Lynx (Praha), n. s., **36**: 9–38 (2005). ISSN 0024–7774

On some Mediterranean populations of bats of the *Myotis mystacinus* morpho-group (Chiroptera: Vespertilionidae)

K některým středomořským populacím netopýrů morfoskupiny *Myotis mystacinus* (Chiroptera: Vespertilionidae)

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received 17. 12. 2005

Abstract. New data on the distribution of bats of the *Myotis mystacinus* morpho-group in certain parts of the Mediterranean region are given and some morphological characters of these populations are analysed and discussed. Statistic comparison (PCA) suggests the distribution of *M. mystacinus* s. str. in the Balkans, along with *M. alcathoe*, *M. aurascens* and *M. brandtii*. The records of *M. brandtii* and *M. mystacinus* s. str. in central Anatolia, Turkey, are reported for the first time. These records suggest a continuous distribution of these species from the Balkans to the Caucasus, while their insulated occurrence in the Caucasus region seems to be unlikely (contra Benda & Tsytsulina 2000). *M. aurascens* is reported from whole Anatolia and from Syria according to the revised and/or newly collected material. Second and third records of *M. aurascens* in Italy are reported as well as a verification of a *M. brandtii* record in Tuscany (after Lanza 1959). The taxonomic status of the Moroccan populations of *M. mystacinus* s. str. was evaluated and their affiliation to the Iberian subspecies *M. m. occidentalis* was not confirmed.

INTRODUCTION

In the western part of the Palaearctic, the group of whiskered bats or the *Myotis mystacinus* morpho-group consists of several forms (see e.g., Benda & Tsytsulina 2000, Tsytsulina 2000a, b, 2001, von Helversen et al. 2001). Initially, the group was considered monospecific but polymorphic with a large number of subspecies (Tate 1941, Ellerman & Morrison-Scott 1951, Kuzjakin 1965). In the 1960s, the eastern European subspecies *brandtii* was repeatedly found in sympatry with the nominotypical form of *M. mystacinus* and its species statut was further supported by morphological differences evidenced throughout European populations (Topál 1958, Hanák 1965, 1970, Gauckler & Kraus 1970); for details on this history see Benda (1999) and/or Benda & Tsytsulina (2000). However, in the same period, Stubbe & Chotolchu (1968) recognised three morphotypes in the rank of *M. mystacinus* s.l.; along with the "Nominatform" (= *M. mystacinus*) and the "*brandtii*-Gruppe" (= *M. brandtii*) they also found the so-called "*przewalskii*-Gruppe". Stubbe & Chotolchu (1968) and also Kraus & Gauckler (1972) supposed the latter form to occur in the southern Palaearctic from the Balkans to Central Asia. The morphotype *przewalskii* was later found in south-eastern Europe and in Asia Minor also by von Helversen (1989a, b). Additionally, Volleth (1987) found altogether four karyotype

forms of whiskered bats in Europe and Turkey, *M. mystacinus*, *M. brandtii*, and *Myotis* sp. A (= *przewalskii* by von Helversen 1989a) and *Myotis* sp. B. This suspicious polymorphism in the group of bats primarily assigned to the only species, *M. mystacinus*, was a reason for a broad morphological revision by Benda & Tsytsulina (2000).

A previous revision of the group in the Palaearctic (Strelkov & Buntova 1982, Strelkov 1983a) revealed only two species in this region; little variable *M. brandtii* and highly variable *M. mystacinus*, in which four subspecies were recognised (*mystacinus*, *popovi*, *aurascens*, *przewalskii*). Subsequent comparison by Benda & Tsytsulina (2000) demonstrated an existence of several morphotypes in the western Palaearctic (defined as Europe, North Africa and the Middle East, incl. the Transcaspian region), some of which were found to occur in sympatry, mainly in the eastern Mediterranean and southern Russia. Based on these findings, they suggested the existence of the following taxa in the region; *Myotis brandtii* (Eversmann, 1845) (incl. *sibiricus*, *gracilis*, *coluotus*; Palaearctic forests from W Europe to the Far East), *M. mystacinus* (Kuhl, 1817) (incl. *nigricans*, *lugubris*, *occidentalis*, *caucasicus*; European mixed forests from Morocco to the Ural Mts. incl. the Mediterranean), *M. aurascens* Kusjakin, 1935 (incl. *bulgaricus*, *popovi*, and *Myotis* sp. A by Volleth 1987, and *przewalskii* by von Helversen 1989a, b; Palaearctic forest-steppes from the central Mediterranean to E Europe incl. the Middle East, possibly Central Asia), *M. nipalensis* (Dobson, 1871) (incl. *przewalskii*, *meinertzhageni*, *transcaspicus*, *kukunorensis*, *pamirensis*, *sogdianus*; arid zones of S Palaearctic from the Middle East to Central Asia), and *M. hajastanicus* Argyropulo, 1939* (Sevan Lake Basin, Armenia).

This concept has been mostly accepted (see e.g. Duff & Lawson 2004 or Krapp 2004), however, Mayer & von Helversen (2001) showed genetic similarity of the forms *mystacinus* and *przewalskii* in the sense by von Helversen (1989a) or *mystacinus* and *aurascens* in the sense by Benda & Tsystulina (2000), respectively. At the same time, Mayer & von Helversen (2001) pointed out the genetic differences between the *mystacinus/aurascens/nipalensis/przewalskii* clade and another form, which von Helversen (1989a) named *M. ikonnikovi* (in fact an East Palaearctic species) and Volleth (1987) *Myotis* sp. B. This newly separated form was described by von Helversen et al. (2001) as a new species, *M. alcathoe* von Helversen et Heller, 2001. On the other hand, this new form was not distinguished by morphological analysis by Benda & Tsytsulina (2000) who considered it to be conspecific with *M. mystacinus* s. str.

Thus, in a synthetic view according to Benda & Tsytsulina (2000), Mayer & von Helversen (2001) and von Helversen et al. (2001), four forms are present in Europe, exactly as was suggested by the karyological investigations by Volleth (1987) and empirical field observations by von Helversen (1989a). Three of these forms (*brandtii*, *mystacinus/alcathoe*, *aurascens*) can be identified using morphological examination of skull and teeth, while other three (*brandtii*, *mystacinus/aurascens*, *alcathoe*) can be identified by an analysis of mitochondrial genes (see also Benda et al. 2003a).

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* Yavruyan et al. (2002) named this species *M. sevanicus* (nomen nudum). They perhaps wanted to reflect in this name distribution range of this bat. It considers the basin of the Sevan Lake only according to Benda & Tsytsulina (2000) and Tsytsulina (2000a). The name *hajastanicus* was adopted from the geographical name Hajastan = the Great Armenia, historical area which also cover broad territory of north-eastern Turkey and which is not the accurate area of the known distribution of *M. hajastanicus* according to the above mentioned authors. In this way, Yavruyan et al. (2002) stressed the endemic position of *M. hajastanicus* in the fauna of Armenia.

When Mayer & von Helversen (2001) described the genetic diversity of European bats, they stressed that the morphotypes *mystacinus* and *aurascens* as defined by Benda & Tsytsulina (2000) do not occur in sympatry, because the *mystacinus*-like form living in sympatry with *M. aurascens* in the Balkans is in fact *M. alcathoe*. Thus, in other words, they did not find an evidence for the sympatry of *mystacinus* and *aurascens* morphotypes in their limited material genetically examined. However, Mayer & von Helversen (2001) did not notice the sympatric occurrence of *brandtii*, *mystacinus* and *aurascens* morphotypes in the Volga and Caucasus regions of Russia, documented by Benda & Tsytsulina (2000), see also Smirnov et al. (2004). Their view, casting doubt on the existence of the species *M. aurascens*, was accepted e.g. by Simmons (2005). On the other hand, *M. alcathoe*, primarily considered to be a faunal element of south-eastern Europe (von Helversen et al. 2001), has been found also in western and Central Europe (Ruedi et al. 2002, Benda et al. 2003a, Agirre-Mendi et al. 2004, Stadelmann et al. 2004), i.e. in the areas where *M. aurascens* has not been found and the sympatric occurrence of *M. alcathoe* and *M. mystacinus* s. str. is obvious. Therefore, *M. alcathoe* does not act as a vicariant of *M. m. mystacinus* in the Balkans but coexists with this subspecies in a broad zone of sympatry. However, the question of sympatric occurrence of *M. mystacinus* s. str. and *M. aurascens* in south-eastern Europe still remains open and thus, one of the main arguments for the uprised species rank of *M. aurascens* has not been fully proved yet (see also Dietz 2004, Dietz & von Helversen 2004).

From the above described modern history of the taxonomic concept of the *M. mystacinus* morpho-group, several open questions arise, namely on the span of morphological variation and/or geographic range of particular forms as well as their systematic positions. Here, we bring some new information concerning distributional data and morphological observations of several populations of the *Myotis mystacinus* morpho-group in the Mediterranean. We also bring some basic data which not appeared in the previous revision by Benda & Tsytsulina (2000) and which could help to depict the morphological context within some populations and taxa.

MATERIAL AND METHODS

For the present morphological comparison, we used skulls of the museum specimens which were examined in the same way as by Benda & Tsytsulina (2000). We also used most of their comparative material, however, here we mention the specimens examined in the Appendix. We evaluated 38 characters in each skull (16 measurements in skull and maxillar tooth-rows, 9 measurements in the maxillar dentition, 9 measurements in the mandible and mandibular tooth-rows and dentition, and 4 phenetic characters in the upper molars, see also the Abbreviations chapter) in the same way as in the previous study (Benda & Tsytsulina 2000). All individuals of *M. alcathoe* used in the comparison were genetically identified. Statistical analyses were performed using the software Statistica 6.0. Table 1 show dimensions of the examined type material (here and in Benda & Tsytsulina 2000). Other methodological details or aspects are discussed in the next chapters.

ABBREVIATIONS

Dimensions. LAt – forearm length; LCr – greatest length of skull; LCb – condylobasal length of skull; LaZ – zygomatic width; LaI – width of interorbital constriction; LaInf – width between foramina infraorbitalia; LaN – neurocranium width; ANc – neurocranium height; ACr – skull height (incl. bullae tympanicae); CC – rostral width between canines (incl.); P^4P^4 – rostral width between third upper premolars (incl.); M^3M^3 – rostral width between third upper molars (incl.); IM^3 – length of upper tooth-row between IM^3

Table 1. Dimesions of the examined type material of bats of the *M. mystacinus* morpho-group: holotype and lectotype specimens; asterisks (*) denote the paratype specimens of the names for which holotype and lectotype specimens were not available. For explanation of the measurement abbreviations see the chapter Abbreviations, for the data on the specimens see Appendix, measurements are in millimetres

Tab. 1. Rozměry šetřeného typového materialu netopýrů morfoskupiny *M. mystacinus*: holotypy a lektotypy; hvězdičky (*) označují paratypy těch jmen, kde holotypy a lektotypy nebyly k disposici. Vysvětlení zkratek rozměrů viz kapitola Abbreviations, údaje k exeplářům viz Appendix; rozměry jsou v milimetrech

No	name	LCr	LCb	LaZ	LaI	LaN	ANc	CC	M^3M^3	CM^3	M^1M^2	P^2P^3	LMd	ACo	CM_3	P_2P_3	ACin	LCn	LaCn	CnR	LAt
OHC MV336*	*alcathoe*	13.30	12.57	8.25	3.31	6.45	4.75	3.37	5.23	4.93	2.12	0.66	9.62	2.82	5.40	0.80	0.147	0.81	0.62	1.31	32.0
ZMMU S9266	*aurascens*	13.88	13.20	8.77	3.47	6.75	4.82	3.48	5.58	5.12	2.31	0.75	9.90	2.95	5.48	0.80	0.063	0.91	0.69	1.32	34.8
ZIN 41687	*brandtii*	–	–	–	3.70	7.02	–	3.47	5.38	5.22	2.32	0.81	10.02	2.70	5.68	0.90	0.251	0.85	0.74	1.14	–
BZM 47264	*bulgaricus*	13.88	12.95	–	3.56	7.12	4.72	3.57	5.52	5.13	2.37	0.73	9.75	2.92	5.67	0.77	0.042	0.79	0.68	1.15	34.6
ZIN 83623	*caucasicus*	13.18	12.53	7.92	3.37	6.96	4.52	3.29	5.38	4.98	2.45	0.69	9.42	2.82	5.45	0.73	0.115	0.92	0.70	1.31	–
MNHN 1987-296	*davidii*	13.18	12.42	–	3.58	6.62	4.57	3.43	5.26	5.03	2.26	0.65	9.30	2.55	5.40	0.75	0.063	0.87	0.59	1.48	32.2
ZMMU S104423	*gracilis*	13.27	12.76	8.27	3.48	6.67	–	3.40	5.43	5.15	2.37	0.76	–	–	–	–	0.283	0.87	0.65	1.34	–
NMP 48536*	*hajastanicus*	13.92	13.13	–	3.41	6.63	4.95	3.32	5.19	5.08	2.43	0.73	–	–	–	–	0.042	0.88	0.63	1.40	36.1
NMP 48537*	*hajastanicus*	14.08	13.20	–	3.48	6.62	4.88	3.42	5.36	5.12	2.45	0.68	–	–	–	–	0.021	0.86	0.60	1.44	34.6
ZMMU S96372	*ikonnikovi*	12.92	12.25	–	3.42	6.58	4.82	3.35	5.05	4.78	2.15	0.72	–	–	5.20	0.87	0.105	0.76	0.59	1.30	31.7
ZIN 2147	*kukunorensis*	–	–	–	3.30	6.82	4.78	3.50	5.50	5.17	2.43	–	–	2.75	5.50	0.80	0.000	0.97	0.63	1.55	37.6
MNHG 713.21	*lugubris*	–	–	–	3.32	–	–	3.25	5.07	5.17	2.42	0.78	9.38	2.60	5.48	0.97	0.220	0.85	0.69	1.23	–
BMNH 26.3.1.1.	*meinertzhageni*	13.35	12.82	–	3.25	6.35	4.62	3.13	–	4.93	2.49	0.63	9.45	2.50	5.20	0.63	–	0.85	0.61	1.40	–
ZMMU S148474	*mongolicus*	14.23	13.52	8.58	3.58	6.82	5.12	3.53	5.52	4.90	2.35	0.68	9.67	2.82	5.51	0.83	0.042	0.80	0.61	1.31	33.4
SMF 19664	*occidentalis*	13.97	13.52	8.22	3.63	6.57	4.63	3.43	5.22	5.28	2.43	0.75	9.82	2.76	5.60	0.96	0.147	0.96	0.75	1.28	34.4
ZMMU S9265	*pamirensis*	14.34	13.67	–	3.54	7.09	4.92	3.57	5.74	5.45	2.43	0.72	10.40	2.93	5.85	0.82	0.073	0.95	0.70	1.36	–
ZIN 45249	*popovi*	14.52	13.78	8.78	3.68	6.85	5.13	3.43	5.40	5.25	2.29	0.69	10.13	2.90	5.70	0.83	0.042	0.92	0.63	1.47	35.2
ZIN 13906	*przewalskii*	–	13.45	–	3.37	6.73	–	3.52	5.40	5.15	2.45	0.48	9.70	2.68	5.43	0.59	0.000	0.95	0.66	1.44	34.9
ZMMU S6819	*sogdianus*	13.29	12.40	–	3.42	6.45	4.63	3.18	5.16	4.95	2.43	0.60	9.07	2.52	5.58	0.77	0.094	0.90	0.60	1.51	–
ZMMU S29214	*transcaspicus*	13.85	13.08	–	3.53	6.62	4.80	3.49	5.17	5.23	2.45	0.58	9.75	2.74	5.39	0.74	0.042	0.90	0.65	1.39	33.5

(incl.); CM^3 – length of upper tooth-row between CM^3 (incl.); P^4M^3 – length of upper tooth-row between P^4M^3 (incl.); M^1M^3 – length of upper tooth-row between M^1M^3 (incl.); M^1M^2 – length of upper tooth-row between M^1M^2 (incl.); CP^4 – length of upper tooth-row between CP^4 (incl.); P^2P^3 – length of upper tooth-row of P^2 and P^3; P^3 – mesiodistal length of second upper premolar; P^4 – palatolabial width of third upper premolar; M^1 – palatolabial width of first upper molar; M^2 – palatolabial width of second upper molar; M^3 – palatolabial width of third upper molar; ACin – height of mesiopalatal cingular cusp of P^4; LCn – mesiodistal length of upper canine; LaCn – palatolabial width of upper canine; RCn – relative width of upper canine (LCn : LaCn ratio); LMd – mandible length; ACo – height of coronoid process; IM_3 – length of lower tooth-row between IM_3 (incl.); CM_3 – length of lower tooth-row between CM_3 (incl.); P_4M_3 – length of lower tooth-row between P_4M_3 (incl.); M_1M_3 – length of lower tooth-row between M_1M_3 (incl.); CP_4 – length of lower tooth-row between CP_4 (incl.); P_2P_3 – length of lower tooth-row of P_2 and P_3; P_3 – mesiodistal length of second lower premolar; upper molar traits: pcl – paraconule, plph – paralophe, mcl – metaconule, mlph – metalophe.

