 pp.

Meklenburcev R. N. 1935: Заметки по биологии летучих мышей окрестностей Ташкента [Notes on the life history of bats in the surroundings of Taškent]. *Bûlleten' Sredne Aziatskogo Gosudarstvennogo Universiteta* **29**: 105–114 (in Russian).

Mlíkovský J., Benda P., Moravec J. & Šanda R. 2011: Type specimens of recent vertebrates in the collections of the National Museum, Prague, Czech Republic. *Journal of the National Museum* (*Prague*), *Natural History Series* **180**: 133–164.

Nader I. A. & Kock D. 1990: Eptesicus (Eptesicus) bottae (Peters 1869) in Saudi Arabia with notes on its subspecies and distribution (Mammalia: Chiroptera: Vespertilionidae). *Senckenbergiana Biologica* **70**: 1–13.

Neuhauser H. N. & DeBlase A. F. 1971: The status of Pipistrellus aladdin Thomas from Central Asia. *Mammalia* **35**: 273–282.

Ogneff S. I. & Heptner W. G. 1928: Einige Mitteilungen über die Säugetiere des mittleren Kopet-Dag und der anliegenden Ebene (Russisch-Turkestan). *Zoologischer Anzeiger* **75**: 258–266.

Ognev S. I. 1927: A synopsis of the Russian bats. *Journal of Mammalogy* **8**: 140–157.

Ognev S. I. 1928: *Звери восточной Европы и северной Азии*. *Том I* [*Mammals of Eastern Europe and Northern Asia*. *Volume I*]. Moskva & Leningrad: Gosudarstvennoe Izdatel'stvo, 631 pp (in Russian).

Ognev S. I. & Geptner V. G. 1929: Млекопитающие среднего Копет-Дага и прилежащих равнин [Mammals of the central Kopetdagh Mts. and adjacent lowlands]. *Trudy Naučno-issledovatel'skogo Instituta Zoologii MGU* **3**(1): 45–171 (in Russian; non vidi, ex Strelkov et al. 1978).

Pavlinov I. Â. & Rossolimo O. L. 1987: Систематика млекопитающих СССР [Systematics of the mammals of the Soviet Union]. *Sbornik Trudov Zoologičeskogo Muzeâ MGU* **25**: 1–285 (in Russian).

Pavlinov I. Â. & Rossolimo O. L. 1998: Систематика млекопитающих СССР. Дополнения [Systematics of the mammals of the Soviet Union. Addenda]. *Sbornik Trudov Zoologičeskogo Muzeâ MGU* **38**: 1–191 (in Russian).

Perov M. V. 1980: К изучению рукокрылых Грузии [To the knowledge of bats in Georgia]. Pp.: 59–63. In: Kuzâkin A. P. & Panûtin K. K. (eds.): *Вопросы териологии*. *Рукокрылые* (*Chiroptera*) [*Questions in Theriology*. *Bats* (*Chiroptera*)]. Moskva: Nauka, 320 pp (in Russian).

Radde G. 1899: *Коллекціи Кавказскаго музея. Том I. Зоологія / Die Sammlungen des Kaukasischen Museum. Band I. Zoologie*. Tiflis: Tipografiâ Kancelârii Glavnonačal'stvuûšago graždanskuû častiû na Kavkaze, 520 pp (in Russian and German).

Radde G. & Walter A. 1889: Die Säugethiere Transkaspiens. *Zoologische Jahrbücher*, *Abteilung für Systematik, Geographie und Biologie der Thiere* **4**: 993–1094.

Rahmatulina I. K. 1980: Материалы по экологии рукокрылых Азыхской пещеры [Materials on the ecology of bats of the Azyhskaâ cave]. Pp.: 154–179. In: Kuzâkin A. P. & Panûtin K. K. (eds.): *Вопросы териологии. Рукокрылые* (*Chiroptera*) [*Questions in Theriology. Bats* (*Chiroptera*)]. Moskva: Nauka, 320 pp (in Russian).

Rahmatulina I. K. 1983: Экология средиземноморского нетопыря (Vespertilio kuhlii Kuhl, 1819) в Азербайджане [Ecology of Vespertilio kuhlii Kuhl, 1819 in Azerbaijan]. *Bûlleten' Moskovskogo Obŝestva Ispytatelej Prirody*, *Otdel Biologičeskij* **88**(3): 33–42 (in Russian, with a summary in English).

Rahmatulina I. K. 2005: *Рукокрылые Азербайджана* (*фауна*, *экология*, *зоогеография*) [*Bats of Azerbaijan* (*Fauna*, *Ecology*, *Zoogeography*)]. Baku: Nacional'naâ Akademiâ Nauk Azerbajdžana, 480 pp (in Russian, with summaries in English and Azeri).

Rahmatulina I. K. & Gasanov N. A. 2002a: Хироптерофауна Абшерон-Гобустана [Bat fauna of Abšeron-Gobustan]. *Plecotus et al*. **pars specialis**: 92–98 (in Russian, with a summary in English).

Rahmatulina I. K. & Gasanov N. A. 2002b: Pipistrellus pygmaeus (Leach, 1825) в Азербайджане [Pipistrellus pygmaeus (Leach, 1825) in Azerbaijan]. *Plecotus et al*. **pars specialis**: 98–99 (in Russian, with a summary in English).

Roberts T. J. 1997: *The Mammals of Pakistan*. Karachi: Oxford University Press, 511 pp.

Rossolimo O. L. & Pavlinov I. Â. 1979: Каталог типовых экземпляров млекопитающих хранящихся в Зоологическом музее МГУ [Catalogue of type specimens of mammals deposited in the Zoological Museum of the Moscow State University]. *Sbornik Trudov Zoologičeskogo Muzeâ MGU* **18**: 5–43 (in Russian).

Rossolimo O. L. & Pavlinov I. Â. 1981: *Каталог териологических коллекций Зоологического музея МГУ* [*Catalogue of Mammalogical Collections of the Zoological Museum of the Moscow State University*]. Moskva: Izdatel'stvo MGU, 68 pp (in Russian).

Ryberg O. 1947: *Studies on Bats and Bat Parasites Especially with Regard to Sweden and Other Neighbouring Countries of the North. I*. Stockholm: Bokförlaget Svensk Natur, 319 pp.

Rybin S. N. 1980: Рукокрылые южной Киргизии [Bats of southern Kirghizstan]. Pp.: 87–95. In: Kuzâkin A. P. & Panûtin K. K. (eds.): *Вопросы териологии. Рукокрылые* (*Chiroptera*) [*Questions in Theriology. Bats* (*Chiroptera*)]. Moskva: Nauka, 320 pp (in Russian).

Rybin S. N., Horáček I. & Červený J. 1989: Bats of southern Kirghizia: distribution and faunal status. Pp.: 421–441. In: Hanák V., Horáček I. & Gaisler J. (eds.): *European Bat Research 1987*. Praha: Charles University Press, 720 pp.

Sachanowicz K., Wower A. & Bashta T.-A. 2006: Further range extension of Pipistrellus kuhlii (Kuhl, 1817) in central and eastern Europe. *Acta Chiropterologica* **8**: 543–548.

Šagoân V. A. 1980: К экологии Vespertilio kühli в Армении [On the ecology of Vespertilio kühli in Armenia]. Pp.: 193–194. In: Kuzâkin A. P. & Panûtin K. K. (eds.): *Вопросы териологии. Рукокрылые* (*Chiroptera*) [*Questions in Theriology. Bats* (*Chiroptera*)]. Moskva: Nauka, 320 pp (in Russian).

Šagoân V. A & Âvruân È. G. 1974: К биологии средиземного нетопыря (Pipistrellus kuhli Natt.) в Армении [To the life history of Kuhl's bat (Pipistrellus kuhli Natt.) in Armenia]. Pp.: 96–98. In: Strelkov P. P. & Kuzâkin A. P. (eds.): *Материалы первого Всесоюзного совещания по рукокрылым* (*Chiroptera*) [*Proceedings of the First Pan-Union Symposium on Bats* (*Chiroptera*)]. Leningrad: Zoologičeskij Institut Akademii nauk SSSR, 184 pp (in Russian).

Šagoân V. A., Âvruân È. G. & Saakân E. G. 1980: Замечания об экологии Vespertilio pipistrellus в Араратском районе Армении [Notes on the ecology of Vespertilio pipistrellus in the Ararat District of Armenia]. Pp.: 193–194. In: Kuzâkin A. P. & Panûtin K. K. (eds.): *Вопросы териологии. Рукокрылые* (*Chiroptera*) [*Questions in Theriology. Bats* (*Chiroptera*)]. Moskva: Nauka, 320 pp (in Russian).

