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Bats (Mammalia: Chiroptera) of the Eastern Mediterranean and Middle East. Part 12. Bat fauna of Afghanistan: revision of distribution and taxonomy*

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Abstract. A complete list of bat records available from Afghanistan was compiled from literature and from examination of museum specimens. The record review is complemented by distribution maps, summaries of distributional status of the particular species, supplemented by observations on morphology and evaluation of taxonomic status of the Afghanistani populations. From the territory of Afghanistan, at least 224 records of 40 bat species belonging to eight families are known; viz. *Rhinopoma microphyllum* (Brünnich, 1782) (15 record sites), *R. muscatellum* Thomas, 1903 (4), *R. hardwickii* Gray, 1831 (10), *Lyroderma lyra* (Geoffroy, 1810) (2), *Rhinolophus ferrumequinum* (Schreber, 1774) (20), *R. bocharicus* Kašenko et Akimov, 1918 (5), *R. hipposideros* (Borkhausen, 1797) (7), *R. lepidus* Blyth, 1844 (6), *R. blasii* Peters, 1867 (10), *Hipposideros fulvus* Gray, 1838 (2), *Asellia tridens* (Geoffroy, 1813) (10), *Taphozous nudiventris* Cretzschmar, 1830 (3), *Myotis blythii* (Tomes, 1857) (14), *M. emarginatus* (Geoffroy, 1806) (2), *M. formosus* (Hodgson, 1835) (1), *M. davidii* (Peters, 1869) (5), *M. longipes* (Dobson, 1873) (4), *Submyotodon caliginosus* (Tomes, 1859) (1), *Vespertilio murinus* Linnaeus, 1758 (1), *Eptesicus serotinus* (Schreber, 1774) (2), *E. pachyomus* (Tomes, 1857) (2), *E. ognevi* Bobrinskoj, 1918 (1?), *E. gobiensis* Bobrinskoj, 1926 (1), *Rhyneptesicus nasutus* (Dobson, 1877) (5), *Hypsugo savii* (Bonaparte, 1837) (4), *Pipistrellus pipistrellus* (Schreber, 1774) (35), *P. kuhlii* (Kuhl, 1817) (9), *P. coromandra* (Gray, 1838) (6), *P. tenuis* (Temminck, 1840) (3), *Nyctalus noctula* (Schreber, 1774) (1), *N. montanus* (Barrett-Hamilton, 1906) (2), *N. leisleri* (Kuhl, 1817) (4), *Otonycteris leucophaea* (Severcov, 1873) (6), *Barbastella darjelingensis* (Hodgson, 1855) (3), *Plecotus strelkovi* Spitzenberger, 2006 (8), *Scotophilus heathii* (Horsfield, 1831) (3), *Miniopterus fuliginosus* (Hodgson, 1835) (1), *M. pallidus* Thomas, 1907 (4), *Tadarida teniotis* (Rafinesque, 1814) (1), and *Nyctinomus aegyptiacus* Geoffroy, 1818 (1). While *Nyctalus noctula* is here reported from the country for the first time, *Rhinolophus mehelyi* Matschie, 1901, *Myotis bucharensis* Kuzâkin, 1950, and *Pipistrellus javanicus* (Gray, 1838), reported erroneously to occur in Afghanistan by some previous authors, have been deleted from the list of the Afghanistani bat fauna.

Key words. Distribution, taxonomy, Rhinopomatidae, Megadermatidae, Rhinolophidae, Hipposideridae, Emballonuridae, Vespertilionidae, Miniopteridae, Molossidae, Afghanistan, Middle East, Turkestan, Indian subcontinent, Palaearctic, Oriental region.

INTRODUCTION

The territory of the State of Afghanistan (647,000–653,000 km^2, according to various sources) lies at the easternmost margin of the Middle East and westernmost margin of the broader Indian region (Fig. 1). It is situated on the crossroads of environmental as well as cultural influences between the Mediterranean, Arabia, Turkestan, Tibet, and India. The Hindu Kush range, with the highest

* Dedicated to late Professor Dalibor Povolný (1924–2004), Brno, a reputable dipteran entomologist and a leader of the Czechoslovak Biological Expeditions to Afghanistan in 1965–1967.

Afghanistani peak of Nowshaq (7,492 m a. s. l.) forms the geographical axis of the country running from the south-west to the north-east; it also creates a border between two principal zoogeographical regions in south-western Asia, the Palaearctic and Orient. From the biogeographical point of view, the area of Afghanistan represents an extremely interesting and also important region, where several faunal influences meet and coexist in a very variable selection of sub-tropical habitats. The bat fauna of this country has never been thoroughly reviewed and its knowledge currently remains far behind that in the surrounding countries (see Bates & Harrison 1997, Benda et al. 2012). So, although Afghanistan only neighbours the Middle East (but this is rather a political term and geographical definition) and with a limited biogeographical influence from the Mediterranean, we still find it useful to assess the bat fauna of this country in this review series. Since Afghanistan is currently inaccessible for field research and most probably will remain inaccessible for a long time, we tried to review bat fauna of this country based on a literature survey and mainly on a thorough examination of as many specimens available in museum collections as possible.

Although the mammal fauna of Afghanistan started to be investigated in a similar period as in other South-Asian areas (see Hutton 1845, Blanford 1881, Scully 1887a, Thomas 1889, etc.), the bats of this country remained almost unknown for a long time. With the exception of very few old individual and perhaps accidental records (Hutton 1845, Dobson 1878, Anderson 1881, Scully 1881b, Ogneff & Heptner 1928, Dupree 1958, Gaisler 1971), the bat fauna of Afghanistan started to be studied in the second half of the twentieth century. Moreover, majority of the bat field studies were made along with a research of other mammal/animal groups and only few campaigns were focused directly on bats.

The first collection of bats was gathered by Johann Friederich Klapperich (1913–1987), an entomologist and preparator at the ZFMK museum, Bonn. He spent more than a year in Afghanistan in 1952–1953 and carried out three long-time trips through the north-eastern part of the country; the description of the trips as well as the gazetteer was published by Klapperich (1954). His collection, comprising 23 bat specimens of five species, was evaluated and published by Zimmermann (1956); however, this collection was spread over several museums in Europe and the US (see Neuhauser 1969), although most of its content remains in the SMF at Frankfurt am Main.

Another collection of bats from Afghanistan was gathered by Knut Lindberg (1892–1962), a Swedish physician who worked between 1927–1947 at the Barsi Light Railways in Kurduvadi near Bombay, India. After his retirement in 1947, Lindberg made three field trips to Afghanistan (1947, 1957–1960, 1962) and during the latter two he collected cave fauna including bats (Lindroth 1963, Löwegren 1964). Most of Lindberg's bat records made until 1959 (99 specimens of 12 species) were published by Aellen (1959a), some others by Lindberg (1961, 1962), several specimens remained unpublished until now; the respective specimens are housed in the MHNG and MZLU collections. Based mainly on the Lindberg's collection, Aellen (1959a) first offered a complete review of bat fauna of Afghanistan then composed of 15 species (Table 1).

In the 1960s, several groups and individuals studied bats in Afghanistan; concerning the enrichment of knowledge of the Afghanistani bat fauna, these years were the most fruitful at all. Jochen Niethammer (1935–1998) from ZFMK, Bonn, visited Afghanistan in the periods 1962–1966 and 1972–1975; he collected an extensive series of small terrestrial mammals (see e.g. Niethammer 1965, 1967, 1969a, b, 1970, 1973, 1975, 1982, 1983, Nauman & Niethammer 1973, 1974, etc.) and along with them also some bats. Including the cave deposit remains, this bat collection comprises some 360 specimens of 18 currently recognised species. Although Meyer-Oehme (1968) and Niethammer (1968, 1983) published some records from this collection, most of the specimens have remained unpublished. Together with J. Niethammer, another German zoologist worked in Afghanistan in the 1960s, Detlef Meyer-Oehme (*1929). As a high school teacher at Kabul, he studied bats extensivelly (sometimes in co-operation with Niethammer, see below) and

published their findings in two rather short publications (Meyer-Oehme 1965, 1968); however, these reports brought records of several species new for the fauna of Afghanistan. As stressed by Niethammer (1968), thanks to the records made by D. Meyer-Oehme, at the late 1960s the bat fauna of Afghanistan was known better than that of any of the neighbouring countries. The bat collection created by Meyer-Oehme, represented by more than 500 specimens, is currently housed in the SMF and although it has not been published as a whole, particular specimens were used in many comparative studies (see e.g. Kock et al. 1972, Felten et al. 1977, Kock 1980, 1999, Nader & Kock 1980, 1990, Van Cakenberge & De Vree 1994, Benda et al. 2006, 2012, etc.).

A group of zoologists from Czech scientific institutes visited Afghanistan at least four times in 1965–1967 to collect various animals, but mostly mammals and their parasites (see Daniel 1966, 1969, and Gaisler et al. 1967 for basic descriptions of the trips). The group included Milan Daniel (*1931), Jiří Gaisler (1934–2014), Dalibor Povolný (1924–2004), Pavel Rödl (*1941), Zdeněk Šebek (*1925), and František Tenora (1930–2011). Their effort resulted in collection of ca. 750 bat specimens belonging to 18 species, originating mainly from the eastern regions of Afghanistan and now housed mostly in the IVB and NMP collections. The bat records of this expedition were published by Gaisler et al. (1968) and taxonomic evaluation of these bats by Gaisler (1970a, 1971) and Hanák & Gaisler (1969). Gaisler (1971) published a new review of the Afghanistani bat fauna, then composed of 32 species (see Table 1); this number was more than twice higher than that reviewed by Aellen (1959a).

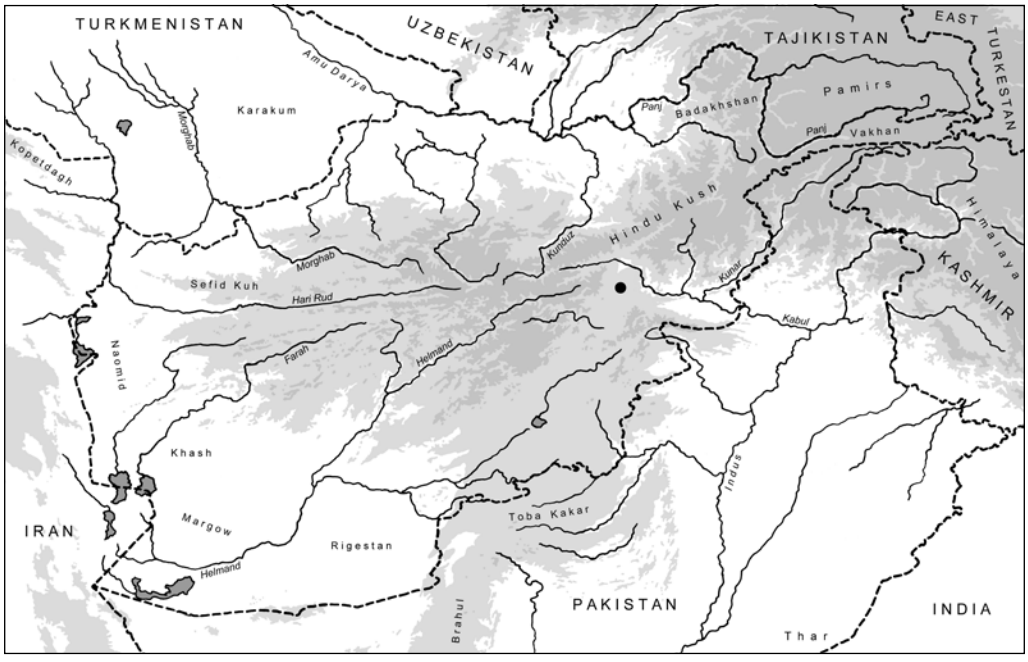

Fig. 1. General map of Afghanistan showing the main geographical features (pale shaded – area above 1500 m a. s. l., dark shaded – area above 3000 m a. s. l.). The closed circle denotes position of the capital city of Kabul, the only record locality of *Eptesicus gobiensis* Bobrinskoj, 1926, *Tadarida teniotis* (Rafinesque, 1814), and *Nyctinomus aegyptiacus* Geoffroy, 1818 in Afghanistan.

Table 1. Composition of the bat fauna of Afghanistan and the number of records of particular species according to subsequent reviews. Numbers of cases with inaccurate species identification are given in parentheses

species	Aellen 1959a*	Gaisler 1970a, 1971	Bates & Harrison 1997	this review
Rhinopoma microphyllum	3	9	12	15
Rhinopoma muscatellum	[1]	[1]	2	4
Rhinopoma hardwickii	–	[5]	7	10
Lyroderma lyra	1	2	1	2
Rhinolophus ferrumequinum	4	8	8	20
Rhinolophus bocharicus	[1]	[1]	–†	5
Rhinolophus hipposideros	1	5	2	7
Rhinolophus lepidus	1	4	5	6
Rhinolophus mehelyi‡	–	–	–†	–
Rhinolophus blasii	1	6	5	10
Hipposideros fulvus	–	2	1	2
Asellia tridens	2	3	3	10
Taphozous nudiventris	–	3	3	3
Myotis blythii	6	7	7	14
Myotis emarginatus	–	1	–†	2
Myotis formosus	–	1	1	1
Myotis davidii	–	[1]	[4]	5
Myotis bucharensis‡	–	–	–†	–
Myotis longipes	–	2	3	4
Submyotodon caliginosus	–	–	[1]	1
Vespertilio murinus	–	–	1	1
Eptesicus serotinus	–	1	2	2
Eptesicus pachyomus	–	[1]	[2]	2
Eptesicus ognevi	–	–	[1]	(1)
Eptesicus gobiensis	–	[1]	1	1
Rhyneptesicus nasutus	–	1	2	5
Hypsugo savii	–	–	3	4
Pipistrellus pipistrellus	1	7	12	35
Pipistrellus kuhlii	1	4	3	9
Pipistrellus coromandra	–	2	2	6
Pipistrellus tenuis	–	[1]	1	3
Pipistrellus javanicus	–	[2]	2	–
Nyctalus noctula	–	–	–	1
Nyctalus montanus	–	1	1	2
Nyctalus leisleri	–	[1]	1[+1]	4
Otonycteris leucophaea	–	[1]	[3]	6
Barbastella darjelingensis	–	[2]	[3]	3
Plecotus strelkovi	[2]	[4]	[6]	8
Scotophilus heathii	[1]	1	2	3
Miniopterus fuliginosus	–	[1]	[1]	1
Miniopterus pallidus	[1]	[1]	[4]	4
Tadarida teniotis	–	1	1	1
Nyctinomus aegyptiacus	–	1	1	1
total number of records (at minimum)	27	95	121	224
total number of species	15	32	36†	40
average records per species	1.8	3.0	3.2	5.6

* Aellen (1959a) included also *Myotis mystacinus*, *M. emarginatus*, *Eptesicus serotinus*, and *E. sodalis ognevi* into the list of bats of Afghanistan on the basis of [unsubstantiated] points in maps by Kuzâkin (1944, 1950); for details see Distribution chapters on these species; † Bates & Harrison (1997) did not consider *Rhinolophus bocharicus*, *R. mehelyi*, *Myotis emarginatus*, and *M. bucharensis* as species occurring in the Indian subcontinent, including the Afghanistani territory of the subcontinent; ‡ *Rhinolophus mehelyi* was erroneously reported as a member of the Afghanistani bat fauna by Allison et al. (1982), Koopman (1993), Harrison & Bates (1991), Corbet & Hill (1992), Horáček et al. (2000), Gaisler (2001), Simmons (2005) and Srinivasulu & Srinivasulu (2012); *Myotis bucharensis* was erroneously reported to occur in Afghanistan by Horáček et al. (2000) and Simmons (2005).

Similarly as to Iran in 1962 and 1968 (see Lay 1967, DeBlase 1980), the Street Expedition of the FMNH at Chicago carried out a field trip to Afghanistan in 1965 to collect mammals (for description of the Expedition 1965 see Hassinger 1968). Hans Newlin Neuhauser (*1942) participated in the Expedition as a bat specialist; an extensive bat collection resulting from this trip, composed of some 500 specimens of at least 28 species, was presented as an unpublished thesis only (Neuhauser 1969). (The complete collection of terrestrial mammals was published by Hassinger 1973.) From the Street Expedition's bats, only selected more interesting species records were published (Neuhauser & DeBlase 1974) and various FMNH specimens were used in taxonomic revisions (Neuhauser & DeBlase 1971, DeBlase et al. 1973, Van Cakenberghe & De Vree 1994), some specimens were also very simply mentioned by DeBlase (1980), Bates & Harrison (1997) and/or Csorba et al. (2003).

In the 1970s and later, minimum number of bat records was made in Afghanistan and only very few of them were published. It can be said that with end of the 1960s, the systematic research of bats in Afghanistan finished. However, several series of bat specimens housed in various museums represent an extensive material, which belongs to the largest available from any country (roughly 2400 items in total). Moreover, a number of parasitological papers were published on the mammal fauna of Afghainstan, dealing mainly with nematode and trematode worms, mites (incl. ticks), fleas, and dipterans (see e.g. Jordan 1944, Anastos 1954, 1956, Aellen 1959b, Peus 1957, 1966, 1976, Cooreman 1960, Nemenz 1960, Smit 1960, Travassos Santos Dias 1961, Vercammen-Grandjean 1962, 1963, Sakaguti 1966, Baruš & Tenora 1967, 1970, Hůrka & Povolný 1968, Tenora & Baruš 1968, Dusbábek 1970, Erhardová-Kotrlá & Daniel 1970, Hůrka 1970, 1976, 1984, Groschaft & Tenora 1971a, b, 1973, 1974, Baruš et al. 1972, Lewis 1973, Smit & Rosický 1973, 1974, Ryšavy et al. 1976, Černý & Daniel 1977, Daniel 1977, Arsen'eva & Neronov 1980, Uchikawa 1985, Kock 1987, Uchikawa et al. 1994, etc.). Therefore, along with various reports of bat findings and/or specimens, the primary faunal data on bats from Afghanistan are – despite the relatively limited effort in the field really made by few persons only – spread over 76 publications, 23 of them (30%) being focused on bat parasites (see the lists of records below).

With the aim to review the bat fauna of Afghanistan, we gathered as much literature data as possible and examined most of the accessible specimens from the European museum collections (BMNH, IVB, MHNG, MZLU, NMP, SMF, ZFMK). As the amount of the faunal data on bats from Afghanistan is rather limited (Table 1), in the respective distribution chapters we discuss the occurrence in the neighbouring countries more thoroughly than usual (mainly as a basis for the evaluation of further possible evidence of the respective taxa in Afghanistan). Since the collections of bats from Afghanistan are mostly too old for examination by molecular genetic methods and/or the specimens were fixed in formalin (which makes such analyses impossible), we tried to examine and compare the morphological and morphometrical traits of the revised specimens in details to evaluate the taxonomic status of the respective Afghanistani populations with this classical tool (and place it into the framework of the current knowledge based on all types of evidence from the neighbouring areas).

METHODS

Records and Distribution

The lists of records (arranged in alphabetical and/or chronological orders) include, for each item, the following information: name of the locality (each record is primarily listed by a name of the nearest settlement or notable physical feature) [in brackets, number of locality is given as indicated in the map], and/or description of the record site, date, number of recorded bats with indication of their sex, age and physiological condition (for details see Abbreviations below), and a reference to museum specimen/s.

For detailed physical and ecological descriptions of Afghanistan see Hassinger (1968: 13–55). All photographs presented originate from Jiří Gaisler's personal archive and were taken between 1 March and 24 May 1967 (some of them were published by Gaisler et al. 1968, and Gaisler 1970a, 2010).

Morphological analysis

For morphological comparisons, we used museum specimens which were examined as described in previous studies (see e.g. Benda et al. 2006). The specimens were measured in a standard way with the use of mechanical or optical callipers. 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.

Note on geographical nomenclature

Several geographical terms are used in an accurate sense, according to the following definitions:

Kashmir = the whole area of the state of Jammu and Kashmir proclamed by India (including Gilgit, Baltistan, Jammu, Kashmir valley, and Ladakh) despite the actual country of control (Pakistan or India);

Punjab = the Pakistani province of Punjab; the term Indian Punjab is used for the respective Indian state;

Indian subcontinent = the western part of the Oriental region covering the territories of western Burma, Bangladesh, Bhutan, Nepal, India, Ceylon, Kashmir (see above), Pakistan, and Afghanistan, namely its south-eastern part (approximately in the sense by Bates & Harrison 1997).

ABBREVIATIONS

Collection acronyms

AUB = American University Beirut, Lebanon; – BMNH = Natural History Museum, London, United Kingdom; – CUP = Department of Zoology, Charles University, Prague, Czech Republic; – FMNH = Field Museum of Natural History, Chicago, United States of America; – HNHM = Hungarian Museum of Natural History, Budapest, Hungary; – HMSC = Hans M. Steiner private collection, Vienna, Austria; – HZM = Harrison Zoological Museum, Sevenoaks, United Kingdom; – IMC = Indian Museum Calcutta, India; – 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; – JOC = Ján Obuch private collection, Blatnica, Slovakia; – MHNG = Natural History Museum, Geneva, Switzerland; – MNHN = National Museum of Natural History, Paris, France; – MSNG = Civil Natural History Museum Giacomo Doria, Genoa, Italy; – MUB = Department of Zoology, Masaryk University, Brno, Czech Republic; – MZLU = Museum of Zoology and Entomology, Lund University, Sweden; – NMNHS = National Museum of Natural History, Sofia, Bulgaria; – NMP = National Museum (Natural History), Prague, Czech Republic; – NMW = Natural History Museum, Vienna, Austria; – OHC = Otto von Helversen Private Collection, Erlangen, Germany; – RMR = Regional Museum, Ruse, Bulgaria; – SMF = Senckenberg Museum and Research Institute, Frankfurt am Main, Germany; – USNM = National Museum of Natural History, Washington D.C., United States of America; – ZDNU = Zoological Department, Niğde University, Niğde, Turkey; – ZFMK = Zoological Institute and Museum Alexander Koenig, Bonn, Germany; – ZIN = Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia; – ZMB = Zoological Museum, Humboldt University, Berlin, Germany; – ZMM = Zemplín Museum, Michalovce, Slovakia; – ZMMU = Zoological Museum, Moscow State University, Moscow, Russia; – ZMSO = Zoological Museum, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia.

Measurements

External dimensions. LAt = forearm length; – LPol = thumb length (without claw); – McIII = length of third metacarpal of the wing; – PhIII1 = length of proximal phalanx of the third wing finger; – PhIII2 = length of medial phalanx of the third wing finger; – PhIII3 = length of distal phalanx of the third wing finger; – McIV = length of fourth metacarpal of the wing; – PhIV1 = length of proximal phalanx of the fourth wing finger; – PhIV2 = length of medial phalanx of the fourth wing finger; – PhIV3 = 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 (incl. praemaxilla in Rhinolophoidea); – LOc = occipito-canine length; – LCb = condylobasal length; – LCc = condylocanine length; – LaZ = zygomatic width; – LaI = width of interorbital constriction; – LaPO = width of postorbital constriction; – LaInf = infraorbital width; – 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 the third upper molars (incl.); – CM^3 = length of upper tooth-row between C and M^3 (incl.); – LMd = condylar length of mandible; – ACo = height of the coronoid process; – CM_3 = length of the lower tooth-row between C and M_3 (incl.).

Others
a = adult; – A = alcoholic specimen; – B = stuffed skin (balg); coll. = collected; – E = embryo/foetus; – f = female, females; – j = juvenile, juveniles; – m = male, males; – M = mean; – max., min. = dimension range margins; – Mu = mummy; – Md = mandible; – s = subadult; – S = skull; – SD = standard deviation; – Sk = skeleton.