Geographical terms (Table 2, Figs. 2, 3). AR – Armenia; AZ – Azebaijan; CE – Central Europe; EE – Eastern Europe; IR – Iran; GE – Georgia; GR – Greece; NE – Northern Europe; RU – Russia; SY – Syria; TC – Transcaspian Region; TR – Turkey.

Collections. BMNH – Natural History Museum, London, United Kingdom; BZM – Natural History Museum, Humboldt University, Berlin, Germany; EBD – Biological Station Doñana, Seville, Spain; MNHG – Natural History Museum Geneva, Switzerland; MNHN – National Museum of Natural History, Paris, France; MTD – Zoological Museum Dresden, Germany; MZSF – Zoological Museum 'La Specola', Florence, Italy; NMNHS – National Museum of Natural History, Sofia, Bulgaria; NMP – National Museum, Prague, Czech Republic; OHC – Otto von Helversen Collection, Erlangen, Germany; SMF – Senckenberg Research Institute and Museum, Frankfurt am Main, Germany; SMO – Silesian Museum, Opava, Czech Republic; TAU – Tel Aviv University, Israel; ZDNU – Department of Zoology, Niğde University, Niğde, Turkey; ZIN – Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia; ZMMU – Zoological Museum of the Moscow State University, Moscow, Russia; ZMSO – Zoological Museum, Siberian Branch of Russian Academy of Science, Novosibirsk, Russia.

RESULTS AND DISCUSSION

The Balkans

As we pointed out above, Mayer & von Helversen (2001) suggested that in the Balkans, two morphotypes which Benda & Tsytsulina (2000) considered to be separate species, *M. mystacinus* and *M. aurascens*, do not occur in sympatry. They assumed that the *M. mystacinus*-like bats which Benda & Tsytsulina (2000) found to live in sympatry with *M. aurascens* in the Balkans are in fact *M. alcathoe*. Thus, the distribution of *M. mystacinus* s. str. in the Balkans and its sympatric occurrence with *M. aurascens* remains to be proved.

Although any exact method how to distinguish individuals of *M. mystacinus* and *M. alcathoe* using only morphological data probably does not exist, as they are almost identical in dental traits and broadly overlap in metrical characters – possibly with an exception of the coloration (see Benda et al. 2003a, Dietz 2004, Dietz & von Helversen 2004), we tried to separate both forms with a help of statistical analysis. We gathered skull material of bats of the *M. mystacinus* morpho-group coming from the Balkans, i.e. Bulgaria, Greece, and Montenegro, which we identified as *M. aurascens* according to characters given by Benda & Tsytsulina (2000) and Tsytsulina (2000a, b) and which we preliminary identified as *M. mystacinus* or *M. alcathoe* (see Hanák et al. 2001, Benda et al. 2003b, Benda 2004b). These two groups were divided using the principal component analysis performed by Benda & Tsytsulina (2000: 351). Here we added this material also with a sample of *M. aurascens* from eastern Europe, *M. mystacinus*

from Central Europe and with available genetically identified specimens of *M. alcathoe*. Most probably, both sets of specimens of *M. mystacinus* from the Balkans and Central Europe contained some unrecognised individuals of *M. alcathoe*, as this species was found in both these regions (von Helversen et al. 2001, Benda et al. 2003a, Schunger et al. 2004, Stadelmann et al. 2004, von Helversen 2004).

The PC analysis (Fig. 1; 27 characters which showed in comparison of all 38 characters the significance >70% in PC1 and >50% in PC2; PC1 52.16%, PC2 15.64%) more or less separated all specific samples according to the skull size (along the PC1, which most reflected skull length dimensions [LCr, LCb, LMd], tooth-rows lengths [IM^3, CM^3, P^4M^3, M^1M^3, M^1M^2, IM_3, CM_3, P_4M_3, M_1M_3], and size of C^1 and P^4). The results well confirmed similarity of both samples of *M. aurascens* from the Balkans and from eastern European steppes (Moldavia, Ukraine, Ciscaucasia), but also similarity of the sample of *M. mystacinus* (C Europe) and the limited sample of *M. alcathoe*. The latter species showed partial overlap with *M. mystacinus*, two Slovak specimens were localised inside the cluster of *M. mystacinus*, but most specimens differed along the PC2 (which was most influenced by premolar dimensions, CP^4, P^2P^3, P^3, P_2P_3, P_3).

However, the sample of *M. mystacinus*-like bats from the Balkans showed almost exclusively the same variation in both components as the sample of *M. mystacinus* from Central Europe, and they only partly overlap with *M. alcathoe*. Although both these *M. mystacinus* clusters probably hold a certain percent of individuals of *M. alcathoe* (possibly some of those with values

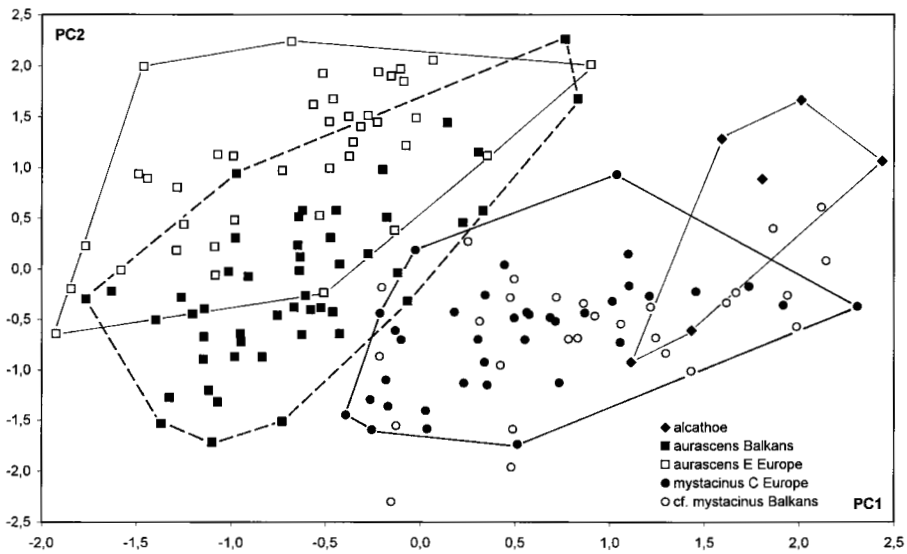

Fig. 1. Results of the principal component analysis of the Balkan samples of bats of the *M. mystacinus* morpho-group (except for *M. brandtii*); for a comparison, the samples from Central and eastern Europe were used, see text for other details.

Obr. 1. Výsledky analysy hlavních proměnných balkánských vzorků netopýrů morfoskupiny *M. mystacinus* (s výjimkou *M. brandtii*); pro srovnání byly použity také vzorky středo- a východoevropské, další podrobnosti viz text.

of PC1>1.0, which were 43% of the Balkan specimens and 27% of the Central European ones, respectively), the most of both clusters should be composed of individuals of *M. mystacinus* s. str. Thus, in other words, the Balkan series of *M. mystacinus*-like bats contains a similar amount of overlooked individuals of *M. alcathoe* as the Central European set of *M. mystacinus*.

According to these results, the presence of the true *M. mystacinus* in the Balkans is more than only likely and seems to be of similar probability as in Central Europe.

Eastern Mediterranean

In the easternmost regions of the Mediterranean, Benda & Tsytsulina (2000) suggested occurrence of five species of the *M. mystacinus* morpho-group, viz. *Myotis brandtii* (forest zone of the Caucasus region in Turkey, W Transcaucasia and W Ciscaucasia), *M. mystacinus* (forest and steppe-forest areas of the Caucasus region), *M. aurascens* (most of the region except for the most arid areas), *M. nipalensis** (arid regions of E Transcaucasia, NE Turkey and Iran), and *M. hajastanicus* (Sevan Lake Basin, Armenia); of course, presence of a sixth form, *M. alcathoe*, is well possible in this area. Here we review the known records and present new findings of the bats of the *M. mystacinus* morpho-group from Asia Minor, the Caucasus region and adjacent areas. The examined individuals along with their dimensions as well as their species identification are presented in Table 2.

Although the accurate identification of the above mentioned morphotypes/species is possible only by detailed examination of the specimens and in most cases also of their skull characters (Benda & Tsytsulina 2000), we performed a principal component analysis of the compared sets of Eastern Mediterranean populations and comparative European taxa for a better demonstration of the particular morphotype variations and/or differences among them (Figs. 2, 3). This analysis well separated four groups of forms, viz. (1) *M. brandtii*, (2) *M. mystacinus* and *M. alcathoe*, (3) *M. aurascens*, and (4) *M. nipalensis* and *M. hajastanicus* (Fig. 2; 22 characters which showed in comparison of all 38 characters the significance >70% in PC1 and >50% in PC2; PC1 54.71%, PC2 15.40%). This grouping more or less corresponds with the separation into species subgroups by Benda & Tsytsulina (2000: 383), except for the division of *aurascens* and *nipalensis/hajastanicus* which are included in one subgroup. However, the detailed analysis of the *nipalensis* subgroup (Fig. 3; 19 characters which showed in comparison of all 38 characters the significance >70% in PC1 and >50% in PC2; PC1 44.00%, PC2 20.43%) showed a similar distribution of individuals and/or population samples as the previous analysis, but more clearly split the sets of comparative specimens (the most significant dimensions for PC1 were the tooth-rows containing molars and large premolars

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* Based on our examination of the holotype of *Vespertilio Davidii* Peters, 1869 (MNHN 1987-296; see Tab. 1), this name represents the senior synonym of the whole group of morphotypes included by Benda & Tsytsulina (2000) into species rank of *Myotis nipalensis* (unlike the name *Vespertilio nipalensis* Dobson, 1871 which is used tentatively as its type specimen has not been available to examine yet). In respect to the absence of profound comparative analysis of East Asian populations of the *M. mystacinus*-like bats based on representative set of specimens as well as in reference to preserve the species concept of the review by Simmons (2005) we continue in the use of the nomenclatory of East Palaearctic taxa suggested by Benda & Tsytsulina (2000). However, Simmons (2005) based her view on the data by Kawai et al. (2003) who did not describe the characters of the specimens analysed and a possible species/names confusions were not excluded (for some details concerning the topics see also Borisenko & Pavlinov 1995 and Benda & Tsytsulina 2000).

Table 2. Cranial dimensions of the examined material of bats of the *M. mystacinus* morpho-group coming from the Caucasus region and the Midle East († – data based on alveolar dimensions; * – specimens of *M. nipalensis* which partly showed several characters typical for *M. hajastanicus*). For abbreviation explanations see the chapter Abbreviations, for the data on the specmens see Appendix, measurements are in millimetres; **T** – type
Tab. 2. Lebeční rozměry šetřeného materialu netopýrů morfoskupiny *M. mystacinus* pocházející z oblastí Kavkazu a Blízkého východu († – údaje založené na alveolárních rozměrech; * – jedinci *M. nipalensis* kteří dílem vykazují znaky typické pro *M. hajastanicus*). Vysvětlení zkratek viz kapitola Abbreviations, údaje o jedincích viz Appendix, rozměry jsou v milimetrech; **T** – typ

No	site	sex	LCr	LCb	LaZ	LaI	LaN	ANc	CC	M^3M^3	CM^3	M^1M^2	P^2P^3	LMd	ACo	CM_3	P_2P_3	ACin	LCn	LaCn	CnR
Myotis brandtii																					
ZDNU 2001/124	TR, Çat	f	14.57	13.88	8.81	3.64	7.14	4.92	3.34	5.32	5.27	2.38	0.84	10.42	2.98	5.81	0.91	0.304	0.80	0.67	1.19
ZDNU 2001/125	TR, Çat	f	14.22	13.67	8.39	3.74	6.88	4.93	3.41	5.33	5.52	2.48	0.90	10.28	2.93	5.92	0.96	0.272	0.87	0.67	1.30
ZDNU 2001/126	TR, Çat	f	14.43	13.64	8.65	3.52	6.95	4.81	3.34	5.37	5.39	2.45	0.92	10.28	2.81	5.94	0.97	0.251	0.83	0.70	1.18
ZDNU 2002/23	TR, Hacıbelsirli	f	14.37	14.03	8.49	3.72	6.86	4.96	3.62	5.76	5.71	2.68	0.85	10.33	2.97	6.11	0.98	0.209	0.95	0.80	1.20
ZIN 9253	GE, Bakuriani	m	13.83	13.20	8.20	3.65	6.92	4.62	3.30	5.10	5.28	2.37	0.82	9.92	2.72	5.62	0.90	–	0.86	0.66	1.30
ZIN 23490	Caucasus	f	14.00	13.32	8.62	3.65	7.03	4.63	3.52	5.45	5.27	2.41	0.82	9.95	–	5.77	0.92	–	0.85	0.71	1.19
ZIN 23490	Caucasus	f	14.10	13.30	8.28	3.60	6.85	4.80	3.42	5.50	5.32	2.41	0.79	9.82	2.68	5.70	0.93	0.230	0.80	0.67	1.19
ZIN 9260	RU, Psebaj	m	14.02	13.28	–	3.72	7.00	4.77	3.35	5.25	5.20	2.28	0.75	9.95	2.92	5.53	0.85	0.199	0.74	0.63	1.18
ZIN 78286	RU, Pšiš river	f	13.68	13.40	8.58	3.62	6.80	4.77	3.27	5.33	5.15	2.29	0.71	10.27	2.77	5.52	0.87	0.262	0.81	0.65	1.24
ZIN 78287	RU, Pšiš river	m	14.02	13.30	8.42	3.67	6.82	4.55	3.38	5.08	5.08	2.21	0.79	9.76	2.58	5.47	0.86	–	0.83	0.64	1.30
ZIN 80876	RU, Teberda	m	13.93	13.42	8.70	3.40	6.82	4.60	3.47	5.23	5.17	2.15	0.75	10.07	2.88	5.63	0.90	–	0.84	0.67	1.25
Myotis mystacinus																					
ZIN 9004	TR, Aralik	m	13.77	13.15	–	3.42	6.72	4.75	3.47	5.10	5.35	2.35	0.67	9.82	2.87	5.68	0.84	0.178	0.94	0.70	1.34
ZIN 9012	TR, Aralik	f	13.80	12.95	8.43	3.55	6.80	4.90	3.43	5.40	5.13	2.34	0.77	–	–	5.48	0.75	0.147	0.89	0.67	1.33
ZDNU 2001/86	TR, Kızılcahamam	m	13.11	12.15	7.66	3.28	6.49	4.54	–	4.98	4.93	2.34	0.71	8.87	2.60	5.27	0.81	0.084	0.87	0.67	1.30
NMP 47915	TR, Van	m	13.54	13.02	8.08	3.25	6.51	4.78	3.40	5.07	5.08	2.40	0.70	9.53	2.73	5.50	0.82	0.073	0.88	0.69	1.27
ZIN 9286	GE, Lagodehi	m	–	–	7.95	3.40	6.48	–	3.30	5.35	5.35	2.49	0.71	9.82	2.60	5.68	0.86	0.105	0.94	0.74	1.27
NMP 48541	AZ, Agdam	m	–	–	–	3.20	6.78	–	2.95	5.12	5.05	2.46	0.85	9.32	2.32	5.53	0.86	0.136	0.82	0.68	1.20
NMP 48540	AZ, Hal'mil	m	13.63	12.98	8.22	3.52	6.87	5.02	3.35	5.15	5.17	2.43	0.89	9.59	2.52	5.65	0.93	0.105	0.83	0.72	1.14
NMP 48520	AZ, Kutakşan	–	13.53	12.82	7.97	3.42	6.68	4.67	3.07	5.07	5.18	2.40	0.75	9.58	2.72	5.53	0.89	0.094	0.84	0.65	1.29
ZIN 83771	RU, Psebaj **T**	m	13.42	12.78	8.22	3.42	6.72	4.63	3.43	5.43	4.82	2.41	0.54	9.37	2.61	5.48	0.68	0.105	0.91	0.70	1.30
ZIN 83008	RU, Adler **T**	f	13.45	12.95	8.22	3.39	6.72	4.63	3.33	–	5.17	2.49	0.75	9.54	2.52	5.38	0.89	0.105	0.87	0.69	1.26
ZIN 69582	RU, Aše	f	12.68	11.95	–	3.38	6.35	4.53	3.28	5.05	4.90	2.20	0.67	9.05	2.45	5.27	0.75	0.136	0.83	0.64	1.30
ZMMU S10447	RU, Gelendžik	f	12.60	12.00	–	3.27	6.30	4.68	3.28	5.02	4.82	2.21	0.74	9.08	2.70	5.32	0.82	0.147	0.74	0.58	1.29
ZMSO 263	RU, Hosta river	–	12.63	12.02	–	3.15	6.12	4.53	3.07	4.92	4.63	2.17	0.73	9.17	2.72	4.93	0.81	0.147	0.77	0.59	1.32
ZIN 83623	RU, Kiša **T**	m	13.18	12.53	7.92	3.37	6.96	4.52	3.29	5.38	4.98	2.45	0.69	9.42	2.82	5.45	0.73	0.115	0.92	0.70	1.31
ZMMU S46565	RU, Nal'čik	m	13.08	12.42	–	3.30	6.67	4.68	3.38	5.20	4.72	2.23	0.51	–	–	–	–	0.042	0.79	0.59	1.34
ZIN 49743	RU, Ermalaevka	f	13.15	12.48	7.78	3.53	6.60	4.60	3.33	5.23	5.05	2.23	0.81	9.45	2.45	5.40	0.88	0.147	0.86	0.66	1.30
ZIN 9178	RU, Stavropol'	f	13.67	13.07	8.15	3.45	6.75	4.92	3.47	5.35	5.42	2.38	0.81	9.80	2.72	5.73	0.90	0.136	0.87	0.73	1.19
ZMMU S166220	RU, Tuapse	f	13.50	12.95	–	3.45	6.87	4.83	3.48	5.32	4.90	2.26	0.57	9.68	2.88	5.35	0.74	0.042	0.80	0.60	1.33
ZIN 6031	RU, Vladikavkaz	f	13.20	12.72	–	3.60	6.57	4.52	3.25	5.37	4.90	2.32	0.82	9.37	–	5.27	0.86	0.115	0.83	0.65	1.27