Šajmardanov R. T. 2001: Новые находки (1985–1993) редких и малоизвестных для фауны Казахстана видов рукокрылых [New records (1985–1993) of bat species (Chiroptera) rare and less known in the fauna of Kazakhstan]. *Plecotus et al*. **4**: 82–83 (in Russian, with a summary in English).

Šajmardanov R. T. 2006: Рукокрылые (Chiroptera) Государственного национального природного парка "Алтын-Эмель" и сопредельных территорий Илийской котловины [Bats (Chiroptera) of the State National Natural Park "Altyn-Èmel'" and adjacent territories of the Ili basin]. *Plecotus et al*. **9**: 32–37 (in Russian, with a summary in English).

Šajmardanov R. T. & Murzov V. N. 1990: Нетопырь-карлик (Pipistrellus pipistrellus): новый вид для фауны рукокрылых Зайсанской котловины [The common pipistrelle (Pipistrellus pipistrellus): new species for the bat fauna of the Zajsan basin]. Pp.: 58–59. In: Il'in V. Û., Strelkov P. P. & Rodionov V. A. (eds.): *Рукокрылие. Материалы пятого Всесоюзного совещания по рукокрылым* (*Chiroptera*) [*Bats. Proceedings of the Fifth Pan-Union Symposium on Bats* (*Chiroptera*)]. Penza: Penzenskij Gosudarstvennyj Pedagogičeskij Institut Imeni V. G. Belinskogo, 174 pp (in Russian).

Samorodov A. V. 1953: Материалы к фауне млекопитающих низовьев реки Атрека [Materials of the fauna of mammals of the Atrek River lowlands]. *Izvestiâ Akademii Nauk Turkmenskoj SSR* **5–6**: 43–49 (in Russian; non vidi, ex Strelkov et al. 1978).

Satunin K. A. 1896: Vorläufige Mittheilungen über die Säugethierfauna der Kaukasusländer. *Zoologische Jahrbücher*, *Abtheilung für Systematik*, *Geographie und Biologie der Thiere* **9**: 277–314.

Satunin K. A. 1901: О млекопитающих степей северо-восточнаго Кавказа [About mammals of steppes of the northeastern Caucasus]. *Izvestiâ Kavkazskago Muzeâ* **1**(4): 1–100 (in Russian).

Satunin K. 1905: Новыя и малоизвестныя млекопитающія Кавказа и Закаспиійской области [New and less known mammals of the Caucasus and Transcaspian Region]. *Izvestiâ Kavkazskago Muzeâ* **2**: 45–69 (in Russian).

Satunin K. A. 1908: Матеріалы къ познанію млекопитающихъ Кавказскаго края и Закаспиійской области. VIII. Экскурсія Кавказскаго Музея въ степи и предгорья восточнаго Закавказья весною 1907 г. [Materials on the knowledge of mammals of the Caucasus and Transcaspian Regions. VIII. Trip of the Caucasus Museum to the steppes and foothills of the eastern Transcaucasia in the autumn 1907]. *Izvestiâ Kavkazskago Muzeâ* **4**: 41–67 (in Russian).

Satunin K. A. 1910: Матеріалы къ познанію млекопитающихъ Кавказскаго края и Закаспиійской области, XII–XVI. XVI. Млекопитающія Кавказа и прилежащихъ странъ хранящіяся въ Зоологическомъ Музее Императорской Академіи Наукъ въ С.-Петербурге [Materials on the knowledge of mammals of the Caucasus and Transcaspian Regions, XII–XVI. XVI. Mammals of the Caucasus and adjacent countries deposited in the Zoological Museum of the Imperial Academy of Sciences in Sankt-Peterburg]. *Izvestiâ Kavkazskago Muzeâ* **4**: 278–285 (in Russian).

Satunin K. A. 1912: Пещерныя летучія мыши Абхазіи [Cave bats of Abkhazia]. *Izvestiâ Kavkazskago Otdela Imperatorskago Russkago Geografičeskago Obŝestva* **21**(1): 47–48 (in Russian).

Satunin K. A. 1914: *Опредѣлитель млекопитающихъ Россійской Имперіи. Выпускъ первый.* (*Рукокрылыя*, *Насекомоядныя и Хищныя*) [*Key to the Mammals of the Russian Empire. First Volume.* (*Bats*, *Insectivores and Carnivores*)]. Tiflis': Tipografiâ Kancelârii Namestnika Ego Imperatorskago Veličestva na Kavkaze, 148 pp (in Russian).

Satunin K. A. 1915: Млекопитающія Кавказскаго края. Томъ I (Chiroptera, Insectivora и Carnivora) [Mammals of the Caucasus Region. Volume I (Chiroptera, Insectivora and Carnivora)]. *Zapiski Kavkazskago Muzeâ*, *Seriâ A* **1**: 1–410, 4 tbl. (in Russian).

Ševčenko L. S. & Zolotuhina S. I. 2005: *Каталог коллекций Зоологического музея ННПМ НАН Украины. Млекопитающие. Вып. 2. Насекомядные* (*Insectivora*), *Рукокрылые* (*Chiroptera*), *Зайцеобразные* (*Lagomorpha*), *Грызуны* (*Rodentia*) [*Catalogue of Collections of the Zoological Museum of the National Scientific Museum of Natural History*, *Ukrainian Academy of Sciences. Mammals. Volume 2. Insectivores* (*Insectivora*), *Bats* (*Chiroptera*), *Lagomorphs* (*Lagomorpha*), *Rodents* (*Rodentia*)]. KIEV: Zoomuzej NNPM NAN Ukrainy, 239 pp (in Russian).

Severcov N. A. 1873: Вертикальное и горизонтальное распределение туркестанскихъ животныхъ [Vertical and horizontal distribution of the Turkestan animals]. *Izvestiâ Imperatorskago Obŝestva Lûbitelej Estestvoznaniâ*, *Antropologii i Ètnografii* **7**(2): 1–136 (in Russian).

Severtzoff N. 1876: The mammals of Turkestan. *Annals and Magazine of Natural History*, *Fourth Series* **18**: 40–57.

Simmons N. B. 2005: Order Chiroptera. Pp.: 312–529. In: Wilson D. E. & Reeder D. M. (eds.): *Mammal Species of the World. A Taxonomic and Geographic Reference. Third Edition. Volume 1*. Baltimore: The John Hopkins University Press, xxxviii+743 pp.

Sinha Y. P. 1973: Taxonomic studies on the Indian horseshoe bats of the genus Rhinolophus Lacépède. *Mammalia* **37**: 603–630.

Spitzenberger F. 1994: The genus Eptesicus (Mammalia, Chiroptera) in southern Anatolia. *Folia Zoologica* **43**: 437–454.

Spitzenberger F., Strelkov P. P., Winkler H. & Haring E. 2006: A preliminary revision of the genus Plecotus (Chiroptera, Vespertilionidae) based on genetic and morphological results. *Zoologica Scripta* **35**: 187–230.

Šrámek J. 2010: *Populační a geografická proměnlivost létavců* (*Miniopterus*) *v západní Palearktidě* [*Population and Geographical Variation in Bent-winged Bats* (*Miniopterus*) *of the Western Palaearctic*]. Unpublished MSc. Thesis. Praha: Department of Zoology, Charles University, 145 pp+CD (in Czech).

Strelkov P. P. 1963: II. Отряд Chiroptera – рукокрылые [II. Order Chiroptera – bats]. Pp.: 122–218. In: Sokolov I. I. (ed.): *Млекопитющие фауны СССР. Часть 1* [*Mammals of the Fauna of the Soviet Union. Part 1*]. Moskva & Leningrad: Izdatel'stvo Akademii nauk SSSR, 640 pp (in Russian).

Strelkov P. P. 1968: Остроухие ночницы на Алтае. В защиту летучих мышей [Lesser mouse-eared bats in the Altai. To the protection of bats]. *Priroda* [Moskva] **1968**(2): 59–61 (in Russian).

Strelkov P. P. 1971: Большие (Rhinolophus ferrumequinum) и бухарские (Rh. bocharicus) подковоносы (Chiroptera) из пустыни Каракумы [The greater (Rhinolophus ferrumequinum) and Central Asian (Rh. bocharicus) horseshoe bats (Chiroptera) from the Karakumy Desert]. *Zoologičeskij Žurnal* **50**: 893–907 (in Russian, with a summary in English).