LIST OF SPECIES

Rhinopoma microphyllum (Brünnich, 1782)

Records. **New data**: N a n g a r h a r: Loe Dakka [1], Jalalabad lowland, cave, 23 February 1966: 1 ind., ZFMK (coll. J. Niethammer); – 8 km N of Jalalabad [2], 23 March 1972: 1 m, ZFMK (coll. J. Niethammer; cf. Benda et al. 2006, 2009a). – K a n d a h a r: Kandahar [3], 6 August 1966: 1 ind., ZFMK (coll. J. Niethammer; cf. Benda et al. 2006, 2009a). – **Published data**: F a r a h: Grande grotte Moumlaï [4], 26 April 1958: 6 m, [MHNG, MZLU] (Aellen 1959a, b); Grande Grotte Moumlai du Kouh-Pir, 26 April 1958: 4 inds. (Vercammen-Grandjean 1963, Lindberg 1961); Moumlai cave, 2 inds., MHNG (Van Cakenberghe & De Vree 1994); Grande Grotte Moumlai, 26 April 1958: 1 m, MHNG (Benda et al. 2006, 2009a); – Koh-i-Duzdan Cave [5], 12 km NE of Dilaram, 15 November 1965: obs. ca. 100 inds., coll. 2 m, 2 f (Neuhauser 1969); Dilaram, 2 inds., FMNH (Van Cakenberghe & De Vree 1994). – H e l m a n d: Grotte de Khvadjah Largar [6], Guerechk, 19 April 1958: 3 m, 2 f, [MHNG, MZLU] (Aellen 1959a, b, Lindberg 1961), 3 inds. (Vercammen-Grandjean 1963); gruta de Khvadjah Largar (ao norte de Guerechk), 19 April 1958 (Travassos Santos Dias 1961); Kvadjar Largar, 4 inds., MHNG (Van Cakenberghe & De Vree 1994); Sarban-Qala, [Khvadjah Largar cave], 25 May 1961: 1 ind., SMF (Kock & Felten 1980, Van Cakenberghe & De Vree 1994); – Kala Bnot [= Qala-e Bust] [7], 1 ind., SMF (Van Cakenberghe & De Vree 1994). – K a n d a h a r: Scham-Schir-Rohr [8], 950 m, 14 January 1953: 1 m (Zimmermann 1956); Shamshir Ghar, subfossil bone material, 7 inds. (Dupree 1958); Grotte Chamchir, près de Kandahar, 4 December 1957: 2 m, 1 f, [MHNG, MZLU] (Aellen 1959a, b), 2 inds. (Vercammen-Grandjean 1963); Chamchir ghar, près Pandjvaï, 4 December 1957 & 14 April 1958 (Lindberg 1961); Chamchir Ghar (perto de Qandahar), 4 December 1957 (Travassos Santos Dias 1961); Shamshir Ghar, 19 km SW of Kandahar, 2 September 1965: obs. ca. 2000 inds., net. 3 m, 7 f, 30 October 1965: net. 2 m, 2 f (Neuhauser 1969); Shamshir Ghar, 28 February 1965: 1 m, 1 f, SMF (Kock & Felten 1980); Chamchir cave, 6 inds., FMNH, 1 ind., MHNG, 103 inds. [= 2 inds.], SMF (Van Cakenberghe & De Vree 1994); Grotte Chamchir, 4 December 1957: 1 m, MHNG (Benda et al. 2006, 2009a). – K o n a r: Cha Wki Sarkani, [Tangi Mazar, cave] [9], 16 July 1964: 17 f, SMF (Kock & Felten 1980, Van Cakenberghe & De Vree 1994, cf. Meyer-Oehme 1965). – N a n g a r h a r: Abdukil [10], near Shigi, 14 April 1967: coll. 2 f, [IVB] (Gaisler et al. 1968, Dusbábek 1970, Gaisler 1970a); – Chak-Naur [11], 1967: coll. 31 m, 38 f (Gaisler et al. 1968; Figs. 3, 4), 7 & 19 April 1967: coll. 32 m, 43 f, [BMNH, IVB, NMP] (Baruš & Tenora 1970, Gaisler 1970a, Hůrka & Povolný 1968, Dusbábek 1970, Hůrka 1970, cf. Groschaft & Tenora 1973, 1974); Chak Naur, 3 inds., BMNH, 4 inds., HZM (Van Cakenberghe & De Vree 1994); Chak-Naur, cave, 7 April 1967: 6 m, 4 f, IVB (Benda et al. 2006, 2009a); – Darunta Hills [12], 1967: coll. 1 m, 3 f (Gaisler et al. 1968, Baruš & Tenora 1970), 2 May 1967 (Hůrka & Povolný 1968), 12 April 1967: coll. 1 m, 4 f, [IVB] (Gaisler 1970a); – Hadda [13], Buddhist Shrine, 8 km S of Jalalabad, 3 August 1965: obs. a maternity colony of ca. 1000 inds., exam. 6 ma, 19 mj, 41 fa, 17 fj, coll. 12 m, 30 f (Neuhauser 1969); Hadda, 750 m, 18 September 1964: 4 m, 2 f, SMF (Kock & Felten 1980); Hadda, 9 inds., FMNH, 6 inds., SMF (Van Cakenberghe & De Vree 1994); – Jalalabad [2], 8 km north of town, shallow dry cave, 19 October 1965: obs. 5–10 inds., coll. 1 f, a shallow cave along the Kabul River, 23 October 1965: exam. ca. 50 inds., coll. 3 m, 1 f (Neuhauser 1969); Jalalabad, 1 ind., FMNH (Van Cakenberghe & De Vree 1994); – near the Kabul River between Darunta and Bisut [14], 1967: coll. 1 m (Gaisler et al. 1968), 2 May 1967: coll. 1 f, [IVB] (Gaisler 1970a); – Loe Dakka [1], 29 May 1965: 13 f, SMF (Kock & Felten 1980); Muang Loei, 12 inds., SMF (Van Cakenberghe & De Vree 1994); – Nangarhar, unnamed caves, appr. 6 km W of the Afghanistan-West Pakistan border at the Khyber Pass [15], series of shallow caves, 22 October 1965: obs. a small colony, coll. 3 m, 3 f (Neuhauser 1969); Khyber Pass, 2 inds., FMNH (Van Cakenberghe & De Vree 1994); – Nangarhah province [undefined], 1 ind. (Meyer-Oehme 1965).

Distribution. *Rhinopoma microphyllum* is a rather common bat in Afghanistan, 15 sites of occurrence were documented in two separate regions of the country (Fig. 2). The largest amount of records is available from the limited lowland area of the Jalalabad valley in eastern Afghanistan – nine sites are known from the Konar and Nangarhar provinces (see also Figs. 3, 4). Another Afghanistani region of *R. microphyllum* occurrence is represented by dry and low situated areas of the northern margins of the southern deserts (Khash and Rigestan) – six sites were documented in the central parts of the Farah, Helmand and Kandahar provinces. In both parts of the distribution range in Afghanistan, the occurrence of *R. microphyllum* is limited below the altitude of 1250 m a. s. l. (mean altitude 785 m, range 450–1230 m). Concerning the number of record localities,

R. microphyllum is the second most common bat species (after *Rhinopoma hardwickii*) in the broader area of the Jalalabad valley.

Srinivasulu & Srinivasulu (2012) mentioned the distribution of *R. microphyllum* also in the Nimruz province; on the other hand, they did not note Farah among the provinces inhabited by this bat. Thus, the incorrect mention may be only a mistake concerning the location of the Mumlai and/or Koh-e Duzdan caves.

The populations of *R. microphyllum* inhabiting the valley region of eastern Afghanistan represent a part of the continuous range of the species distribution in the western part of the Oriental region, covering namely southern and central Pakistan and western and central India (Bates & Harrison 1997). The occurrence in the Jalalabad valley continues eastwards in the common distribution of this bat in the Indus valley of northern Pakistan (Bates & Harrison 1997, Mahmood-ul-Hassan et al. 2009); four records are known from Khyber Pakhtunkhwa (Amb, Malakand Hills, Mardan, Peshawar; Hill 1977, Roberts 1977, Perveen & Rahman 2015) and at least nine sites were reported from Punjab (Ara, Jhelum, Gujrat, Mailsi, Multan, Qutabpur, Rohtas, Sadiqabad, Sakesar; Hinton & Thomas 1926, Lindsay 1927b, Roberts 1977). However, this species is missing in Kashmir and Himachal Pradesh (Chakraborty 1983, Bates & Harrison 1997, Saikia et al. 2011).

On the other hand, the distribution area of *R. microphyllum* in south-western Afghanistan seems to be rather an isolated spot that has no close and direct continuation in the neighbouring areas. In Iran, *R. microphyllum* is distributed continuously across the south-western part of the country, while only two records are known from the Kerman and Baluchistan provinces, i.e. from the whole eastern third of Iran (Benda et al. 2012). The closest record is available from Damin near Iranshah

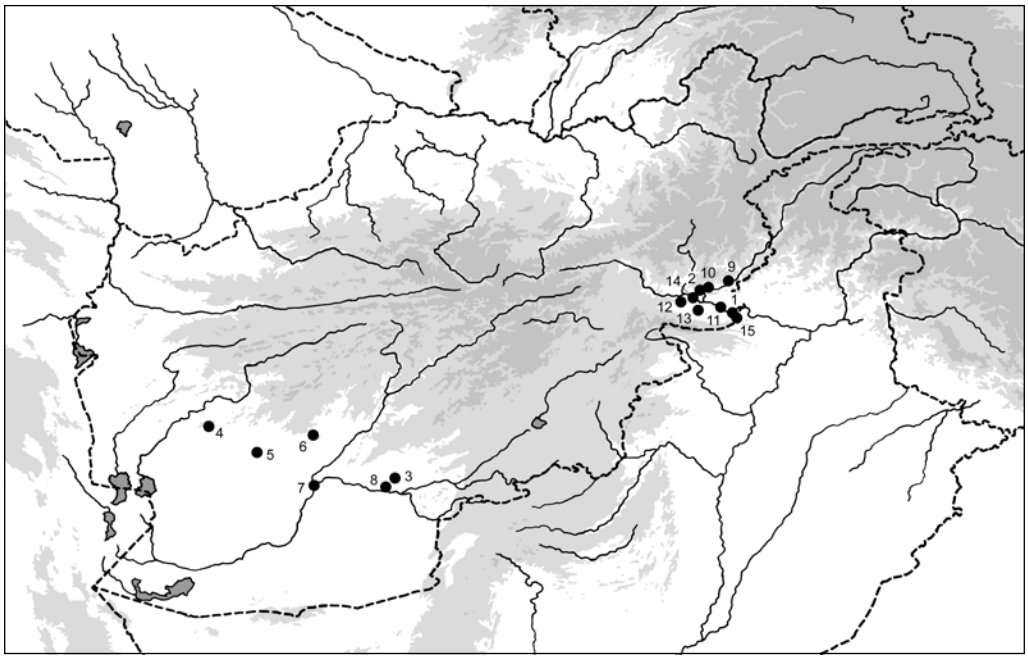

Fig. 2. Records of *Rhinopoma microphyllum* (Brünnich, 1782) in Afghanistan.

Figs. 3, 4. Small artificial caves in a rocky massif above the Kabul river at Chak Naur (Nangarhar province), in the Jalalabad valley some 12 km west of the Afghanistani-Pakistani border along the river. A roosting site of *Rhinopoma microphyllum*, *R. hardwickii*, and *Taphozous nudiventris*; around a hundred specimens of these species in total were collected there on 7 and 19 April 1967.

(Baluchistan; Schlitter & DeBlase 1975) some 260 km south-west of the Afghanistani border and ca. 570 km from the belt of localities in south-western Afghanistan (Mumlai cave, Koh-e Duzdan cave, Qala-e Bust); another Iranian locality, Jiroft (Kerman; Akmali et al. 2011), lies as far as 340 km from the Afghanistani border. In Pakistani Baluchistan, only two exactly localised sites of this bat are known; Las Bela (Gaisler 1970a), situated ca. 380 km south of the Afghanistani border and the Uzhda Ridge near Quetta (Van Cakenberghe & De Vree 1994), which lies roughly 200 km from Kandahar and/or Shamshir Ghar (and ca. 60 km from the Afghanistani border). While the former site belongs to the south-Pakistani continuous range of *R. microphyllum*, the latter one represents a prolongation of the range in southern Afghanistan to the south-east. Another Pakistani record localised closely to the range of this bat in southern Afghanistan was made in Sadiqabad (Punjab; Roberts 1977), some 560 km from the Kandahar region and ca. 380 km from the Uzhda Ridge. The known records in central and eastern Pakistan thus again indicate the isolation of the *R. microphyllum* range in southern Afghanistan.

R. microphyllum is a widespread species in the eremic zone of the southern Palaearctic with extensions to the Afro-tropical and Oriental regions, it is distributed from West Africa and Morocco, over the southern Sahara and Sahel to Sudan and Egypt, and in Asia from the Levant and south-western Arabia over southern Iran, Afghanistan, Pakistan and India to the Sunda Archipelago (Schlitter & Qumsiyeh 1996). It reaches southern margins of its distribution range in Senegal and Niger in the west and in Sumatra in the east, while in western Iran, eastern Afghanistan and northern Pakistan *R. microphyllum* reaches its northern distribution limits (see Benda et al. 2012).

Material examined. 2 ♂♂ (ZFMK 96.448 [S+B], 96.467 [A]), ca. 8 km N Jalalabad, 23 February 1973, coll. J. Niethammer; – 2 ♀♀ (IVB af685, af686 [S+B]), Abdukil at Shigi, 14 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F.

Table 2. Basic biometric data on the examined Afghanistani samples of *Rhinopoma microphyllum* (Brünnich, 1782), *R. muscatellum* Thomas, 1903, and *R. hardwickii* (Gray, 1831). For abbreviations see p. 272

	Rhinopoma microphyllum					*Rhinopoma muscatellum*					*Rhinopoma hardwickii*				
	n	**M**	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	86	**65.57**	60.3	70.8	2.192	26	**53.02**	48.8	54.8	1.429	22	**59.73**	54.9	62.9	2.370
LCr	87	**20.32**	19.37	21.62	0.468	23	**16.71**	16.02	17.48	0.403	32	**18.39**	17.53	19.47	0.409
LOc	85	**19.98**	18.11	21.29	0.503	23	**16.37**	15.89	16.98	0.318	33	**17.94**	16.98	18.93	0.386
LCc	83	**18.14**	11.48	19.23	0.860	24	**15.00**	14.22	15.44	0.304	33	**16.29**	15.39	17.14	0.371
LaZ	81	**11.76**	11.14	12.74	0.354	23	**9.79**	9.28	10.17	0.248	32	**10.67**	9.81	11.21	0.291
LaI	91	**2.57**	2.16	2.94	0.131	24	**2.16**	1.92	2.41	0.130	34	**2.83**	2.52	5.27	0.445
LaInf	92	**5.25**	4.73	5.84	0.247	24	**4.92**	4.53	5.27	0.185	34	**5.08**	4.81	5.54	0.151
LaN	88	**8.56**	8.21	9.09	0.217	24	**7.00**	6.59	7.32	0.161	34	**8.07**	7.71	8.62	0.194
LaM	86	**9.76**	9.11	10.54	0.280	23	**8.38**	7.92	8.72	0.235	34	**9.03**	8.56	9.53	0.219
ANc	83	**6.88**	6.24	8.35	0.492	24	**5.09**	4.75	5.46	0.186	34	**5.99**	5.47	6.41	0.206
LBT	87	**4.91**	4.53	5.28	0.153	23	**4.97**	4.63	5.46	0.179	32	**4.84**	4.45	5.38	0.251
CC	92	**5.07**	4.64	5.84	0.232	24	**4.11**	3.58	4.63	0.283	34	**4.69**	4.29	5.16	0.207
M^3M^3	88	**8.83**	8.43	9.39	0.236	24	**7.36**	6.91	7.64	0.196	33	**7.86**	7.37	8.43	0.251
CM^3	91	**7.36**	7.01	8.58	0.220	24	**5.85**	5.64	6.08	0.107	33	**6.29**	5.95	6.93	0.189
LMd	91	**14.33**	13.56	14.98	0.358	24	**11.35**	10.75	11.76	0.271	34	**12.50**	11.68	13.58	0.358
ACo	91	**5.34**	4.75	6.12	0.231	24	**4.09**	3.82	4.44	0.169	34	**4.74**	4.09	5.22	0.239
CM_3	90	**7.97**	7.52	8.54	0.197	24	**6.21**	5.93	6.51	0.148	34	**6.79**	6.47	7.59	0.211

Tenora; – 2 ♀♀ (SMF 39787, 39788 [S]), Cha Wki Sarkani, Konar, Höhle in der Tangi Mazar, 860 m, 16 July 1964, leg. D. Meyer-Oehme; – 25 ♂♂, 26 ♀♀ (IVB af582–585, af585, af587, af597–608, af611–623, af625–635, af638–643, af645–647 [S+B], NMP 95424 [B]), Chak-Naur, caves above the Kabul river, 7 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 5 ♂♂, 12 ♀♀ (IVB af914–925, af933, af934 [S+B], BMNH 68.453–48.455 [S]), Chak-Naur, caves above the Kabul river, near the Pakistan border, 19 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂ (IVB af1014 [S+B]), Darunta, cave above the Kabul river, 7 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂, 4 ♀♀ (IVB af674, af679–681, af684 [S+B]), cave 5 km SW of Darunta, 12 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 6 ♂♂ (MHNG 952.082, 952.083 [S+A], MZLU L58/3317 [A]), Grande Grotte de Moumlai, 26 April 1958, leg. K. Lindberg; – 3 ♂♂, 2 ♀, 2 inds. (MHNG 952.078 [S+A], MHNG 952.079, MZLU L58/3318 [A], MHNG 952.080, 952.081 [S]), Grotte de Khradjah Largar, Guerechk, 19 April 1958, leg. K. Lindberg; – 2 ♂♂, 1 ♀ (MHNG 952.077, MZLU L57/3113, L57/3181 [S+A], MZLU L57/3181 [A]), Grotte Chamchir, Kandahar, 4 December 1957, leg. K. Lindberg; – 2 ♂♂, 2 ♀♀ (SMF 39804, 39805, 39832, 39833 [S]), Hadda, Nangarhar, 750 m, 18 September 1964, leg. D. Meyer-Oehme; – 1 ind. (ZFMK 96.447 [S+Sk]), Halbhöhle von Dacca, Ebene von Jalalabad, 23 February 1966, coll. J. Niethammer; – 1 ind. (ZFMK 96.454 [S+B]), Kandahar, 6 August 1966, coll. J. Niethammer; – 1 ♀ (SMF 39808 [S]), Loe Dakka, Nangarhar, 450 m, 29 May 1965, leg. D. Meyer-Oehme; – 1 ind. (SMF 39938 [S]), Sarban-Qala, Helmand, Höhle Khvadjah Largar, 1150 m, 25 May 1961, leg. D. Meyer-Oehme; – 1 ♂, 1 ♀ (SMF 39806, 39908 [S]), Shamshir Ghar, Kandahar, Höhle, 1080 m, 28 February 1965, leg. D. Meyer-Oehme.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Rhinopoma microphyllum* are shown in Table 2. For the material examined see above.

According to the results of the last and most comprehensive revision of the geographical variation in *R. microphyllum*, covering its whole distribution range (Van Cakenberghe & De Free 1994), this bat represents a polytypic species creating three to four named geographical forms. The Afghanistani populations were assigned by these authors to the medium-sized nominotypical subspecies, *R. m. microphyllum*, distributed from West Africa and Sudan to the Middle East and Pakistan. The territory of Afghanistan belongs to the easternmost occurrence areas of this taxon. This taxonomical view is in line with the opinions of the previous authors who evaluated the Afghanistani samples of *R. microphyllum* (Aellen 1959a, Felten 1962, Kock 1969, Neuhauser 1969, Gaisler 1970a, Hill 1977, Sinha 1980) and was also accepted by the main compendium

authors (Koopman 1994, Schlitter & Qumsiyeh 1996, Horáček et al. 2000, Srinivasulu & Srinivasulu 2012).

Moreover, the available molecular genetic comparisons (Hulva et al. 2007, Levin et al. 2008, Benda et al. 2012) demonstrated relatively very shallow divergences among populations of *R. microphyllum* living in the area between Morocco and Rajasthan (western India), supposedly covering also Afghanistan. This again supports an existence of a single taxon in this extensive range, i.e. the nominotypical subspecies (described from Lower Egypt; Brünnich 1782, Benda et al. 2006) as already suggested by previous authors (Felten 1962, Kock 1969, Hill 1977, Van Cakenberghe & De Free 1994).

As mentioned above, *R. microphyllum* inhabits two separate regions of Afghanistan, the broader Jalalabad valley in the eastern part of the country (Konar and Nangarhar provinces) and margins of the Khash and Rigestan deserts in southern Afghanistan (Farah, Helmand and Kandahar provinces). The populations occurring in these two regions slightly differ in the average body size, the bats from eastern Afghanistan are slightly smaller (LAt 60.3–69.0 mm [mean 65.0; n=74], LCr 19.37–21.18 mm [mean 20.28; n=80], CM^3 7.01–7.76 mm [mean 7.33; n=82]) than the south-Afghanistani samples (LAt 62.8–70.8 mm [mean 68.2; n=15], LCr 19.88–21.62 mm [mean 20.66; n=9], CM^3 7.18–7.75 mm [mean 7.40; n=11]); however, the dimensional ranges of both groups largely overlap (Fig. 5). The south-Afghanistani populations correspond in size with the samples from Iran, examined by Benda et al. (2012: 192, Table 4; LAt 63.2–71.5 mm [mean 67.9; n=10], LCr 19.44–21.34 mm [20.69; n=8], CM^3 7.21–7.72 mm [mean 7.47; n=9]) and also those identified by Schlitter & DeBlase (1975) and DeBlase (1980) as *R. m. microphyllum* (LAt 65.3–70.1 mm [n=12], LCr 20.2–21.5 mm [n=12], CM^3 6.7–7.6 mm [n=12]). The smallest repre-

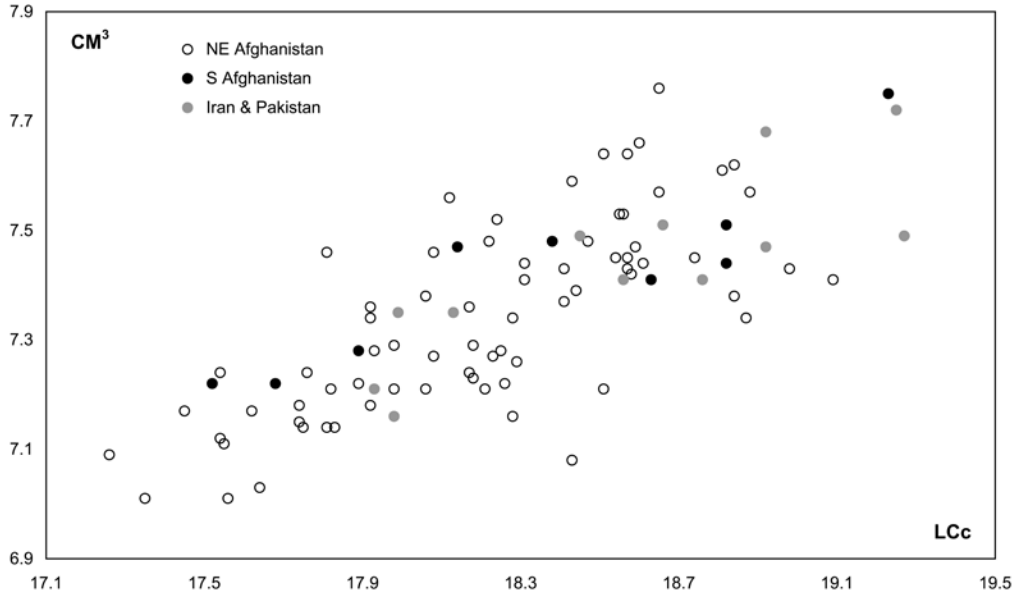

Fig. 5. Bivariate plot of the examined Afghanistani and comparative samples of *Rhinopoma microphyllum* (Brünnich, 1782): condylocanine length of skull (LCc) against the length of upper tooth-row (CM^3).

sentatives of the east-Afghanistani populations correspond in size to the small-sized individuals from the coastal areas of south-western Iran considered by the latter authors as a separate subspecies, *R. m. harrisoni* Schlitter et DeBlase, 1975 (LAt 57.5–66.1 mm [n=25], LCr 18.4–20.6 mm [n=27], CM^3 6.4–7.3 mm [n=9]) and approach the dimensions of the smallest-sized subspecies, *R. microphyllum asirensis* Nader et Kock, 1983, described from south-western Saudi Arabia (Nader & Kock 1983).