No	site	sex	LCr	LCb	LaZ	LaI	LaN	ANc	CC	M^3M^3	CM^3	M^1M^2	P^2P^3	LMd	ACo	CM_3	P_2P_3	ACin	LCn	LaCn	CnR
Myotis aurascens																					
NMP 48345	GR, Crete	m	13.68	13.28	8.12	3.40	6.60	4.77	5.90	5.13	5.17	2.34	0.65	9.77	2.63	5.50	0.79	0.031	0.88	0.68	1.29
OHC (no num.)	TR, Ispir	m	13.55	12.98	8.24	3.38	6.75	4.80	3.34	5.33	5.20	2.20	0.69	9.74	2.82	5.52	0.86	0.073	0.89	0.63	1.42
ZDNU 1998/101	TR, Beyşehir	m	13.99	13.29	8.38	3.36	6.64	4.75	3.34	5.29	5.14	2.51	0.70	9.69	2.78	5.62	0.90	0.042	0.89	0.66	1.35
ZDNU 1998/103	TR, Beyşehir	f	13.75	13.07	–	3.54	6.68	4.95	3.32	5.13	5.10	2.43	0.71	9.72	2.87	5.47	0.85	0.031	0.91	0.67	1.36
ZDNU 2002/111	TR, Kızılcahamam	f	14.03	13.54	8.47	3.38	6.64	5.02	3.55	5.66	5.47	2.51	0.79	10.05	2.74	5.87	0.90	0.042	0.98	0.66	1.49
OHC (no num.)	TR, Üçpınar	f	13.82	13.08	8.58	3.42	6.79	4.92	3.43	5.29	5.17	2.21	0.79	9.85	2.75	5.39	0.80	–	0.87	0.64	1.36
NMP 48094	TR, Sirbasan	m	13.82	13.22	8.52	3.41	6.73	5.08	3.42	5.32	5.15	2.35	0.72	9.62	2.75	5.43	0.82	0.073	0.87	0.66	1.32
NMP 47912	TR, Van	m	14.02	13.08	8.22	3.45	6.86	5.12	3.13	5.28	5.12	2.31	0.80	9.93	2.69	5.80	0.85	0.094	0.88	0.64	1.38
NMP 47913	TR, Van	m	13.92	13.20	8.39	3.36	6.70	5.17	3.45	5.27	5.10	2.32	0.75	9.83	2.58	5.57	0.83	0.052	0.90	0.65	1.39
NMP 47914	TR, Van	m	13.71	12.95	8.15	3.37	6.75	4.77	3.29	5.35	5.18	2.51	0.73	9.58	2.70	5.68	0.77	0.084	0.94	0.71	1.32
OHC (no num.)	TR, Beşkonak	f	13.40	12.56	8.03	3.39	6.52	4.82	–	–	–	2.20	–	9.47	2.57	–	–	0.042	–	–	1.51†
ZIN (no num.)	AR, Sevan L.	–	14.18	13.32	8.75	3.47	7.13	4.92	3.43	5.32	5.22	2.35	0.77	9.88	3.02	5.52	0.86	0.063	0.90	0.66	1.37
ZIN 9019	AZ, Găncă Reg.	f	13.83	13.28	8.42	3.50	6.72	4.90	3.38	5.43	5.17	2.26	0.69	9.93	2.80	5.55	0.75	0.000	0.90	0.67	1.34
NMP 48519	AZ, Geokçay V.	m	14.42	13.73	8.65	3.77	6.92	5.00	3.47	5.43	5.45	2.52	–	–	–	–	–	0.115	0.95	0.70	1.36
ZIN 23507	AZ, Port Iliç	f	13.93	13.20	–	3.45	6.88	5.02	3.28	5.30	5.07	2.32	0.66	9.62	2.75	5.45	0.80	0.052	0.90	0.62	1.46
ZIN 76-1916	AZ, Port Iliç	–	13.43	12.88	8.25	3.35	6.55	4.43	3.33	5.28	5.18	2.31	0.69	9.53	2.60	5.50	0.84	0.042	0.96	0.70	1.37
ZIN 9287	GE, Lagodehi	m	13.70	12.93	8.37	3.87	6.70	4.83	3.40	5.47	5.22	2.29	0.75	9.80	3.03	5.57	0.86	0.063	0.92	0.66	1.40
TAU M9456	SY, Mt. Hermon	m	13.70	13.25	–	3.78	6.73	4.72	3.20	5.30	5.43	–	–	9.93	2.85	5.80	–	0.000	–	–	1.43†
BMNH 63.1196	IR, Gutur-Su	m	14.57	14.00	–	3.78	7.10	5.52	3.60	5.80	5.80	–	–	10.27	3.05	6.03	–	–	–	–	–
BMNH 63.1197	IR, Gutur-Su	m	–	14.15	–	3.94	7.62	–	3.60	5.65	5.70	–	–	10.83	3.05	6.00	–	0.000	–	–	–
BMNH 63.1198	IR, Gutur-Su	m	14.10	–	–	3.87	7.25	–	3.42	5.62	5.42	–	–	10.17	2.75	5.76	–	0.000	–	–	–
ZIN 80847	RU, Levokumskoe	f	13.60	12.80	8.53	3.55	6.97	5.02	3.55	5.70	5.07	2.29	0.69	9.60	2.70	5.43	0.71	0.073	–	–	–
ZIN 80848	RU, Levokumskoe	f	13.92	13.02	–	3.57	6.93	4.92	3.37	5.52	4.97	2.23	0.67	9.57	2.72	5.35	0.75	0.031	0.79	0.61	1.29
ZIN 80850	RU, Levokumskoe	f	14.10	13.47	8.75	3.65	6.78	4.82	3.60	5.65	5.13	2.38	0.66	10.18	2.87	5.47	0.74	0.031	0.86	0.67	1.28
ZIN 4910	RU, Dagestan	–	14.43	13.60	–	3.52	7.10	5.00	3.35	5.18	5.25	2.32	0.67	10.00	2.90	5.52	0.82	0.084	0.93	0.67	1.39
ZIN 4909	RU, Dagestan	m	–	–	8.43	3.48	6.75	–	3.38	5.07	5.02	2.23	0.60	9.57	2.97	5.48	0.82	0.031	0.85	0.64	1.33
ZMMU S46560	RU, Kurkužin **T**	f	13.50	12.78	8.42	3.43	6.70	4.80	3.26	5.38	5.10	2.37	0.64	9.55	2.70	5.60	0.80	0.042	0.88	0.61	1.45
ZMMU S46562	RU, Kurkužin **T**	f	13.78	12.87	–	3.45	6.87	4.85	3.28	5.22	4.90	2.15	0.66	9.67	2.67	5.42	0.79	–	0.88	0.63	1.40
ZMMU S9266	RU, Kurkužin **T**	m	13.88	13.20	8.77	3.47	6.75	4.82	3.48	5.58	5.12	2.31	0.75	9.90	2.95	5.48	0.80	0.063	0.91	0.69	1.32
ZIN 78274	RU, Malyj Irtyš	f	13.97	13.30	8.48	3.58	6.80	4.93	3.53	5.62	5.25	2.41	0.59	10.00	2.65	5.60	0.71	0.063	0.89	0.67	1.33
ZMMU S46561	RU, N Caucasus	m	13.60	12.92	–	3.18	6.48	4.62	3.25	5.48	5.18	2.37	0.68	9.25	2.78	5.30	0.71	0.073	0.84	0.65	1.29
ZMMU S46564	RU, N Caucasus	m	13.55	12.92	–	3.57	6.72	4.82	3.28	5.28	4.90	2.45	0.64	9.62	2.70	5.30	0.79	0.063	0.79	0.57	1.39
ZIN 69879	RU, nr Ipatovo	f	14.10	13.32	8.47	3.42	6.80	5.08	3.45	5.38	5.03	2.38	0.59	9.75	2.72	5.45	0.75	0.073	0.93	0.66	1.41
ZMMU S5022	RU, Tarasovskij	–	14.45	13.75	8.83	3.75	7.00	5.22	3.42	5.32	5.20	2.26	0.63	10.17	2.78	5.62	0.77	0.084	0.85	0.61	1.40
ZMMU S29432	RU, Tarasovka **T**	m	14.08	13.38	–	3.58	7.00	4.80	3.41	5.28	5.15	2.29	0.65	10.08	2.73	5.77	0.83	0.021	0.94	0.68	1.38
ZIN 78288	RU, Terek river	f	13.82	13.12	8.40	3.25	6.87	4.78	3.27	5.28	4.95	2.26	0.61	9.83	2.53	5.33	0.75	0.031	0.83	0.63	1.32
ZMMU S166219	RU, Tuapse	f	13.93	12.98	8.55	3.60	6.55	4.83	3.47	5.48	5.05	2.35	0.67	9.53	2.75	5.45	0.75	0.052	0.86	0.60	1.44

Table 2. (continuation)
Tab. 2. (pokračování)

No	site	sex	LCr	LCb	LaZ	LaI	LaN	ANc	CC	M^3M^3	CM^3	M^1M^2	P^2P^3	LMd	ACo	CM_3	P_2P_3	ACin	LCn	LaCn	CnR
Myotis nipalensis																					
ZIN 9002	TR, Aralik	m	13.28	12.35	8.25	3.22	6.67	4.65	–	5.15	–	2.26	0.59	9.17	2.65	–	0.71	0.094	–	–	–
ZIN 9003*	TR, Aralik	f	13.25	12.75	8.22	3.27	6.45	4.67	3.20	5.18	5.07	2.38	0.59	9.52	2.63	5.47	0.80	0.052	0.91	0.64	1.43
ZIN 9009*	TR, Aralik	–	13.60	13.02	8.47	3.30	6.70	4.77	3.25	5.18	5.07	2.26	0.65	9.53	2.68	5.42	0.77	0.000	0.91	0.63	1.45
ZIN 9011	TR, Aralik	–	13.45	12.60	8.56	3.32	6.47	4.55	3.50	5.52	5.10	2.35	0.62	9.75	2.85	5.48	0.77	0.052	0.94	0.71	1.32
ZDNU 2000/15	TR, Selim	m	13.68	12.85	8.10	3.36	6.60	4.90	3.38	5.29	4.93	2.29	0.67	9.57	2.76	5.33	0.80	0.073	0.91	0.67	1.36
ZDNU 2003/38	TR, Sirbasan	f	13.62	12.82	8.19	3.48	6.66	4.76	3.43	5.19	5.14	2.43	0.64	9.68	2.69	5.38	0.80	0.105	0.92	0.68	1.35
NMP 48095	TR, Sirbasan	m	13.17	12.62	–	3.32	6.48	4.53	3.25	5.20	5.09	2.29	0.70	9.40	2.60	5.48	0.77	0.126	0.92	0.63	1.47
OHC (no num.)*	TR, Şohun Dere	m	13.20	12.50	8.14	3.42	6.55	4.65	3.33	5.21	5.07	2.20	0.75	9.45	2.68	5.48	0.80	0.063	0.88	0.61	1.45
ZIN 9008	AR, Erevan	f	13.67	13.00	8.40	3.15	6.55	4.88	3.50	5.40	5.12	2.35	0.71	9.75	2.72	5.53	0.75	0.073	0.94	0.70	1.34
ZIN 9018	AZ, Găncă Reg.	f	13.43	12.87	8.23	3.32	6.53	4.68	–	5.33	5.07	2.26	0.67	9.65	2.65	5.50	0.82	0.021	0.88	0.66	1.33
NMP 49237*	AZ, Mingaçevir	f	13.45	12.88	–	3.24	6.35	4.53	3.27	5.18	5.02	2.18	0.69	9.62	2.59	5.42	0.80	0.063	0.91	0.61	1.50
ZIN 23505(6)	AZ, Port Iliç	f	13.80	12.92	8.32	3.40	6.80	4.93	3.22	5.27	5.20	2.35	0.64	9.62	2.68	5.57	0.80	0.031	0.89	0.64	1.39
ZIN 8182	AZ, Port Iliç	f	12.73	12.21	7.67	3.42	6.38	4.43	3.23	5.20	4.92	2.35	0.67	8.95	2.48	5.32	0.77	0.000	0.87	0.66	1.32
ZIN 5346	AZ, Salyan	–	13.27	12.42	8.22	3.47	6.77	4.88	3.12	4.92	4.87	2.29	0.67	9.20	2.72	–	0.67	0.052	0.91	0.69	1.32
NMP 48521*	AZ, Şaki	f	13.68	12.92	8.25	3.40	6.53	4.68	3.27	5.10	5.05	2.26	0.63	9.62	2.74	5.44	0.82	0.042	0.86	0.60	1.44
NMP 48119	IR, Bastam	m	13.68	12.88	8.40	3.46	6.63	4.88	3.20	5.33	5.12	2.32	0.65	9.53	2.65	5.48	0.77	0.073	0.91	0.69	1.32
NMP 48120	IR, Bastam	m	13.42	12.72	8.22	3.33	6.52	4.73	3.22	5.12	5.00	2.32	0.64	9.47	2.67	5.40	0.76	0.115	0.96	0.64	1.51