Strelkov P. P. 1972: Остроухие ночницы; распространение, географическая изменчивсть, отличия от больших ночниц [Myotis blythi (Tomes, 1857): distribution, geographical variability and differences from Myotis myotis (Borkhausen, 1797)]. *Acta Theriologica* **17**: 355–380 (in Russian, with an abstract in English).

Strelkov P. P. 1973: Нетопырь средиземноморский (Pipistrellus kuhlii Natterer, 1819) в Средней Азии [Kuhl's pipistrelle (Pipistrellus kuhli Natterer, 1819) in Central Asia]. *Vestnik Zoologii* **7**(2): 82–85 (in Russian, with a summary in English).

Strelkov P. P. 1974: Проблемы охраны рукокрылых [Problems of bat conservation]. Pp.: 49–55. In: Strelkov P. P. & Kuzâkin A. P. (eds.): *Материалы первого Всесоюзного совещания по рукокрылым* (*Chiroptera*) [*Proceedings of the First Pan-Union Symposium on Bats* (*Chiroptera*)]. Leningrad: Zoologičeskij Institut Akademii nauk SSSR, 184 pp (in Russian).

Strelkov P. P. 1980: Летучие мыши (Chiroptera, Vespertilionidae) центрального и западного Казахстана [Bats (Chiroptera, Vespertilionidae) of central and western Kazakhstan]. *Trudy Zoologičeskogo Instituta* **99**: 99–123 (in Russian).

Strelkov P. P. 1981: Отряд Chiroptera Blumenbach, 1779 – рукокрылые [Order Chiroptera Blumenbach, 1779 – Bats]. Pp.: 31–53. In: Gromov I. M. & Baranova G. I. (eds.): *Каталог млекопитающих СССР. Плиоцен–современность* [*Catalogue of Mammals of the Soviet Union. Pliocene–Recent*]. Leningrad: Nauka, 456 pp (in Russian).

Strelkov P. P. 1983: Места находок Myotis brandti Eversmann, 1845 и Myotis mystacinus Kuhl, 1819 (Chiroptera, Vespertilionidae) по материалам музеев СССР [Record sites of Myotis brandti Eversmann, 1845 and Myotis mystacinus Kuhl, 1819 (Chiroptera: Vespertilionidae) based on collections of the museums in the Soviet Union]. *Trudy Zoologičeskogo Instituta* **119**: 38–42 (in Russian).

Strelkov P. P. 1988: Опыт использования железных дорог для изучения распространения синантропных видов рукокрылых [Experience of the use of railways for the study of distribution of synathropic bat species]. Pp.: 290–309. In: Voronov A. G. (ed.): *Вопросы териологии. Общая и региональная териогеография* [*Questions in Theriology. General and Regional Theriogeography*]. Moskva: Nauka, 344 pp (in Russian).

Strelkov P. P. 2002: Материалы по зимовкам перелетных видов рукокрылых (Chiroptera) на территории бывшего СССР и смежных регионов. Сообщение 2. Nyctalus noctula [Materials on hibernation of the migratory bat species (Chiroptera) on the territory of the former Soviet Union and adjacent regions. Part 2. Nyctalus noctula]. *Plecotus et al*. **5**: 35–56 (in Russian, with a summary in English).

Strelkov P. P. & Kurskov A. N. 1990: Памяти Александра Петровича Кузякина [Obituary of Aleksandr Petrovič Kuzâkin]. Pp.: 8–12. In: Il'in V. Û., Strelkov P. P. & Rodionov V. A. (eds.): *Рукокрылие. Материалы пятого Всесоюзного совещания по рукокрылым* (*Chiroptera*) [*Bats. Proceedings of the Fifth Pan-Union Symposium on Bats* (*Chiroptera*)]. Penza: Penzenskij Gosudarstvennyj Pedagogičeskij Institut Imeni V. G. Belinskogo, 174 pp (in Russian).

Strelkov P. P. & Šajmardanov R. T. 1983: Новые данные о распространении летучих мышей (Chiroptera) в Казахстане [New data on the distribution of bats (Chiroptera) in Kazakhstan]. *Trudy Zoologičeskogo Instituta* **119**: 3–37 (in Russian).

Strelkov P. P. & Sosnovceva V. P. 1994: Новые данные о рукокрылых (Chiroptera) пустыни Каракум [New data on bats (Chiroptera) of the Karakum Desert]. *Zoologičeskij Žurnal* **73**: 140–142 (in Russian).

Strelkov P. P., Sosnovceva V. P. & Babaev H. B. 1978: Летучие мыши (Chiroptera) Туркмении [Bats (Chiroptera) of Turkmenistan]. *Trudy Zoologičeskogo Instituta* **79**: 3–71 (in Russian).

Strelkov P. P., Unkurova V. I. & Medvedeva G. A. 1985: Новые данные о нетопыре Куля (Pipistrellus kuhlii) и динамике его ареала в СССР [New data on Kuhl's pipistrelle (Pipistrellus kuhlii) and on dynamics of its range in the Soviet Union]. *Zoologičeskij Žurnal* **64**: 87–97 (in Russian, with a summary in English).

Strelkov P. P., Il'in V. Û., Mazing M. V. & Morozov P. N. 1990: Новые данные о рукокрылых северного Предкавказья [New data on bats of northern Ciscaucasia]. Pp.: 65–72. In: Il'in V. Û., Strelkov P. P. & Rodionov V. A. (eds.): *Рукокрылие. Материалы пятого Всесоюзного совещания по рукокрылым* (*Chiroptera*) [*Bats. Proceedings of the Fifth Pan-Union Symposium on Bats* (*Chiroptera*)]. Penza: Penzenskij Gosudarstvennyj Pedagogičeskij Institut Imeni V. G. Belinskogo, 174 pp (in Russian).

Strelkov P. P., Ambramson N. I. & Dzeverin I. I. 2002: Географическая изменчивость краниометрических признаков у рыжей вечерницы, Nyctalus noctula (Chiroptera), в связи с особенностями ее образа жизни [Geographic variation of craniometric characters in the common noctule Nyctalus noctula (Chiroptera) in relation to its life history]. *Zoologičeskij Žurnal* **81**: 850–863 (in Russian, with a summary in English).

Taake K.-H. & Vierhaus H. 2004: Pipistrellus pipistrellus (Schreber, 1774) – Zwergfledermaus. Pp.: 761–814. In: Krapp F. (ed.): *Handbuch der Säugetiere Europas*. *Band 4*: *Fledertiere*. *Teil II*: *Chiroptera II*. *Vespertilionidae 2*, *Molossidae*, *Nycteridae*. Wiebelsheim: Aula-Verlag, x+605–1186 pp.

Temminck C. J. 1835–1841: *Monographies de Mammalogie*, *ou description de quelques genres de mammifères*, *dont les espèces ont été observées dans les différens musées de l'Europe*. *Tome second*. Leiden: Van der Hoek, 392 pp [+lxx plates].