The relatively small size of *R. microphyllum* individuals from eastern Afghanistan in comparison with those from the southern part of the country thus perhaps represents a similar phenomenon as that described from Iran by Schlitter & DeBlase (1975). These authors found two size categories among specimens from southern Iran, which they considered as two separate subspecies (see above). Larger bats (considered a nominotypical form) occurring "at higher elevations and in areas of rather cooler mean temperatures" (Schlitter & DeBlase 1975: 662), while smaller bats (newly described as *R. m. harrisoni*) in rather low situated areas near the coast of the Persian Gulf. However, these climate-biased size categories were regarded as only extreme variants of the nominotypical subspecies by Van Cakenberghe & De Free 1994 (see also Simmons 2005, Benda et al. 2012).

A similar difference can be observed also in Afghanistan, larger bats come from the areas between 840–1230 m a. s. l. (mean 1001 m) in the southern part of the country, while smaller bats occur in sites at the range 450–980 m a. s. l. (mean 641 m) in the broad Jalalabad valley of eastern Afghanistan.

The slight size differences within *R. microphyllum* observed between higher and lower altitudes of the eastern part of the Middle East (Iran, Afghanistan) are obviously an effect of the local climate conditions (temperature and relative humidity). The lower situated areas show on average a more arid and warmer climate than the elevated ones and the bats are consequently smaller in these harsher conditions. This size bimodality is a general phenomenon in bat taxa inhabiting both deserts and more humid areas, see Benda et al. (2015) for a review of the Saharan cases.

Rhinopoma muscatellum Thomas, 1903

Records. **Published data**: F a r a h: Moumlai Höhle [Farah-e-Dun] [1], Kuh Dir, 1 September 1965: 1 m, 1 f, SMF (Kock & Felten 1980); – Sarai-Siah Ab [2], 22.5 km W of Bakva, 15 November 1965: obs. ca. 1000 inds., coll. 9 m, 9 f (Neuhauser 1969 [as *R. hardwickei*]); Sarai-Siah Ab Cave, 69 km. W Dilaram, 1965: 18 inds., FMNH (DeBlase et al. 1973, DeBlase 1980); Kuh-Siah Ab Berg, 770 m, 31 August 1965: 1 m, 1 f, SMF (Kock & Felten 1980); Sarai-Siah cave, 12 inds., FMNH (Van Cakenberghe & De Vree 1994); 48 km (30 miles) west of Dilaram, FMNH (Bates & Harrison 1997). – K a n d a h a r: Scham-Schir-Rohr [3], 950 m, 14 January 1953: 8 inds., [SMF] (Zimmermann 1956 [as *R. hardwickei*], Kock & Felten 1980); Grotte Chamchir, près de Kandahar, 4 December 1957: 8 m, 5 f, [MHNG, MZLU] (Aellen 1959a, b [as *R. hardwickei*]), 7 inds. (Vercammen-Grandjean 1963 [as *R. hardwickei*]); Chamchir ghar, près Pandjvaï, 4 December 1957 [2 m, 1 f, MHNG] & 14 April 1958 (Lindberg 1961 [as *R. hardwickei*]); Samshir Ghor, 6 January 1961, 28 February 1965 [: 2 m, 4 f], SMF (Meyer-Oehme 1965 [as *R. hardwickei*], Kock & Felten 1980); Shamshir Ghar, 19 km SW of Kandahar, 27 September 1965: obs. ca. 1000 inds., coll. 5 m, 2 f, 30 October 1965: net. 14 m, 3 f, 6 November 1965: 2 f (Neuhauser 1969 [as *R. hardwickei*]); Shamshir Cave, 19 km. SW Kandahar, 1965: 26 inds., FMNH (DeBlase et al. 1973, DeBlase 1980); Shamshir Cave, 19 km. SW Kandahar, 28 February 1965 (Lewis 1973 [as *R. hardwickei*]); Chamchir cave, 21 inds., FMNH, 3 inds., MHNG (Van Cakenberghe & De Vree 1994); 19.2 km (12 miles) south-west of Kandahar, FMNH (Bates & Harrison 1997); Shamshir Gor bei Kandahar, 28 February 1965: 4 inds. [= 1 m, 5 f], ZFMK (Benda et al. 2009a, 2012); Grotte Chamchir, Kandahar, 4 December 1957: 2 m, 1 f, MHNG (Benda et al. 2012). – N i m r u z: Seistan [4], 1 fa, BMNH (Lay 1967 [as *R. hardwickei*], Thomas 1913, DeBlase et al. 1973, DeBlase 1980, Van Cakenberghe & De Vree 1994, Benda et al. 2009a, 2012).

Distribution. *Rhinopoma muscatellum* is a rather rare bat in Afghanistan, three to four localities are available from the south-western part of the country (Fig. 6). The Afghanistani records are known only from low situated (altitude range 480–1075 m a. s. l., mean altitude 794 m) and

dry regions of the northern margins of the southern deserts (Khash, Margow, Rigestan); three occurrence sites were documented in the central parts of the Farah and Kandahar provinces. One additional record was reported from the Seistan basin; however, it is not clear from which part of this region divided between two countries it originates (cf. Thomas 1913, DeBlase et al. 1973). Various authors attributed this record either to Afghanistan (Van Cakenberghe & De Vree 1994) or to Iran (Lay 1967, DeBlase 1980, Bates & Harrison 1997, Benda et al. 2009a, 2012).

The Afghanistani occurrence of *R. muscatellum* represents the northernmost part of the species distribution range (Qumsiyeh & Knox Jones 1986). It continues to the south-west, an additional record was reported from the Iranian part of Seistan (Kuh-i-Khwjah near Zabol; Lay 1967, DeBlase et al. 1973) and numerous other sites are known from southern Iran, the closest of them are situated in southern Baluchistan and in the areas along the Strait of Hormuz (Benda et al. 2012). In the east of the Afghanistani range, the occurrence of *R. muscatellum* continues to the area of similar latitude in western Pakistan, two records are available from near Quetta in northern Baluchistan (Sibi, Uzhda Ridge; Kock & Felten 1980, Van Cakenberghe & De Vree 1994), situated ca. 320 km and 200 km from the Kandahar region, respectively. Another record was reported to originate even further east, from Genji, India (Van Cakenberghe & De Vree 1994); however, its exact location remains uncertain (see Bates & Harrison 1997).

On the other hand, *R. muscatellum* has never been documented to occur in the southern parts of Pakistan – southern Baluchistan, Punjab and/or Sindh (see Bates & Harrison 1997, Roberts 1997, Mahmood-ul-Hassan et al. 2009). The occurrence in Afghanistan thus represents a north-eastern extension of the distribution range of *R. muscatellum*; from central Pakistan, southern Afghani-

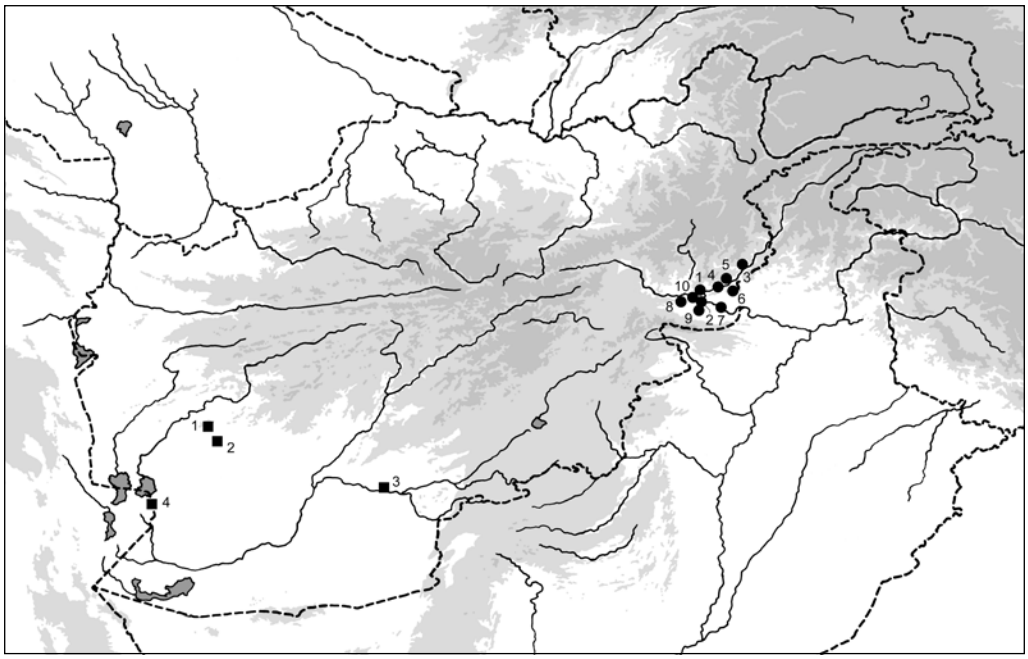

Fig. 6. Records of *Rhinopoma muscatellum* Thomas, 1903 (squares) and *R. hardwickii* Gray, 1831 (circles) in Afghanistan.

stan and southern Iran, it continues to north-eastern Oman and UAE over the Strait of Hormuz (Qumsiyeh & Knox Jones 1986, Van Cakenberghe & De Vree 1994, Harrison & Bates 1991).

Material examined. 1 ♂ (SMF 39910 [S]), Farah-e-Dun, Farah, 725 m, 1 September 1965, leg. D. Meyer-Oehme; – 9 ♂♂, 5 ♀♀ (MHNG 952.075, 952.076 [S+A], MNHG 952.074, MZLU L57/3182 [A]), Grotte Chamchir, Kandahar, 4 December 1957, leg. K. Lindberg; – 1 ♂ (SMF 39909 [S]), Höhle im Kuh-Siah Ab, Farah, 770 m, 31 August 1965, leg. D. Meyer-Oehme; – 1 ♀ (SMF 39892 [S]), Höhle Moumlai (im Kuh-Dir), Farah, 835 m, 1 September 1965, leg. D. Meyer-Oehme; – 2 ♀♀ (SMF 39863, 39864 [S]), Shamshir Ghar, Kandahar, Höhle, 1080 m, 6 January 1961, leg. D. Meyer-Oehme; – 3 ♂♂, 7 ♀♀ (ZFMK 96.458, 96.459, 96.461, 96.463 [S+A], SMF 39869, 39870, 39894, 39896 [S], ZFMK 96.460, 96.462 [A]), Shamshir Ghar, Kandahar, Höhle, 1080 m, 28 February 1965, leg. D. Meyer-Oehme & J. Niethammer; – 6 ♂♂, 1 ♀ (SMF 49226–49232 [S+B]), Scham-Schir-Rohr, 50 km westl. Kandahar, 950 m, 14 January 1953, leg. J. Klapperich; – 1 ♀ (SMF 39891 [S]), zwischen Dilaram und Farah, Höhle im Kuh-Siah Ab, 770 m, 31 August 1965, leg. D. Meyer-Oehme; – 1 ♀ (BMNH 6.1.2.2. [S], holotype of *Rhinopoma muscatellum seianum* Thomas, 1913), Seistan [Afghanistan/Iran], date unlisted, coll. Calcuttahues.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Rhinopoma muscatellum* are shown in Table 2. For the material examined see above.

R. muscatellum was originally proposed as a full species by Thomas (1903), but this opinion was refused by Ellerman & Morrison-Scott (1951) who considered this form a subspecies of *R. hardwickii* Gray, 1831 (see below). Based on the morphological comparison of the *Rhinopoma* samples from south-western Iran, DeBlase et al. (1973) suggested to restore the species status of *R. muscatellum*, because of its sympatric occurrence with the (then) conspecific *R. hardwickii* s.str. This conclusion was generally accepted and/or re-confirmed by a series of subsequent authors (Hill 1977, Niethammer 1983, Qumsiyeh & Knox Jones 1986, Nader 1990, Harrison & Bates 1991, Corbet & Hill 1992, Koopman 1993, 1994, Van Cakenberghe & De Vree 1994, Roberts 1997, Kock et al. 2001, Simmons 2005, Hulva et al. 2007, Benda et al. 2009a, etc.).

However, despite the variable species position of the south-Afghanistani populations, the subspecific affiliation was assigned always identically to the name *seianum* Thomas, 1913 (Zimmermann 1956, Aellen 1959a, Meyer-Oehme 1965, Kock 1969, Neuhauser 1969, Gaisler 1970a, DeBlase et al. 1973, Hill 1977, Kock & Felten 1980, Qumsiyeh & Knox Jones 1986, Corbet & Hill 1992, Koopman 1994, Van Cakenberghe & De Free 1994, Srinivasulu & Srinivasulu 2012), originally described as *R. muscatellum seianum* from Seistan, a basin situated at the Iranian-Afghanistani border (Thomas 1913: 90). This taxon was described as a form slightly larger in body size and with large molars than *R. muscatellum* s.str. from Oman, but very similar in other aspects (Thomas 1913). Most of the respective authors (Kock 1969, DeBlase et al. 1973, Hill 1977, Qumsiyeh & Knox Jones 1986, Corbet & Hill 1992, Koopman 1994) considered this subspecies to inhabit southern Afghanistan and in various extent also eastern Iran. However, based on the broad-scale morphometric revision of the genus *Rhinopoma*, Van Cakenberghe & De Vree (1994) recognised only *R. m. muscatellum* in Iran, as they considered individuals of the Iranian part of Seistan too small in their body size to be a part of the large-sized *R. m. seianum* from Afghanistan.

Benda et al. (2012) carried out analyses or morphometric and molecular genetic traits in *R. muscatellum*, based on specimens from the Omani, Iranian and Afghanistani populations. The morphometric comparison did not reveal any considerable differences in skull dimensions among the geographical sample sets, all groups conformed to each other in most of their metric traits. Slight differences represented only a cline shift in size between the populations, from the south to the north, the smallest representatives being found in Oman, medium in Iran, and the largest ones in Afghanistan, however, with a very broad overlap among the sample sets. The comparison of the complete sequences of the cytochrome *b* gene showed a relatively deep divergence between the populations from Oman and Iran (4.9–5.4% of *p* distance), as the Afghanistani samples were not available for the analysis. Based on these results, Benda et al. (2012) suggested to assign all

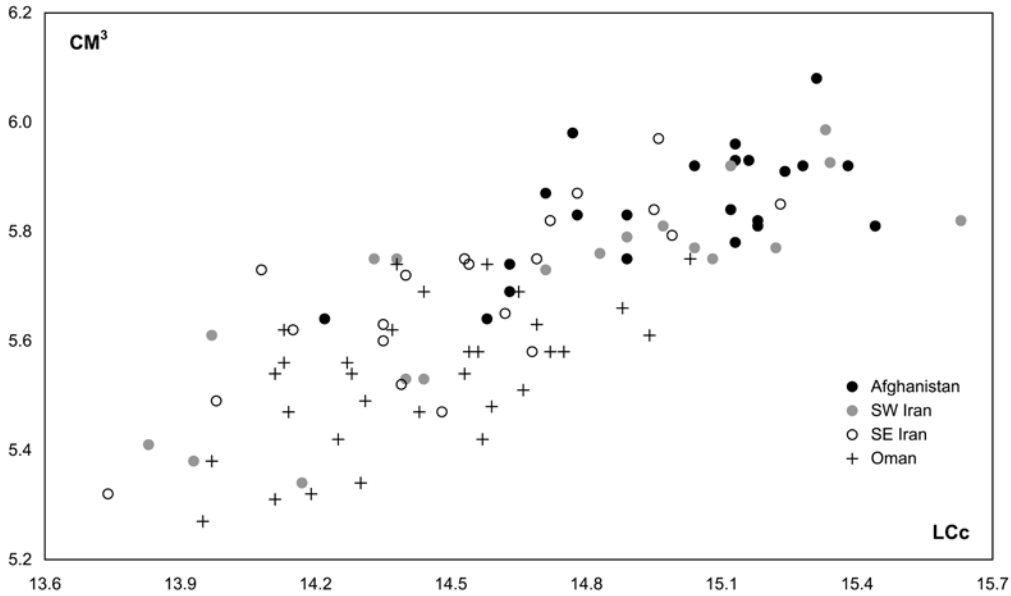

Fig. 7. Bivariate plot of the examined Afghanistani and comparative samples of *Rhinopoma muscatellum* Thomas, 1903: condylocanine length of skull (LCc) against the length of upper tooth-row (CM^3).

the populations living in the Asian continent (Iran, Afghanistan, Pakistan, and western India) to the subspecies *R. m. seianum* (with *R. pusillum* Thomas, 1920 as a synonym, see also Lay 1967), while the populations inhabiting the east of the Arabian peninsula (NE Oman and UAE) to the nominotypical subspecies, *R. m. muscatellum*.

The metric comparison of a richer material of *R. muscatellum* from Afghanistan (23 specimens instead of six, used by Benda et al. 2012; Fig. 7, see also Table 2) conform to results of the observation by Benda et al. (2012). The dimensional ranges of skull size of the Afghanistani specimens conform to those of the bats from south-western Iran (n=19) and on average very slightly oversize the samples from south-eastern Iran (n=20). On average the smallest Omani samples (n=32) fall within the ranges of the Iranian bats and in some $^2/_3$ of the range they overlap with the Afghanistani samples. Results of this comparison are thus in line with the conclusions by Benda et al. (2012) and suggest all populations of *R. muscatellum* from continental Asia (or at least from Iran and Afghanistan) to be assigned to a single taxon, *R. m. seianum*. The significantly broader dimensional range of the size of *R. m. seianum* than that of *R. m. muscatellum* could be explained by a much larger distribution range in the former subspecies (ca. 7 : 1 in area) with more variable climatic conditions. The most continental climate within this range is certainly in southern Afghanistan, where the bats are on average the largest ones (comp. the analogical situation in *R. microphyllum* above).

Rhinopoma hardwickii Gray, 1831

Records. **New data**: N a n g a r h a r: ca. 8 km N of Jalalabad [1], 23 February 1972: 2 f, ZFMK (coll. J. Niethammer; cf. Benda et al. 2009a), 23 March 1972: 2 f, ZFMK (coll. J. Niethammer; cf. Benda et al. 2009a); – Jalalabad [2], 1 July 1966: 1 f, 1 ind., ZFMK (coll. J. Niethammer). – **Published data**: K o n a r: Katar [3], 3 July 1965: 3 f, SMF (Kock & Felten

1980, Van Cakenberghe & De Vree 1994); – Nurgul [4], 8 km W of Kunar, shallow light cave, 3 August 1965: obs. a small maternity colony of ca. 20 inds., coll. 7 fa, 19 October 1965: coll. 1 mj (Neuhauser 1969 [as *R. microphyllum*]); Cha Wki Sarkani, [Qachgar cave], 15 March 1964: 1 f, SMF (Kock & Felten 1980, Van Cakenberghe & De Vree 1994); Nurgul, 5 inds., FMNH (Van Cakenberghe & De Vree 1994); – Tshambel/Dewagall [= Chambel] [5], 940 m, [cave], 11 September 1964: 1 m, SMF (Kock & Felten 1980, Van Cakenberghe & De Vree 1994); – Tut-Tangei [6], [cave], 800 m, 2 April 1964 & 16 July 1964: 8 m, 5 f, SMF (Kock & Felten 1980, Van Cakenberghe & De Vree 1994). – N a n g a r h a r: Chak-Naur [7], 1967: coll. 3 m, 7 f (Gaisler et al. 1968; Figs. 3, 4), 7 April 1967: coll. 2 m, 2 f, [IVB] (Hůrka & Povolný 1968, Baruš & Tenora 1970, Dusbábek 1970, Gaisler 1970a, Hůrka 1970, Smit & Rosický 1974), 19 April 1967 (Hůrka & Povolný 1968, Dusbábek 1970); Chak-Naur, 12 March & 2 May [1967]: 2 m, 2 f, IVB (Benda et al. 2009a); – Darunta Hills [8], 1967: coll. 2 m, 5 f (Gaisler et al. 1968), 12 April 1967: coll. 2 m, 4 f, [IVB] (Hůrka & Povolný 1968, Baruš & Tenora 1970, Dusbábek 1970, Gaisler 1970a, cf. Groschaft & Tenora 1973, 1974); Darunta Hills, 12 April 1967: 2 m, 4 f, IVB (Benda et al. 2009a); – Hadda [9], 18 September 1964: 1 m, 1 f, SMF (Kock & Felten 1980, Van Cakenberghe & De Vree 1994); – Jalalabad [2], 26 June 1965 (Lewis 1973); Jalalabad, [Pul-e-Bisut, cave], 25 June 1965: 5 f, SMF (Kock & Felten 1980); Jalalabad, 1 ind., FMNH, 5 inds., SMF (Van Cakenberghe & De Vree 1994); – Jalalabad, 3 mi N [1], 1 ind., FMNH (Van Cakenberghe & De Vree 1994); – near the Kabul River between Darunta and Bisut [10], 12 March & 2 May 1967: coll. 4 m, 3 f, [IVB, BMNH] (Gaisler et al. 1968, Hůrka & Povolný 1968, Gaisler 1970a); Darunta & Bisut, between, 1 ind., BMNH (Van Cakenberghe & De Vree 1994); between Darunta and Bisut, cave near the Kabul river, 12 March & 2 May 1967: 4 m, 2 f, IVB (Benda et al. 2009a). – Nangarhar and Konar provinces, five [undefined] localities, 7 m, 15 f (Meyer-Oehme 1965, 1968).

Distribution. *Rhinopoma hardwickii* ranks among medium-frequent bats in Afghanistan, ten sites of occurrence were documented from a limited lowland area of the broader Jalalabad valley in the eastern part of the country (Konar and Nangarhar provinces; Fig. 6). This range is represented by semi-arid areas situated below the altitude of 1000 m a. s. l. (mean altitude 713 m, range 450–980 m; Figs. 3, 4).

Concerning the number of record localities, *R. hardwickii* is the most common bat species in the broader area of the Jalalabad valley. The occurrence in this region continues eastwards in the distribution of this bat in northern Pakistan (Bates & Harrison 1997); however, unlike *R. microphyllum*, *R. hardwickii* is a rather rare bat in Pakistan and its distribution there is rather insular (Javid et al. 2012b). Two records are known from Khyber Pakhtunkhwa (Amb, Charsadda; Siddiqi 1969, Perveen & Rahman 2015), four sites were reported from northern Punjab (Ara, Chitti Dil, Rohtas, Sakesar; Hinton & Thomas 1926, Lindsay 1927b), one record in southern Punjab (Bahawalpur; Javid 2011) and also some findings in the Hyderabad and Karachi regions of southern Sindh (Roberts 1997, Ghosh 2008). On the other hand, this species is completely missing in Kashmir and Himachal Pradesh (Chakraborty 1983, Bates & Harrison 1997, Saikia et al. 2011).

Anyway, the Afghanistani occurrence of *R. hardwickii* constitutes the north-westernmost part of the species range in the Oriental region, covering also the eastern parts of Pakistan and almost the whole India (Bates & Harrison 1997). Separate parts of the distribution range of *R. hardwickii* are known from the Sunda Islands (Van Cakenberghe & De Vree 1994) and Mesopotamia between western Iraq and the south-western part of Iran (Harrison & Bates 1991, Benda et al. 2012); the latter range part is isolated by a ca. 1200 km long gap from the main range margin in southern Pakistan and even by more than 1600 km from its segment in eastern Afghanistan. In western Iran and eastern Afghanistan, *R. hardwickii* reaches its northern distribution limits at very similar latitudes reaching almost 35° N.