Table 3. Dimensions of the examined material of bats of the *M. mystacinus* morpho-group coming from Italy. For abbreviation explanations see the chapter Abbreviations, for the data on the specmens see Appendix, measurements are in millimetres
Tab. 3. Rozměry šetřeného materialu netopýrů morfoskupiny *M. mystacinus* pocházejících z Italie. Vysvětlení zkratek viz kapitola Abbreviations, údaje o jedincích viz Appendix, rozměry jsou v milimetrech

No	species	date	sex	LCr	LCb	LaZ	LaI	LaN	ANc	CC	M^3M^3	CM^3	LMd	ACo	CM_3	ACin	LCn	LaCn	CnR	LAt
MZSF 5950	*aurascens*	May 1873	f	14.50	13.67	8.47	3.42	7.00	4.92	3.32	5.45	5.34	10.16	2.90	5.82	0.021	0.91	0.73	1.24	36.1
MZSF 5200	*aurascens*	summ. 1896	f	14.47	13.63	–	3.43	6.75	4.88	3.58	5.57	5.32	10.35	2.97	5.81	0.052	0.93	0.75	1.24	38.6
SMF 34265	*aurascens*	May 1964	f	14.52	13.87	8.77	3.53	6.93	4.93	3.64	5.48	5.23	10.24	2.88	5.75	0.000	–	–	–	36.1
MZSF 5208	*brandtii*	June 1874	m	13.68	12.93	–	3.62	6.79	4.57	3.55	5.42	5.13	9.80	2.69	5.52	0.290	0.81	0.69	1.17	36.0

[IM^3, CM^3, P^4M^3, M^1M^3, M^1M^2, CP^4, M^2, M^3, IM_3, CM_3, P_4M_3, M_1M_3], for PC2 the largest skull lengths [LCr, LCb, LMd] and certain skull widths [LaI, LaInf, LaN]). Both evaluations demonstrated the presence of the above listed morphotypes in the widely defined Caucasus region (see also Fig. 4).

M. brandtii has been reported from Turkey, Georgia, and Russia (Strelkov & Buntova 1982, Strelkov 1983b, Albayrak 1990, 1991, Steiner & Gaisler 1994, Ilyin et al. 1998), as summarised by Benda & Tsytsulina (2000: 357, Fig. 45). Additional data from Turkey and Georgia were published by Albayrak (2003) and Bukhnikashvili et al. (2004). In Turkey, all the records published come from the vicinity of Çamlıhemşin, Rize Province (Albayrak 1990, 1991, 2003, Steiner & Gaisler 1994), as well as three individuals here newly reported (ZDNU 2001/124–126; see Appendix [40° 51' N, 40° 56' E; 1290 m a. s. l.]). However, another individual of *M. brandtii* was collected in Hacıbekir, Yozgat Province [39° 51' N, 34° 48' E] (ZDNU 2002/23; Table 2). This record represents the first evidence of this species in central Anatolia and suggests its occurrence in the western Karadeniz Mts. as well as in the whole northern part of Turkey (Fig. 4). The new record could suggest a non-isolated distribution of this bat in the eastern Mediterranean and a possible connection of the Balkan and Caucasian parts of the range (contra Benda & Tsytsulina 2000). Recently, *M. brandtii* has been confirmed from three

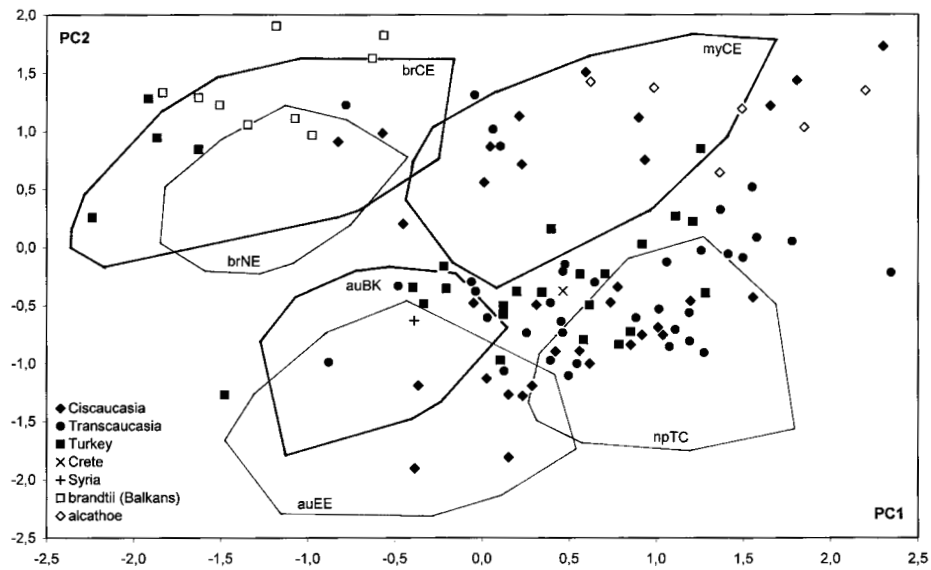

Fig. 2. Results of the principal component analysis of the Caucasian and the Middle Eastern samples of bats of the *M. mystacinus* morpho-group (see Table 2); for a comparison, the samples from Central, northern and eastern Europe and the Balkans were used, see text for other details.
Obr. 2. Výsledky analysy hlavních proměnných kavkazských a blízkovýchodních vzorků netopýrů morfoskupiny *M. mystacinus* (viz tab. 2); pro srovnání byly použity také vzorky balkánské, středo-, severo- a východoevropské, další podrobnosti viz text.
Polygons acronyms / označení polygonů: au – *M. aurascens*; br – *M. brandtii*; my – *M. mystacinus*; np – *M. nipalensis*; for abbreviations of geographical terms see the chapter Abbreviations.

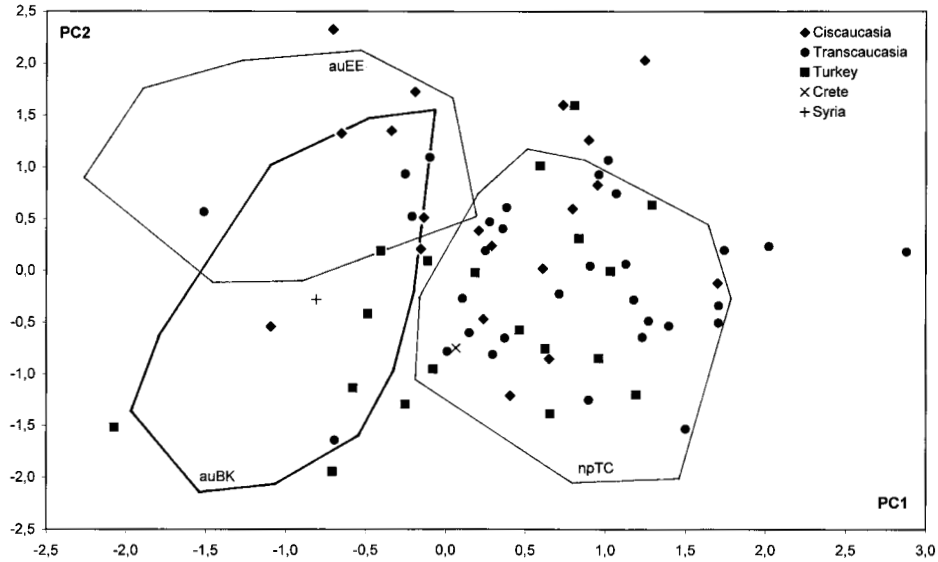

Fig. 3. Results of the principal component analysis of the Caucasian and the Middle Eastern samples of bats of the *M. nipalensis*-group (after Benda & Tsytsulina 2000); for a comparison, the samples from the Balkans, eastern Europe and the Transcaspian region were used, see text for other details. Polygons: for abbreviations of geographical terms (large caps) see the chapter Abbreviations, for those of species names (small caps) see Fig. 2.
Obr. 3. Výsledky analysy hlavních proměnných kavkazských a blízkovýchodních vzorků netopýrů skupiny *M. nipalensis* (podle Bendy & Tsytsuliny 2000); pro srovnání byly použity také vzorky balkánské, východoevropské a zakaspické, další podrobnosti viz text. Polygony: zkratky zeměpisných názvů (velká písmena) viz kapitola Abbreviations, zkratky druhových jmen (malá písmena) viz obr. 2.

patches within the mountainous belt stretching from the Rhodopes Mts., Bulgarian Thrace, in the west to the eastern Karadeniz Mts., Turkey, in the east, over north-central Anatolia (Benda et al. 2003b, Benda & Horáček 1998).

In the Caucasus region and the Middle East, *M. mystacinus* s. str. has been reported only from a restricted area covering the north-eastern part of Turkey, Transcaucasia, and Russian part of the Greater Caucasus (Benda & Tsytsulina 2000: 361), see Table 2 and Fig. 4. Additionally, we collected a male of this species in Kızılcahamam, Ankara Province [40° 20' N, 32° 42' E], north-western part of central Anatolia (ZDNU 2001/86; Table 2). Similarly as in the previous species, such record interconnects the known patches of occurrence in the eastern Mediterranean (Fig. 4). The nearest finding in the west is known from the Strandža/Istranca Mts. of Bulgaria (Benda et al. 2003b), and in the east from Van and Aralik, eastern Turkey (Benda & Tsytsulina 2000). However, in this case a confusion with *M. alcathoe* is possible (see above), considering the rather smaller dimensions of the specimen (Table 2).

M. aurascens is the most widely distributed and abundant species of the group in south-eastern Europe (Benda & Tsytsulina 2000). This statement could be also applied for populations of the Middle East and the Caucasus region (Fig. 4, Table 2). Based on the more thoroughly revised

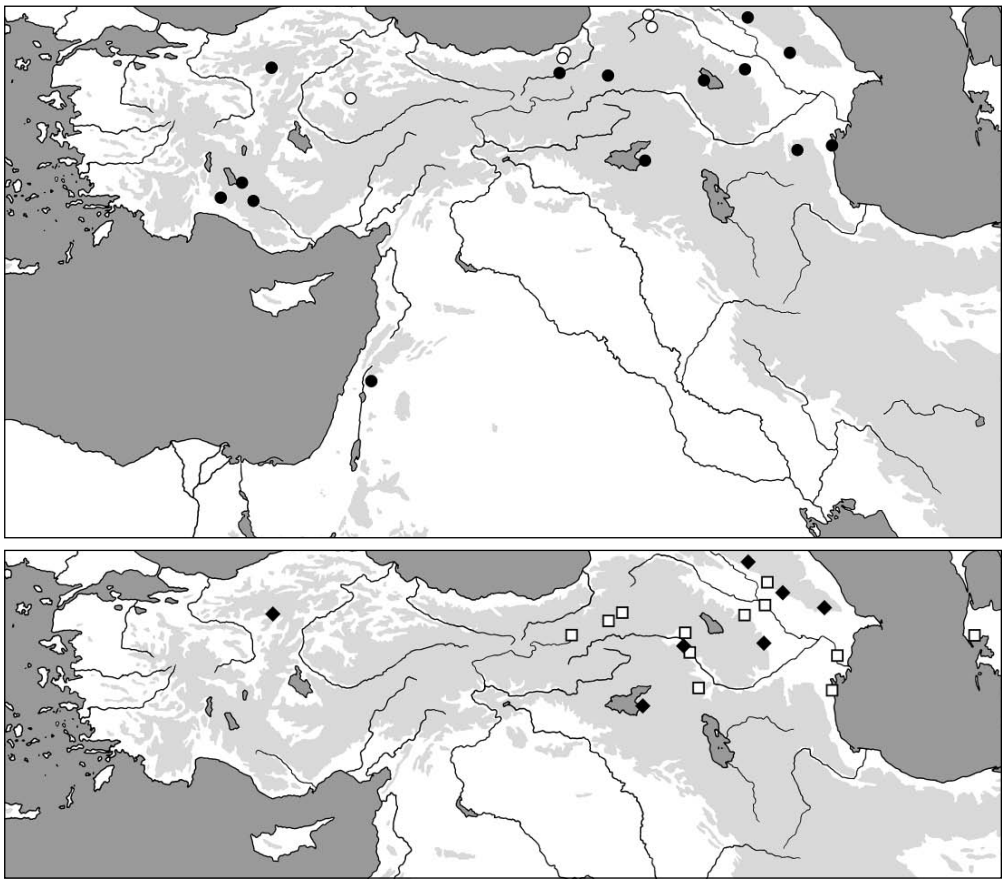

Fig. 4. Revised records of *M. brandtii* (open circles) and *M. aurascens* (closed circles) (above), and of *M. mystacinus* s. str. (closed diamonds) and *M. nipalensis* (open squares) (below) in the Middle East and Transcaucasia (for other records of *M. mystacinus* s. l. in the region see DeBlase 1980, Strelkov 1983b, Hasbenli 1997, and Benda & Horáček 1998). The revised distribution of these bats in the Caucasus region is depicted by Benda & Tsytsulina (2000: 357, Fig. 45); records of *M. brandtii* are here also partly reported after literary resources given in the text.

Obr. 4. Ověřené nálezy *M. brandtii* (prázdné kroužky) a *M. aurascens* (plné kroužky) (nahoře) a *M. mystacinus* s. str. (plné kosočtverce) a *M. nipalensis* (prázdné čtverce) (dole) na Blízkém východě a v Zakavkazí (pro další nálezy netopýrů *M. mystacinus* s. l. na tomto území viz DeBlase 1980, Strelkov 1983b, Hasbenli 1997 a Benda & Horáček 1998). Revidované rozšíření těchto druhů na Kavkaze je vyznačeno na obr. 45, str. 357, v práci Bendy & Tsytsuliny (2000); nálezy *M. brandtii* jsou zde také dílem vyznačeny podle literárních zdrojů uvedených v textu.

part of the material published by Harrison (1963), von Helversen (1989b), Benda & Horáček (1998), and Mendelssohn & Yom-Tov (1999) and the newly collected Turkish bats, we can conclude that *M. aurascens* occurs almost in the whole Anatolia and Transcaucasia as well as

in north-western Iran (Fig. 4). Such distribution well connects the known broad occurrence of this species in the southern Balkans and in the Crete (Hanák et al. 2001, Benda 2004a). Newly, this paper confirms its distribution in western Anatolia, partly based on the recently collected bats (Beyşehir [37° 41' N, 31° 43' E], ZDNU 1998/101, 103; Kızılcahamam, ZDNU 2002/111), partly due to a revision of several records published by von Helversen (1989b) as *M*. (*mystacinus*) *przewalskii* and *M. przewalskii*, respectively (Beşkonak [37° 08' N, 31° 12' E], Üçpınar [37° 08' N, 31° 49' E]).