Thomas O. 1905: On a collection of mammals from Persia and Armenia presented to the British Museum by Col. A. C. Bailward. *Proceedings of the Zoological Society of London* **1905**(2): 519–527.
Thomas O. 1907: On mammals from Northern Persia, presented to the National Museum by Col. A. C. Baiward. *Annals and Magazine of Natural History*, *Seventh Series* **20**: 197–202.
Thomas O. 1909: On mammals collected in Turkestan by Mr. Douglas Carruthers. *Annals and Magazine of Natural History*, *Eight Series* **3**: 257–266.
Thomas O. 1910: A collection of small mammals from China. *Proceedings of the Zoological Society of London*, **1910**(2): 635–638.
Tihomirov A. A. & Korčagin A. N. 1889: Список и описание предметов, хранящихся в Зоологическом музее Московского университета [Catalogue and description of subjects deposited in the Zoological Museum of the Moscow University]. *Izvestiâ Imperatorskago Obŝestva Lûbitelej Estestvoznaniâ*, *Antropologii i Ètnografii* **6**(1) (in Russian; non vidi, ex Bogdanov 1953).
Topál G. 1971: The taxonomic position of Myotis dobsoni (Trouessart, 1879), and some statistical data to the subspecific examination of Myotis blythi (Tomes, 1857). *Annales Historico-naturales Musei Nationalis Hungarici*, *Pars Zoologica* **63**: 383–400.
Topál G. 1974: Field observations on Oriental bats. Sex ratio and reproduction. *Vertebrata Hungarica* **15**: 83–94.
Trouessart E.-L. 1904: *Catalogus mammalium tam viventum quam fossilum*. *Quinquennale supplementum*. Berolini: R. Friedländer & Sohn, iv+929 pp.
Tsytsulina K. A. 2000: Geographical variation in Myotis mystacinus-group (Mammalia: Chiroptera, Vespertilionidae). *Trudy Zoologičeskogo Instituta* **286**: 163–168.
Tsytsulina K. & Strelkov P. P. 2001: Taxonomy of the Myotis frater species group (Vespertilionidae, Chiroptera). *Bonner Zoologische Beiträge* **50**: 15–26.
Vereŝagin N. K. 1959: *Млекопитающие Кавказа*. *История формирования фауны* [*Mammals of the Caucasus*. *History of Forming of the Fauna*]. Moskva & Leningrad: Izdatel'stvo Akademii nauk SSSR, 704 pp (in Russian).
Vinogradov B. S. & Stal'makova V. A. 1938: О скоплении остатков животных в нефтяных лужах [On the accumulation of animal remains in oil pools]. *Priroda* [Moskva] **1938**(5): 104–106 (in Russian; non vidi, ex Strelkov et al. 1978).
Wilson D. E. 2008: Order Chiroptera – Bats. Pp.: 327–387. In: Smith A. T. & Xie Y. (eds.): *A Guide to the Mammals of China*. Princeton & Oxford: Princeton Univeristy Press, xxvi+544 pp.
Zhang Y., Jin S., Quan G., Li S., Ye Z., Wang F. & Zhang M. 1997: *Distribution of Mammalian Species in China*. Beijing: China Forestry Publishing House, xii+281 pp (in Chinese and English).
Zhang J.-S., Han N.-J., Jones G., Lin L.-K., Zhang J.-P., Zhu G.-J., Huang D.-W. & Zhang S.-Y. 2007: A new species of Barbastella (Chiroptera: Vespertilionidae) from North China. *Journal of Mammalogy* **88**: 1393–1403.
Zima J. 2004: Karyotypic variation in mammals of the Balkan Peninsula. Pp.: 109–133. In: Griffiths H. I., Kryštufek B. & Reed J. M. (eds.): *Balkan Biodiversity*. *Pattern and Process in the European Hotspot*. Dordrecht: Kluwer Academic Press, 357 pp.
Zima J., Červený J. & Horáček I. 1989: Karyotypes of Eptesicus bottae and some other vespertilionid bat species from Soviet Central Asia. Pp.: 105–110. In: Hanák V., Horáček I. & Gaisler J. (eds.): *European Bat Research 1987*. Praha: Charles University Press, 720 pp.
Zima J., Červený J., Horáček I., Červená A., Průcha K., Macholán M. & Rybin S. N. 1991: Standard karyology of eighteen species of bats (Rhinolophidae, Vespertilionidae, Molossidae) from Eurasia. *Myotis* **29**: 31–33.
Zima J., Volleth M., Horáček I., Červený J., Červená A., Průcha K. & Macholán M. 1992a: Comparative karyology of rhinolophid bats (Chiroptera: Rhinolophidae). Pp.: 229–236. In: Horáček I. & Vohralík V. (eds.): *Prague Studies in Mammalogy*. Praha: Charles University Press, 246 pp.
Zima J., Volleth M., Horáček I., Červený J. & Macholán M. 1992b: Karyotypes of two species of bats, Otonycteris hemprichi and Pipistrellus tramatus (Chiroptera, Vespertilionidae). Pp.: 237–242. In: Horáček I. & Vohralík V. (eds.): *Prague Studies in Mammalogy*. Praha: Charles University Press, 246 pp.

APPENDIX I

Gazetteer

current site name	former site name†	No.*	province	coordinates	altitude [m a. s. l]
Armenia					
Erewan	Ереван	1	Erewan	40° 11’ N, 44° 31’ E	1032
Iǰewan	Иджеван	2	Tavowš	40° 53’ N, 45° 09’ E	755
Karbi	Карби	3	Aragaçotn	40° 20’ N, 44° 23’ E	1287
Oġǰi	Охчогли	4	Širak	40° 49’ N, 43° 45’ E	1614
Šorža	Шоржа	5	Gēġark’ownik’	40° 30’ N, 45° 16’ E	1896
Vaġaršapat	Эчмиадзин	6	Armavir	40° 10’ N, 45° 21’ E	867
Vedi	Веди	7	Ararat	39° 55’ N, 44° 44’ E	932
Azerbaijan					
Acınohur	Аджиноур	8	Şəki	40° 58’ N, 47° 00’ E	110
Ağdam	Агдам	9	Ağdam	39° 33’ N, 46° 57’ E	1236
Bakı	Баку	10	Bakı	40° 24’ N, 49° 53’ E	5
Boyuk Taglar	Таглар	11	Xocavənd	39° 37’ N, 46° 57’ E	819
Göyçay river valley	Геокчай	12	İsmayıllı	40° 58’ N, 48° 13’ E	1460
Kür and Tərtər confluence	Кура & Тертер	13	Bərdə	40° 24’ N, 47° 20’ E	10
Mingəçevir	Мингечаур	14	Mingəçevir	40° 46’ N, 47° 03’ E	25
Nağaraxana	Кировка	15	Şamaxı	40° 44’ N, 48° 38’ E	1237
Niyazoba	Низовая	16	Xaçmaz	41° 31’ N, 48° 55’ E	–23
Ordubad	Ордубад	17	Ordubad	38° 54’ N, 46° 02’ E	906
Qəbələ	Куткашен	18	Qəbələ	40° 59’ N, 47° 51’ E	788
Qobustan	Гобустан	19	Bakı	40° 05’ N, 49° 25’ E	–27
Şamaxı	Шемаха	20	Şamaxı	40° 38’ N, 48° 38’ E	618
Şəki	Шеки	21	Şəki	41° 12’ N, 47° 10’ E	545
Suçma	Сучма	22	Şəki	40° 57’ N, 47° 08’ E	223
Tuğ	Туг	23	Xocavənd	39° 35’ N, 46° 58’ E	742
Xaçmaz	Хачмас	24	Xaçmaz	41° 28’ N, 48° 49’ E	37
Zaqatala	Закаталы	25	Zaqatala	41° 38’ N, 46° 39’ E	518
Georgia					
Džal	Джали	26	Očamčire	42° 50’ N, 41° 31’ E	77
Gumist’a	Гумиста	27	Sohumi	43° 02’ N, 40° 58’ E	90
Mcheta	Мцхета	28	Mcheta-Mtianeti	41° 51’ N, 44° 43’ E	445
Varžia	Вардзия	29	Asp’inža	41° 23’ N, 43° 17’ E	1325
Russia					
Macesta	Мацеста	30	Soči	43° 34’ N, 39° 48’ E	190
Kazakhstan					
Almaty	Алма-Ата	31	Almaty	43° 15’ N, 76° 57’ E	861
Grodikovo	Гродиково	32	Taraz	42° 50’ N, 71° 30’ E	663
Taraz	Джамбул	33	Taraz	42° 54’ N, 71° 22’ E	610
Kirghizstan					
Ala-Arča NP	Ала-Арча	34	Alamudun	42° 34’ N, 74° 29’ E	2172
Aravan	Араван	35	Aravan	40° 31’ N, 72° 30’ E	765
Biškek	Фрунзе	36	Biškek	42° 52’ N, 74° 36’ E	771
Čauvaj	Чаувай	37	Nookat	40° 08’ N, 73° 07’ E	1220
Hajdarkan	Хайдаркан	38	Kadamžaj	39° 54’ N, 71° 24’ E	2390
Kadamžaj	Фрунзенское	39	Kadamžaj	40° 08’ N, 71° 41’ E	1240
Kara-Kokty	Кара-Кокту	40	Nookat	40° 21’ N, 72° 37’ E	1104
Kyzyl-Kiâk	Кызылкияк	41	Batken	39° 57’ N, 71° 05’ E	1220
Samarkandyk	Самаркандык	42	Batken	40° 00’ N, 70° 27’ E	1270
Oš, city	Ош	43	Oš	40° 32’ N, 72° 48’ E	981