Material examined. 2 ♀♀ (ZFMK 96.465, 96.466 [S+A]), ca. 8 km N Jalalabad, 23 February 1972, coll. J. Niethammer; – 2 ♀♀ (ZFMK 96.474 [S+A], 96.464 [A]), ca. 8 km N Jalalabad, 23 March 1972, coll. J. Niethammer; – 1 ♀ (SMF 39840 [S]), Cha Wki Sarkani, Konar, Grotte Qachgar, 770 m, 15 July 1964, leg. D. Meyer-Oehme; – 2 ♂♂, 2 ♀♀ (IVB af586, af596, af624, af644 [S+B]), Chak-Naur, cave above the Kabul river, 7 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 3 ♂♂, 2 ♀♀ (IVB af1009–1013 [S+B]), Darunta, caves above the Kabul river, 2 May 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 2 ♂♂, 4 ♀♀ (IVB af675–678, af682, af683 [S+B]), caves 5 km SW of Darunta, 12 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂ (IVB af398 [S+B]), cave above the Kabul river between Darunta and Jalal Abad, 12 March 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂,

1 ♀ (SMF 39844, 39862 [S]), Hadda, Nangarhar, 750 m, 18 September 1964, leg. D. Meyer-Oehme; – 1 ♀, 1 ind. (ZFMK 96.452, 96.453 [S+B]), Jalalabad, 1 July 1966, coll. J. Niethammer; – 2 ♀♀ (SMF 39845, 39846 [S]), Jalalabad, Nangarhar, Höhle, Pul-e-Bisut, 690 m, 25 June 1965, leg. D. Meyer-Oehme; – 2 ♀♀ (SMF 39850, 39851 [S]), Katar, Konar, Höhle, 780 m, 3 July 1965, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39861 [S]), Tschambel/Dewagall, Konar, Höhle, 940 m, 11 September 1964, leg. D. Meyer-Oehme; – 2 ♀♀ (SMF 39838, 39839 [S]), Tut-Tangei, Konar, Höhle, 800 m, 2 May 1964, leg. D. Meyer-Oehme; – 2 ♂♂, 2 ♀♀ (SMF 39841, 39842, 39853, 39854 [S]), Tut-Tangei, Konar, Höhle, 800 m, 16 July 1964, leg. D. Meyer-Oehme.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Rhinopoma hardwickii* are shown in Table 2. For the material examined see above.

R. hardwickii was for a long time considered a widespread and polytypic species, distributed from West Africa and Kenya to the Middle East and western Indochina (Ellerman & Morrison-Scott 1951, Harrison 1964, Kock 1969). Under this taxonomic arrangement, two subspecies were recognised in Afghanistan (Meyer-Oehme 1965, Kock 1969, Neuhauser 1969, Gaisler 1970a), *R. h. hardwickii* from the broader Jalalabad valley in eastern Afghanistan, and *R. h. seianum* Thomas, 1913, from the southern part of the country. DeBlase et al. (1973) separated *R. muscatellum* as a species of its own from the species rank of *R. hardwickii*; to the former species they assigned the south-Afghanistani populations as a subspecies *R. muscatellum seianum* (see also above under *R. muscatellum*). The subsequent revision of the genus *Rhinopoma* by Hill (1977) assigned again the Jalalabad valley populations to the large-sized nominotypical subspecies of *R. hardwickii*; this view was accepted by the main compendium authors (Corbet 1978, Qumsiyeh & Knox Jones 1986, Bates & Harrison 1997, Horáček et al. 2000, Srinivasulu & Srinivasulu 2012) and supported by results of a more comprehensive revision by Van Cakenberghe & De Vree (1994).

The molecular genetic analysis by Hulva et al. (2007) revealed significantly deep divergences within the broadly recognised Afro-Asian species *R. hardwickii* s.l. and suggested to split it into two species living in allopatry, the western one, Afro-Arabian *R. cystops* Thomas, 1903, and the eastern one, Irano-Indian *R. hardwickii* s.str. This separation was further confirmed by results of the analyses by Akmali et al. (2011) and Benda et al. (2012).

However, the split of *R. hardwickii* s.l. (sensu Hill 1977 and Van Cakenberghe & De Vree 1994) into two species did not affect the taxonomic position of the Afghanistani (Jalalabad valley) populations; they could be again considered as a part of the nominotypical subspecies of *R. hardwickii*, described from Bengal, India (Gray 1831: 37). Although the Afghanistani populations were not a subject of a molecular genetic analysis, the available broad-scale morphological comparisons (Kock 1969, Gaisler 1970a, Hill 1977, Van Cakenberghe & De Vree 1994, Benda et al. 2006, 2009a) always clustered the respective Afghanistani and Indian samples into one group. The Afghanistani populations thus represent the westernmost extent of the range of the nominotypical subspecies of *R. hardwickii*.

Lyroderma lyra (Geoffroy, 1810)

Records. **Published data**: K o n a r: Grotte Qachqar [1], valée du Konar, NE de Djalalabad, 6 February 1958: 1 ind., [MHNG] (Aellen 1959a, Lindberg 1961); Nurgul, 8 km W of Kunar, Qachqar cave, 19 October 1965: shot & coll. 1 m, 1 f (Neuhauser 1969). – N a n a g a r h a r: an artificial cave near the Kabul river between Darunta and Bisut [2], 20 March 1967: coll. 1 m, 1 f, [IVB] (Gaisler et al. 1968, Hůrka & Povolný 1968, Gaisler 1970a, Groschaft & Tenora 1971b); Jalal-Abad, 2 inds. (Groschaft & Tenora 1973).

Distribution. *Lyroderma lyra* is a rare bat in Afghanistan, its findings were reported only from two localities in the eastern part of the country, in the broader area of the Jalalabad valley (Fig. 8). These sites are situated in semi-arid, rather low areas below the altitude of 900 m a. s. l. (580 m and 860 m) of the Konar and Nangarhar provinces.

The occurrence of *L. lyra* in Afghanistan continues eastwards in the known distribution of this bat in northern Pakistan, Kashmir and north-western India (Bates & Harrison 1997). Seven records are currently known from this area, viz. three sites from northern Punjab (Lahore, Lehtrar, Sialkot; Lindsay 1927b, Roberts 1977), one site from Kashmir (Rambon; Chakraborty 1983), two from Himachal Pradesh (Damtal, Kangra; Dobson 1872, Saikia et al. 2011), and one from Uttarakhand (Ranibag; Bhat 1974). Most recently, a record of *L. lyra* from Heroshah in Khyber Pakhtunkhwa has been reported by Salim & Mahmood-ul-Hassan (2014); this site interconnects the Afghanistani and Punjabi distribution spots, it is situated ca. 60 km east of the Afghanistani border. All these localities – including the two Afghanistani sites – seem to be an islet of *L. lyra* occurrence, separated from the continuous belt of records stretching from southern Pakistan (south-eastern Baluchistan, Sindh) and central Rajasthan east- and south-eastwards (Bates & Harrison 1997). *L. lyra* is distributed continuously in a large part of the Oriental region, from southern Pakistan and Nepal over most of India and Bangladesh to Ceylon, Burma, southern China, and Indochina, including Malaya (Corbet & Hill 1992, Simmons 2005). The occurrence in Afghanistan, northern Pakistan and Kashmir represents the northernmost extension of the species distribution range (Bates & Harrison 1997).

Material examined. 1 ind. (MHNG 952.073 [S+Sk]), Grotte Qachqar, Nourgal, vallée du Konar, 6 February 1958, leg. K. Lindberg; – 1 ♂, 1 ♀ (IVB af503, af504 [S+B]), a cave above the the Kabul river near Jalal Abad, 20 March 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Lyroderma lyra* are shown in Table 3. For the material examined see above.

Several recent phylogenetic analyses concerning the megadermatid bats (Eick et al. 2005, Kaňuch et al. 2015, Soisook et al. 2015) did not support monophyly of two species within the genus *Megaderma* Geoffroy, 1810, in which *Vespertilio spasma* Linnaeus, 1758 is the type species

Table 3. Basic biometric data on the examined Afghanistani samples of *Lyroderma lyra* (Geoffroy, 1810), *Rhinolophus ferrumequinum* (Schreber, 1774), and *R. bocharicus* Kašenko et Akimov, 1918. For abbreviations see p. 272

	Lyroderma lyra			*Rhinolophus ferrumequinum*					*Rhinolophus bocharicus*				
	MHNG 952.073	IVB af503	IVB af504	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	67.7	–	70.6	86	**57.25**	53.5	60.6	1.560	7	**50.64**	48.6	51.9	1.128
LCr	–	–	–	43	**22.41**	21.66	23.21	0.387	7	**19.79**	19.38	20.47	0.367
LOc	29.41	–	30.28	54	**22.16**	21.38	23.27	0.401	7	**19.52**	19.15	19.78	0.238
LCc	25.93	–	27.05	54	**19.69**	18.75	20.43	0.343	7	**17.21**	16.98	17.38	0.148
LaZ	16.86	–	18.02	54	**11.53**	11.05	12.08	0.246	7	**10.26**	10.00	10.54	0.210
LaI	4.79	4.66	4.75	54	**2.60**	2.23	3.58	0.200	7	**2.37**	2.02	2.48	0.160
LaInf	5.08	–	5.59	54	**5.85**	5.51	6.11	0.133	7	**4.98**	4.74	5.18	0.141
LaN	12.48	12.48	12.81	54	**9.16**	8.63	9.92	0.238	7	**8.42**	8.33	8.64	0.132
LaM	12.71	13.17	13.11	54	**10.15**	9.75	10.58	0.176	7	**9.31**	9.17	9.47	0.110
ANc	9.96	10.84	10.76	54	**6.48**	6.05	6.98	0.190	7	**6.08**	5.92	6.26	0.123
LBT	–	5.14	4.88	54	**3.44**	3.08	3.81	0.145	7	**3.23**	2.93	3.54	0.230
CC	5.49	5.47	6.15	54	**6.06**	5.68	6.42	0.157	7	**4.92**	4.44	5.33	0.284
M^3M^3	9.93	–	10.45	54	**8.56**	8.05	8.92	0.213	7	**7.35**	6.69	7.67	0.325
CM^3	11.52	11.62	11.73	54	**8.43**	8.02	9.04	0.181	7	**6.98**	6.79	7.13	0.111
LMd	20.12	20.27	20.44	54	**14.97**	14.37	16.09	0.320	7	**12.64**	12.19	12.88	0.219
ACo	5.01	5.24	5.21	54	**3.65**	3.28	4.22	0.163	7	**2.86**	2.63	2.98	0.133
CM_3	12.61	12.75	12.88	54	**9.04**	8.43	9.83	0.225	7	**7.51**	7.03	7.81	0.256

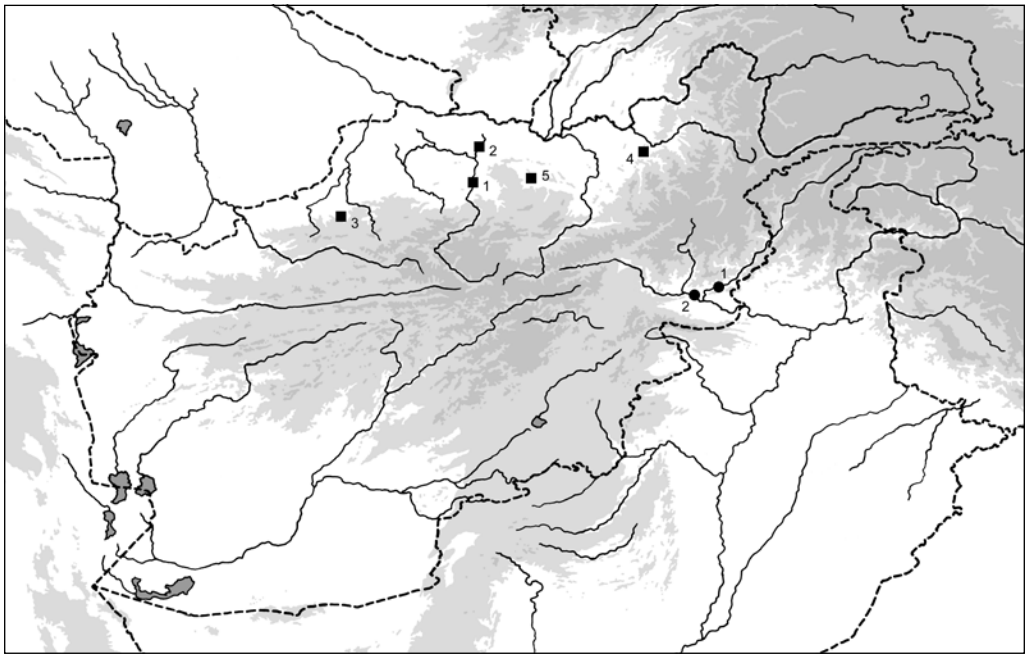

Fig. 8. Records of *Lyroderma lyra* (Geoffroy, 1810) (circles) and *Rhinolophus bocharicus* Kašenko et Akimov, 1918 (squares) in Afghanistan.

(see e.g. Ellerman & Morrison-Scott 1951). As the most parsimonious solution of the topologies demonstrated by the above analyses, we suggest the subgenus *Lyroderma* Peters, 1872 (sensu Ellerman & Morrison-Scott 1951, Corbet & Hill 1992, Simmons 2005, etc.) to be upraised to the genus level, similarly as it was previously done by Miller (1907: 104). However, all previous authors who reported on this bat from Afghanistan traditionally used the genus name *Megaderma*.

The Afghanistani range of *L. lyra* belongs to the Pakistani / west-Indian range of the species. These populations, based on the examination of eight specimens from the "West Coast of India", were separated by Andersen & Wroughton (1907) into a small-sized subspecies *M. lyra caurina* (Andersen et Wroughton, 1907); the authors reported this taxon to live in India (s.l.), west of 77° E. The populations from the eastern part of India, east of 75° E, were included by Andersen & Wroughton (1907) into the medium- to large-sized nominotypical subspecies. This taxonomic view was followed only by Ellerman & Morrison-Scott (1951), who, however, included the populations from mountains of the north-western part of the Indian subcontinent (Kumaon and Kashmir; i.e. west of 75° E) into the nominotypical form. The taxon *caurina* was revised by Brosset (1962b: 588–589), who finally concluded: "The subspecies *caurina* […] cannot be maintained. In fact, we collected many specimens in the area assigned to the subspecies *caurina*, but the greater number are bigger and have the size of *Megaderma lyra lyra*. The small size of the specimens from which the race *caurina* was described is due to individual variations only. We consider that all *Megaderma lyra* of central and western India are *lyra lyra* and the subspecies *caurina* has therefore to be struck off the checklist of Indian bats." This view was accepted by the subsequent authors; from the whole Indian subcontinent, from Baluchistan, Afghanistan, Khyber Pakhtunkhwa and Rajasthan in the west

to Burma in the east, only the nominotypical subspecies is currently recognised (see e.g. Siddiqi 1969, Sinha 1970, 1976, 1980, 1986, Khajuria 1980, Corbet & Hill 1992, Bates & Harrison 1997, Csorba et al. 1999, Alfred et al. 2002, Srinivasulu & Srinivasulu 2012).

Concerning the Afghanistani specimens, all the respective authors (Aellen 1959a, Neuhauser 1969, Gaisler 1970a) reported only *M. lyra lyra* from the broader Jalalabad valley of the eastern part of the country. Considering the dimensional data published by Andersen & Wroughton (1907), those of the few examined specimens from Afghanistan (Table 3) rather conform to the large-sized *L. l. sinensis* (Andersen et Wroughton, 1907) from southern China and Indochina (LCr 29.3–32.0 mm) than to the nominotypical subspecies (LCr 29.0–29.5 mm), or even a smaller form (*caurina*: LCr 27.8–28.3 mm). The exceptionally large size of Afghanistani specimens of *L. lyra* within the populations of the Indian subcontinent was noted already by Gaisler (1970a), who observed a cline increase of the body and namely skull size in this species from the east to the west across the subcontinent with the absolutely largest individuals just in Afghanistan. The assignation of the Afghanistani populations of *L. lyra* to the nominotypical form was accepted by the relevant compendium authors (Corbet & Hill 1992, Koopman 1994, Bates & Harrison 1997, Srinivasulu & Srinivasulu 2012).

Rhinolophus ferrumequinum (Schreber, 1774)

Records. **New data**: H e l m a n d: Qala-e Bust [1], fortress, 2 March 1965: 2 m, ZFMK (coll. D. Meyer-Oehme & J. Niethammer; cf. Neuhauser 1969, Benda et al. 2012), 29 March 1972: 2 m, 1 f, ZFMK (coll. J. Niethammer; cf. Benda et al. 2012). – K a b o l: Kabul, Dar ul Aman [2], 13 May 1966: 1 m, ZFMK (coll. J. Niethammer; cf. Benda et al. 2012). – K o n a r: Nurgul, Qachgar cave [3], 770 m, 3 July 1965: 1 f, SMF (leg. D. Meyer-Oehme). – N a n g a r h a r: rocks 10 km N of Jalalabad [4], 28 February 1966: 1 m, ZFMK (coll. J. Niethammer; cf. Benda et al. 2012). – **Published data**: B a l k h: Ghar-e-Tschechmesch-e-Schaffar [5], [cave, 11 April 1965: 1 f,] SMF (Felten et al. 1977); – Mazar-i-Sharif [6], a series of inter-connecting underground stables in the center of town, 2 September 1965: 1 m, 2 f (Neuhauser 1969); Mazar-i-Sharif, FMNH (Bates & Harrison 1997); – Tangi-Shadian ravine [7], about 16 km. S of Mazar-i-Sharif, shallow caves, 3 September 1965: 1 f, 5 September 1965: 1 m (Neuhauser 1969). – F a r y a b: Grotte Kham Zindan [8], Darreh-Chakh, Beltchiragh, 29 October 1957: 5 m, 5 f, [MHNG, MZLU] (Aellen 1959a, b, Cooreman 1960, Lindberg 1961), 6 inds. (Vercammen-Grandjean 1963); gruta de Kham Zindan (a sudoeste de Beltchiragh), 29 October 1957 (Travassos Santos Dias 1961); Grotte Kham Zindan, Beltehiragh, 29 October 1957: 1 m, MHNG (Benda et al. 2012); – Grotte Zarmast [9], Maimaneh, 18 October 1957: 8 m, 5 f, [MHNG, MZLU] (Aellen 1959a, b), 9 inds. (Vercammen-Grandjean 1963); Grotte de Zarmast, 18 October 1957 & 5 July 1959 (Lindberg 1961); gruta de Zarmast (perto de Maïmaneh), 18 October 1957 (Travassos Santos Dias 1961); Zarmast Cave, 16 km SE of Maimana, 14 September 1965: net. 8 m, 4 f (Neuhauser 1969); Pashtunkot, [Zarmast cave, 27 August 1964: 6 m, 4 f,] SMF (Felten et al. 1977); Grotte Zarmast, Maïmaneh, 18 October 1957: 1 m, MHNG (Benda et al. 2012). – H e l m a n d: Chambre souterraine de la fortresse de Qal'eh Bost [1], 6 December 1957: 7 m, 5 f, [MHNG, MZLU] (Aellen 1959a, b, Lindberg 1961), 9 inds. (Vercammen-Grandjean 1963); Qal'eh Bost, 6 December 1957 (Smit 1960); Qala Bist, fortress, 4 November 1965: 5 m, 5 f, 1 ind. (Neuhauser 1969); Qala Bist, 26 May 1961: 1 ind. (Lewis 1973); Kala-e-Bust, [26 May 1961: 1 m, 13 f, 27 May 1961: 1 m, 2 March 1965: 5 m, 5 f,] SMF (Felten et al. 1977); Bist, FMNH (Bates & Harrison 1997); Qal'eh Bojr, 6 December 1957: 1 m, MHNG (Benda et al. 2012); – Girishk [10], qanat system 5 km NE, 11 November 1965: obs. ca. 15 inds., coll. 6 m, 4 f (Neuhauser 1969); – Lashkari Bazar [11], [28 August 1965: 1 m,] SMF (Felten et al. 1977). – H e r a t: Parapamis [12] (Ogneff & Heptner 1928). – K a b o l: Dahan-ghar [13], 27 May 1960 [1 f, MZLU] (Lindberg 1962); Gr. Dahan-Char, Tang-Lalonda, 27 May 1960: 1 ind. (Vercammen-Grandjean 1963); limestone cave at Lalanda, some 20 km to the SSW of Kabul, 12 May 1967: coll. 1 m, [IVB] (Gaisler et al. 1968, Hůrka & Povolný 1968, Gaisler 1970a, Hůrka 1976, 1984; Fig. 10); Dahnan-ghar cave, Lalandar, 20 km SW of Kabul, 5 October 1965: coll. & net. 1 m, 1 f (Neuhauser 1969); Dahan Ghar, [cave, 12 March 1965: 1 m,] SMF (Felten et al. 1977); – Kabul [14], [11 March 1965:] 1 m, 1 f, SMF (Meyer-Oehme 1965, Felten et al. 1977). – K a n d a h a r: Shamshir Ghar [15], [cave, 23 May 1961: 1 m,] SMF (Felten et al. 1977). – L a g h m a n: [Alishing], Grotte Pialeh [16], ca. 1600 m, 24 August 1961: 1 m, [SMF] (Meyer-Oehme 1965). – P a r v a n: Firindjal [17], [14 December 1962: 2 f,] SMF (Felten et al. 1977); – Samotch-e-Nayak [18], [tomb, 14 December 1962: 2 m, 2 April 1965: 2 m,] SMF (Felten et al. 1977). – S a m a n g a n: Grotte Kaftar Khaneh [19], 17 May 1959 [1 f, MZLU] (Lindberg 1961); Gr. Knaffor, Khaneh, 17 May 1959: 1 ind. (Vercammen-Grandjean 1963). – Z a b o l: Boulan Ghar [20], [cave, 27 February 1965: 1 f,] SMF (Felten et al. 1977). – Afghanistan, five localities, 49 inds., FMNH (DeBlase 1980).

Distribution. *Rhinolophus ferrumequinum* ranks among common bats in Afghanistan, it is known from twenty localities lying in 12 provinces (Fig. 9). It represents the second most frequently documented bat in the country, after *Pipistrellus pipistrellus* (Table 1); however, it is the most widespread bat in Afghanistan, regarding the geographical extent of the records. Most of the sites of *R. ferrumequinum* occurrence in Afghanistan lie in rather low situated areas below 1250 m a. s. l. surrounding the central mountain chain (mean altitude 1317 m, range 450–2150 m). This pattern is in contrary to that recorded in the neighbouring Iran, where almost 90% of records were made in areas above 1500 m a. s. l. (Benda et al. 2012). This difference is perhaps caused by the continental climate of the Afghanistani mountains which is harsher than that in the Mediterranean zone of mountainous Iran.

R. ferrumequinum is distributed mainly in the Mediterranean part of the south-western Palaearctic (Corbet 1978, Horáček et al. 2000); in Asia it occurs in the Mediterranean zone of the Middle East, in Transcaucasia, West Turkestan and the Himalayas (Bates & Harrison 1997, Horáček et al. 2000, Benda et al. 2006). The Afghanistani occurrence of *R. ferrumequinum* constitutes a part of the southern margin of its whole distribution range; although both in Iran and Pakistan, the sites are known to be situated further south than the southernmost localities in Afghanistan, the south-Afghanistani and Baluchistani deserts represent a gap in the continuous distribution range of *R. ferrumequinum* in south-western Asia. In southern Iran, the closest record is available from Deh Bakri at the south-eastern edge of the Zagros Mts. (Benda et al. 2012), some 300 km south-west of the Afghanistani border and 675 km from Qala-e Bust (Helmand), the closest site in Afghanistan. On the other hand, from south-eastern Afghanistan the range continues directly

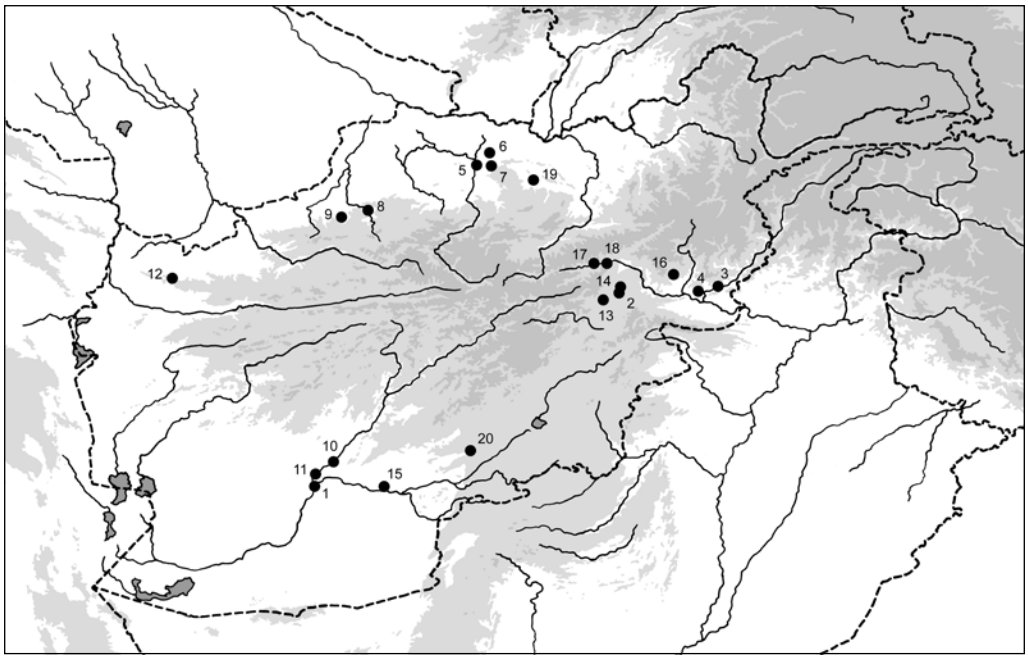

Fig. 9. Records of *Rhinolophus ferrumequinum* (Schreber, 1774) in Afghanistan.