As the only species of the complex, *M. aurascens* reaches the southern Levant (Mt. Hermon [33° 26' N, 35° 51' E]; cf. Mendelssohn & Yom-Tov 1999). This record represents the only precise reference of the *M. mystacinus*-like bats from Arabia, although in literature some records appeared. A BMNH specimen of *M. mystacinus* (s. l.) was reported from 'Syria' (= the Levant in the present-time sense) by Dobson (1878), however, no later reference that would comment this individual and/or its finding (its fate or clear origin) is available (see e.g. Harrison 1964, Kumerloeve 1975, Harrison & Bates 1991). Only Tristram (1884) mentioned *M. mystacinus* 'in Southern Lebanon' [= southern edge of the Lebanon Mts.], which may be identical with the above BMNH individual. Several subsequent authors accepted these records of *M. mystacinus* (s. l.) in 'Syria' (Doria 1887, Trouessart 1879, 1897, Méhely 1900, Palacký 1901, Ryberg 1947) or even suggested its occurrence in Palestine (Bodenheimer 1935, 1958, Theodor & Moscona 1954). Most presumably, these references as well as all the records by Mendelssohn & Yom-Tov (1999) represent *M. aurascens* as the revision of the only available specimen indicates (see also Figs. 2, 3). This species seems to occur in the whole Mediterranean arboreal region of the Middle East, similarly as other such faunal elements which use to be more often recorded, like e.g. *Myotis blythii* (Tomes, 1857), see Harrison & Bates (1991) and Benda & Horáček (1998).

The last species with a rather marginal distribution range in the Middle East was named *M. przewalskii przewalskii* by Tsytsulina (2000b), and *M. nipalensis* (or *M.* cf. *nipalensis*), by Benda & Tsytsulina (2000) and Tsytsulina (2001). This species occurs in the extensive area of the Middle and Central Asian deserts and adjacent regions. In this range, this species creates several morphologically well defined subspecies which could actually be separate forms (for details see Benda & Tsytsulina 2000). The form *M. nipalensis transcaspicus* Ogneff et Heptner, 1928 stretches to the Middle East and Transcaucasia (Fig. 4). It inhabits semi-desert and steppe regions of Azerbaijan, and it further penetrates along the Araxes river into north-western Iran and north-eastern Turkey. The records from Turkish steppes of the Araxes/Euphrates watershed (Şohun Dere [39° 55' N, 41° 15' E], Sirbasan [40° 19' N, 42° 20' E], Selim [40° 33' N, 42° 36' E; 2108 m a. s. l.]) indicate the western extension of the species distribution range. However, most of records of *M. nipalensis* in Azerbaijan and the Middle East come from rather lowland arid regions. Several individuals here identified as *M. nipalensis* showed partly also some characters of another form, the endemic Armenian bat, *M. hajastanicus* (see Table 2). Although a profound analysis of a larger material outside of Armenia is necessary to be able to draw any reliable conclusions about possible different morphological/geographical extent of *M. hajastanicus* than that described by Benda & Tsytsulina (2000), these records can at least indicate a broader distribution of this morphotype.

In conclusion, the examination of the newly collected and revised specimens of bats of the *M. mystacinus* morpho-group in the Middle East confirmed the results by Benda & Tsytsulina (2000). In some species, such as *M. brandtii*, *M. mystacinus* s. str. and *M. aurascens*, new records are presented which extend their known distribution range in the region.

I t a l y

In older collections of the National Museum (Natural History), Prague, we found three Italian individuals of whiskered bats originating from the collections of the Zoological Museum 'La Specola', Florence, Italy. The bats were once borrowed by Professor Vladimír Hanák (Charles University, Prague) for identification – they were supposed to be *M. brandtii*, see Lanza (1959). These bats are prepared as alcohol specimens with skulls extracted. Wing and skull dimensions of the respective Italian specimens are given in Table 3. The reason why the bats were sent to Prof. Hanák is obvious from their skull characters; one bat (male, MZSF 5208) represents *M. brandtii*, while the other two (females, MZSF 5200, 5950) are undoubtedly *M. aurascens*.

The identification of *M. brandtii* is clear according to its cranial dimensions, dental traits as well as the shape of penis (although it was formerly partially dissected for the extraction of baculum, see Lanza 1959: 470). This bat was collected on the Monte Amiata, southern Tuscany, in June 1874. This record was originally published by Lanza (1959: 468) as *M. mystacinus brandtii*, however, was omitted by later authors (see e.g. Vernier 1987, 1997, Fornasari et al. 1997). Only Agnelli et al. (1999) noted the Lanza's record as a possible finding of *M. brandtii* in Tuscany. Lanza (1999a, b) mentioned this record as a possible first reference of this species in Italy, and Lanza & Agnelli (1999a) as the only verified record of *M. brandtii* from Italy. So far, *M. brandtii* has been found in Italy only several times and remains one of the rarest Italian bats. Although Tupinier (2001) did not show any record of this species from Italy, Vernier (1987) summarised three records of *M. brandtii* made in two northern regions (Piedmont and Julian Venetia). Zava & Violani (1992) added records from the Abruzzi Mts., central Italy. Later, Vernier (1997) resumed occurrence of *M. brandtii* even in four Italian regions (additionally also in Abruzzi and Venetia). However, Lanza (1999b) and Lanza & Agnelli (1999a) suggested the Abruzzi records to be in fact misidentified findings of *M. daubentonii* (Kuhl, 1817). Later, Issartel (2001) found *M. brandtii* in the Abruzzi Mts. again. However, these records probably also deserve a revision as the reported individuals most probably were not collected and their skull measurements were not given. Agnelli (2005) mentioned only three sites of revised records of *M. brandtii* in Italy; viz. Pescasseroli (Abruzzi; Issartel 2001), Mte Amiata, and Equi (= in fact record of *M. aurascens*, see below). Thus, the newly confirmed old finding of *M. brandtii* from southern Tuscany probably represents the southernmost known indisputable occurrence of this species in the western part of Europe (comp. Mitchell-Jones et al. 1999) and perhaps its only confirmed record in Italy.

The records of *M. aurascens* from Italy are also significant as they represent the second and third confirmations of this species in Italy and, moreover, they slightly enlarge its known distribution range. Both these records were published already by Lanza (1959) but they were preliminary identified as of *M. mystacinus brandtii* based on their larger skull dimensions. Benda & Tsytsulina (2000) published a record of *M. aurascens* from Monte Altissimo di Nago (the Monte Baldo Range) [45° 53' N, 10° 53' E] which lies on the border between Lombardy and Trent, close to the Garda Lake, in the southern Alps. Once, this only Italian record was the westernmost point of the whole species range (Benda 2004a). One of the newly revealed individuals (MZSF 5950) was collected in Canale di Miradolo, Pinerolo, western Piedmont [44° 53' N, 7° 21' E], in May 1873. This record shifts the hitherto documented border of the distribution of this bat about 300 km to the west. However, such distribution was well presumable as the new locality lies, similarly as the previous record site, on the margin of

the Po Basin which connects the regular distribution of *M. aurascens* in Dalmatia and the Balkans (Benda 2004a, b).

However, the other Italian individual of *M. aurascens* (MZSF 5200), collected in summer 1876, comes from Equi, Apuane Alps, Lucca, north-western Tuscany [44° 09' N, 10° 40' E]. This site lies on the south-western slopes of the Tuscan Apennines, i.e. an area separated by a mountain range from the Po Basin. The Tuscan occurrence of this species may be further confirmed by the bat recorded by Lanza (1959) in Bescolungo, Pistoia Prov. which showed similar baculum size and shape as *M. aurascens* (Benda & Tsytsulina 2000). Thus, these records suggest distribution of *M. aurascens* also in peninsular Italy. Provided that the species lives in Tuscany, it may also occur in other regions of northern and central Italy where bats of the *M. mystacinus* group were reported (see Vernier 1987, 1997, Fornasari et al. 1997, Lanza & Agnelli 1999b, Agnelli 2005).

Western Mediterranean

In the westernmost part of the Mediterranean basin, Benda & Tsytsulina (2000) recognised a distinct form of *M. mystacinus* s. str., which they described as a separate subspecies *M. m. occidentalis*. It differs from the nominotypical form by a larger body and skull size and more robust canines. This subspecies was described from Spain (terra typica: Linares de Riofrio, Salamanca) and its tentative distribution range was delineated from Iberia to Morocco, i.e. the westernmost corner of the species range. Although the given extension of the distribution range of *M. m. occidentalis* was only preliminary, Benda et al. (2004) rather supported its original delimitation according to examination of an additional specimen of *M. mystacinus* from Morocco. However, Ibañez (1988) as well as Benda et al. (2004) emphasised the isolation of the Moroccan population of *M. mystacinus* from the geographically closest conspecifics which live north of 40° N in Iberia (see e.g. Agirre-Mendi 2002). Here, we analysed material of *M. mystacinus* from Morocco in more details and in higher number than in the previous study (Benda & Tsytsulina 2000), which allow us to determine its real systematic position and distance to the Iberian and nominotypical subspecies.

According to the comparison of cranial dimensions (Table 4; see also Benda & Tsytsulina 2000: 388–390, Tables 1–3), the Moroccan samples are more similar to the Central European ones (i.e., to *M. m. mystacinus*) than to the Iberian form, *M. m. occidentalis*. In the skull size, the Moroccan samples only slightly exceed, but are almost identical with the Central European ones. Significant differences between these two groups were found only in molar and unicuspidal tooth-rows (M^1M^3, CP^4, M_1M_3, CP_4) and in the height of the cingular cusp on the third upper premolar (ACin). However, all these measurements are very variable within the whole complex and the size of the P^4 cingular cusp has the same range in Moroccan samples as in the nominotypical ones (Benda & Tsytsulina 2000). On the other hand, in the upper canine traits (LCn, LaCn), which are considered to be among the most important within the group (Benda & Tsystulina 2000, Tsytsulina 2000a, 2001), these two populations well concur. *M. m. occidentalis* differs from the Moroccan samples in skull size, Moroccan individuals being slightly smaller. Similarly as from the nominotypical form, the Iberian subspecies differs from the Moroccan samples also in the size of upper canines, i.e. one of the most important diagnostic characters of the Iberian form as well (Benda & Tsytsulina 2000).

Although the Moroccan and Central European samples of *M. mystacinus* well correspond in most of compared characters, the Moroccan samples are unique within the whole compared set

Table 4. Dimensions of the examined material of *M. mystacinus* coming from Morocco (MO, n=10) and results of its statistical comparison (ANOVA) with Central European (CE, n=37) and Spanish (SP, n=15) samples. For details see text, for abbreviation explanations see the chapter Abbreviations (**M** – mean, **F** – ANOVA result, *p* – probability; significant F values are bold typed), measurements are in millimetres

Tab. 4. Rozměry šetřeného materialu *M. mystacinus* pocházejícího z Maroka (MO, n=10) a výsledky jeho statistického srovnání (ANOVA) se vzorky ze střední Evropy (CE, n=37) a ze Španělska (SP, n=15). Podrobnosti k analyse jsou uvedeny v textu, vysvětlení zkratek viz kapitola Abbreviations (**M** – průměr, **F** – výsledek testu ANOVA, *p* – míra pravděpodobnosti; statisticky významné hodnoty F jsou vysazené tučně), rozměry jsou v milimetrech

No	LCr	LCb	LaZ	LaI	LaN	ANc	CC	M^3M^3	CM^3	M^1M^3	CP^4	LMd	ACo	CM_3	M_1M_3	CP_4	ACin	LCn	LaCn	CnR	pcl	plph	mcl	mlph	LAt
EBD 13775	13.81	13.02	8.22	3.42	6.76	4.95	3.46	5.28	5.22	3.00	2.37	9.71	2.73	5.54	3.18	2.20	0.094	0.85	0.64	1.33	–	–	2	2	36.8
EBD 13776	13.11	12.64	8.20	3.39	6.52	4.50	3.43	5.15	4.85	2.87	2.18	9.52	2.55	5.32	3.13	2.07	0.126	0.84	0.68	1.23	1	1	2	2	35.8
EBD 13777	13.28	12.63	–	3.32	6.58	4.56	3.42	5.12	4.98	2.82	2.31	9.38	2.50	5.28	3.11	2.09	0.126	0.83	0.71	1.16	0	1	2	2	33.8
EBD 15350	14.02	13.37	8.38	3.47	6.80	4.79	3.37	5.22	5.35	3.05	2.46	10.07	2.72	5.55	3.21	2.21	0.084	0.81	0.66	1.22	–	–	2	2	35.6
EBD 15354	13.54	12.91	8.27	3.23	6.68	4.75	3.45	5.38	5.02	2.92	2.29	9.56	2.88	5.34	3.18	2.01	0.052	0.86	0.70	1.22	2	2	2	2	33.5
EBD 15363	13.27	13.33	8.23	3.37	6.62	4.75	3.33	5.21	5.32	2.97	2.51	10.07	2.70	5.67	3.29	2.18	0.105	0.82	0.68	1.20	1	2	2	2	35.3
EBD 15364	13.57	12.80	8.41	3.42	6.72	4.76	3.38	5.35	5.02	2.84	2.31	9.53	2.69	5.37	3.13	2.14	0.115	0.82	0.62	1.32	1	2	2	2	34.8
EBD 15365	13.40	12.82	8.08	3.42	6.63	4.66	3.33	5.19	5.03	2.92	2.31	9.68	2.63	5.38	3.21	2.14	0.094	0.87	0.66	1.32	2	2	2	2	33.3
EBD 25848	13.51	12.70	8.10	3.38	6.82	4.62	3.31	5.06	5.07	2.87	2.35	9.54	2.66	5.39	3.16	2.12	0.105	0.86	0.66	1.30	2	2	2	2	34.1
NM P90031	14.03	13.19	8.40	3.38	6.92	4.69	3.37	5.35	5.22	2.49	2.48	10.08	2.75	5.48	3.58	2.18	0.094	0.86	0.66	1.30	1	1	2	1	35.1
M MO	13.55	12.94	8.25	3.38	6.71	4.70	3.39	5.23	5.11	2.88	2.36	9.71	2.68	5.43	3.22	2.13	0.100	0.84	0.67	1.26	1.25	1.63	2.00	1.90	34.8
M SP	13.83	13.13	8.28	3.44	6.64	4.69	3.39	5.24	5.19	2.88	2.36	9.83	2.70	5.56	3.22	2.13	0.094	0.92	0.74	1.25	0.18	1.00	0.86	0.42	34.9
M CE	13.49	12.81	8.20	3.40	6.61	4.69	3.32	5.21	5.03	3.02	2.44	9.63	2.63	5.43	3.41	2.18	0.128	0.83	0.67	1.25	0.00	0.38	0.64	0.11	33.5
F MO×SP	**8.75**	4.12	–	2.04	2.04	0.08	0.03	0.03	2.45	**23.7**	**20.3**	1.37	0.33	**7.79**	**81.1**	**20.0**	0.04	**37.7**	**30.3**	0.06	**22.1**	**5.73**	**21.7**	**58.4**	–
p	0.01	0.06	–	0.17	0.17	0.78	0.87	0.88	0.13	0.00	0.00	0.26	0.57	0.01	0.00	0.00	0.84	0.00	0.00	0.81	0.00	0.03	0.00	0.00	–
F MO×CE	0.42	2.06	–	0.27	2.99	0.09	3.60	0.12	2.49	**10.6**	**11.1**	0.93	2.20	0.00	**56.8**	**4.00**	**7.36**	0.17	0.01	0.22	**170**	**44.5**	**49.7**	**355**	–
p	0.52	0.16	–	0.61	0.09	0.76	0.06	0.73	0.12	0.00	0.00	0.34	0.15	0.97	0.00	0.05	0.01	0.68	0.94	0.64	0.00	0.00	0.00	0.00	–
F SP×CE	**21.9**	**18.5**	–	1.32	0.42	0.00	**4.29**	0.31	**17.5**	1.45	**7.09**	**7.39**	**6.25**	**12.4**	0.52	**7.56**	**10.4**	**58.5**	**38.8**	0.06	**4.52**	**8.24**	**1.07**	**5.68**	–
p	0.00	0.00	–	0.26	0.52	0.97	0.04	0.58	0.00	0.24	0.01	0.01	0.02	0.00	0.47	0.01	0.00	0.00	0.00	0.81	0.04	0.01	0.31	0.02	–

of *M. mystacinus* in forming of their molars. The crowns of molars in Moroccan *M. mystacinus* bear paralophi, metaconuli and metalophi in all examined specimens, paraconuli are also present in most of specimens (Tab. 4). Such state of these molar traits has not been found in any other population of *M. mystacinus* and neither in *M. aurascens* or in other of the eastern forms of the *M. mystacinus* complex. However, it rather resembles the situation in *M. brandtii* or *M. alcathoe*, although in the latter species metalophi were not found either.