current site name	former site name†	No.*	province	coordinates	altitude [m a. s. l]
Oš, Bir-Uâ cave	Ош, Бир-Уя	44	Kara-Suu	40° 25’ N, 72° 38’ E	960
Toâ-Moûn	Тюя-Муюн	45	Nookat	40° 21’ N, 72° 37’ E	1200
Uzgen	Узген	46	Uzgen	40° 46’ N, 72° 18’ E	1225
Žijdelik	Фрунзе	47	Kadamžaj	40° 06’ N, 71° 43’ E	1087
Tajikistan					
Čarku	Чорку	48	Isfara	39° 58’ N, 70° 34’ E	1110
Dušanbe	Душанбе	49	Dušanbe	38° 34’ N, 68° 46’ E	789
Dusti	Дусти	50	Qumsangir	37° 21’ N, 68° 40’ E	377
Turkmenistan					
Aşgabat	Ашхабад	51	Ruhabat	37° 57’ N, 58° 23’ E	215
Baharly	Бахарден	52	Baharly	38° 26’ N, 57° 26’ E	154
Esenguly	Гасан-Кули	53	Esenguly	37° 28’ N, 53° 58’ E	–22
Germab	Гермаб	54	Gökdepe	38° 01’ N, 57° 45’ E	771
Repetek	Репетек	55	Sarderabat	38° 34’ N, 63° 11’ E	181
Uzbekistan					
Aman-Kutan	Аманкутан	56	Urgut	39° 19’ N, 66° 56’ E	1533
Džum-Džum	Джум-Джум	57	Bahmal	39° 40’ N, 67° 57’ E	750
Farg’ona	Фергана	58	Farg’ona	40° 24’ N, 71° 47’ E	574
Samarqand	Самарканд	59	Samarqand	39° 39’ N, 66° 58’ E	702
Toškent	Ташкент	60	Toškent	41° 19’ N, 69° 15’ E	459

†names used in the period of Soviet rule in Transcaucasia and West Turkestan
*numbers correspond with numbers in Figs. 1, 2

APPENDIX II
List of the comparative material examined

Rhinolophus hipposideros (Borkhausen, 1797)

Algeria: 1 m (ISEA 9586 [S+B]), 20 km NW of Sebdou, 6 November 1981, leg. K. Kowalski & B. Rzebik-Kowalska; – 2 m (ISEA 9584, 9585 [S+B]), Brezina, cave, 31 October 1981, leg. K. Kowalski & B. Rzebik-Kowalska; – 1 m (IVB A204 [S+B]), Gorges de Kherrata, tunnel, 15 January 1982, leg. J. Gaisler; – 1 m (ISEA 9587 [S+B]), Misserghin, 14 December 1982, leg. K. Kowalski & B. Rzebik-Kowalska; – 1 m, 1 f (ISEA 9588, 9664 [S+B]), Sig, 4 and 25 January 1983, leg. K. Kowalski & B. Rzebik-Kowalska; – 1 m (IVB A237 [S+B]), Sebdou, 1 May 1982, leg. J. Gaisler. – **Bulgaria**: 2 m (NMP 49788, 49789 [S+A]), Âgodina, Gorna Karanska dupka Cave, 16 August 1978, leg. P. Donát, J. Flegr, J. Janda & V. Vohralík; – 5 m, 1 f (NMP 49780–49786 [S+A]), Âgodina, Imamova dupka Cave, 15 August 1978, leg. P. Donát, J. Flegr, J. Janda & V. Vohralík; – 1 f (NMP 49807 [S+A]), Bačkovo, cave, 30 July 1979, leg. D. Holečková, P. Donát, I. Horáček, J. Jirouš & V. Vohralík; – 2 m (NMP 49434, 49435 [S+A]), Bačkovo, Bačkovski Monastery, 14 July 1976, leg. M. Braniš, V. Hanák, I. Horáček, K. Hůrka, J. Jirouš, V. Švihla & V. Vohralík; – 1 f (NMNHS unnumbered [S]), Borovo, 19 March 1968, leg. P. Beron; – 2 m, 3 f (NMP 50091–50095 [S+B]), Brestnica, Saeva dupka Cave, 8 February 1965, leg. J. Figala, J. Gaisler, V. Hanák & K. Hůrka; – 1 m (NMP 49433 [S+A]), Čepelare, 13 July 1976, leg. M. Braniš, V. Hanák, I. Horáček, K. Hůrka, J. Jirouš, V. Švihla & V. Vohralík; – 1 m (NMNHS unnumbered [S]), Filipovci, 27 February 1967, leg. P. Beron; – 1 ind. (NMNHS unnumbered [S]), Ginci, Tošova dupka Cave, 17 February 1968, leg. P. Beron; – 5 f (NMP 50027–50031 [S+A]), Gorna Breznica, 24 July 1981, leg. J. Flousek, R. Fuchs & V. Vohralík; – 2 m, 1 f (NMP 49354, 49758, 49777 [S+A]), Karlukovo, 5 July 1976, 8 and 9 August 1978, leg. M. Braniš, P. Donát, J. Flegr, V. Hanák, I. Horáček, K. Hůrka, J. Janda, J. Jirouš, V. Švihla & V. Vohralík; – 1 m (NMP 50080 [S+B]), Karlukovo, Bankova peŝera Cave, 7 February 1965, leg. J. Figala, J. Gaisler, V. Hanák & K. Hůrka; – 1 m (NMP 49753 [S+A]), Karlukovo, Temnata dupka Cave, 7 August 1978, leg. P. Donát, J. Flegr, J. Janda & V. Vohralík; – 5 m (NMP 49793–49797 [S+A]), Kotel, 15 July 1979, leg. D. Holečková, P. Donát, I. Horáček, J. Jirouš & V. Vohralík; – 1 ind. (NMNHS N12 [S]), Kričim, leg. I. Bureš; – 2 m (NMP 50136, 50137 [S+B]), Lakatnik, Svinskata peŝera Cave, 19 March 1956, collector unlisted; – 1 ind. (NMP 49813 [S+B]), Lakatnik, Temnata dupka Cave, 3 January 1962, leg. J. Sklenář; – 1 m, 4 f (NMP 49368–49372 [S+A], Lilânovo, 9 July 1976, leg. M. Braniš, V. Hanák, I. Horáček, K. Hůrka, J. Jirouš, V. Švihla & V. Vohralík; – 5 m, 2 f (NMP 49997–50003 [S+A]), Orehovo, 30 August 1980, leg. D. Holečková, J. Jirouš, H. Prág-