Fig. 10. The Lalandar (Kabul) river valley (Tang-e Lalandar) at Lalandar (Kabol province), at the entrance to the Dahan (Lalandar) cave, 2090 m a. s. l. A roosting and foraging area of *Rhinolophus ferrumequinum*, *R. hipposideros*, *R. blasii*, *Myotis longipes*, and *Pipistrellus pipistrellus*.

to the mountains of north-eastern Baluchistan of Pakistan, where three sites are known (Kalat, Nushki and Quetta; Mirza 1965, Bates & Harrison 1997), situated 24–96 km from the Afghanistani border and 200–300 km from the closest localities in Afghanistan, the Shamshir (Kandahar) and Bulan (Zabol) caves. These Baluchistani sites, however, represent an isolated area of distribution of *R. ferrumequinum* without continuation to the south or east and also the southernmost spot of occurrence of this bat in the western part of the Oriental region (see Bates & Harrison 1997).

In the Indian subcontinent, the occurrence of *R. ferrumequinum* continues from eastern Afghanistan (broad area of the Kabul river basin) directly to the south-east along the southern slopes of the Hindu Kush and Himalayas (Bates & Harrison 1997). This bat is rather commonly found in northern Pakistan, four sites are known from Khyber Pakhtunkhwa (Abbottabad, Dir, Karakar Pass, Kululai; Roberts 1977, Bates & Harrison 1997); Dir being situated only 17 km east of the Afghanistani border. Five sites of *R. ferrumequinum* are available from Kashmir, except for Gilgit (Scully 1881a) only from the south-western part of the country (Bumzov Cave, Shar, Shikargarh, Punch, Udhampur; Chakraborty 1983, Bates & Harrison 1997). Eleven records were reported from Himachal Pradesh (Arki, Barog, Chakmoh, Chuari, Ghannati, Koolloo, Mandi, Manali, Shimla, Solan, Tottu; Saikia et al. 2011) and three from Uttarakhand (Almora, Katarmal, Masuri; Andersen 1905, Bhat 1974). However, the range of *R. ferrumequinum* continues also to Nepal and Sikkim, where at least twelve records are available (Bates & Harrison 1997, Csorba et al. 1999).

To the north and north-west of Afghanistan, the occurrence of *R. ferrumequinum* continues in West Turkestan and northern Iran (Bogdanov 1953, Strelkov et al. 1978, Rybin et al. 1989, Habilov 1992, Benda et al. 2012), in both these territories it ranks among the most common bat species. From West Turkestan, numerous records are available even from the areas adjacent to the Afghanistani border (Pulhatyn, Bathyz reserve, Serhetabat [Kuška], Rabatkaşan, Tagtabazar, Aymanoyjike cave, Gurşunmagdan Käni [Svincovyj Rudnik], N of Šôrči, Hodža-Beh-Ob in the

Aktau Mts., Staraâ pristan' [old port] in Tigrovaâ balka, Danghara, Ovgard in the Darvaz range, Qal'ai Humb; Radde & Walter 1889, Bobrinskoj 1925, Bogdanov 1953, 1956, Ŝerbin 1968, Strelkov et al. 1978, Habilov 1992).

Kuzâkin (1965: 87) mentioned: "Some of the [greater] horseshoe bats fly out across the border of our country [= Soviet Union] (in particular, to Iran and Afghanistan)." [translated from Russian]. However, he did not report any source of such information or other evidence and most probably, it is a mere speculation.

Material examined. 1 ♂ (SMF 39767 [S+A]), Alishing, Laghman, Grotte Pialeh (im Kuh-Pialeh), 1550 m, 24 August 1961, leg. D. Meyer-Oehme; – 1 ♀ (SMF 39756 [S+A]), Boulan Ghar, Zabul, Höhle, 1850 m, 27 February 1965, leg. D. Meyer-Oehme; – 1 ♀ (SMF 39785 [A]), Cha Wki Sarkani, Konar, Grotte Qachgar, 770 m, 3 July 1965, leg. D. Meyer-Oehme; – 7 ♂♂, 5 ♀♀ (MHNG 952.090, 952.092 [S+A], MHNG 952.091, MZLU L57/3185 [A]), Chambre souterraine dela fortresse de Qal'eh Bost, 6 December 1957, leg. K. Lindberg; – 1 ♂ (SMF 39782 [S+A]), Dahan Ghar, Wardak, Höhle, 2020 m, 12 March 1965, leg. D. Meyer-Oehme; – 1 ♂ (ZFMK 97.063 [S+B]), Felsen 10 km n. Jalalabad, 28 February 1966, coll. J. Niethammer; – 2 ♀♀ (SMF 39238, 39239 [S+A]), Firindjal, Parwan, 2070 m, 14 December 1962, leg. D. Meyer-Oehme; – 1 ♀ (SMF 39763 [S+A]), Ghar-e-Tschemschmesch-e-Schaffar, Balkh, Höhle, 500 m, 11 April 1965, leg. D. Meyer-Oehme; – 1 ♀ (MZLU L60/3731 [A]), Grotte Dahan-Ghar (Tang-Lalanda), alt. 2090 m, 27 May 1960, leg. K. Lindberg; – 1 ♀ (MZLU L59/3186 [A]), Grotte Khaftar, Khaneh, Aïbak, 17 May 1959, leg. K. Lindberg; – 6 ♂♂, 5 ♀♀ (MHNG 952.087 [S+A], MHNG 952.088, 952.089, MZLU L57/3184 [A]), Grotte Kham Zindan, Beltchiragh, 29 October 1957, leg. K. Lindberg; – 2 ♂♂, 1 ♀, 10 inds. (MHNG 952.084, 952.086 [S+A], MHNG 952.085, MZLU L57/3186 [A]), Grotte Zarmast, Maïmaneh, 18 October 1957, leg. K. Lindberg; – 1 ♂, 1 ♀ (SMF 39762, 39781 [S+A]), Kabul, 1800 m, 11 March 1965, leg. D. Meyer-Oehme; – 1 ♂ (ZFMK 97.064 [S+B]), Kabul, Darulaman, 13 May 1966, coll. J. Niethammer; – 2 ♂♂, 1 ♀ (ZFMK 97.065–97.067 [S+B]), Kala-Bust, 29 March 1972, coll. J. Niethammer; – 1 ♂, 13 ♀♀ (SMF 39231–39237 [S+A], 39225–39230, 39765 [A]), Kala-e-Bust, Helmand, 870 m, 26 May 1961, leg. D. Meyer-Oehme; – 7 ♂♂, 5 ♀♀ (SMF 39757–39761, 39776–39780, ZFMK 97.068, 97.069 [S+A]), Kala-e-Bust, Helmand, 870 m, 2 March 1965, leg. D. Meyer-Oehme & J. Niethammer; – 1 ♂ (SMF 39766 [A]), Kala-e-Bust, Helmand, 870 m, 27 May 1961, leg. D. Meyer-Oehme; – 1 ♂ (IVB af1058 [S+B]), Lalanda, Lalanda cave, 20 km S of Kabul, 12 May 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂ (SMF 39786 [S+A]), Lashkari Bazar, Helmand, 870 m, 28 August 1965, leg. D. Meyer-Oehme; – 6 ♂♂, 4 ♀♀ (SMF 39240, 39241, 39755, 39770, 39772–39775 [S+A], 39242, 39771 [A]), Pashtunkot, Fariab, Grotte Zarmast, 1295 m, 27 August 1964, leg. D. Meyer-Oehme; – 2 ♂♂ (SMF 39768, 39769 [S+A]), Samotch-e-Nayak, Parwan, Gruft, 2150 m, 14 December 1962, leg. D. Meyer-Oehme; – 2 ♂♂ (SMF 39783, 39784 [S+A]), Samotch-e-Nayak, Parwan, Gruft, 2150 m, 2 April 1965, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39764 [S+A]), Shamshir Ghar, Kandahar, Höhle, 1080 m, 23 May 1961, leg. D. Meyer-Oehme.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Rhinolophus ferrumequinum* are shown in Table 3. For the material examined see above.

Up to five subspecies of *R. ferrumequinum* have been reported from the central and western parts of southern Asia (Andersen 1905, Ellerman & Morrison-Scott 1951, Corbet 1978, Koopman 1994, Csorba et al. 2003, Simmons 2005, Benda et al. 2006), besides the nominotypical form, *R. f. ferrumequinum* (Schreber, 1774), living in the Mediterranean habitats of the Levant, Turkey and Transcaucasia (besides Europe and North Africa), also *R. f. tragatus* Hodgson, 1835 (type locality [Central hilly region of] Nepal; Hodgson 1835: 699; Gray & Gray 1847: 2) from Nepal, north-eastern India and south-western China, *R. f. regulus* Andersen, 1905 (t.l. Masuri [Uttarakhand, India]; Andersen 1905: 112) from north-western India, *R. f. proximus* Andersen, 1905 (t.l. Gilgit [Kashmir]; Andersen 1905: 113) from Kashmir, and *R. f. irani* Cheesman, 1921 (t.l. Shiraz, Persia [Fars, Iran]; Cheesman 1921: 576) from the arid parts of the Middle East and from West Turkestan.

Three of these names were reported from Afghanistan. Ogneff & Heptner (1928) mentioned *R. ferrumequinum ferrumequinum* concerning the populations of the Parapamis (= Sefid Kuh) Mts., north-western Afghanistan; however, these authors used this name to differentiate *R. ferrumequinum* s.str. from *R. ferrumequinum bocharicus*, then considered just a subspecies of the former species (Bobrinskoj 1925, Ognev 1927, 1928). This report thus in fact does not refer to a subspecific position of the respective population.

Aellen (1959a) first tried to identify the subspecies of the Afghanistani populations of *R. ferrum-equinum* (specimens from the Zarmast cave, Kham Zindan cave, and Qala-e Bust). He evaluated body size, pelage colouration and the relative length of tail, and found the Afghanistani bats to be small-sized, pale coloured and with a relatively long tail (tail length >60% of the forearm length). According to the identification key created by this author, this combination of characters indicated *R. f. irani*. This subspecies was reported from Afghanistan also by Neuhauser (1969), Felten et al. (1977), and Roberts (1997). On the other hand, Meyer-Oehme (1965) identified a specimen from the Pialeh cave (Laghman, eastern Afghanistan) as *R. f. proximus* (according to Aellen's (1959a) key: small bat with a relatively short tail) and two specimens from Kabul as an intermediate form between *proximus* and *irani*. Although Gaisler (1970a) found his specimen from Lalandar to fit in its characters to *R. f. irani* according to the key by Aellen (1959a), he suggested, based on the report by Meyer-Oehme (1965), two forms to occur in Afghanistan, *R. f. irani* in the northern, western, southern and central parts of the country, while *R. f. proximus* in eastern Afghanistan. Sinha (1973) and Felten et al. (1977) suggested a possible synonymy of *proximus* and *irani*, while Chakraborty (1977) and Koopman (1994) regarded both names as synonyms (with *proximus* as a prior name). Finally, Koopman (1994), Csorba et al. (2003), and Srinivasulu & Srinivasulu (2012) reported only *R. f. proximus* from Afghanistan.

The comparison of metric skull characters of more than 200 specimens from south-western Asia by Benda et al. (2012: 224–225, Fig. 34), comprising also a limited series of the Afghanistani samples (n=10), showed these bats to fit the dimension ranges of the small-sized populations, i.e. those from Transcaucasia, Mesopotamia, Iran, and West Turkestan. The values of the type specimens of *proximus* and *irani* also fall into this cluster of small-sized samples. The specimens from the Levant, Anatolia and northern India represented large-sized bats, showing only a small range overlap with the small-sized bats (with the exception of the Anatolian samples, which overlapped broadly). Thus, according to the results of the simple comparison by Benda et al. (2012), i.e. according to the body and skull size, the Afghanistani populations could be assigned to *R. ferrumequinum proximus* (= *R. f. irani*), in line with the opinions of the previous authors, and along with the populations from Transcaucasia, Mesopotamia, Iran, and West Turkestan.

Benda et al. (2006) speculated that the size variation in the populations of *R. ferrumequinum* could perhaps be humidity-dependent, individuals from the more humid areas being larger than individuals from arid areas. However, this dependence can explain the size differences among *R. ferrumequinum* samples from various parts of the Middle East (small-sized bats in arid Mesopotamia and Iran, while large-sized bats in the humid and/or elevated areas of the Levant and Anatolia). This hypothesis implies plasticity rather than conservatism in morphological traits and thus a somewhat limited use of the size differences for taxonomic division of the species. This view is also in accordance with the results of molecular genetic analyses (see the review by Benda et al. 2012), which clustered the samples of *R. ferrumequinum* from the Middle East (Turkey, Syria, Cyprus, Lebanon, Iran) in to one common lineage, despite the size morphotype of the particular samples. Since this lineage only minutely differs from the lineage composed of the European and Maghrebian samples (ca. 1% of uncorrected distance), the Middle Eastern bats could be co-identified with the nominotypical subspecies which includes all populations of the species living in the areas situated in and broadly adjacent to the Mediterranean basin, i.e. in the belt from Morocco and Great Britain to the Caucasus, Levant and Iran (i.e. including the populations assigned originally to *R. f. irani*).

However, the available genetic analyses (Rossiter et al. 2007, Kůs 2008, Flanders et al. 2009, Benda & Vallo 2012) did not comprise the populations of *R. ferrumequinum* from the Indian subcontinent, including those of Afghanistan. Moreover, only the small-sized bats were documented from Afghanistan (cf. Table 3), despite their origin in more arid lowland areas or in more humid

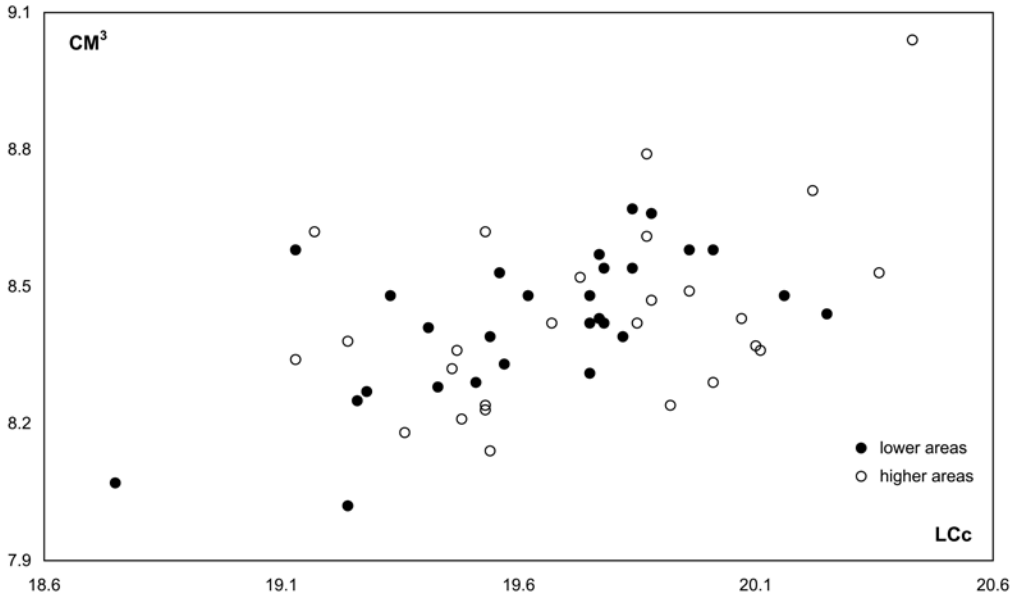

Fig. 11. Bivariate plot of the examined samples of *Rhinolophus ferrumequinum* (Schreber, 1774) from Afghanistan: condylocanine length of skull (LCc) against the length of upper tooth-row (CM^3); comparison of skull size in populations inhabiting lower situated areas (450–1100 m a. s l.; n=28) and higher situated areas (1250–2150 m a. s. l.; n=26).

mountain habitats (although the extensive altitudinal range of 1700 m was documented in this bat from the country, see Distribution). Only a very fine shift in size between the bats from low and high elevations was found (ca. 0.25 mm in the longest skull dimensions, see Fig. 11); both groups, however, lie within the dimension ranges of the above defined small-sized bats.

As a conclusion, until results of a molecular genetic comparison are available, which can help to describe more properly the phylogenetic relationships of the Afghanistani populations of *R. ferrumequinum* as well as to interpret their taxonomic position, we suggest to keep the original view, mentioned last by Srinivasulu & Srinivasulu (2012), i.e. to consider populations of Afghanistan, northern Pakistan, and Kashmir as representatives of *R. f. proximus.*

Rhinolophus bocharicus Kaŝenko et Akimov, 1918

Records. **Published data**: B a l k h: Ak Kopruk [1], 2 April [= 11 April] 1965: 1 ind. (Lewis 1973 [as *Rhinolophus* sp.]); Sholghara, [Darra Band-i-Haba, unknown cave], 10–11 April 1965: 2 m, 1 f [= 11 April 1965: 1 m, 1 f,] SMF (Felten et al. 1977); – Sholghara, [Takhtar Pul] [2], 10–11 April 1965: 2 m, 1 f [= 10 April 1965: 1 m,] SMF (Felten et al. 1977). – F a r y a b: Grotte Zarmast [3], Maimaneh, 18 October 1957: 1 f, [MZLU] (Aellen 1959a, Vercammen-Grandjean 1963 [as *R. clivosus*]); Grotte de Zarmast, 18 October 1957 & 5 July 1959 (Lindberg 1961 [as *R. clivosus*]); Pashtunkot, [Zarmast cave], 27 August 1964: 1 m, SMF (Felten et al. 1977). – T a k h a r: 7 km E of Taliq-an [4], 21 August 1965: coll. 1 ind. (mummy) (Neuhauser 1969 [as *R. clivosus*]); 4.4 miles E Taliq-an, Pakhar Province, 1 fa (DeBlase 1980); Taliqan, FMNH (Csorba et al. 2003). – S a m a n g a n: Grotte Kaftar Khaneh [5], Haibak, 17 May 1959: 1 ind., [= 1 m, 1 f, MHNG, MZLU] (Lindberg 1961, Vercammen-Grandjean 1963 [as *R. clivosus*]).

Distribution. *Rhinolophus bocharicus* is a rather infrequent bat in Afghanistan, five sites are known from the northernmost part of the country (Fig. 8), from the provinces of Balkh, Faryab,

Takhar, and Samangan. The records were made at rather low situated localities, at the altitude range of 420–1250 m a. s l. (mean altitude 863 m).

R. bocharicus is one of the endemics of Central Asia, it occurs mostly in West Turkestan and only marginally it extends to northern Afghanistan. The only record from Iran published by Farhang-Azad (1969) was rejected by Strelkov et al. (1978) and Benda et al. (2012), it was based on a misidentified juvenile of *R. ferrumequinum*.

The Afghanistani occurrence of *R. bocharicus* constitutes a part of the southern margin of the distribution range of this bat. *R. bocharicus* occurs in two slightly separated ranges in Central Asia (Strelkov 1971, Rybin et al. 1989), one range is a small lowland desert area in northern Turkmenistan and western Uzbekistan (Strelkov 1971, Strelkov et al. 1978), the other range covers the foothills and lower mountains of northern Afghanistan and the eastern part of West Turkestan, from south-eastern Turkmenistan to eastern Uzbekistan and southern Kirghizstan (Bogdanov 1953, Strelkov et al. 1978, Rybin et al. 1989, Habilov 1992, Kaškarov & Mitropol'skaâ 2004, this review). In the latter range, *R. bocharicus* is not a rare bat (cf. Rybin et al. 1989), numerous records are available even in the areas just on the Afghanistani border – the species was described on the basis of a series of 49 specimens originating from Termiz, south-eastern Uzbekistan (Kaŝenko & Akimov 1918). In the adjacent part of Uzbekistan (Surxondarë region), Bogdanov (1953) reported four additional records of *R. bocharicus* made in and near Šôrči and Gricina et al. (2013) three findings from Zinda near Aktepa and from two caves at Gaz near Pašhurt. In the neighbouring region of Turkmenistan, Strelkov et al. (1978) reported two localities of this bat that are close to the border of Afghanistan, Gurşunmagdan Käni [Svincovyj Rudnik] and Kapkatan cave at Garlyk [Karlûk]. Similarly, there are also two records from close areas in southern Tajikistan, Vahš near Qurgonteppa [Kurgan-Tûbe] (Bogdanov 1956) and Qal'ai Humb (Habilov 1992). The latter site, situated just on the border of Afghanistan (38° 27' N, 70° 47' E), represents the south-easternmost locality within the whole range of *R. bocharicus*; it also delimits the possible extent of the species distribution in Afghanistan, i.e. in the adjacent northern part of the Badakhshan province.

A series of records are known from the Morghab river basin in south-eastern Turkmenistan, at the border with Afghanistan (Strelkov et al. 1978), this area constitutes the southernmost part of the whole known distribution range of *R. bocharicus*, reaching 35° 16' N (see Rybin et al. 1989); Strelkov et al. (1978) reviewed eight localities in this area within the distance of 2–98 km (between Taraşek and Sandykgaçy) from the Afghanistani border. This area of occurrence is situated westwards of the Afghanistani range, ca. 160 km west of the Zarmast cave, the closest Afghanistani site; this indicates a possible western extension of the species occurrence in Afghanistan, i.e. in the adjacent provinces of Herat and Badghis.

Concerning the latter population of *R. bocharicus* occurring in the upper Morghab valley of Turkmenistan, the following interesting note should be mentioned (see also Aellen 1959a: 363–364). Without providing any evidence, Kuzâkin (1944: 68–69) expected seasonal migrations of *R. bocharicus* from West Turkestan to Afghanistan: "A part of the animals remain in winter in the same caves, in which they live in summer […], however others (from the valleys of the Morghab and Kaşan rivers) move to spend the winter time in Afghanistan". However, he also noted that "The distribution [of *R. bocharicus*] in Afghanistan is unknown". Later on, Kuzâkin (1950: 219) wrote: "Most probably, it [= *R. bocharicus*] occurs also in the districts of Afghanistan bordering our country [= Soviet Union]." Finally, Bogdanov (1953: 50) mentioned: "This horseshoe bat occurs in Central Asia and Afghanistan." [all quotations translated from Russian]. Here it should be added that the first individual of *R. bocharicus* from Afghanistan was found by K. Lindberg in October 1957 and published by Aellen (1959a), but, the record was made in the Zarmast cave, i.e. in the region close to the Afghanistani part of the Morghab river valley.

Material examined. 1 ♂, 1 ♀ (MHNG 974.005, MZLU L59/3167, L59/3185 [S+A]), Grotte Khaftar Khaneh, pres Aibak/Haïbak, alt. 1200 m, 17 May 1959, leg. K. Lindberg; – 1 ♀ (MZLU L57/3116, L57/3183 [S+A]), Grotte Zarmast, 18 October 1957, leg. K. Lindberg; – 1 ♂ (SMF 39222 [S+A]), Pashtunkot, Fariab, Grotte Zarmast, 1295 m, 27 August 1964, leg. D. Meyer-Oehme; – 1 ♂, 1 ♀ (SMF 39221, 39224 [S+A]), Sholgara, Balkh, unbekannte Höhle im Darra Band-i-Haba, 725 m, 11 April 1965, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39223 [S+A]), Takhtar Pul, Balkh, 390 m, 10 April 1965, leg. D. Meyer-Oehme.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Rhinolophus bocharicus* are shown in Table 3. For the material examined see above.