The factor analysis confirmed a peculiar position of Moroccan populations within both the complex and the species. The comparison with the European forms of the complex, i.e. *M. m. mystacinus*, *M. m. occidentalis*, *M. aurascens*, *M. brandtii*, and *M. alcathoe* (Fig. 5; 23 characters which showed in comparison of all 38 characters the significance >50%; PC1 46.81%, PC2 14.27%), showed a clear separate position of the Moroccan samples, while the Iberian subspecies *M. m. occidentalis* exhibited a large overlap with *M. m. mystacinus* from Central Europe. A similarly unique position of the Moroccan samples resulted also from the PC analysis of the samples of all taxa within the species rank of *M. mystacinus* sensu Benda & Tsytsulina (2000), i.e. *M. m. mystacinus*, *M. m. occidentalis* and *M. m. caucasicus* (Fig. 6; 27 characters which showed in comparison of all 38 characters the significance >60%; PC1 46.94%, PC2 13.54%). The exclusivity of the Moroccan form was presented in the PC2 of this analysis which is most significantly influenced by molar traits state (more than 70% by the presence and/or nature of paraconuli, paralophi, metaconuli and metalophi), while the PC1, where Moroccan bats showed similar values as the nominotypical and Iberian ones,

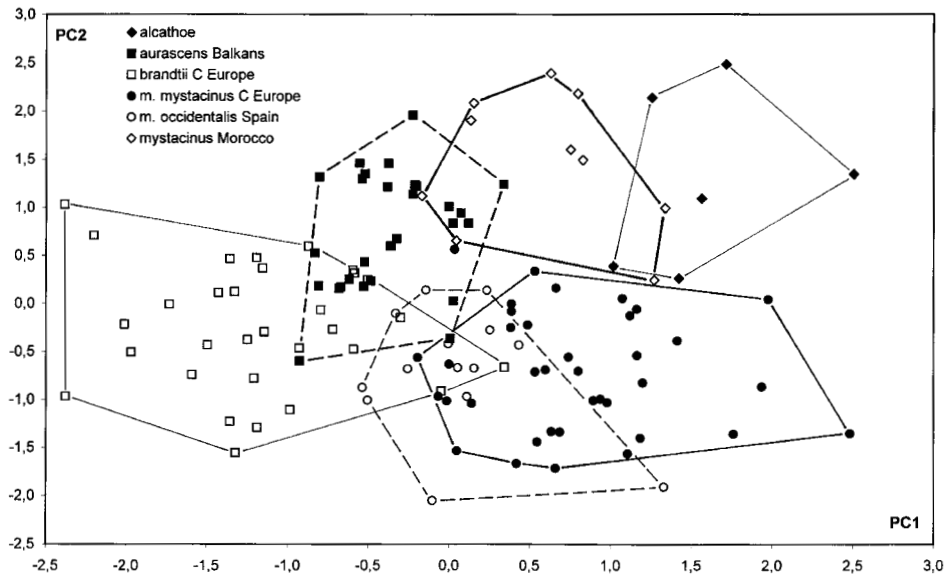

Fig. 5. Results of the principal component analysis of western Mediterranean samples of bats of the *M. mystacinus* morpho-group; for a comparison, the samples from Central Europe and the Balkans were used, see text for other details.
Obr. 5. Výsledky analysy hlavních proměnných západostředomořských vzorků netopýrů morfoskupiny *M. mystacinus*; pro srovnání byly použity také vzorky balkánské a středoevropské, další podrobnosti viz text.

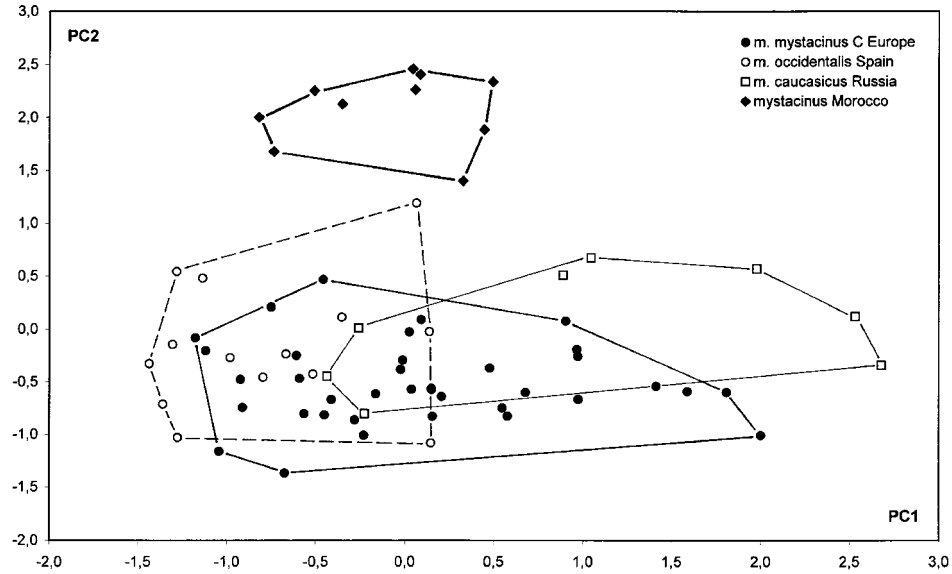

Fig. 6. Results of the principal component analysis of selected samples of *M. mystacinus* from western Palaearctic. See text for details concerning the analysis.
Obr. 6. Výsledky analysy hlavních proměnných vybraných vzorků netopýrce vousatého (*M. mystacinus*) ze západní Palearktidy. Pro podrobnosti analysy viz text.

was affected mostly by skull size and tooth length characters (LCr, LCb, LMd, tooth-rows, P^4, M^2 and mesiodistal length of C^1).

In summary, the comparison of skull and dental characters as well as the PC analysis based on these characters indicated uniqueness of the Moroccan populations of *M. mystacinus* which do not belong to the Iberian subspecies *M. m. occidentalis* as defined by Benda & Tsytsulina (2000), contra the tentative conclusions by Benda & Tsytsulina (2000) and Benda et al. (2004). Although the Moroccan bats show morphological proximity in several dental characters to the smaller *M. alcathoe* or the larger *M. brandtii*, their actual phylogenetic position is outlying according to the genetic analysis by von Helversen et al. (2001). This genetic comparison of mitochondrial genes showed Moroccan sample within the *M. mystacinus* genetic group (incl. *M. m. mystacinus*, *M. m. occidentalis* and *M. aurascens*). In comparison with the Iberian and nominotypical forms of *M. mystacinus* in the sense by Benda & Tsytsulina (2000) and Tsytsulina (2001) and according to the limited material available, the Moroccan population represents a separate evolutionary unit which has maintained some traits being absent in all other examined populations of the species. On the other hand, the species affiliation of the Moroccan whiskered bats to *M. mystacinus* is undoubted.

However, we consider a possible taxonomic expression of the undisputed peculiar position of Moroccan populations of *M. mystacinus* untimely before a definite geographical assessment of the Iberian subspecies. Although this form is morphologically well defined, it remains known almost only from the type locality (see Benda & Tsytsulina 2000 for details). Thus, more data

from the Iberian Peninsula are needed to specify the geographical and morphological extent of the subspecies *M. m. occidentalis* as well as its here challenged proximity to the Moroccan populations. However, an alternative exists, that *M. m. occidentalis* has a similar exclusive evolutionary and biogeographical context as another Iberian endemic subspecies of a rather boreal bat, *Plecotus auritus begognae* de Paz, 1994 (de Paz 1994, Juste et al. 2004) and the Moroccan populations of *M. mystacinus* should thus represent a separate taxon.

ACKNOWLEDGEMENT

Our thank go to Pauline Jenkins and Daphne Hill (BMNH), Javier Juste and Carlos Ibáñez (EBD), Manuel Ruedi (MHNG), Jacques Cuisin and Ronan Kirsch (MNHN), Uwe Fritz (MTD), Miloš Anděra (NMP), Dieter Kock and Gerhard Storch (SMF), Yoram Yom-Tov (TAU), Otto von Helversen (Univ. Erlangen), Petr P. Strelkov and Galina I. Baranova (ZIN), Manfred Ade (ZMB), Sergej Kruskop, Aleksej Borisenko and Igor Pavlinov (ZMMU), for their kind permission to use museum specimens under their care; Marco Riccucci and Ivan Horáček for their help with obtaining some literary sources; Ivan Horáček for valuable comments on the manuscript.

The study was completed with a support of grants of the Grant Agency of the Czech Republic (206/02/D041, 206/05/2334) and of the Ministry of Culture of the Czech Republic (MK 00002327201).

SOUHRN

Článek přináší nové údaje o rozšíření netopýrů morfoskupiny *Myotis mystacinus* v některých částech Středomoří, u určitých středomořských populací jsou analysovány či diskutovány jejich morfologické (lebeční) znaky. Statistické srovnání (analysou hlavních proměnných) poukázalo na velmi dobře možné rozšíření netopýrce vousatého (*Myotis mystacinus* s. str.) na Balkánském poloostrově, v sympatrii s třemi dalšími druhy skupiny, netopýrcem nimfiným (*M. alcathoe*), netopýrcem zlatistým (*M. aurascens*) a netopýrcem Brandtovým (*M. brandtii*). Toto rozšíření bylo dříve zpochybněno vzhledem k výsledkům genetické analysy (Mayer & von Helversen 2001), avšak předložené morfologické srovnání svědčí spíše pro dříve popsaný stav sympatrie (Benda & Tsytsulina 2000). Ten je také formálním argumentem pro chápání netopýrce zlatistého jakožto separátního druhu (srovnej Mayer & von Helversen 2001). Poprvé jsou uváděny nálezy netopýrce Brandtova (*M. brandtii*) a netopýrce vousatého (*Myotis mystacinus* s. str.) ve střední Anatolii (Turecko). Tyto nálezy nasvědčují souvislému rozšíření obou druhů od Balkánu po Kavkaz, zatímco jejich isolovaný výskyt v Kavkazské oblasti, který uváděli Benda & Tsytsulina (2000), je tak spíše zpochybněn. Podle revidovaných a nově kolektovaných jedinců je zřejmé, že netopýrec zlatistý (*M. aurascens*) je rozšířen v celé Anatolii a také v Levantě (Mt. Hermon) a stejně jako na Balkáně, i ve Středozemí je nejběžnějším druhem celé morfoskupiny. Článek uvádí druhý a třetí nález netopýrce zlatistého (*M. aurascens*) v Italii (okraje Pádské nížiny na severu země), jakož i potvrzení nálezu netopýrce Brandtova (*M. brandtii*) v Toskánsku (severní Italie) z roku 1874. Tento nález byl už dříve předběžně publikován (Lanza 1959) a zůstává jediným potvrzeným nálezem druhu z Italie. Analysován byl také taxonomický statut populace netopýrce vousatého (*M. mystacinus* s. str.) v Maroku, zejména ve vztahu k iberskému poddruhu tohoto netopýra (*M. m. occidentalis*), ke kterému původně byla tato populace předběžně přiřazena (Benda & Tsytsulina 2000). Tato předpokládaná souvislost nebyla potvrzena, naopak, marocká populace netopýrce vousatého se zdá být morfologicky a geograficky zcela unikátní a isolovaná v rámci celého druhu.

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APPENDIX

Material examined

The specimen descriptions are noted according to the data on their labels.
Abbreviations: S – skull, A – alcohol specimen, B – prepared skin (balg); m – male, f – female, s. i. – sex indetermined; for other abbreviations see the chapter Abbreviations.

Type material (in alphabetical order; for details see Table 1)

Myotis alcathoe von Helversen et Heller, 2001: f* (OHC MV336 [S+B]), Greece, Loutropygi, 17 June 1992, leg. O. VON HELVERSEN; – ***M. mystacinus aurascens*** Kusjakin, 1935: m (ZMMU S9266 [S+B]), Russia, Kurkužin, near Vladikavkaz, 11 May 1928, A. RADYŠČEV; – ***Vespertilio Brandtii*** Eversmann, 1845: s. i. (ZIN 41687 [S+B]), Russia, Spask, 100 km WNW of Orenburg, 29 June 1842, leg. E. EVERSMANN; – ***Myotis mystacinus bulgaricus*** Heinrich, 1936: f (BZM 47264 [S+B]), Bulgaria, Philippopel [= Plovdiv], 3 Sept. 1935, leg. G. HEINRICH; – ***Myotis mystacinus caucasicus*** Tsytsulina, 2000: m (ZIN 83623 [S+A]), Russia, Krasnodar Reg., Kiša forestry, 19 June 1998, leg. B. TUNIEV; – ***Vespertilio Davidii*** Peters, 1869: s. i. (MNHN 1987-296 [S+A]), China, Pekin, leg. A. DAVID; – ***Myotis mystacinus gracilis*** Ognev, 1927: f (ZMMU S104423 [S]), Russia, Vladivostok, leg. N. KRYLOV; – ***Myotis mystacinus hajastanicus*** Argyropulo, 1939: 2 f* (NMP 48536, 48537 [S+B]), Armenia, Šordža, eastern bank of the Sevan Lake, 25 June 1928, leg. A. ŠELKOVNIKOV; – ***Myotis ikonnikovi*** Ognev, 1911: f (ZMMU S96372 [S+B]), Russia, Primorskij Reg., Iman Dist., near Evseevka, 2 June 1910, leg. N. IKONNIKOV; – ***Myotis mystacinus kukunorensis*** Bobrinskoj, 1929: s. i. (ZIN 2147 [S+B]), China, Huang-He River, to S of the Kuku-Noor Lake, 18 May 1880, leg. N. PRŽEVALSKIJ; – ***Vespertilio lugubris*** Fatio, 1869: s. i. (MNHG 713.21 [S+B]), Switzerland, Rosenlauï, Bern, 1863, leg. M. FATIO; – ***Myotis meinertzhageni*** Thomas, 1926: f (BMNH 26.3.1.1. [S+B]), Kashmir, Ladak, Nubra and Shyok Rivers junction, 17 June 1925, leg. R. MEINERTZHAGEN; – ***Myotis mystacinus mongolicus*** Kruskop et Borissenko, 1996: m (ZMMU S148474 [S+A]), Russia, Čita Reg., Borzin Dist., Barik-Torej, 18 July 1989, leg. M. GOLOVUŠKIN; – ***Myotis mystacinus occidentalis*** Benda, 2000: f (SMF 19664 [S+B]), Spain, Salamanca, Linares de Riofrio, 18 May 1960, leg. H. GRÜNN; – ***Myotis mystacinus pamirensis*** Kusjakin, 1935: f (ZMMU S9265 [S+B]), Tajikistan, Pamir Mts., Jašil' Kul' Lake, 27 August 1934, leg. R. MEKLENBURCEV; – ***Myotis mystacinus popovi*** Strelkov, 1983: m (ZIN 45249 [S+B]), Ukraine, Crimea, Kerč Pen., near Kamenskoe, Febr. 1961, leg. A. KONSTANTINOV; – ***Myotis mystacinus przewalskii*** Bobrinskoj, 1926: s. i. (ZIN 13906 [S+B]), China, S Kashgaria, Mol'dža River Valley, 4 May 1885, leg. N. PRŽEVALSKIJ; – ***Myotis mystacinus sogdianus*** Kuzjakin, 1934: f (ZMMU S6819 [S+B]), Uzbekistan, Taškent, 14 Sept. 1932, leg. A. KUZJAKIN; – ***Myotis mystacinus transcaspicus*** Ogneff et Heptner, 1928: m (ZMMU S29214 [S+B]), Turkmenistan, Germad, 12 June 1925, leg. S. OGNEV.