nerová & V. Vohralík; – 1 f (RMHR 739 [S]), Pepelina, Orlova čuka Cave, February 1961, leg. I. Ivanov; – 1 f (IVB 398 [S+B]), Pešera, Lilova skala Cave, 3 February 1965, leg. J. Figala, J. Gaisler, V. Hanák & K. Hůrka; – 1 m (NMP 50072 [S+B]), Pešera, Nova pešera Cave, 4 February 1965, leg. J. Figala, J. Gaisler, V. Hanák & K. Hůrka; – 1 m (NMP 50076 [S+B]), Pešera, Snežânka Cave, 5 February 1965, leg. J. Figala, J. Gaisler, V. Hanák & K. Hůrka; – 1 f (NMP 49347 [S+B]), Ropotamo, 6 June 1957, leg. V. Hanák; – 2 m (NMNHS N63, unnumbered [S]), Studen Kladenec, mine, 3 May 1996, leg. T. Ivanova; – 1 m (NMNHS unnumbered [S]), Treklâno, date & collector unlisted; – 3 m, 1 f (NMNHS unnumbered [S]), Urvič, 8 April 1971, leg. V. Beškov. – **Cyprus**: 2 f (MSNG 44488 [A]), Akantu, 12 January 1899, leg. Cecconi; – 2 m (NMP 90424, 91269 [S+A]), 4 km SE Cinarli, Inçirli Cave, 6 and 17 April 2005, leg. P. Benda, V. Hanák, I. Horáček, P. Hulva & R. Lučan; – 4 m, 2 f (NMP 90924–90928 [S+A], 90923 [A]), Troodos Forest, valley N of Kakopetria, mine, 27 July 2006, leg. P. Benda; – 1 f (MSNG 45691 [A]), Cipro (= Cyprus, undef.), date & collector unlisted. – **Czech Republic**: 1 f (NMP 343/64 [S]), Jílové u Prahy, 30 October 1964, leg. V. Hanák; – 1 m (NMP E7 [S]), Karlštejn, mine, 15 February 1957, leg. V. Hanák; – 2 m, 1 f (NMP 341/58, 347/58, 348/58 [S]), Mníšek pod Brdy, 8 March 1958, leg. J. Sklenář; – 1 m (NMP ZN17 [S]), Vranov nad Dyjí, castle attic, 31 July 1957, leg. V. Hanák; – 1 m, 1 ind. (NMP ZB11, ZB12 [S]), Zbraslav, 1 December 1956, leg. V. Hanák; – 2 f (NMP ZN26, ZN27 [S]), Znojmo, castle attic, 3 August 1957, leg. V. Hanák. – **Greece**: 1 m, 6 f (NMP 48710–48715, 49028 [S+A]), Kombotades, bunker, 9 and 10 September 1996, 31 August 2001, leg. M. Andreas, P. Benda & M. Uhrin; – 1 f (NMP 48643 [S+B]), 3 km SW of Maronia, Cave of the Cyclops Polyphemos, 19 June 1989, leg. R. Chaloupka, V. Hanák & V. Vohralík. – **Iran**: 3 m (NMP 48096, 48097, 48439 [S+A]), Emamzadeh, 15 km W of Kashan, 1 May 1997 & 6 April 2000, leg. P. Benda & A. Reiter; – 1 f (BMNH 94.11.16.1. [S], holotype specimen of *Rhinolophus midas* Andersen, 1905), Jask, Persian Gulf, date & collector unlisted; – 1 f (NMP 48117 [S+A]), 15 km SW of Nosrat Abad, 7 May 1997, leg. P. Benda; – 1 ind. (NMP 93853 [S+Sk]), Moghan, Moghan Cave, 30 km SW Mashhad, September 1999, leg. K. Faizolahi & M. Tarahomi. – **Jordan**: 1 ind. (NMP 92842 [S+Sk]), Bait Idis, Jesus' Cave, 15 July 2010, leg. P. Benda & A. Reiter; – 2 f (NMP 92409, 92410 [S+A]), Dibbin, Dibbin Forest, 27 October 2008, leg. P. Benda & J. Obuch; – 1 m, 2 f (NMP 92508–92510 [S+A]), Zubiya, Zubiya Cave, 24 May 2009, leg. P. Benda & A. Reiter. – **Lebanon**: 3 m (NMP 91806, 93709 [S+A], 91807 [A]), Aamchit, Saleh Cave, 28 January 2007, 25 March 2009, leg. T. Bartonička, P. Benda, R. Černý, I. Horáček & R. Lučan; – 1 m, 1 f (NMP 93552 [S+A], 93553 [A]), Aanjar, Cellis Cave, 5 June 2010, leg. P. Benda & M. Uhrin; – 1 m (NMP 91782 [S+A]), Afqa, Afqa Cave, 17 January 2008, leg. P. Benda, I. Horáček, R. Lučan & M. Uhrin; – 1 m (NMP 91798 [S+A]), Antelias, Kenaan Cave, 25 January 2007, leg. P. Benda, R. Černý, I. Horáček & R. Lučan; – 1 m, 1 f (NMP 91789, 91790 [S+A]), Bcharre, Qadicha Cave, 23 January 2007, P. Benda, R. Černý, I. Horáček & R. Lučan; – 1 m (AUB M-170 [V-6059] [B]), Beit el Dine, tunnel under a house, 7 September 1960, leg. J. Stencel; – 1 f (NMP 93711 [A]), Dahr el Mghara, Aaonamie Cave, 28 March 2009, leg. T. Bartonička, P. Benda, I. Horáček & R. Lučan; – 1 m (NMP 91775 [S+A]), El Aaqoura, Er Rouais Cave, 22 January 2007, leg. P. Benda, R. Černý, I. Horáček & R. Lučan; – 2 m (NMP 93537, 93538 [S+A]), Faraya El Mzar, Grotte Raymond, 2 July 2010, leg. P. Benda & M. Uhrin; – 1 ms (NMP 91801 [A]), Faraya, El Qana Cave, 27 January 2007, leg. P. Benda, R. Černý, I. Horáček & R. Lučan; – 2 m (NMP 91906 [S+A], 91802 [A]), Faraya, Seraaya Cave, 27 January 2007, 20 January 2008, leg. P. Benda, R. Černý, I. Horáček, R. Lučan & M. Uhrin; – 1 m, 1 f (NMP 91770 [S+A], 91769 [A]), Haqel El Aazime, Achou Cave, 21 January 2007, leg. P. Benda, R. Černý, I. Horáček & R. Lučan; – 1 f (NMP LE36 [S+A]), Jezzine, Pont El Khalass, 23 June 2006, leg. I. Horáček, P. Hulva, R. Lučan & P. Němec; – 3 m, 1 f (NMP 91753–91755 [S+A], 91756 [A]), Marjaba, mines, 19 January 2007, leg. P. Benda, R. Černý, I. Horáček & R. Lučan; – 1 m (NMP 91809 [S+A]), Nabaa Es Safa, mines, 29 January 2007, leg. P. Benda, R. Černý, I. Horáček & R. Lučan; – 1 f (NMP 93706 [S+A]), Ouadi Jilo, cave in quarry, 22 March 2009, leg. T. Bartonička, P. Benda, I. Horáček & R. Lučan; – 1 f (NMP 93577 [S+A]), Seraal, Qadicha Valley, 10 June 2010, leg. P. Benda & M. Uhrin; – 1 m (NMP 91786 [S+A]), Tourzaiya, Grotto Maba'aj, 23 January 2007, leg. P. Benda, R. Černý, I. Horáček & R. Lučan. – **Morocco**: 1 f (NMP pb4775 [S+A]), Gorges du Dadès, 5 km NE of Ait-Ali, 7 October 2010, leg. P. Benda, A. Reiter, M. Ševčík & M. Uhrin; – 1 ind. (BMNH 10.11.24.2. [S], holotype specimen of *Rhinolophus hipposideros escalerae* Andersen, 1918), Mogador, date & collector unlisted; – 2 f (NMP pb3921, 3922 [S+A]), Takoumit, 26 April 2008, leg. P. Benda, J. Červený, A. Konečný & P. Vallo. – **Slovakia**: 6 m (NMP 118/58, 121/58–123/58, 125/58, 130/58 [S]), Ardovo, Ardovská Cave, 5 February 1958, leg. V. Hanák; – 1 m, 1 f (NMP 101/58, 102/58 [S]), Domica, Čertova diera Cave, 5 February 1958, leg. V. Hanák; – 1 m, 2 f (NMP J185–J187 [S]), Kečovo, mine, 10 December 1956, leg. V. Hanák; – 5 m, 1 f (NMP 109/58–114/58 [S]), Domica, Liščia diera Cave, 5 February 1958, leg. V. Hanák; – 5 m, 1 f (NMP J209–J213, J215 [S]), Gombasek, Ludmila Cave, 11 December 1956, leg. V. Hanák. – **Syria**: 1 f (NMP 48054 [S+A]), Qala'at Al Hosn, 28 June 1998, leg. M. Andreas, P. Benda & M. Uhrin; – 1 f (NMP 48979 [S+A]), Qanawat, 27 April 2001, leg. P. Munclinger & P. Nová. – **Turkey**: 1 f (CUP T93/63 [S+A]), Narlikuyu, 29 October 1993, leg. P. Benda & I. Horáček; – 2 f (NMP 90488, 90489 [S+A]), Posyağbasan, 15 June 2003, leg. J. Hájek & J. Hotový; – 1 m (MSNG 44534 [A]), Smyrne (= Izmir), 1870, leg. G. Gonzenbach; – 1 m, 2 f (CUP T93/65, T93/67, T93/68 [S+A]), Yalan Dünya Mağara Cave, 30 October 1993, leg. P. Benda & I. Horáček. – **Ukraine**: 1 f (NMP pb4360 [S+A]), General'skoe, 18 September 2009, leg. P. Benda, S. Gazarân & M. Uhrin; – 2 f (NMP pb4287, 4289 [S+A]), Kujbyševo, 12 September 2009, leg. P. Benda, S. Gazarân & M. Uhrin; – 1 f (NMP pb4342 [S+A]), Partizanskoe, 16 September 2009, leg. P. Benda, S. Gazarân & M. Uhrin.