R. bocharicus is currently regarded a monotypic species endemic to a limited range of Central Asian lowland deserts and dry steppes (see Distribution above) by most authors (Kuzâkin 1934, 1944, 1950, 1965, Meklenburcev 1935, Strelkov 1963, 1971, 1981, Hanák 1969, Gaisler 1970b, Ânuševič et al. 1972, Felten et al. 1977, Strelkov et al. 1978, DeBlase 1980, Butovskij et al. 1985, Pavlinov & Rossolimo 1987, 1998, Rybin et al. 1989, Harrison & Bates 1991, Corbet & Hill 1992, Habilov 1992, Borisenko & Pavlinov 1995, Horáček et al. 2000, Csorba et al. 2003, Simmons 2005, Benda et al. 2011a, 2012, Srinivasulu & Srinivasulu 2012, etc.). Although a subspecies *R. bocharicus rubiginosus* Gubar'ov, 1941 was described based on two specimens from Upper Karabakh, Azerbaijan (Gubar'ov 1941), i.e. from the area far out of the distribution range of *R. bocharicus*, this subspecies name was shown to be a synonym of *R. ferrumequinum* (see Pavlinov & Rossolimo 1987, 1998, Koopman 1993, Csorba et al. 2003); as a valid subspecies (of *R. clivosus* s.l.) it was mentioned only by Koopman (1994).

R. bocharicus was described as a separate species by Kaŝenko & Akimov (1918), but several subsequent Russian authors considered it as the West Turkestani subspecies of *R. ferrumequinum* (Bobrinskoj 1925, Ognev 1927, 1928). However, this opinion was turned back by Kuzâkin (1934),

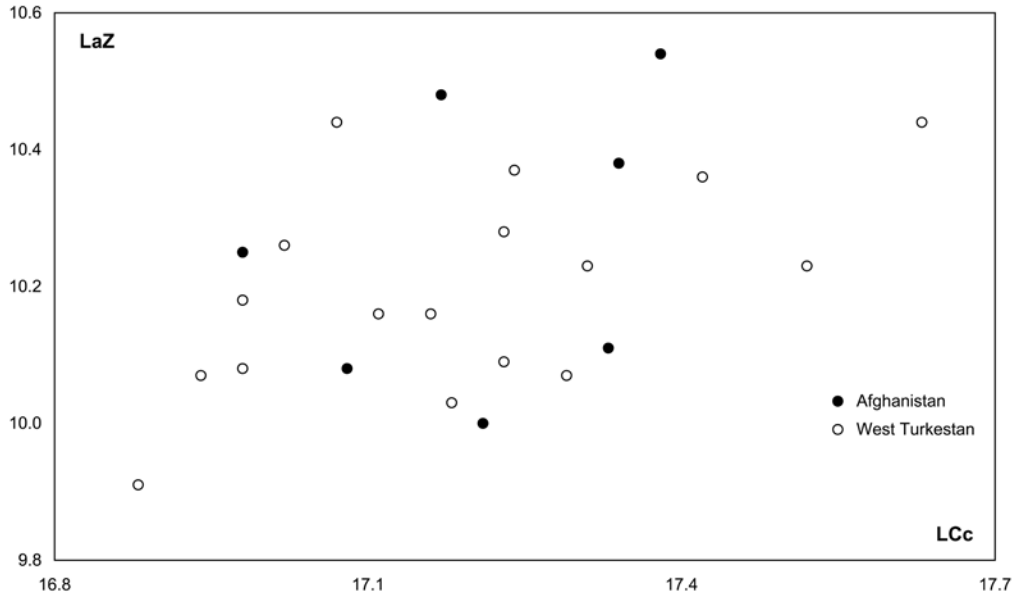

Fig. 12. Bivariate plot of the examined Afghanistani and comparative samples of *Rhinolophus bocharicus* Kaŝenko et Akimov, 1918: condylocanine length of skull (LCc) against the zygomatic width of skull (LaZ).

who found these two species (*R. bocharicus* and *R. ferrumequinum*) to occur in sympatry in eastern Uzbekistan and pointed out morphological differences between them (body size, relative lengths of ear, tail, and metacarpal bones). It is interesting to note that, based on examination of a single specimen of *R. bocharicus* from Afghanistan, Aellen (1959a) suggested to consider this bat a subspecies of an Afro-Arabian species, *R. clivosus* Cretzschmar, 1828; he stressed the similar size of body and nose-leaf, similar level of reduction of the third metacarpal (to 90% of the fifth metacarpal length), and similar level of reduction of the second upper premolar of these two taxa. This conclusion was accepted by some authors (Lindberg 1961, Harrison 1964, Koopman 1966, 1993, 1994, Neuhauser 1969, Gaisler 1971, Hayman & Hill 1971, Corbet 1978, Corbet & Hill 1980, Allison et al. 1982, Niethammer 1983), although already Hanák (1969), Strelkov (1971) and Felten et al. (1977) found a series of morphological traits differing *R. bocharicus* from *R. clivosus* (structure of skull and baculum, relative size of the nose-leaf, tooth and postcranial skeleton characters) and suggested again the separate species position for *R. bocharicus*.

A morphometric comparison of the Afghanistani specimens of *R. bocharicus* with those from West Turkestan did not reveal any significant differences between these sample sets (Fig. 12; comp. also Table 3 and Benda et al. 2011a: 164, Table 1).

Rhinolophus hipposideros (Borkhausen, 1797)

Records. **Published data**: K a b o l: limestone cave at Lalanda [1], some 20 km to the SSW of Kabul, 12 May 1967: coll. 1 m, [IVB] (Gaisler et al. 1968, Gaisler 1970a; Fig. 10); Dahnan-ghar cave, Lalandar, 20 km SW of Kabul, 5 October 1965: net. 1 m (Neuhauser 1969); Dahan Ghar, [cave, 12 March 1965: 1 m,] SMF (Felten et al. 1977); – Sarobi [2], 5 April 1967: coll. 1 f, [IVB] (Gaisler et al. 1968, Dusbábek 1970, Gaisler 1970a); Sarobi (Groschaft & Tenora 1973, 1974 [as *R. lepidus*]); – Tscharasiaw [3], [23 September 1963: 1 m, 2 October 1963: 1 f,] SMF (Felten et al. 1977). – N a n g a r h a r: Abdukil near Shigi [4], 1 April 1967: coll. 1 f, [IVB] (Gaisler et al. 1968, Hůrka & Povolný 1968, Gaisler 1970a, Hůrka 1976, 1984); – Jalal-Abad [5], 19 February 1965: coll. 2 m, [IVB] (Gaisler et al. 1968, Gaisler 1970a); Jalalabad, a ventilation cellar under the Spinchar Hotel, 4 August 1965: net. 4 m, 3 f, 21 October 1965: net. 2 m, 25 October 1965: net. 1 m (Neuhauser 1969); Jalalabad, [3 August 1965: 2 m,] SMF (Felten et al. 1977); Jalalabad, 10 inds., FMNH (DeBlase 1980, Bates & Harrison 1997). – N u r i s t a n: Barg-i-Matal [6], [21 July 1964: 1 f,] SMF (Felten et al. 1977). – Z a b o l: Grotte Boulan [7], Qalat, 9 April 1958: 1 m, [MZLU] (Aellen 1959a, Lindberg 1961, Vercammen-Grandjean 1963); Bolan Cave, 13.6 km S of Kalat-i-Ghilzai, 6 November 1965: net. 4 m, 2 f (Neuhauser 1969); Boulon Cave, 3 inds., FMNH (DeBlase 1980).

Distribution. *Rhinolophus hipposideros* ranks among rather medium-frequent bats in Afghanistan, seven localities of occurrence are available from the eastern and south-eastern parts of the country (Fig. 13), situated in four provinces (Kabol, Nangarhar, Nuristan, Zabol). The records originate from sites at medium to high altitudes in the range of 580–2110 m a. s. l. (mean 1436 m), localised on the southern slopes of the Hindu Kush range in the broader sense.

The Afghanistani occurrence of *R. hipposideros* represents a part of the south-eastern margin of the species distribution range. To the east, from Afghanistan the range continues only ca. 365 km to Kashmir, where two records of this bat are known, from Gilgit (Scully 1881a) and the Bumzov cave (Topál 1974); the latter site represents the easternmost point of the species range as well (ca. 75° 24' E). The occurrence of *R. hipposideros* in Afghanistan thus constitutes a major part of the species range in the Indian subcontinent (Bates & Harrison 1997).

R. hipposideros is distributed continuously in the south-western Palaearctic, from the Maghreb through southern and central Europe to Crimea, Caucasus, north-eastern Africa and most of the Middle East including Iran and southern Turkmenistan (Corbet 1978, Harrison & Bates 1991, Horáček et al. 2000, Benda et al. 2011a). The Afghanistani/Kashmiri and West Turkestani part of the species range seems to be somewhat isolated, situated at the easternmost margin of the range. The apparent gap in the known occurrence of *R. hipposideros* covers more than 800 km between

eastern Iran and central Turkmenistan in the west (see Strelkov et al. 1978, Benda et al. 2012) and south-western Tajikistan and eastern Afghanistan in the east (Habilov 1992, this review), and includes the areas of western and northern Afghanistan, eastern Turkmenistan and western and southern Uzbekistan (see Benda et al. 2011a: 167, Fig. 6).

However, theoretically this gap in *R. hipposideros* occurrence could be caused by a lack of sufficient knowledge of bat distribution in the respective areas. Benda et al. (2012) reviewed more than thirty localities of this bat from Iran, but only three sites from the eastern part of this country; these few records are distributed regularly along the eastern Iranian border and two of them are localised relatively close to the western border of Afghanistan, the Moghan cave in north-eastern Khorasan (ca. 180 km north-west of the Afghanistani border) and a pass near Nosrat Abad in Baluchistan (ca. 100 km from the border). These records indicate possible continuous occurrence of *R. hipposideros* in the mountains of eastern Iran (see Benda et al. 2012) and perhaps also of western Afghanistan.

Similarly, the West Turkestani range of *R. hipposideros*, which covers (besides the records in south-western Turkmenistan, belonging to the Mediterranean range of the species) a rather limited area of western Kirghizstan, eastern Uzbekistan, southern Kazakhstan, and western and central Tajikistan (Benda et al. 2011a), reaches the northern border of Afghanistan in a relatively large extent, including a belt over 300 km along the Panj river in southern Tajikistan (Habilov 1992). At least five sites of *R. hipposideros* occurrence are available from this region, viz. Babatag Mts., Gandžina, Garam Čašma, Horugh, and Zigar in the Darvaz range (Kornev 1941, Ŝerbin 1968, Habilov 1992). These records indicate a well possible distribution of *R. hipposideros* also in north-

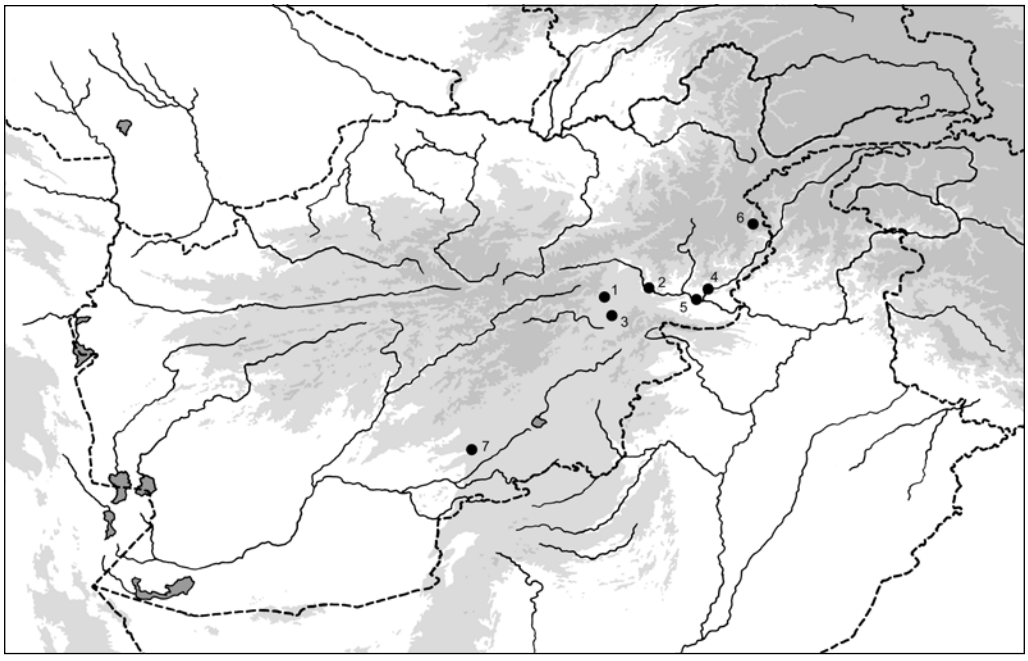

Fig. 13. Records of *Rhinolophus hipposideros* (Borkhausen, 1797) in Afghanistan.

eastern Afghanistan, namely in the Kondoz, Takhtar, Baghlan, and Badakhshan provinces, most probably in similar altitudinal zones as in the south-eastern part of the country (see above).

When the distribution of *R. hipposideros* in the mountainous regions of western and/or northern Afghanistan is confirmed, the geographical gap in the species range in south-western Asia will perhaps not be so extensive.

Material examined. 1 ♀ (IVB af547 [S+B]), Abdukil at Shigi, cave above the Kunar river, 1 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♀ (SMF 39214 [S+A]), Barg-i-Matal, Konar, 2010 m, 21 July 1964, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39216 [S+A]), Dahan Ghar, Wardak, Höhle, 2020 m, 12 March 1965, leg. D. Meyer-Oehme; – 1 ♂ (MZLU L58/3277, L58/3321 [S+A]), Grotte Boulan, 9 April 1958, leg. K. Lindberg; – 2 ♂♂ (SMF 39217 [S+A], 39218 [A]), Jalalabad, Nangarhar, 650 m, 3 August 1965, leg. D. Meyer-Oehme; – 2 ♂♂ (IVB af1389 [S+B], af1388 [B]), Jalal Abad, hotel, attic, 19 February 1965, leg. D. Povolný & F. Tenora; – 1 ♂ (IVB af1057 [S+B]), Lalanda, Lalanda cave, 20 km S of Kabul, 12 May 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♀ (IVB af573 [S+B]), Sarobi, cave above the Sarobi–Kabul road, 5 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂ (SMF 39215 [S+A]), Tscharasiaw, Logar, 1850 m, 23 September 1963, leg. D. Meyer-Oehme; – 1 ♀ (SMF 39213 [S+A]), Tscharasiaw, Logar, 1850 m, 2 October 1963, leg. D. Meyer-Oehme.

Morphology and variation. External and cranial dimensions of the Afghanistani specimens of *Rhinolophus hipposideros* are shown in Table 4. For the material examined see above.

Prevailing majority of authors (Andersen 1918, Ellerman & Morrison-Scott 1951, Aellen 1959a, Strelkov 1963, Kuzâkin 1965, Gaisler 1970a, Ânuševič et al. 1972, Sinha 1973, Topál 1974, Felten et al. 1977, Corbet 1978, Butovskij et al. 1985, Koopman 1994, Bates & Harrison 1997, Horáček et al. 2000, Alfred et al. 2002, Csorba et al. 2003, Srinivasulu & Srinivasulu 2012) considered the populations of *R. hipposideros* from Afghanistan and Kashmir and mostly

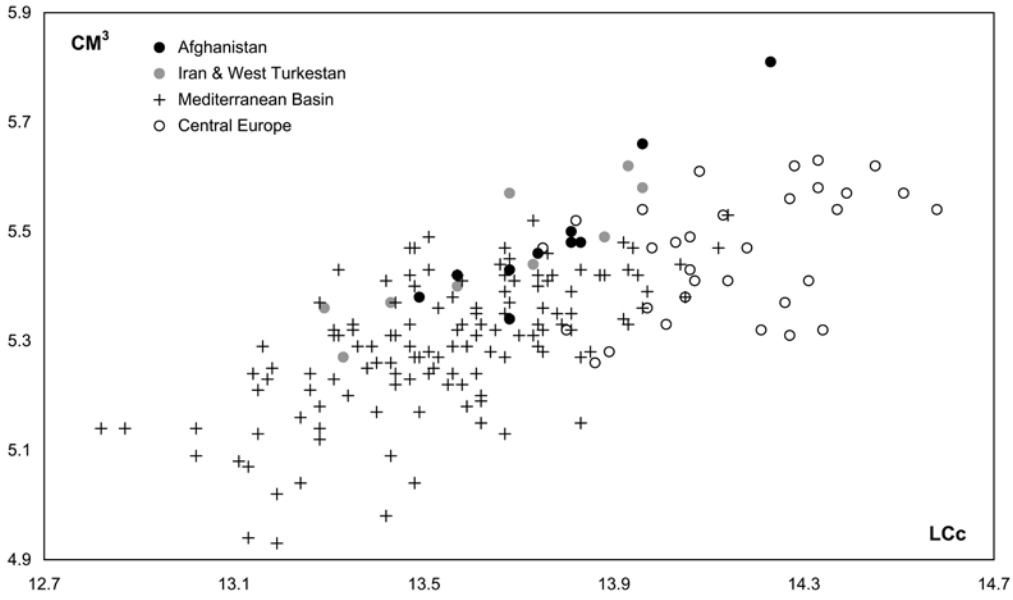

Fig. 14. Bivariate plot of the examined Afghanistani and comparative samples of *Rhinolophus hipposideros* (Borkhausen, 1797): condylocanine length of skull (LCc) against the length of upper tooth-row (CM^3).

Table 4. Basic biometric data on the examined Afghanistani samples of *Rhinolophus hipposideros* (Borkhausen, 1797), *R. lepidus* Blyth, 1844, and *R. blasii* Peters, 1867. For abbreviations see p. 272; indices: I = CM^3/LCc, II = CC/LCc, III = M^3M^3/LCc

	Rhinolophus hipposideros					*Rhinolophus lepidus*					*Rhinolophus blasii*				
	n	**M**	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	11	**39.93**	38.3	41.0	0.801	22	**42.87**	40.9	44.5	0.941	15	**48.70**	45.7	51.6	1.776
McIII	5	**27.14**	25.8	27.8	0.847	21	**31.00**	29.5	32.0	0.736	–	–	–	–	–
PhIII1	5	**13.02**	12.4	13.3	0.370	21	**12.53**	11.6	13.4	0.453	–	–	–	–	–
PhIII2	5	**19.10**	18.2	20.5	0.872	19	**15.79**	15.2	16.6	0.359	–	–	–	–	–
PhIII3	5	**1.26**	0.8	1.6	0.358	19	**3.13**	2.1	3.9	0.496	–	–	–	–	–
McIV	5	**30.74**	29.7	31.3	0.658	19	**32.35**	31.0	33.6	0.665	–	–	–	–	–
PhIV1	5	**6.98**	6.4	7.2	0.349	19	**8.91**	8.3	9.6	0.386	14	**9.01**	8.4	9.9	0.425
PhIV2	5	**13.28**	12.7	14.0	0.476	19	**10.59**	9.4	11.3	0.492	14	**16.11**	14.8	17.3	0.660
PhIV3	5	**0.80**	0.7	0.9	0.071	19	**1.62**	0.9	3.3	0.473	–	–	–	–	–
IIIFr	5	**0.813**	0.791	0.848	0.021	19	**0.984**	0.919	1.016	0.024	–	–	–	–	–
IVFr	5	**1.905**	1.833	2.047	0.091	19	**1.190**	1.093	1.310	0.058	–	–	–	–	–
LCr	1	**15.98**	–	–	–	17	**16.75**	16.31	17.33	0.284	12	**19.51**	18.83	20.02	0.314
LOc	9	**15.50**	15.17	15.94	0.228	19	**16.39**	15.90	16.75	0.209	15	**19.32**	18.75	19.96	0.345
LCc	10	**13.78**	13.49	14.23	0.208	17	**14.56**	14.09	14.83	0.181	15	**17.02**	16.43	17.57	0.327
LaZ	10	**7.54**	7.21	7.93	0.203	20	**8.12**	7.83	8.32	0.146	16	**9.33**	8.81	9.64	0.215
LaI	10	**1.62**	1.41	1.75	0.122	20	**2.06**	1.92	2.22	0.078	16	**2.37**	2.22	2.52	0.086
LaInf	9	**3.65**	3.32	3.92	0.165	20	**4.24**	3.87	4.46	0.117	16	**4.81**	4.59	4.98	0.105
LaN	10	**6.46**	5.98	6.82	0.225	20	**7.16**	6.87	7.57	0.158	16	**8.40**	8.15	8.68	0.147
LaM	9	**7.38**	7.21	7.62	0.116	20	**8.08**	7.86	8.29	0.114	16	**9.24**	8.82	9.54	0.182
ANc	10	**4.64**	4.38	4.92	0.152	19	**5.09**	4.83	5.37	0.157	15	**6.14**	6.02	6.33	0.105
LBT	10	**2.36**	2.13	2.69	0.161	20	**2.78**	2.56	3.08	0.130	14	**3.28**	3.07	3.55	0.132
CC	9	**3.64**	3.31	3.92	0.189	20	**4.10**	3.81	4.28	0.116	15	**4.45**	4.07	4.64	0.156
M^3M^3	9	**5.62**	5.43	5.91	0.141	20	**6.15**	5.83	6.38	0.124	16	**6.61**	6.47	6.82	0.105
CM^3	10	**5.49**	5.34	5.81	0.140	20	**5.93**	5.68	6.17	0.112	16	**6.82**	6.60	7.01	0.099
LMd	10	**9.97**	9.69	10.22	0.179	20	**10.50**	10.23	10.69	0.124	15	**12.16**	11.74	12.64	0.240
ACo	10	**2.08**	1.88	2.83	0.278	20	**2.34**	2.19	2.48	0.073	15	**2.70**	2.50	2.81	0.086
CM_3	10	**5.75**	5.52	6.02	0.151	20	**6.22**	5.93	6.42	0.142	15	**7.14**	6.93	7.35	0.118
I	10	**0.399**	0.390	0.408	0.005	–	–	–	–	–	–	–	–	–	–
II	9	**0.263**	0.242	0.284	0.012	–	–	–	–	–	–	–	–	–	–
III	9	**0.407**	0.395	0.415	0.006	–	–	–	–	–	–	–	–	–	–

also from West Turkestan and the Middle East, as belonging to one and identical subspecies, *R. h. midas* Andersen, 1905. The only different opinion was introduced by Andersen (1905: 142), who included the Kashmiri (Gilgit) specimen into his subspecies *R. hipposiderus typicus* (= *R. h. hipposideros*), distributed "From the extreme N.W. Himalayas, through N.W. Persia and Armenia, over the whole of Central Europe N. of the Balkans and the Alps.", thus, presumably also in Afghanistan. However, this taxonomic view was accepted only by Bobrinskoj (1925) and Ognev (1927, 1928) and only concerning the West Turkestani populations.

Andersen (1918: 378) reported *R. h. midas* to be distributed from Gilgit (Kashmir) to Cyprus, being relatively large-sized, with a relatively broadened infraorbital bridge and the second lower premolar (P_3) nearly always present. These states of the respective characters were found in the examined Afghanistani specimens by Aellen (1959a), Gaisler (1970a), and Felten et al. (1977). Gaisler (1970a) and Felten et al. (1977) added another character, the position of P_3 out of the tooth-row, giving the P_2 to contact with P_3; to *R. h. midas* these authors assigned the populations

from eastern Turkey, Iraq, Iran, and Afghanistan. Koopman (1994: 57) and Csorba et al. (2003: 53) generalised the distribution range of this subspecies as "Transcaucasia and Iraq to Kazakhstan and Kashmir".

The comparison of skull and forearm dimensions of the Afghanistani samples of *R. hipposideros* with other Palaearctic samples (Figs. 14, 15, Table 5) showed the bats from Afghanistan to be similar in skull shape to the Iranian samples (having relatively long and broad rostra), but slightly larger in body and skull size, in this respect approaching the values of the Central European bats (which are known to be the largest in size, Fig. 14; see also Andersen 1918, Felten et al. 1977, Benda et al. 2011a). However, the skull shape similarity and relative proximity in size suggest close phylogenetic position of the Afghanistani and Iranian bats.