Comparative material

***Myotis alcathoe* von Helversen et Heller, 2001**

Switzerland (1). 1 f (MHNG 1828.073 [S+A]), Arzier (Vaud Canton), 9 Sept. 2002, leg. M. RUEDI.
Slovakia (2). 1 m, 1 f (NMP 50446, 50447 [S+A]), Šurice , Stĺpová cave (Lučenec Dist.), 2 August 2001, leg. P. BENDA & M. UHRIN.

Greece (3). 1 m, 1 f (OHC [without number] [S], MV366 [S+B]), Loutropygi (Karditsa Dist.), 5 June 1991, 17 June 1992, leg. K.-G. Heller, M. Volleth & O. von Helversen; – 1 f (OHC [without number] [S]), Arkoudorema (Drama Dist.), 18 August 1997, leg. O. von Helversen.

***Myotis brandtii* (Eversmann, 1845)**

Italy (1). 1 ma (MZSF 5208 [S+A]), Monte Amiata, Toscana, June 1874.
Czech Republic (16). 4 m, 1 f (NMP 49312, 49449 [S], 49331, 49338, 49473 [S+B]), Bílá Desná dam (Liberec Dist.), 24 Febr. 1958, 2 Dec. 1964, 16 Febr. 1970, leg. V. Hanák & M. Nevrlý; – 2 f (NMP 49277, 49280 [S]), Býchory (Kolín Dist.), 19 July 1959, leg. V. Hanák; – 1 f (NMP 49450 [S+B]), Karlštejn (Beroun Dist.), 22 Febr. 1971, leg. V. Hanák; – 1 m (NMP 49474 [S+B]), Králický Sněžník, Pacltova cave (Ústí nad Orlicí Dist.), 20 Jan. 1966, leg. V. Hanák; – 1 m (NMP 49330 [S]), Mikulov (Teplice Dist.), 13 March 1958, leg. V. Hanák; – 2 f (NMP 49333 [S], 49480 [S+B]), Poteply (Beroun Dist.), 17 July 1973, leg. I. Horáček; – 1 f (NMP 49290 [S+B]), Praha-Nové Město (Praha Dist.), 15 May 1971, leg. V. Hanák; – 1 f (NMP 37305 [S+B]), Vůznice u Nové Huti (Příbram Dist.), 12 April 1944, leg. V. Ložek; – 1 f (NMP 49313 [S+B]), Vyžlovka u Jevan (Kolín Dist.), 30 May 1971, leg. L. Peške.
Slovakia (16). 13 m, 3 f (NMP 49282, 49297 [S], 49239, 49274, 49275, 49281, 49295, 49298, 49301, 49310, 49327, 49328, 49448, 49451, 49457, 49462 [S+B]), Dobšinská Ľadová Jaskyňa, Dobšinská cave (Rožňava Dist.), 2–4 March 1963, 2 March 1964, 16 Febr. 1968, 5 Febr. 1970, leg. V. Hanák.
Serbia and Montenegro (2). 1 f (NMP 90227 [S+A]), Stabna near Plužine (Montenegro), 8 August 2002, leg. P. Benda; – 1 m (ZIN 35063 [S+B]), Čakor (Montenegro), 24 August 1939, leg. V. Martino.
Bulgaria (9). 1 m (NMP 48482 [S]), Gela, Ladenica (Smoljan Dist.), 12 July 1978, leg. J. Flegr, J. Janda, F. Pojer & V. Vohralík; – 5 m (NMP 38764–38766, 38776, 38777 [S+B]), Gela, Rhodopes Mts., 1350 m a. s. l. (Smoljan Dist.), 31 July 1971, leg. J. Červený, I. Horáček, A. Tauš & D. Vítek; – 1 m (NMNHS N120 [S+A]), Hristo Danovo, Mazata Cave (Plovdiv Dist.), 26 Sept. 1997, leg. T. Ivanova; – 1 m, 1 f (NMNHS N96, N97 [S+A]), Murgaš Hut, Stara Planina Mts. (Sofija Dist.), 3 August 1994, leg. V. Beškov, T. Ivanova & R. Pandurska.
Turkey (4). 3 f (ZDNU 2001/124–126 [S+B]), Çamlıhemşin, Çat (Rize Prov.), 24 August 2001, leg. A. Karataş; – 1 f (ZDNU 2002/23 [S+B]), Hacıbekir farm, Çeşka castle ruins (Yozgat Prov.), 12 April 2002, leg. H. C. Öztekin.
Georgia (1). 1 m (ZIN 9253 [S+A]), Bakuriani (Tbilisskaja gubernija [= Tbilisi Reg.]), 9 July 1910, leg. (?) K. Satunin.
Southern Russia (6). 1 f (ZIN 23490 [S+A]), Kavkaz [= Caucasus Mts.], leg. Gorbunov; – 1 m (ZIN 9260 [S+A]), Psebaj (Kubanskaja Oblast' [= Kuban' Reg.]); – 1 m, 1 f (ZIN 78286, 78287 [S+B]), reka Pšiš, meždu pos. Oktjabrskij i Kurinskij (Krasnodarskij kraj) [Pšiš river, betw. the villages of Oktjabrskij and Kurinskij (Krasnodar Reg.)], 30 May 1990; – 1 m (ZIN 80876 [S+B]), pojas reki Teberdy u pos. Teberda (Karačaevo-Čerkesskaja Respublika) [= Teberda river alluvium near the village of Teberda (Karačaevo-Čerkesskaja Republic)], 8 June 1994.
Northern Russia (18). 5 f (ZIN 40691, 40692, 40727, 40851, 40852 [S+A]), Sablino, Tosnenskij rajon, Sablinskie peščery (Leningradskaja obl.) [= Sablino, Tosna Dist., Sablinskie caves (Leningrad Reg.)], 12, 19 and 26 Febr., 5 March 1959, leg. P. Strelkov; – 2 m, 5 f, 1 s. i. (ZIN 38545, 38546, 38548, 42909 [S+A], NMP 49269–49272 [S+A]), Staraja Ladoga, Volhovskij rajon, Staroladožskie peščery (Leningradskaja obl.) [= Staraja Ladoga, Volhov Dist., Staroladožskije caves (Leningrad Reg.)], 19 April 1956, 4 Jan. 1960, 15 Febr. 1997, leg. P. Strelkov & P. Benda; – 1 s. i. (ZIN 41670 [S+A]), Lužskij ujezd (Leningradskaja obl.) [= Luga Dist. (Leningrad Reg.)], summer 1922, leg. (?) Zamošy-Ol'tno; – 4 s. i. (ZIN 69044–69046, 69048 [S]), Leningradskaja obl. [= Leningrad Reg.], 1982, leg. P. Strelkov.

***Myotis mystacinus* (Kuhl, 1817)**

Morocco (10). 1 m, 2 f (EBD 13775–13777 [S+B]), Lochaich, 8 km of Chechouaen, 27 June 1986, leg. J. Peña; – 5 f (EBD 15350, 15354, 15363, 15364, 15365 [S+B]), Puente Fomento, 5 km NW of Chechaouen,

12 May 1987, leg. C. Ibáñez; – 1 m (EBD 25848 [S+B]), Lago Agenourir, Azrou, 2 May 2000; – 1 f (NMP 90031 [S+B]), Oum er Rbia river, 5 km SW of Bekrite, 28 August 2003, leg. P. Benda.
Spain (14). 4 m, 10 f (SMF 16183, 17828, 19664–19667, 20696– 20700, 21547, 21548, 22455 [S+B]), Linares de Riofrio (Salamanca Prov.), 4 June 1956, 21 August 1958, 18–21 May 1960, 17 and 28 July 1961, 10–11 July 1962, 30 June 1963, leg. H. Grünn.
Czech Republic (26). 2 m (NMP 49452, 49472 [S+B]), Bílá Desná dam (Liberec Dist.), 2 Dec. 1964, leg. V. Hanák; – 2 m (NMP 49308, 49319 [S]), Chýnov, Chýnovská cave (Tábor Dist.), 1 Nov. 1957, 15 Jan. 1958, leg. V. Hanák; – 1 f (NMP 49443 [S+B]), Dolní Počernice (Praha Dist.), 25 March 1971, leg. Kutal; – 2 f (NMP 49305, 49309 [S]), Dunajovice (Jindřichův Hradec Dist.), 30 May 1958, leg. V. Hanák; – 2 f (NMP 49320, 49475 [S+B]), Jindřichův Hradec (Jindřichův Hradec Dist.), 18 July 1970 , leg. V. Hanák; – 1 f (NMP 49335 [S]), Kersko (Kolín Dist.), 5 Sept. 1955, leg. V. Hanák; – 1 f (NMP 49278 [S+B]), Lednice, Tři Gracie (Břeclav Dist.), 22 June 1963, leg. V. Hanák; – 1 m (NMP 49464 [S]), Lnáře (Strakonice Dist.), 6 June 1956, leg. V. Hanák; – 4 f (NMP 49315, 49323, 49459, 49465 [S]), Lomnice nad Lužnicí, Potěšil fishpond (Jindřichův Hradec Dist.), 5 July 1959, 25 July 1969, leg. V. Hanák; – 3 m, 1 f (NMP 49306, 49311, 49339, 49454 [S+B]), Mikulov (Teplice Dist.), 6 March, 12 April and 2 Dec. 1964, leg. V. Hanák; – 1 m (NMP 49447 [S+B]), Mořina (Beroun Dist.), 23 Febr. 1971, leg. V. Hanák; – 3 f (NMP 49300, 49458, 49494 [S]), Novosedly nad Nežárkou (Jindřichův Hradec Dist.), 7 August 1958, 17 May 1959, leg. V. Hanák; – 1 f (NMP 49461 [S+B]), Srbsko (Beroun Dist.), 16 Nov. 1962, leg. V. Hanák; – 1 f (NMP 49303 [S+B]), Třeboň, Novořecká bašta (Jindřichův Hradec Dist.), 24 May 1970, leg. K. Šťastný.
Slovakia (11). 1 f (NMP 49292 [S+B]), Demänovská Dolina, Okno cave (Liptovský Mikuláš Dist.), 28 Febr. 1964, leg. V. Hanák; – 1 m (NMP 49293 [S+B]), Demänovská Dolina, Dračia cave (Liptovský Mikuláš Dist.), 14 Febr. 1961, leg. V. Hanák; – 2 m, 5 f (NMP 49279, 49284–49286, 49289, 49318, 49321 [S+B]), Dobšinská Ľadová Jaskyňa, Dobšinská cave (Rožňava Dist.), 29 Febr. and 2 March 1964, 16 Febr. 1968, leg. V. Hanák; – 1 f (NMP 49446 [S+B]), Haligovce, Aksamítka cave (Stará Lubovňa Dist.), 28 July 1972, leg. V. Hanák; – 1 m (NMP 49477 [S+B]), Muráň (Revúca Dist.), 12 June 1975, H. Burda & M. Braniš.
Serbia and Montenegro (1). 1 f (NMP 90228 [S+A]), Stabna, Vrbnica river (Montenegro), 8 August 2002, leg. P. Benda.
Bulgaria (26). 1 f (NMP 38769 [S+B]), Čepelare, Rhodopes Mts., 1040 m a. s. l. (Smoljan Dist.), 5 August 1971, leg. J. Červený, I. Horáček, A. Taušl & D. Vítek; – 1 m (NMP 38770 [S+B]), Čepelare, Rhodopes Mts., 1240 m a. s. l. (Smoljan Dist.), 7 August 1971, leg. J. Červený, I. Horáček, A. Taušl & D. Vítek; – 1 f (SMO 5221 [S]), Durankulak (Varna Dist.), 10 July 1980, leg. B. Beneš; – 2 m (NMP 48484, 48485 [S+B]), Gela, Ladenica cave (Smoljan Dist.), 13 August 1978, leg. P. Donát, J. Flegr, J. Janda, F. Pojer & V. Vohralík; – 7 m, 1 f (NMP 38762, 38763, 38767, 38768, 38772, 38773, 48483, 49233 [S+B]), Gela, Rhodopes Mts., 1350 m a. s. l. (Smoljan Dist.), 31 July 1971, 13 August 1978, 14 July 1981, leg. J. Červený, P. Donát, J. Flegr, J. Flousek, R. Fuchs, I. Horáček, J. Janda, F. Pojer, A. Taušl, D. Vítek & V. Vohralík; – 3 m, 4 f (NMP 48487, 48501, 48504, 48505, 48507 [S+B], 48343, 48344 [S+A]), Gorna Breznica (Blagoevgrad Dist.), 14 and 22 July 1981, 15, 18 and 19 July 1982, 25 July 1994, leg. P. Benda, J. Flousek, D. Frynta, R. Fuchs, D. Holečková, I. Horáček, H. Pragerová & V. Vohralík; – 3 m (NMP 38771, 38775, 49235 [S+B]), Izgrev (Burgas Dist.), 15 August 1971, leg. J. Červený, I. Horáček, A. Taušl & D. Vítek; – 1 m (NMP 48486 [S+B]), Kotel, Nirica cave (Sliven Dist.), 14 July 1979, leg. P. Donát, D. Holečková, I. Horáček, J. Jirouš & V. Vohralík; – 1 m (NMNHS N11 [S+A]), Orehovo, Modarskata cave, Rhodopes Mts. (Smoljan Dist.), 26 Sept. 1994, leg. B. Petrov; – 1 m (NMP 38774 [S+B]), Pamporovo, Rhodopes Mts. (Smoljan Dist.), 8 August 1971, leg. J. Červený, I. Horáček, A. Taušl & D. Vítek.
Greece (1). 1 m (NMP 48514 [S+B]), Ormília (Halkidíki Dist.), 14 Sept. 1988, leg. V. Hanák & V. Vohralík.
Turkey (4). 1 m, 1 f (ZIN 9004, 9012 [S+A]), Aralyh (Erivan'skaja gubernija) [= nowadays Aralik (Iğdir Prov.)], 1901, 6 Sept. 1906, leg. K. Satunin; – 1 m (ZDNU 2001/86 [S+B]), Kızılcahamam, Kirmir Çayı river (Ankara Prov.), 30 July 2001, leg. A. Karataş; – 1 m (NMP 47915 [S+A]), Van Castle (Van Prov.), 28 July 1992, leg. P. Benda.
Georgia (1). 1 m (ZIN 9286 [S+A]), Lagodehi, 25 July 1911, leg. (?) K. Satunin.

Azerbaijan (3). 1 m (NMP 48541 [S+B]), Agdam, 27 July 1974, leg. I. Rahmatulina; – 1 m (NMP 48540 [S+B]), near Hal'mil, 24 June 1975, leg. I. Rahmatulina; – 1 s. i. (NMP 48520 [S+B], Kutakşen, 7 August 1935, leg. N. Vereščagin.
Southern Russia (11). 1 m (ZIN 83771 [S+A]), okolo 10 km k vostoku ot pos. Psebaj, hrebet Ahmet-skala (Krasnodarskij kraj) [= ca. 10 km E of the village Psebaj, Ahmet-skala Range (Krasnodar Reg.)], Jan. 1998, leg. S. Gazarjan; – 1 f (ZIN 83008 [S+A]), Adler (Krasnodarskij kraj [= Krasnodar Reg.]), 16 July 1997, leg. K. Tsytsulina; – 1 f (ZIN 69582 [S+A]), Aše (Černomorskaja gubernija [= Black Sea Reg.]), 20 July 1913; – 1 f (ZMMU S10447 [S+A]), Gelendžik, Černomorskoe poberežie [= Black Sea coast], 20 August 1927, leg. B. Obrazcov; – 1 s. i. (ZMSO 263 [S+A]), reka Hosta, Kavkazskij zapovednik [= Hosta river, the Caucasus Reserve], 8 July 1967; – 1 m (ZIN 83623 [S+B]), kordon Kiša, Severnuj otdel Kavkazkogo zapovednika, Krasnodarskij kraj [= Kiša forestry, Northern Part of the Caucasus Reserve, Krasnodar Reg.], 19 June 1998, leg. B. Tuniev; – 1 m (ZMMU S46565 [S+B]), Nal'čik, 23 August 1928, leg. A. Radyščev; – 1 f (ZIN 49743 [S+A]), estonskaja derevnja bliz goroda Ermalaevka, Černomorskaja gubernija [= Estonian village near the town of Ermalaevka, Black Sea Reg.], 21 July 1914; – 1 f (ZIN 9178 [S+A]), Stavropol'; – 1 f (ZMMU S166220 [S+A]), Tuapsijskij rajon, Krasnodarskij kraj [= Tuapse Dist., Krasnodar Reg.], 12 August 1998, leg. S. Kruskop & S. Apisimova; – 1 f (ZIN 6031 [S+A]), Vladikavkaz, 1896.