Myotis blythii (Tomes, 1857)

Afghanistan: 1 f (ZFMK 97.138 [S]), cave above Maindar Valley, 2700 m, 20 km E of Unai-Pass, 30 April 1965, leg. J. Niethammer; – 1 m (MHNG 952.98 [S+A]), Finidjal, W of Kabul, 29 July 1957, leg. K. Lindberg; – 2 inds. (MHNG 974.7, 974.8 [S+Sk]), Maimaneh, Grotte Zarmast, 5 July 1959, leg. K. Lindberg; – 1 ind. (MHNG 953.2 [S]), Qalat, Grotte Boulan, 9 April 1958, leg. K. Lindberg. – **China**: 1 m (ZIN 2146 [S]), Alašan' (= Alšaan uulz), ca. 300 km NE of the Kuku-Nor (= Qinghai) Lake, 18 September 1880, leg. N. Prževalskij; – 3 m, 1 f (BMNH 10.5.2.4. [S+B], 10.5.2.5–10.5.2.7. [S], incl. holotype specimen of *Myotis myotis ancilla* Thomas, 1910), Shang-chou (= Shangluo) Dist., SE Shensi (= Shaanxi), 27 November 1909, leg. I. Anderson; – 2 m (ZIN 5191, 5192 [S]), Tundza-indzi, S slope of the Bol'šoj Hingan (= Greater Khingan) range, nr. the Dalai-Nor Lake, July 1891, leg. Putâta. – **India**: 1 m (BMNH 71.14 [S+A]), Bahmajo Bat Cave, 6 miles from Achabal, Kashmir, 5,700 ft, leg. G. LePatourel; – 1 m (BMNH 20.4.24.1. [S]), Balna, W Kumaon, date unlisted, leg. H. L. Tyter; – 1 f (ZFMK 97.137 [S]), Srinagar, Kashmir, August 1962, leg. E. Kollmann; – 1 ind. (BMNH 49.8.16.22. [S+B], holotype specimen of *Vespertilio blythii* Tomes, 1857), Nurshabad, date unlisted, leg. Warwick; – 1 ind. (BMNH 13.10.16.1. [S+A]), Swinla/Simla Dist. (?), date unlisted, leg. P. Dodsworth. – **Iran**: 9 inds. (JOC unnumbered [S+Sk]), Abshahr, 3 May 1996, leg. J. Obuch; – 1 m (NMP 90799 [S+A]), 5 km W of Amir Abad, 21 May 2006, leg. P. Benda & A. Reiter; – 2 m, 12 f (ZIN 11227, 11234, 11257, 11275, 11276, 11292, 11294, 11307–11310, 11316, 11325, 11326 [S+A]), Astrabad (= Gorgan), April–June 1914, leg. Kiričenko; – 2 f (NMP 90777 [S+A], 90778 [A]), 7 km E of Bazangan, 17 May 2006, leg. P. Benda & A. Reiter; – 10 m (NMP 48353–48362 [S+A]), Deh Bakri, 7 April 2000, leg. J. Obuch & A. Reiter; – 1 m (BMNH 5.10.4.14. [S+B], holotype specimen of *Myotis myotis omari* Thomas, 1906), Darband, 6500 ft, 60 mi. W of Isfahan, 14 May 1905, leg. R. Woosnam; – 4 f (NMP 48459–48462 [S+A]), Firuz Abad, 21 April 2000, leg. P. Benda & A. Reiter; – 1 m (NMP 90775 [S+A]), 2 km S of Karizbalagh, 17 May 2006, leg. P. Benda & A. Reiter; – 5 m, 2 f (NMP 90848, 90850, 90852–90854 [S+A], 90849, 90851 [A]), Korud Abad, 2 km SE of Ali Abad, 28 May 2006, leg. P. Benda & A. Reiter; – 4 inds. (HSC MOZ 1–4 [S]), Mazduran, 17 August 1968, leg. H. M. Steiner; – 1 m, 11 f (NMP 90815–90823 [S+A], 90812–90814 [A]), 5 km S of Mina, 22 May 2006, leg. P. Benda & A. Reiter; – 1 m (BMNH 20.2.9.18. [S+B], holotype specimen of *Myotis myotis risorius* Cheesman, 1921), Shiraz, date unlisted, leg. J. E. B. Hotson; – 9 m, 1 f (NMP 48131–48137, 48142–48144 [S+A]), Tahkt-e Suleiman, 3 October 1998, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin. – **Jordan**: 1 m, 3 f (NMP 92528–92530, 92836 [S+A]), Khashibah, Al Wardeh Cave, 26 May 2009, 14 July 2010, leg. P. Benda, J. Obuch & A. Reiter; – 3 m, 3 f (NMP 92544–92546, 92548, 92549 [S+A], 92547 [A]), Kufranja, Iraq al Wahaj Cave, 26 May 2009, leg. P. Benda, J. Obuch & A. Reiter. – **Kazakhstan**: 12 f (ZIN 69175–69186 [S]), Andreevka (= Kabanbaj), 18 June 1982, leg. P. P. Strelkov. – **Kirghizstan**: 1 f (CUP CT 84/254 [S+A]), Aravan, Čarvak, cave, 20 August 1984, leg. J. Červený & I. Horáček; – 1 m (CUP CT 84/255 [S+A]), Aravan, Duvahan-Ungur Cave, 21 August 1984, leg. J. Červený & I. Horáček; – 2 m, 1 f (CUP CT 84/279–281 [S+A]), Aravan, Sasyk-Ungur Cave (Fig. 20), 24 August 1984, leg. J. Červený & I. Horáček; – 9 m, 5 f (CUP CT 84/361–374 [S+A]), Nižnaâ Serafimovka, Solânka Cave, 29 August 1984, leg. J. Červený & I. Horáček; – 1 m (CUP CT 84/324 [S+A]), Oš, Sulejman, 26 August 1984, leg. J. Červený & I. Horáček; – 9 m (CUP CT 84/67–69, CT 84/116–118, CT 84/246–248 [S+A]), Oš, Toâ-Moûn, mine, 2, 6 and 19 August 1984, leg. J. Červený & I. Horáček; – 27 m, 30 f (CUP CT 84/97–112, CT 84/129–162, CT 84/164–169 [S+A]), Oš, Toâ-Moûn, Ažidar-Ungur Cave, 5 and 8 August 1984, leg. J. Červený & I. Horáček; – 8 f, 7 f (CUP CT 84/205–219 [S+A]), Oš, Toâ-Moûn, Barytovaâ Cave, 9 August 1984, leg. J. Červený & I. Horáček; – 1 f (CUP CT 84/233 [S+A]), Sujčikty, Kara-Goj, cave, 3000 m, 14 August 1984, leg. J. Červený & I. Horáček. – **Lebanon**: 1 f (NMP LE6 [S+A]), Aalmane, Nahr El Litani valley, 21 June 2006, leg. I. Horáček, P. Hulva, R. Lučan & P. Němec; – 1 f (NMP 93695 [S+A]), Aarsal, Chmiss El Emjar, 18 March 2009, leg. T. Bartonička, P. Benda, I. Horáček & R. Lučan; – 1 m (NMP 90898, LE112 [S+A]), Afqa, Afqa Cave, 26 June & 15 July 2006, leg. P. Benda, I. Horáček, P. Hulva, R. Lučan & P. Němec; – 1 m, 1 f (NMP 93557, 93707 [S+A]), Arnoun, Beaufort Castle ruins, 22 March 2009, 6 June 2010, leg. T. Bartonička, P. Benda, I. Horáček, R. Lučan & M. Uhrin; – 1 m (NMP 91797 [S+A]), Baalbek, ruins, 25 January 2007, leg. P. Benda, R. Černý, I. Horáček & R. Lučan; – 2 f (NMP LE243, LE244 [S+A]), El Laboue, 7 July 2006, leg. I. Horáček, P. Hulva, R. Lučan & P. Němec; – 2 m, 4 f (NMP 91762–94764, 93539 [S+A], 91760, 91761 [A]), Faraya El Mzar, Grotte Raymond, 20 January 2007, 2 June 2010, leg. P. Benda, R. Černý, I. Horáček, R. Lučan & M. Uhrin; – 1 m, 1 f (AUB M174, M176 [S+B]), Faraya, Natural Bridge, 21 and 29 July 1960, leg. R. E. Lewis; – 2 m (NMP 93569 [S+A], 93570 [A]), Jenta, mine, 8 June 2010, leg. P. Benda & M. Uhrin; – 1 m (NMP 91907 [S+A]), Marjaba, mine, 21 January 2008, leg. P. Benda, I. Horáček, R. Lučan & M. Uhrin. – **Russia**: 21 f (ZIN 45654, 45656–45661, 45663–45666 [S+B], 45653, 45673, 45676–45679, 45681, 45683, 45684, 45691 [S], incl. the type series of *Myotis blythii altaicus* Dzeverin et Strelkov, 2008), Ust'-Čagyrka, cave at the Čariš River, Čariš Dist., Altai Region, 30 July 1961, leg. P. P. Strelkov. – **Syria**: 1 m, 7 f (NMW 22048–22055 [S+A]), Aleppo (= Halab), 4 July 1914, leg. V. Pietschmann, Armenien-Expedition 1914; – 1 f (NMW 21931 [S+B]), Camp Faouar, June 1976, leg. P. Schneider & K. Kollnberger; – 1 f (MNHN 1983-1484 [A]), Djéroud (= Jeiroud), 1908, leg. H. Gadeau de Kerville; – 2 f (MNHN 1876-335A, 335B [A]), Lattaquié (= Al Lathiqiyeh), date unlisted, leg. M. Deyrolle; – 4 m, 1 f (NMP 47976–47978, 48057, 48874 [S+A]), Qala'at al Hosn, 15 July 1997, 28 June 1998, 29 May 2001, leg. M. Andreas, P. Benda, A. Reiter, M. Uhrin & D. Weinfurtová; – 1 m (NMP 48917 [S+A]), Qala'at al Marqab, 1 June 2001, leg. M. Andreas, A. Reiter & D. Weinfurtová; – 1 m (NMP 48271 [S+A]), Qala'at Nimrod, 18 July 1999, leg. P. Benda; – 2 m, 1 f (BMNH 61.388,