The conclusions on the *R. hipposideros* taxonomy are traditionally based mostly on simple morphological comparisons (skull and teeth structure, forearm length and pelage colouration). However, Benda et al. (2012) co-identified several morphotypes revealed by various analyses (Andersen 1918, Felten et al. 1977, Benda et al. 2011a) with phylogenetic lineages resulting from a molecular genetic comparison by Kůs (2008). The Iranian lineage was found to be separated from the Mediterranean populations by 2.7–4.3% of *p* distance in the cytochrome *b* gene. Conclusions of a recent, more profound analysis by Dool et al. (2013) conform to these results, the eastern populations of *R. hipposideros* (Middle East, incl. Iran and Tajikistan) were demonstrated to be separated from the European and Maghrebian populations (divergence 3.2–3.8% in various mitochondrial markers). Hence, the traditionally reported separate taxonomic position of the easternmost populations of *R. hipposideros* seems to be sufficiently supported. Since the name of this taxon, *R. h. midas*, was described from Jask, Hormozgan, south-eastern Iran (Andersen 1905: 139), this name is certainly available to be applied for this subspecies.

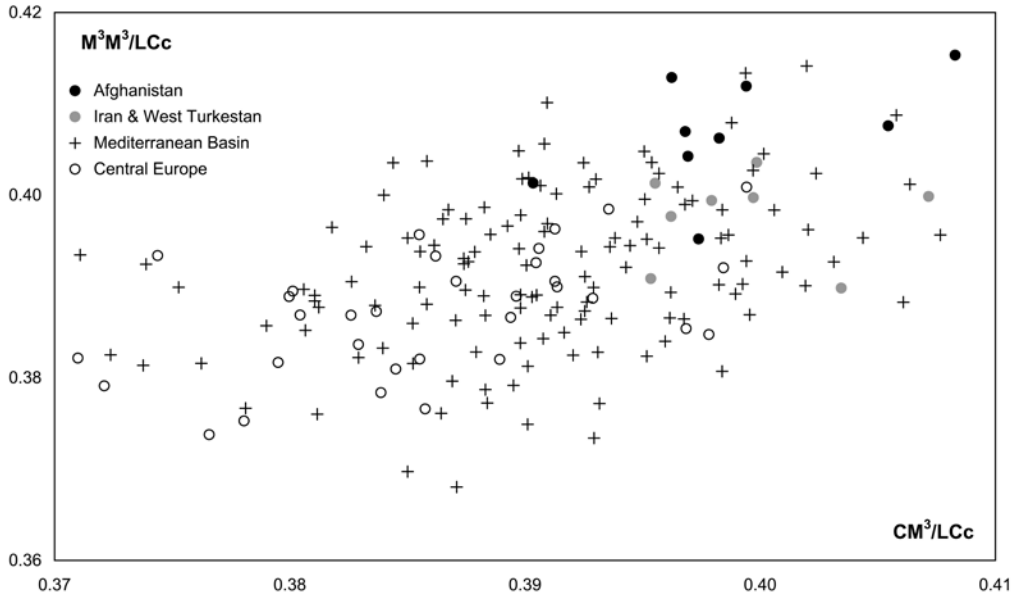

Fig. 15. Bivariate plot of the examined Afghanistani and comparative samples of *Rhinolophus hipposideros* (Borkhausen, 1797): relative length of rostrum (CM^3/LCc) against the relative width of rostrum (M^3M^3/LCc).

Table 5. Comparison of biometric data on three sample sets of *Rhinolophus hipposideros* (Borkhausen, 1797) from the south-western Palaearctic. For abbreviations see p. 272; indices: I = CM^3/LCc; II = CC/LCc; III = M^3M^3/LCc

	Iran & West Turkestan					Mediterranean					Central Europe				
	n	**M**	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	8	**38.70**	37.7	40.1	0.723	142	**37.72**	33.9	40.6	1.317	6	**39.10**	38.3	40.1	0.642
LCr	7	**16.07**	15.64	16.31	0.237	103	**15.96**	15.03	16.76	0.340	8	**16.41**	16.17	16.56	0.132
LOc	8	**15.25**	14.89	15.57	0.254	112	**15.25**	14.47	15.98	0.283	33	**15.79**	15.53	16.22	0.200
LCc	9	**13.64**	13.29	13.96	0.255	134	**13.54**	12.82	14.14	0.261	33	**14.14**	13.75	14.58	0.212
LaZ	9	**7.41**	7.17	7.66	0.161	129	**7.41**	6.94	8.10	0.194	33	**7.73**	7.42	8.09	0.155
LaI	9	**1.61**	1.43	1.77	0.089	140	**1.57**	1.24	2.00	0.121	33	**1.72**	1.49	1.97	0.103
LaInf	8	**3.60**	3.42	3.75	0.113	115	**3.53**	3.28	3.81	0.090	33	**3.69**	3.51	3.87	0.084
LaN	9	**6.46**	6.18	6.73	0.192	141	**6.51**	6.13	7.02	0.162	34	**6.69**	6.42	6.93	0.141
LaM	9	**7.39**	7.26	7.51	0.098	114	**7.37**	6.98	7.75	0.164	33	**7.61**	7.23	7.81	0.127
ANc	9	**4.61**	4.34	4.82	0.179	135	**4.61**	4.23	4.93	0.137	31	**4.77**	4.55	5.10	0.113
CC	7	**3.52**	3.28	3.64	0.122	134	**3.42**	2.98	3.88	0.125	31	**3.59**	3.42	3.81	0.096
M^3M^3	8	**5.45**	5.21	5.58	0.114	140	**5.30**	4.93	5.64	0.141	34	**5.47**	5.29	5.69	0.101
CM^3	9	**5.46**	5.27	5.62	0.118	141	**5.30**	4.93	5.53	0.122	34	**5.46**	5.26	5.63	0.108
LMd	9	**9.75**	9.36	10.24	0.270	142	**9.61**	9.05	10.10	0.223	33	**10.04**	9.72	10.34	0.189
ACo	9	**1.97**	1.66	2.12	0.143	143	**1.97**	1.67	2.24	0.116	30	**2.04**	1.87	2.16	0.080
CM_3	9	**5.66**	5.47	5.93	0.155	141	**5.47**	5.04	9.46	0.365	34	**5.64**	5.46	5.87	0.106
I	9	**0.400**	0.395	0.407	0.004	132	**0.391**	0.371	0.408	0.007	33	**0.386**	0.371	0.399	0.007
II	7	**0.256**	0.244	0.267	0.008	127	**0.253**	0.229	0.285	0.009	30	**0.254**	0.239	0.273	0.008
III	8	**0.398**	0.390	0.404	0.005	132	**0.392**	0.368	0.414	0.009	33	**0.387**	0.374	0.401	0.007

Rhinolophus lepidus Blyth, 1844

Records. **New data**: Z a b o l: Bulan cave [1], Qalat-e Ghilzai, 2 February 1965: 2 m, ZFMK (coll. J. Niethammer). – **Published data**: F a r y a b: Zarmast Cave [2], 16 km SE of Maimana, 14 September 1965: net. 1 m (Neuhauser 1969 [as *R. hipposideros*]); Pashtunkot, [Zarmast cave], 27 August 1964: 2 f, SMF (Felten et al. 1977); Maimana, FMNH (Bates & Harrison 1997, Csorba et al. 2003). – K a b o l: Kabul [3], FMNH (Bates & Harrison 1997, Csorba et al. 2003). – L a g h m a n: Alishing [4], [Kuh-Pialeh, Pialeh cave], 24 August 1961: 3 m, 2 f, SMF (Felten et al. 1977, cf. Meyer-Oehme 1965). – N a n g a r h a r: Grotte Tagheh Tchineh [5], Ibrahim Khel, SW de Djalalabad, 23 January 1958: 1 f, [MZLU] (Aellen 1959a, b, Vercammen-Grandjean 1963); Grotte Taghah Tchinah, au sud-ouest de Djelalabad, 23 January 1958 (Lindberg 1961). – P a r v a n: Firindjal [6], lead mine 2 km W of Ghorband, 3 October 1965: obs. ca. 500 inds., 10 m, 3 f (Neuhauser 1969 [as *R. hipposideros*]); Firindjal, 2 April 1965: 1 m, SMF (Felten et al. 1977, cf. Meyer-Oehme 1965); Firindjal, FMNH (Bates & Harrison 1997, Csorba et al. 2003). – Z a b o l: Boulan Ghar [1], [cave], 27 February 1965: 6 m, 2 f, SMF (Felten et al. 1977, cf. Meyer-Oehme 1965); Qalat, FMNH (Bates & Harrison 1997, Csorba et al. 2003). – Afghanistan, several localities (DeBlase 1980).

Distribution. *Rhinolophus lepidus* is a rather infrequent but not rare bat in Afghanistan, six sites of its occurrence are known from the country (Fig. 16). Despite the number of the records of this bat is relatively small, they originate from six provinces (Faryab, Kabol, Laghman, Nangarhar, Parvan, Zabol) and the distribution covers a large part of Afghanistan. The records of *R. lepidus* come from sites at high altitudes in the range of 1250–2150 m a. s. l. (mean 1694 m) mainly at the southern slopes of the central Hindu Kush range, but one site lies in the Faryab province in the north-west (Zarmast cave).

R. lepidus in its current taxonomic arrangement (Koopman 1994, Bates & Harrison 1997, Csorba et al. 2003, Simmons 2005) is an unusual faunal element, quite extraordinary among the Afghani-

stani bat fauna. It occurs in almost the entire Oriental region from Afghanistan and southern India to southern China, Malaya and Sumatra, including Nepal and Burma (Corbet & Hill 1992, Bates & Harrison 1997), but also in Central Asia from northern Afghanistan to central Uzbekistan and south-western Kirghizstan (Felten et al. 1977, Benda et al. 2011a). A similar distribution pattern has not been documented in any other bat species.

The occurrence of *R. lepidus* in Afghanistan constitutes a part of the western margin of the species distribution range and the Zarmast cave at Maimana (Faryab) its westernmost point as well. The Afghanistani part of *R. lepidus* range is somewhat separated from the Indian part, it continues only in the east to the southern slopes of the Himalayas (see Bates & Harrison 1997). However, this bat is completely missing in Kashmir and only three records are available from the eastern part of Pakistan, one from the mountainous Khyber Pakhtunkhwa at ca. 1230 m a. s. l. and 179 km east of the Afghanistani border (near Abbottabad; Roberts 1997) and two from lowland Punjab, at ca. 500 m and 210 m a. s. l. (Rawalpindi and Rasul Nagar; Nadeem et al. 2013, Shahbaz et al. 2014). Two findings from similar altitudes as in Afghanistan were reported from central Himachal Pradesh (Drang, Kullu; Ghosh 2008) and four additional records are known from these altitudes (mean 1640 m a. s. l.) of Uttarakhand (Almora, Khati, Masuri, Ranibagh; Andersen 1905, Wroughton 1914). However, very numerous records – more than fifty – are available from rather low altitudes of central, southern and eastern India (Bates & Harrison 1997).

The distribution pattern of *R. lepidus* in West Turkestan is extremely poorly known, in this area this species was for a long time misidentified as *R. hipposideros* (see Rybin et al. 1989,

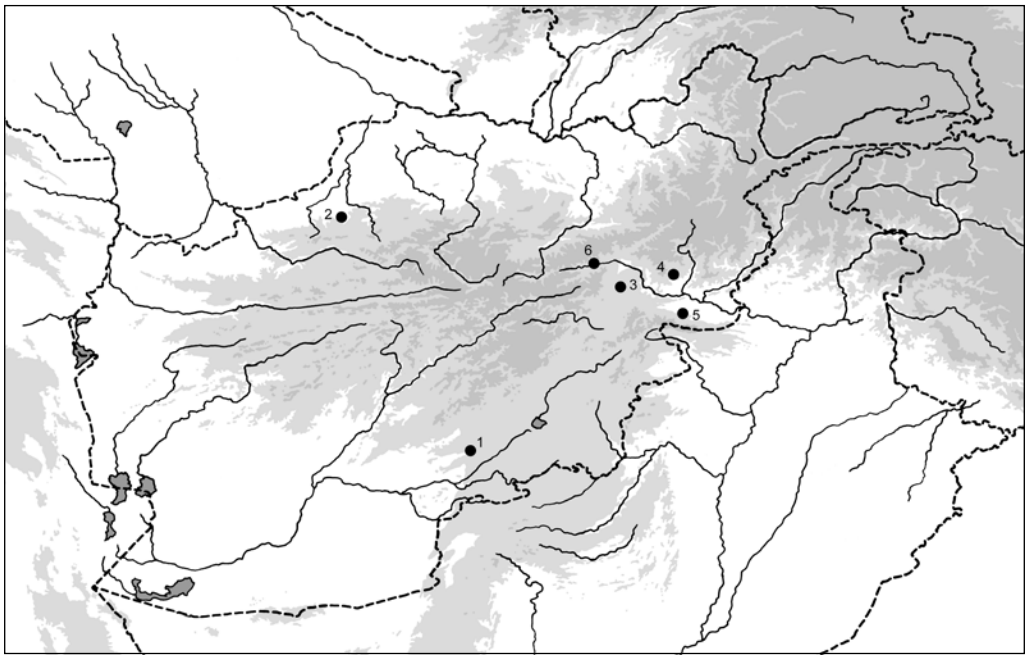

Fig. 16. Records of *Rhinolophus lepidus* Blyth, 1844 in Afghanistan.

Zima 2004, Benda et al. 2011a). Only three localities of *R. lepidus* are precisely known from the region, originating from the altitude range of 1104–1533 m a. s. l. (Benda et al. 2011a), two from south-western Kirghizstan (Kara-Kokty and Toâ-Moûn near Oš) and one from central Uzbekistan (Aman-Kutan south of Samarkand). However, considering the geographically broad range of this bat in Afghanistan as well as in West Turkestan, its occurrence in Central Asia is perhaps more extensive. Particularly, examination of a larger series of Tajikistani specimens originally identified as *R. hipposideros* could certainly bring new distribution data on *R. lepidus*.

Material examined. 4 ♂♂, 2 ♀♀ (SMF 39196, 39197, 39200–39203 [S+A]), Alishing, Laghman, Grotte Pialeh (im Kuh-Pialeh), 1550 m, 24 August 1961, leg. D. Meyer-Oehme; – 8 ♂♂, 2 ♀♀ (SMF 39198, 39199, 39204–39209 [S+A], 39210, 39211 [A]), Bolan Ghar, Zabul, Höhle, 1850 m, 27 February 1965, leg. D. Meyer-Oehme; – 2 ♂♂ (ZFMK 97.083, 97.084 [S+A]), Bulan Ghor, 1800 m NN, bei Kelat-i-Ghilzai, 2 February 1965, coll. J. Niethammer; – 1 ♂ (SMF 39212 [S+A]), Firindjal, Parwan, 2090 m, 2 April 1965, leg. D. Meyer-Oehme; – 1 ♀ (MZLU L58/3276, L58/3319 [S+A]), Grotte Tagheh Tchineh, 23 January 1958, leg. K. Lindberg; – 2 ♀♀ (SMF 39219, 39220 [S+A]), Pashtunkot, Fariab, Grotte Zarmast, 1295 m, 27 August 1964, leg. D. Meyer-Oehme.

Morphology and variation. External and cranial dimensions of the Afghanistani specimens of *Rhinolophus lepidus* are shown in Table 4. For the material examined see above.

Most authors consider *R. lepidus* a polytypic species, in which a various number of subspecies is recognised (Andersen 1918, Ellerman & Morrison-Scott 1951, Sinha 1973, 1980, Hill & Yoshiyuki 1980, Das 1986, Koopman 1994, Bates & Harrison 1997, Csorba et al. 2003, Simmons 2005, etc.). Aellen (1959a) was the first who assigned the Afghanistani populations to the subspecies *R. lepidus monticola* Andersen, 1905, until then considered a separate species (see e.g. Andersen 1905, Ellerman & Morrison-Scott 1951). He examined a single specimen from Afghanistan and found it to agree in the size of body and wing segments as well as in the structure of the nose-leaf with the descriptions of *R. lepidus* and *R. monticola* by Andersen (1905). The conclusion made by Aellen (1959a) was subsequently accepted by Meyer-Oehme (1965), Neuhauser (1969), Gaisler (1971), Felten et al. (1977), Koopman (1994), Bates & Harrison (1997), Csorba et al. (2003), and Srinivasulu & Srinivasulu (2012). On the other hand, Khajuria (1980) and Sinha (1980) regarded the Afghanistani populations a part of *R. lepidus lepidus*, i.e., they considered the name *monticola* just a junior synonym of the name *lepidus*. The only subspecies they recognised other than *R. l. lepidus*, was *R. l. shortridgei* Andersen, 1918, occurring in southern China and northern Burma (nowadays regarded a separate species, see Simmons 2005).

However, Horáček et al. (2000: 101–102) provided the following opinion concerning the Afghanistani and West Turkestani populations of *R. lepidus*: "Horáček and Zima (1996) demonstrated that the lesser horseshoe bat from S-Kirghizia reported until then as *R. hipposideros* represents in fact a different species belonging neither to *R. hipposideros* group nor *R. pusillus* group but close to *Rhinolophus lepidus* Blyth, 1844 (t.t. Calcutta ?). At the same time they demonstrated that it differs also from the Indian and E-Oriental forms of that group and, hence, is to be considered a separate species. Unfortunately, its formal description has not been published as yet. […]. *R.* "*kirgisorum*" (the samples from S-Kirgizia and Afghanistan) was compared with *monticola*, *blythi* [Andersen, 1918], *refulgens* [Andersen, 1905], *shortridgei*, *midas*, *szewchanus* [= *szechwanus* Andersen, 1818] etc, (including the respective types) and was found different in more characters. The type material of *lepidus* is probably lost, the S-Indian specimens differ from the Kirgizian sample, too." For more details, concerning the West Turkestani populations, see also Benda et al. (2011a).

So, it cannot be excluded that the westernmost populations of the bat referred now to *R. lepidus*, occurring in the mountains of West Turkestan and Afghanistan, represent a separate species of *Rhinolophus*. The taxonomic status of these populations thus remains open and calls for a profound taxonomic analysis concerning all small-sized Indian forms of the genus.

Rhinolophus mehelyi Matschie, 1901

Comments. *Rhinolophus mehelyi* was erroneously reported as a member of the Afghanistani bat fauna for the first time probably by Allison et al. (1982) in a broadly used compendium of the mammals of the world (Honacki et al. 1982). Due to this widely spread error, Afghanistan as a part of the species range was mentioned again by Harrison & Bates (1991), Corbet & Hill (1992), Koopman (1993), Horáček et al. (2000), Gaisler (2001), Simmons (2005) and Srinivasulu & Srinivasulu (2012). However, *R. mehelyi* is a Mediterranean faunal element (Csorba et al. 2003); in Asia, it occurs in the Mediterranean arboreal and steppe habitats eastwards to Transcaucasia and south-western Iran (see Benda et al. 2012: 244, Fig. 45). It does not occur in eastern and northern Iran, in West Turkestan, nor in Afghanistan (Csorba et al. 2003).

Rhinolophus blasii Peters, 1867

Records. **New data**: F a r y a b: Zarmast cave [1], Maimana, 5 July 1959: 1 ind., MHNG (leg. K. Lindberg; cf. Benda et al. 2012). – **Published data**: B a l k h: Tschell Ghar [2], 11 April 1965: 1 ind., SMF (Felten et al. 1977, Benda et al. 2006). – F a r y a b: Zarmast Cave [1], 13 September 1965: net. 9 m, 4 f (Neuhauser 1969); Pashtunkot (Grotte Zarmast, 1295 m NN), 27 August 1964: 8 m, SMF (Felten et al. 1977, Benda et al. 2006, cf. Meyer-Oehme 1965). – H e l m a n d: Girishk [3], qanat system 5 km NE, 11 November 1965: obs. ca. 15 inds. (Neuhauser 1969); – Lashkari Bazar [4], 28 August 1965: 1 f, SMF (Felten et al. 1977, Benda et al. 2006). – K a b o l: Dahan-ghar [5], 27 May 1960 [: 1 ind., MHNG] (Lindberg 1962); Dahnan-ghar cave, Lalandar, 20 km SW of Kabul, 5 October 1965: net. 5 m, 5 f (Neuhauser 1969); Grotte Dahan-Ghon (Tang-la-Landar, W. Kaboul), 27 May 1960: 1 ind., MHNG (Benda et al. 2012; Fig. 10). – K a n d a h a r: Qanat System [6], 24 km NW of Kandahar, 3 November 1965: coll. 1 m (Neuhauser 1969); – Shamshir Ghor [7] [cave,

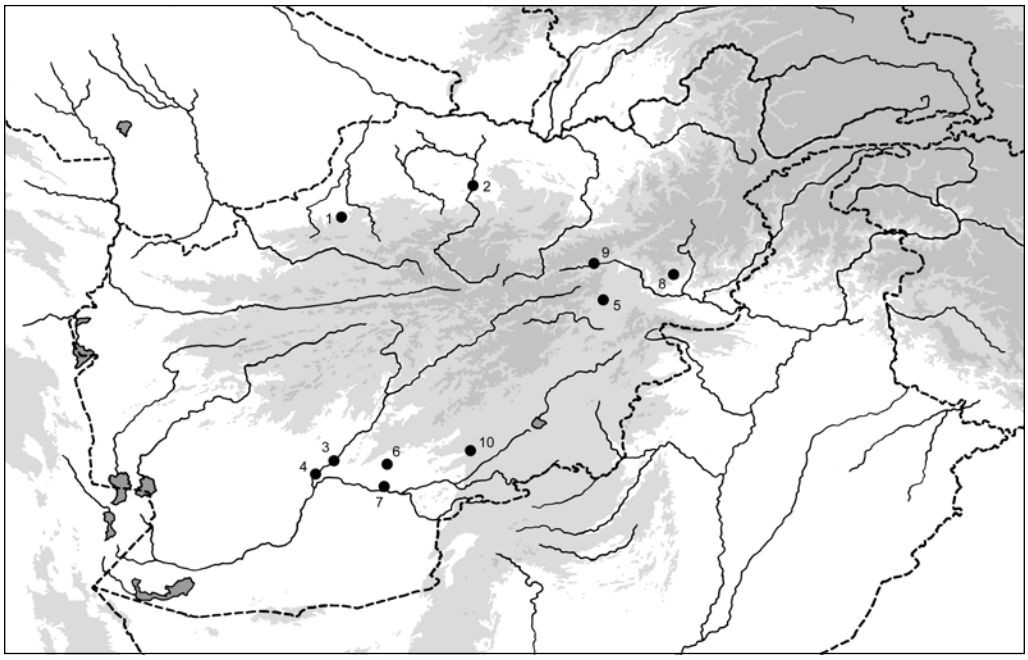

Fig. 17. Records of *Rhinolophus blasii* Peters, 1867 in Afghanistan.

23 May 1961: 1 m, SMF] (Meyer-Oehme 1965); Shamshir Ghar, 19 km SW of Kandahar, 30 October 1965: obs. ca. 500 inds., net. 10 m, 10 f (Neuhauser 1969); Shamshir Ghat, [cave], 23 May 1961: 1 m, SMF (Felten et al. 1977, Benda et al. 2006). – L a g h m a n: Grotte Pialeh [8], NW de Djalalabad, 27 January 1958: 1 f, [MZLU] (Aellen 1959a, Lindberg 1961, Vercammen-Grandjean 1963). – P a r v a n: Firindjal [9], lead mine 2 km W of Ghorband, 2–3 October 1965: obs. ca. 500 inds., net. ind/s. (Neuhauser 1969); Firindjal, 2 April 1965: 1 f, SMF (Felten et al. 1977, Benda et al. 2006, cf. Meyer-Oehme 1965). – Z a b o l: Boulan Ghar [10], [cave], 27 February 1965: 2 m, SMF (Felten et al. 1977, Benda et al. 2006, cf. Meyer-Oehme 1965). – Afghanistan, six localities, 89 inds., FMNH (DeBlase 1980).

Distribution. *Rhinolophus blasii* ranks among medium-frequent bats of Afghanistan, ten sites are available from the country (Fig. 17); these localities are situated in a high number of provinces in southern, northern and eastern parts of Afghanistan (Balkh, Faryab, Helmand, Kabol, Kandahar, Laghman, Parvan, Zabol), i.e. in a relatively large section of the country. The records of *R. blasii* come from sites at medium to higher altitudes in the range of 550–2150 m a. s. l. (mean altitude 1404 m).