***Myotis aurascens* Kusjakin, 1935**

Italy (3). 1 fa (MZSF 5200 [S+A]), Equi, Alpi Apuane, Lucca, Toscana, summer 1876; – 1 fa (MZSF 5950 [S+A]), Can. Miradolo, Pinerolo, Piemonte, May 1873; – 1 fa (SMF 34265 [S+B]), Mt. Altissimo di Nago (Mte. Baldo), May 1964, leg. G. Storch & F. Malec.
Serbia and Montenegro (4). 2 s. i. (ZIN 35062, 35064 [S+B]), Peć (Kosovo), 17 and 31 August 1939, leg. V. Martino; – 1 m (NMP 90208 [S+A]), Vitoglav, 2 km SW of Risan (Montenegro), 31 July 2002, leg. P. Benda; – 1 m (NMP 90226 [S+A]), Stabna, Vrbnica river (Montenegro), 8 August 2002, leg. P. Benda.
Macedonia (1). 1 s. i. (ZIN 62630 [S+B]), Kočane [= Kočani], 29 Sept. 1931, leg. V. Martino.
Bulgaria (35). 1 m (NMNHS N92 [S+A]), Beli Iskar dam, Rila Mts., 1900 m (Sofija Dist), 16 July 1994, leg. V. Beškov; – 1 m (NMP 38778 [S+B]), Čepelare (Smoljan Dist.), 1240 m a. s. l., 7 August 1971, leg. J. Červený, I. Horáček, A. Taušl & D. Vítek; – 1 f (NMP 48478 [S+B]), Gara Tulovo, near Kazanlak (Stara Zagora Dist.), 24 May 1957, leg. V. Hanák; – 7 m, 13 f (NMP 48342 [S+A], 48488, 48489, 48493, 48494, 48497–48500, 48502, 48503, 48506, 48508, 48509 [S+B], 48491, 48492, 48495, 48496, 48510, 48511 [S]), Gorna Breznica (Blagoevgrad Dist.), 15–22 July 1981, 14 and 19 July 1982, 9 and 13 July 1983, 25 July 1994, leg. P. Benda, J. Flousek, D. Frynta, R. Fuchs, D. Holečková, I. Horáček, K. Hůrka, H. Pragerová & V. Vohralík; – 1 m (NMNHS N138 [S+A]), Hristo Danovo, Mazata Cave (Plovdiv Dist.), 3 Nov. 1997, leg. P. Beron & V. Beškov; – 1 m (NMP 48481 [S+B]), Karlukovo (Loveč Dist.), 8 August 1978, leg. P. Donát, J. Flegr, J. Janda, F. Pojer & V. Vohralík; – 2 f (NMP 48479, 48480 [S]), Momčilgrad (Kărdžali Dist.), 17 June 1977, May 1978, leg. V. Bejček, P. Donát, F. Pojer, J. Škopek, P. Vašák & V. Vohralík; – 1 m (NMNHS N139 [S]), Bulgaria (undef.), 25 August 1907; – 1 m, 1 f (NHNMS N94, 95 [S+A]), Pasarel, Iskar river (Sofija Dist.), leg. V. Beškov, T. Ivanova & R. Pandurska; – 3 m, 1 f (MTD B13208 [S+B], ZMB 47264–47266 [S+B]), Philippopel [= Plovdiv] (Plovdiv Dist.), 3, 9, and 21 Sept. 1935, leg. G. Heinrich; – 1 m (NMNHS N117 [S+A]), Pleven hut, Vodnite Dupki cave (Gabrovo Dist.), 15 August 1997, leg. T. Ivanova.
Greece (8). 1 m (NMP 48517 [S]), Metamorfósi (Halkidíki Dist.), 16 Sept. 1988, leg. V. Hanák & V. Vohralík; – 3 f (NMP 48512, 48513, 48515 [S+B]), Ormília (Halkidíki Dist.), 14 Sept. 1988, leg. V. Hanák & V. Vohralík; – 1 f (NMP 48516 [S+B]), Priónia, Olympos Mts. (Pieriá Dist.), 17 Sept. 1988, leg. V. Hanák & V. Vohralík; – 1 f (NMP 48346 [S+A]), Spárti (Lakonía Dist.), 17 Sept. 1996, leg. P. Benda & M. Uhrin; – 1 f (NMP 51477 [S+A]), Stoupa, near Kardamíli (Messinía Dist.), 7 July 1991, leg. M. Anděra & P. Zbytovský; – 1 s. i. (ZFMK 77.37 [S]), Halkidíki, 28 May 1962, leg. H. Wolf.
Crete (1). 1 m (NMP 48345 [S+A]), Stavros (Hania Dist.), 10 July 1995, leg. I. Horáček.
Moldavia (8). 2 f (ZIN 55692, 55693 [S+B]), selo Bygok, Tiraspol'skij rajon [= Bygok vill., Tiraspol' Reg.], 24 and 26 Febr. 1969, leg. P. Strelkov; – 1 m, 1 s. i. (ZIN 62424, 62426 [S+B]), okresnosti Kišineva [vicinity of Chişinau], 22–23 Jan. 1976, leg. P. Strelkov; – 1 f (ZIN 62691 [S+B]), Malye Melešty

[= Meleşti], 27 Jan. 1976, leg. P. Strelkov; – 2 m, 1 f (ZIN 55594–55596 [S+B]), Moldavia, February 1969, leg. P. Strelkov.
Ukraine (21). 1 m (ZIN 49555 [S+B]), selo Bolgrad, Melitopol'skaja obl. [= Bolgrad vill., Melitopol' Reg.], 5 August 1913; – 2 m, 3 f (ZIN 53032–52036 [S+B]), Beljaevskij rajon, Odesskaja oblast' [= Beljaevka Dist., Odessa Reg.], 14 Jan. and 7 Febr. 1964; – 2 m (ZIN 68508, 67509 [S+B]), Karadag, Krym [= Crimea], 6 July 1960; – 1 m, 2 f (ZIN 78275–78277 [S+B]), ostrov Kujuk-Tuk, Sivašskij zaliv, Hersonskaja oblast' [= Kujuk-Tuk Island, Sivaš Bay, Herson Reg.], 12 and 13 August 1990; – 1 f (ZMMU S4159 [S+B]), oblast' Donskogo Vojska [= Don Army Reg., cf. present-day Doneck Reg.], leg. B. Obrazcov; – 3 f (ZMMU S84006–84008 [S+B]), Zaporožie [= Zaporižžija], 9, 14 and 19 July 1939, leg. B. Popov; – 1 s. i. (ZMMU S29157 [S+A]), Doneckij okr. [= Doneck Reg.], 31 August 1926, leg. Karabukov; – 2 s. i. (ZIN 8057, 9189 [S+B]), Tatajkoj, Krym [= Crimea], 1890; – 2 m (ZIN 9249, 9250 [S+B]), okresnosti Simferopol'ja [= vicinity of Simferopol'], 1889; – 1 m (ZIN 45249 [S+B]), okresnosti po. Kamenskoe, Kerčenskij poluostrov, Krym [= vicinity of the Kamenskoe vill., Kerč Peninsula, Crimea], Febr. 1961, leg. A. Konstantinov.
Turkey (10). 1 m (OHC [without number] [S+B]), Buchtal nordwestlich Ispir (Erzurum Prov.), 4 August 1983, leg. O. von Helversen; – 1 f (OHC [without number] [S+B]), Bachschlucht oberhalb Beşkonak (Antalya Prov), 10 Oct. 1984, eg. O. von Helversen; – 1 m, 1 f (ZDNU 1998/101, 103 [S+B]), Beyşehir (Konya Prov.), 9–10 August 1998, leg. A. Karataş; – 1 f (ZDNU 2002/111 [S+B]), Kızılcahamam, Kirmir river (Ankara Prov.), 8 August 2002, leg. A. Karataş; – 1 f (OHC [without number] [S+B]), Taurus bei Üçpınar, ca. 20 km östlich Bozkir (Konya Prov.), 27 June 1986, leg. O. von Helversen; – 1 m (NMP 48094 [S+A]), a railway bridge ca. 5 km N of Sirbasan (Kars Prov.), 10 Sept. 1995, leg. P. Benda & I. Horáček; – 3 m (NMP 47912–48914 [S+A]), Van Castle (Van Prov.), 28 July 1992, leg. P. Benda; – 1 m (OHC [without number] [S]), Şohun Dere (Erzurum Prov.), 8 August 1983, leg. O. von Helversen.
Georgia (1). 1 m (ZIN 9287 [S+A]), Lagodehi, 25 July 1911, leg. (?) K. Satunin.
Armenia (1). 1 s. i. (ZIN [without number] [S+A]), ozero Sevan [= Sevan Lake].
Azerbaijan (5). 1 f (ZIN 9019 [S+A]), Elizavetpol'skaja gubernija [= Gănčă Reg.], 1895, leg. (?) K. Satunin; – 1 m (NMP 48519 [S+B]), údolí Geokčaj [= Geokçay river valley], 1460 m a. s. l., 29 August 1975, leg. V. Bejček; – 1 f, 1 s. i. (ZIN 23507, 76-1916 [S+A]), Geok-Tapa Arešskogo uezda, Elizavetpol'skaja gubernija [= nowadays Port Iliç], 30 July 1915, leg. (?) K. Satunin; – 1 m (ZMMU S84003 [S+A]), Azerbaijan (undef.), 12 July 1938, leg. Apuljan.
Russia (16). 3 f (ZIN 80847, 80848, 80850 [S+B]), šosse meždu Levokumskom i pos. Aleksandrovskoe, Stavropol'skij kraj [road between Levokumskoe and Aleksandrovskoe, Stavropol' Reg.], 15 June 1994; – 1 m, 1 s. i. (ZIN 4909, 4910 [S+A]), Dagestan, Miusskij okrug [= Mius Dist.]; – 1 m, 2 f (ZMMU S9266, S46560, S46562 [S+B]), selo Kukružin bliz Vladikavkaza [Kurkužin village near Vladikavkaz], 11 May 1928, leg. A. Radyščev; – 1 f (ZIN 78274 [S+B]), terrennaja biostancija Malyj Irtyš, Novorossijskij rajon [Malyj Irtyš field station, Novorossijsk Dist.], 17 August 1990; – 1 m (ZMMU S46561, S46564 [S]), severnij Kavkaz [= Northern Caucasus], 31 May 1925, 2 May 1928, leg. A. Radyščev; – 1 f (ZIN 69879 [S+B]), železnodarožnaja kazarma, okresnosti goroda Ipatovo (Stavropol'skij kraj) [= railway quarters, near Ipatovo (Stavropol' Reg.)], 4 July 1983; – 1 s. i. (ZMMU S5022 [S+B]), Tarasovskij rajon (Rostovskaja oblast') [= Tarasovskij Dist. (Rostov-na-Donu Reg.)], 14 Sept. 1926; – 1 m (ZMMU S29432 [S+B]), stancija Tarasovka (Krasnodarskij kraj) [= Tarasovka station (Krasnodar Reg.)], 17 August 1925, leg. V. Raevskij; – 1 f (ZIN 78288 [S+B]), pojma reki Terek, Kardaminskaja na šosse Groznyj–Kizljar [Terek river alluvium, Kargaminskaja on the road betw. Groznyj and Kizljar], 6 June 1990, leg. P. Strelkov; – 1 f (ZMMU S166219 [S+A]), okresnosti pos. Krinipovskoe, Tuapsijskij rajon (Krasnodarskij kraj) [= vicinity of the Krinipovskoe vill., Tuapse Dist. (Krasnodar Reg.)], 10 August 1998, leg. S. Kruskop & S. Apisimova.
Iran (3). 3 m (BMNH 63.1196–1198 [S]), Gutur Su, N of Mt. Sabalan (Azarbaijan-e-Sharqi Prov.), 21 August 1961, leg. Univ. of Wales Expedition.
Syria (1). 1 m (TAU M9456 [S+B]), Mount Hermon, 2 Sept. 1994, leg. B. Shalmon.

***Myotis nipalensis* (Dobson, 1871)**

Turkey (8). 1 m, 1 f, 2 s. i. (ZIN 9002, 9003, 9009, 9011 [S+A]), Aralyh (Erivan'skaja gubernija) [= nowadays Aralik (Iğdir Prov.)], 1901, 6 Sept. 1900, 6 Sept. 1910, leg. K. Satunin; – 1 m (NMP 48095

[S+A]), a railway bridge ca. 5 km N of Sirbasan (Kars Prov.), 10 Sept. 1995, leg. P. Benda & I. Horáček; – 1 f (ZDNU 2003/38 [S+B]), Sarıkamış, 2 km S of Sirbasan (Kars Prov.), 21 July 2003, leg. A. Karataş & F. Toprak; – 1 m (ZDNU 2000/15 [S+B]), Selim, Sarıgün (Kars Prov.), 15 Sept. 2000, leg. A. Karataş.
Armenia (1). 1 f (ZIN 9008 [S+A]), Erivan' [= Erevan], August 1902, leg. (?) K. Satunin.
Azerbaijan (6). 1 f (ZIN 9018 [S+A]), Elizavetpol'skaja gubernija [= Găncă Reg.], 1895, leg. (?) K. Satunin; – 2 f (ZIN 8182, 23505 [S+A]), Geok-Tapa Arešskogo uezda, Elizavetpol'skaja gubernija [= nowadays Port Iliç], 1906, 1915, leg. (?) K. Satunin; – 1 f (NMP 49237 [S], Mingečaur [= Mingaçevir], 27 June 1986, leg. P. Škoudlín; – 1 s. i. (ZIN 5346 [S+A]), reka Kura, Sal'jany [= Kura river, Salyan], 1888; – 1 f (NMP 48521 [S+B]), Šekinskij rajon [= Şaki Dist.], 29 April 1976, leg. I. Rahmatulina.
Iran (2). 2 m (NMP 48119, 48120 [S+A]), Bastam (Azarbaijan-e-Sharqi Prov.), 30 Sept. 1998, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin.
Kazakhstan (7). 4 f (ZIN 65107, 65109–65111 [S+B]), levyj bereg reki Èmba, 125 km VVS ot goroda Kul'sary (Aktjubinskaja obl.) [= left bank of the Emba river, 125 km ENE of the town of Kul'sary (Aktjubinsk Reg.)], 10 May 1977, leg. P. Strelkov; – 1 s. i. (ZIN 5117 [S]), Mangyšlak, leg. K. Ber; – 1 f (ZIN 69040 [S+B]), ozero Karakol', nizov'e reki Turgaj [Karakol' Lake, Turgaj river estuary], 10 June 1974, leg. V. Orlov; – 1 s. i. (ZIN 9461 [S+A]), Fort Aleksandrovskij, Zakaspijskaja obl. [= Fort-Ševčenko, Transcaspian Reg.], 28 May 1904.
Turkmenistan (13). 1 f (ZMMU S104470 [S]), Krasnovodsk [= Türkmenbaşi]; – 10 f (NMP 48539 [S+B], ZIN 56674–56682 [S+B]), Gasan-Kuli, 16 July 1964, 29 and 30 May 1970, leg. V. Hanák & P. Strelkov; – 2 m (NMP 48538 [S+B], ZMMU S29214 [S+B]), Germad, 12 June 1925 and 16 July 1964, leg. S. Ognev & V. Hanák.