61.389 [S+B], 61.390 [S]), Tall Kalakh, dungeon of Krak des Chevaliers (= Qala'at al Hosn, ruins of Krak des Chevaliers), 8 December 1952, leg. D. Potter. – **Tajikistan**: 1 ind. (ZIN 32277 [S]), Kulâb, July 1941/1943, leg. B. Vinogradov & S. Stroganov; – 1 m (ZIN 24389 [S]), N slope of the Tissarskij Range, kišlak Kzyl-Tam, 18 July 1933, leg. Vel'gišev. – **Turkey**: 2 inds. (HSC CAM 1, 6 [S]), Çamlimağara Cave, 10 September 1969, leg. H. M. Steiner; – 1 m (NMP 47903 [S+A]), Muradiye, 27 July 1992, leg. P. Benda; – 5 m, 2 f (HSC 67/261–267 [S+A]), Tuzluca, 14 September 1967, leg. H. M. Steiner; – 4 m (NMP 47905–47908 [S+A]), Van, 28 July 1992, leg. P. Benda; – 1 m (NMP 90421 [S+A]), Elaman Hani nr. Tatvan, 30 June 2003, leg. J. Hájek & J. Hotový. – **Turkmenistan**: 7 f (ZIN 63915–63921 [S]), E Kopetdagh, 18 km S of the Duşak Station, Kelat Cave, 20 May 1967, leg. K. Babaev; – 2 inds. (ZIN 48479, 48480 [S]), Tahta-Bazar (= Tagtabazar), Murgab Valley, 25 June 1930, leg. K. Flerov.

Nyctalus noctula (Schreber, 1774)

Bulgaria: 1 m, 1 f (NMP 50148, 50149 [S]), Albena, 14 October 1965, leg. P. Beron; – 1 ind. (NMNHS unnumbered [S]), Dragalevci nr. Sofia, 7 August 1964, leg. P. Beron; – 4 m, 1 f (NMP 49366, 49739–49741, 49768 [S+A]), Karlukovo, 6 July 1976, 9 August 1978, leg. M. Braniš, P. Donát, J. Flegr, V. Hanák, I. Horáček, K. Hůrka, J. Janda, J. Jirouš, V. Švihla & V. Vohralík; – 1 ind. (IVB 9 [S]), Karlukovo, Troevratica Cave, 2 October 1962, leg. J. Gaisler; – 2 m (NMP 49639, 49746 [S+A]), Karlukovo, Prohodna Cave, 13 June 1977, 7 August 1978, leg. V. Bejček, P. Donát, J. Flegr, J. Janda, J. Škopek, P. Vašák & V. Vohralík; – 1 m (NMP 49348 [S+B]), Petrič, 19 June 1957, leg. V. Hanák; – 1 f (NMNHS unnumbered [S]), Bulgaria (undef.), 7 August 1969, collector unlisted. – **Czech Republic**: 1 f (NMP 482/59 [S]), Břve, tree hollow, 1 May 1959, leg. P. Miles; – 1 f (NMP 657/58 [S]), Číměř, Krvavý Fishpond, 2 August 1958, leg. V. Hanák; – 1 f (NMP 148/65 [S]), Horusice, Kvíčadlo Fishpond, 1 May 1965, leg. V. Hanák; – 10 m, 2 inds. (NMP 29–35/74, 25/76, 28/76, 29/74, 8/77, 13/77 [S]), Horusice, Ruda Forestry, 9 and 12 October 1974, 30 September 1976, 24 August 1977, leg. V. Hanák; – 1 f (NMP 853/58 [S]), Jindřichův Hradec, Kacležský Fishpond, 1 October 1958, leg. B. Král; – 3 m, 4 f, 1 ind. (NMP 810/58, 811/58, 813/58, 814/58, 506/59, 739/59, 740/59, E122 [S]), Klec, Potěšil Fishpond, 13 May 1957, 15 September 1958, 24 May and 4 July 1959, leg. V. Hanák; – 1 f (NMP 49/75 [S]), Kolešovice u Rakovníka, 3 April 1975, ded. V. Hanák; – 1 m, 1 f (NMP D17, D18 [S]), Lomnice nad Lužnicí, Velký Tisý Fishpond, 5 October 1956, leg. V. Hanák; – 3 inds. (NMP unnumbered [S]), Praha-Nové Město, Emauzy Monastery, date unlisted, leg. V. Hanák; – 8 m (NMP 33/68, 36/68, 14/70, 9/72, 18–21/78 [S]), Praha-Záběhlice, 17 April 1968, 24 February 1970, 12 September 1972, 30 January 1978, leg. V. Hanák; – 1 m (NMP 37/74 [S]), Srbsko, 19 November 1974, leg. V. Bejček; – 1 m (NMP 469/58 [S]), Stará Hlína u Třeboně, 27 October 1958, leg. V. Hanák; – 1 m, 1 f (NMP P9, B58 [S]), Tchořovice, Velký Pálenec Fishpond, 3 October 1955, 5 June 1956, leg. V. Hanák. – **Germany**: 1 m (ZFMK 35.240 [S+B]), Augsburg, 6 March 1924, leg. A. Fischer; – 1 ind. (ZFMK 82.239 [S+Sk]), Hambacher Forst nr. Köln/Tagebau, 6 June 1982, collector unlisted; – 1 ind. (ZFMK 35.241 [S+B]), Lohr am Mein, 21 March 1924, leg. A. Fischer; – 1 f (ZFMK 46.294 [S+B]), Möggingen nr. Radolfzell, Bodensee, 14 January 1946, leg. Freiherr von Bodmann; – 1 m (ZFMK 54.9 [S+B]), Pleisse/Wald nr. Leipzig, 22 January 1952, collector unlisted; – 1 f (ZFMK 37.130 [S+B]), Reipzig nr. Frankfurt/Oder, 24 January 1936, leg. G. Stein; – 1 m (ZFMK 2003.862 [S+Sk+B]), Villip (NRW), October 1999, leg. H. Roer. – **Greece**: 1 f (NMP 49032 [S+A]), Anthiro, above river, 31 August 2001, leg. P. Benda; – 1 m (NMP 48695 [S+B]), Thassos Island, Theologos, above creek, 25 June 1989, leg. R. Chaloupka, V. Hanák & V. Vohralík. – **Kirghizstan**: 7 m (IVB 1.4.43–1.4.49 [S+B]), Biškek, city park, 28 May 1980, leg. J. Gaisler & V. Hanák. – **Lebanon**: 1 m (BMNH 61.406. [S+B]), Faraya, Natural Bridge, 29 July 1960, leg. R. E. Lewis (holotype of *Nyctalus noctula lebanoticus* Harrison, 1962). – **Serbia**: 2 m, 3 f (ZFMK 36.329, 36.331–36.334 [S+B]), Fruška gora, Matina Ugljara, 29 March 1936, leg. H. Müche; – 6 inds. (ZFMK 36.30a–36.30f [S+B]), Stari Futog, November 1935, leg. H. Müche. – **Slovakia**: 2 m (NMP 90626, 90627 [S+A]), Zlatno, Za Havraník Valley, 2 August 2005, leg. P. Benda & M. Uhrin. – **Syria**: 2 m, 2 f (NMP 48876–48879 [S+A]), Safita, 29 May 2001, leg. M. Andreas, P. Benda, A. Reiter & D. Weinfurtová. – **Turkey**: 2 m, 1 f (CUP T93/2, T93/3, NMP 47950 [S+A]), Velika Köprüsü Bridge, 15 October 1993, 31 August 1996, leg. M. Andreas, P. Benda, I. Horáček & M. Uhrin.