R. blasii has a rather unusual type of distribution, covering a mosaic of occurrence patches in the south-western Palaearctic (south-eastern Europe, Maghreb, south-eastern Transcaucasia, several parts of the Middle East) and in eastern and southern Africa (Horáček et al. 2000, Simmons 2005). The distribution of this bat in Afghanistan constitutes a part of the easternmost extension of the species range; only a single spot of occurrence is known further east, two records of *R. blasii* were reported from the Lahore area of Punjab (Shalimar Gardens, Manawa; Roberts 1977, Javid et al. 2015). This bat is almost absent from West Turkestan, being known there only from four sites in the north-western Kopetdagh Mts. of Turkmenistan (Radde & Walter 1889, Strelkov et al. 1978, Kovaleva & Ŝerbak 1990); the site situated closest to the Afghanistani border is the Baharly cave, some 465 km to north-east. The four localities in the northern part of Afghanistan (Zarmast cave, Shulgareh, Firindjal, Pialeh cave) thus represent a part of the northern border-line of the species range in Asia.

The distribution of *R. blasii* in Afghanistan continues to the west, in a rather frequent occurrence in Iran; it is one of the most widespread bats of this country and the most common horseshoe bat in its eastern part (Benda et al. 2012). From near the border of Afghanistan, at least seven records were reported; the closest ones being the Mozduran cave in north-eastern Khorasan (92 km from the border; Benda et al. 2012), two sites at Esfedan in southern Khorasan (67 km; DeBlase 1980), and Mount Taftan in north-eastern Baluchistan (128 km; de Roguin 1988). All these records indicate possible presence of *R. blasii* also in (at least) the mountain altitudes of the western part of Afghanistan.

In the south of Afghanistan, only one uncertain record of *R. blasii* is available. Andersen (1906) and DeBlase (1980) reported a BMNH specimen collected at the Mekran Coast of Baluchistan, i.e. in south-eastern Iran or south-western Pakistan; it represents the only record that could geographically interconnect the known south-Afghanistani spots of *R. blasii* occurrence and its distribution in north-eastern Oman (see Harrison 1977). Anyway, the sites of *R. blasii* occurrence in southern Afghanistan (Lashkar-e Bazar, Shamshir cave, Bulan cave) constitute a part of the known southern margin of the species range in southern Asia.

Material examined. 3 ♂♂ (SMF 39193, 39194 [S+A], 39195 [A]), Boulan Ghar, Zabul, Höhle, 1850 m, 27 February 1965, leg. D. Meyer-Oehme; – 1 ♀ (SMF 39182 [S+A]), Firandjal, Parwan, 2090 m, 2 April 1965, leg. D. Meyer-Oehme; – 1 ind. (MHNG 983.004 [S]), Grotte Dahan-Ghon (Tang-la-Landar, W. Kaboul), 27 May 1960, leg. K. Lindberg; – 1 ♀ (MZLU L58/3275, L59/3187 [S+A]), Grotte Pialeh, 27 January 1958, leg. K. Lindberg; – 1 ind. (MHNG 974.006 [B]), Grotte Zarmast, Maïmaneh, 5 July 1959, leg. K. Lindberg; – 1 ♀ (SMF 39183 [S+A]), Lashkari Bazar, Helmand, 870 m, 28 August 1965, leg. D. Meyer-Oehme; – 8 ♂♂ (SMF 39185–39192 [S+A], type series of *Rhinolophus blasii meyeroehmi* Felten, 1977), Pashtunkot, Fariab, Grotte Zarmast, 1295 m, 27 August 1964, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39184 [S+A]), Shamshir Ghar, Kandahar, Höhle, 1080 m, 23 May 1961, leg. D. Meyer-Oehme; – 1 ind. (SMF 42292 [S]), Tschell Ghar, Balkh, 11 April 1965, leg. D. Meyer-Oehme.

Morphology and variation. External and cranial dimensions of the Afghanistani specimens of *Rhinolophus blasii* are shown in Table 4. For the material examined see above.

R. blasii is a polytypic species, up to four subspecies are currently recognised within its distribution range (Kock & Howel 1988, Koopman 1994, Csorba et al. 2003, Simmons 2005, Benda et al. 2006). The Palaearctic populations of the species, comprising those of the Maghreb, southeastern Europe, Middle East, Afghanistan, and Pakistan, were primarily considered to belong to the nominotypical form (Andersen 1905, Ellerman & Morrison-Scott 1951, Hayman & Hill 1971, Corbet 1978, Strelkov et al. 1978, DeBlase 1980, Strelkov 1981, etc.). Aellen (1959a) assigned the only Afghanistani specimen he evaluated to the nominotypical form, with a note on its slightly larger body size than found in the European samples (this was accepted by Neuhauser 1969 and Gaisler 1971).

Felten et al. (1977) divided the Palaearctic populations of *R. blasii* into two forms, the nominotypical subspecies from the Mediterranean region eastwards to western Turkey and a newly described *R. b. meyeroehmi* Felten, 1977 from Afghanistan and Iran (type locality: Pashtunkot (Grotte Zarmast, 1295 m NN), Prov. Fariab, Afghanistan; Felten et al. 1977: 25). Felten et al. (1977) defined this new subspecies to be larger in skull and forearm size than the nominotypical form and mainly, to differ by much longer phalangi of its fourth wing finger. The existence of the new subspecies as described by Felten et al. (1977) was accepted by most of the later authors (Corbet 1984, Corbet & Hill 1992, Koopman 1994, Horáček et al. 2000, Kryštufek & Đulić 2001, Kock et al. 2002, Csorba et al. 2003, Simmons 2005, Srinivasulu & Srinivasulu 2012, etc.).

However, Kock & Howel (1988) accepted *R. b. meyeroehmi* to occur in Afghanistan, but indicated the Iranian populations to belong to the nominotypical subspecies. Similarly, de Ro-

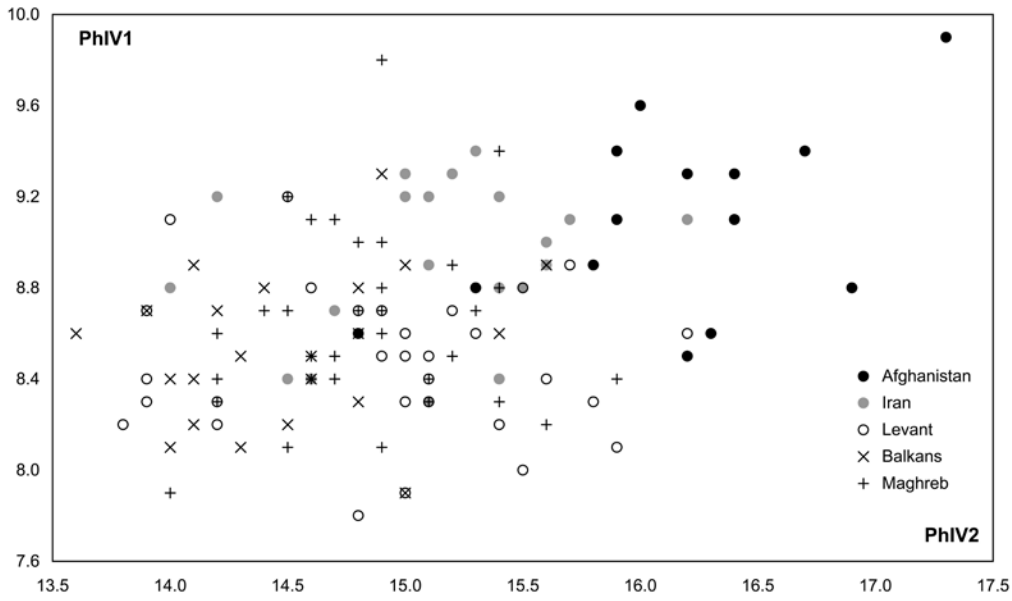

Fig. 18. Bivariate plot of the examined Afghanistani and comparative samples of *Rhinolophus blasii* Peters, 1867: length of the medial phalanx of the fourth wing finger (PhIV2) against the length of the proximal phalanx of the fourth wing finger (PhIV1).

Table 6. Comparison of biometric data on four sample sets of *Rhinolophus blasii* Peters, 1867 from the south-western Palaearctic. For abbreviations see p. 272

	Iran					Levant				
	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	25	**47.36**	45.0	50.6	1.261	77	**47.04**	44.7	49.4	1.036
PhIV1	21	**8.91**	8.3	9.4	0.332	32	**8.46**	7.8	9.2	0.326
PhIV2	21	**15.15**	14.0	16.2	0.523	31	**14.92**	13.8	16.2	0.640
LCr	18	**19.47**	18.97	20.07	0.318	58	**19.61**	18.30	20.42	0.335
LCc	24	**16.66**	16.32	17.19	0.257	71	**16.76**	16.13	17.29	0.239
LaZ	24	**8.98**	8.67	9.63	0.228	72	**9.16**	8.81	9.55	0.139
LaI	26	**2.32**	2.14	2.51	0.090	72	**2.32**	1.94	2.55	0.116
LaN	25	**8.13**	7.69	8.62	0.230	72	**8.35**	8.02	8.65	0.141
ANc	24	**6.03**	5.77	6.27	0.136	71	**6.12**	5.75	6.36	0.150
CC	25	**4.34**	4.06	4.54	0.134	71	**4.45**	4.11	4.69	0.126
M^3M^3	25	**6.62**	6.48	6.88	0.107	72	**6.45**	6.02	6.70	0.129
CM^3	25	**6.71**	6.47	6.93	0.092	72	**6.72**	6.37	7.00	0.132
LMd	25	**12.02**	11.73	12.43	0.210	71	**11.95**	11.37	12.34	0.191
ACo	27	**2.55**	2.32	2.86	0.127	72	**2.67**	2.34	2.87	0.089
CM_3	25	**7.06**	6.82	7.24	0.116	72	**7.02**	6.63	7.40	0.142
	Balkans					Maghreb				
LAt	47	**46.8**	44.8	49.0	0.987	45	**47.0**	44.1	49.3	1.222
PhIV1	23	**8.53**	7.9	9.3	0.325	36	**8.61**	7.9	9.8	0.399
PhIV2	23	**14.50**	13.6	15.6	0.491	36	**14.83**	14.0	15.9	0.435
LCr	38	**19.68**	18.92	20.23	0.321	43	**19.69**	19.29	20.17	0.219
LCc	49	**16.80**	16.22	17.33	0.263	59	**16.80**	16.40	17.23	0.200
LaZ	47	**9.17**	8.67	9.47	0.160	59	**9.39**	9.12	9.75	0.131
LaI	49	**2.36**	2.07	2.62	0.137	59	**2.35**	2.15	2.60	0.085
LaN	49	**8.36**	7.92	8.75	0.208	59	**8.40**	8.02	8.68	0.146
ANc	49	**6.10**	5.77	6.38	0.180	59	**6.12**	5.82	6.53	0.148
CC	47	**4.43**	3.89	4.68	0.163	57	**4.58**	4.32	4.87	0.116
M^3M^3	48	**6.45**	6.08	6.73	0.151	59	**6.55**	6.16	6.86	0.139
CM^3	50	**6.69**	6.23	6.98	0.142	59	**6.71**	6.40	6.93	0.105
LMd	49	**11.95**	11.52	12.38	0.193	52	**12.10**	11.67	12.44	0.167
ACo	49	**2.69**	2.38	3.02	0.131	59	**2.70**	2.50	2.97	0.090
CM_3	49	**7.02**	6.61	7.28	0.142	59	**7.12**	6.93	7.40	0.096

guin (1988) reported *R. b. blasii* from Iran. Kryštufek & Đulić (2001) considered the taxonomic status of the Iranian populations as uncertain. On the other hand, Koopman (1994) and Csorba et al. (2003) reported *R. b. meyeroehmi* to occur in Afghanistan, Iran and Turkmenistan; Corbet & Hill (1992), Bates & Harrison (1997), Roberts (1997), Csorba et al. (2003), and Srinivasulu & Srinivasulu (2012) suggested this subspecies to be present also in Pakistan.

The comparison of a set of Palaearctic samples of *R. blasii* including the specimens from Afghanistan by Benda et al. (2006) did not confirm the significant differences in skull size previously reported by Felten et al. (1977), i.e. between the Afghanistani and Iranian samples on one side and the European, Levantine and Maghrebian bats on the other side. Benda et al. (2012) did not find any remarkable differences between the Iranian and other Palaearctic samples in the phalanx lengths, as suggested Felten et al. (1977). Finally, Benda et al. (2012) suggested that the nominotypical subspecies (as defined by Felten et al. 1977) lives probably in the whole Palaearctic

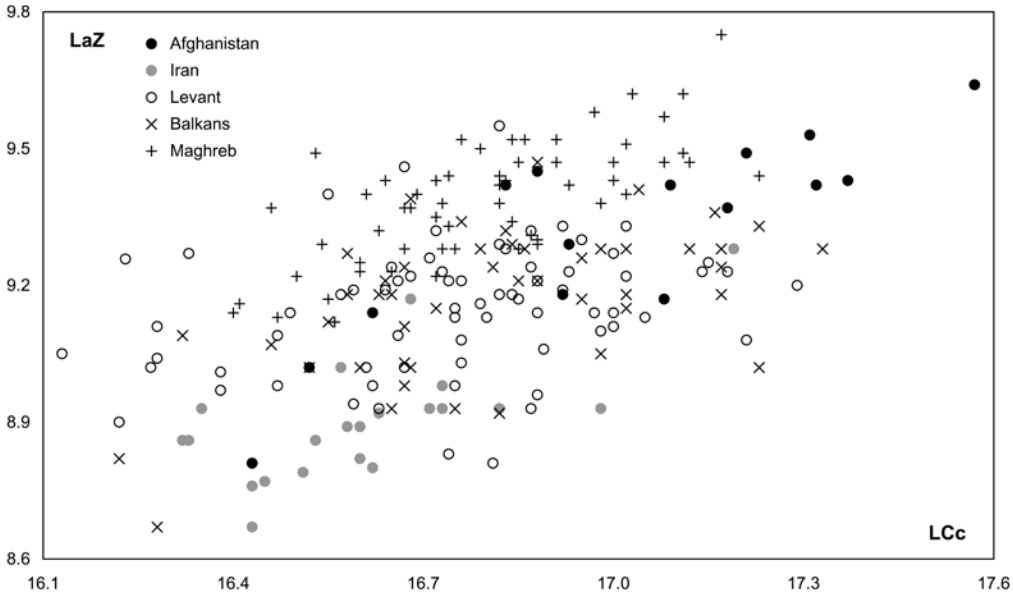

Fig. 19. Bivariate plot of the examined Afghanistani and comparative samples of *Rhinolophus blasii* Peters, 1867: condylocanine length of skull (LCc) against the zygomatic width of skull (LaZ).

range of *R. blasii* west of Afghanistan, i.e. including the whole territory of Iran, while the form *R. b. meyeroehmi* probably occurs solely in Afghanistan (and perhaps also in Pakistan, as suggested by a series of authors, see above).

Here we made new comparisons of the whole set of the examined Afghanistani specimens of *R. blasii* with numerous samples from the rest of the Palaearctic distribution range of this bat. The comparison of the proximal and medial phalanx lengths of the fourth wing finger (Fig. 18) clearly showed the Afghanistani samples to be large in both dimensions, the cluster of values of these bats was positioned almost completely out of the morphospace created by the remaining samples, with an insignificant overlap mainly with the Iranian specimens. Similarly, the comparison of skull dimensions (Fig. 19, Table 6) showed the Afghanistani samples on average larger than the other compared samples of *R. blasii*, although the overlap covered almost the whole ranges of other sample sets. Interestingly, in skull dimensions the Iranian samples were shown as the most distant from the Afghanistani ones, while the Levantine, Balkanian and Maghrebian samples overlapped more markedly with the Afghanistani samples. In both comparisons, a few specimens of *R. blasii* from southern Afghanistan (provinces of Helmand and Kandahar) were exceptional among the Afghanistani samples and agreed in dimensions with the bats from Iran, while the samples of this bat from northern and eastern Afghanistan were shown to be the most distant from other Palaearctic population sets. On average, the Afghanistani bats demonstrated the largest skull length, while the Maghrebian samples the largest skull width and the Iranian and Levantine samples the smallest skull lengths, the Iranian also skull width (see also Table 6).

These simple morphometric comparisons showed the Palaearctic populations of *R. blasii* as a mosaic of several more or less distinct morphotypes. The Afghanistani populations represent a peculiar morphotype clearly separated and most distinct from all others that live in the Palaearctic,

and undoubtedly deserve an assignation to a separate subspecies, *R. b. meyeroehmi*. However, the mutual phylogenetic positions of populations from the particular parts of the distribution range could be probably solved only with the help of a molecular genetic analysis.

Hipposideros fulvus Gray, 1838

Records. **Published data**: L a g h m a n: Laghman [1], 24 February 1966: remains in fresh *Asio otus* pellets (Niethammer 1968). – N a n g a r h a r: Darunta Hills [2], 10 March 1967: coll. 1 m, [IVB] (Gaisler et al. 1968, Gaisler 1970a).

Distribution. *Hipposideros fulvus* is a rare bat in Afghanistan, two findings from two localities in the eastern part of the country were reported (Laghman and Nangarhar provinces; Fig. 20). These sites are situated in semi-arid areas of the broader Jalalabad valley at the altitudes of ca. 600 and 900 m a. s. l.

The occurrence of *H. fulvus* in Afghanistan continues eastwards in the distribution range of this bat in northern Pakistan and Kashmir (Bates & Harrison 1997, Saikia et al. 2006), where two records are known from Khyber Pakhtunkhwa (Heroshah, Mardan; Salim & Mahmood-ul-Hassan 2014, Perveen & Rahman 2015), three others from northern Punjab (Bhaklala, Chak Lala, Pind Dadun Khan; Hinton & Thomas 1926, Ghosh 2008), and one record is known from Kashmir (near Mansar Lake; Saikia et al. 2006). These few sites – including the two Afghanistani localities – create an island of *H. fulvus* occurrence, separated from the continuous belt of records stretching from southern Iran (Hormozgan) via southern Pakistan (Baluchistan, Sindh) and western India eastwards and southwards (Bates & Harrison 1997, Benda et al. 2012). *H. fulvus* is an endemic of

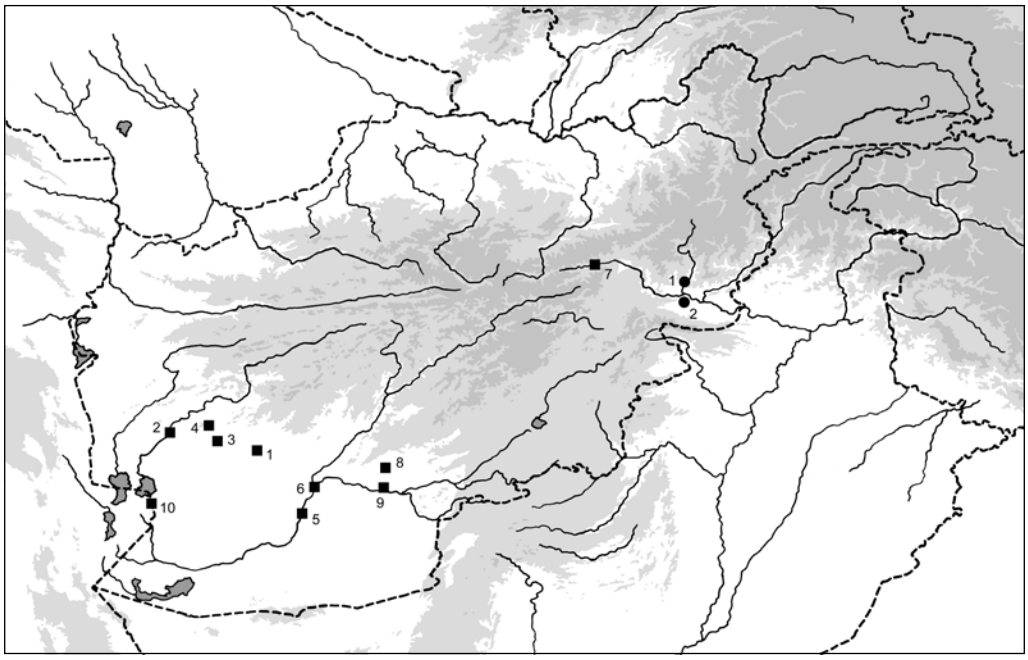

Fig. 20. Records of *Hipposideros fulvus* Gray, 1838 (circles) and *Asellia tridens* (Geoffroy, 1813) (squares) in Afghanistan.

the Indian subcontinent, it is distributed continuously over most of the Indian territory, in Nepal, Ceylon, southern Pakistan, southern Iran, and perhaps also in the Nicobar Islands (Hill et al. 1987, Bates & Harrison 1997, Benda et al. 2012). The separate occurrence area in eastern Afghanistan, northern Pakistan and Kashmir constitutes the northernmost extension of the species distribution range, where Laghman (Afghanistan) is the most extreme site at 34° 37' N.

Material examined. 1 ♂ (IVB af373 [S+B]), a mine above Darunta near Jalal Abad, 10 March 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimen of *Hipposideros fulvus* are shown in Table 7. For the material examined see above.

The only specimen of *H. fulvus* from Afghanistan available for a full examination – from the IVB collection – was examined and identified by Hill shortly after its collection (Gaisler et al. 1968: 44): "Mr. J. E. Hill (London) was kind enough to examine the specimen and find it to be an example of *H. fulvus pallidus* Andersen, 1918." This name was broadly accepted by subsequent authors for designation of the Afghanistani populations of the species (Neuhauser 1969, Gaisler 1970a, Hill et al. 1987, Corbet & Hill 1992, Koopman 1994, Srinivasulu & Srinivasulu 2012). Another specimen of *H. fulvus*, reported by Niethammer (1968: 101) to be found in owl pellets, was also identified by J. E. Hill, however, only to the species level.

Although *H. fulvus* was described as a separate species by Gray (1838) and considered so e.g. by Stoliczka (1872), Scully (1887b), Wroughton (1912b), Andersen (1918), or Hinton & Thomas (1926), it was regarded as a subspecies of *H. bicolor* (Temminck, 1834) e.g. by Dobson (1876) or Blanford (1891), and with a question mark also by Ellerman & Morrison-Scott (1951). Consequently, also the subspecies originally described as *H. fulvus pallidus* by Andersen (1918) was placed with a question mark under *H. bicolor* by the latter authors. However, this arrangement was rejected by Hill (1963) who separated *H. fulvus* and *H. bicolor*, and who recognised two subspecies in the former species, the nominotypical one and *H. f. pallidus*. These two subspecies are defined only by their pelage colour differences (Andersen 1918, Brosset 1962b, Hill 1963, Corbet & Hill 1992, Bates & Harrison 1997), with a pale dorsal and creamy ventral pelage colouration in *H. f. pallidus*, while a chestnut brown or brown dorsal and paler ventral pelage colouration in *H. f. fulvus*. These subspecies are reported to occur in two separate ranges of the Indian subcontinent, which differ in the humidity of their environment, *H. f. fulvus* in the relatively humid areas in Ceylon and the southern part of India, while *H. f. pallidus* in dry areas in Afghanistan, Pakistan and northern India (Brosset 1962b, Sinha 1980, Corbet & Hill 1992, Koopman 1994, Bates & Harrison 1997, Alfred et al. 2002, Srinivasulu & Srinivasulu 2012). On the other hand, since these forms do not differ in morphological traits other than pelage colouration, it cannot be excluded that they represent just morphs adapted by their colouration tinge to the relative humidity of the environment, and the colour difference does not reflect any phylogenetic separation of the respective populations. However, such a hypothesis could be tested by molecular genetic methods only.

Asellia tridens (Geoffroy, 1813)

Records. **New data**: F a r a h: Dilaram, Kuh-e Duzdan cave [1], 3 June 1962: 12 m, MHNG (leg. K. Lindberg); Dilaram, Kuh-e Duzdan cave, 3 March 1965: 5 m, 4 f, 1 ind., SMF, 2 m, 192 skulls and 30 mandibles from a cave deposit, ZFMK (leg. D. Meyer-Oehme & J. Niethammer; cf. Benda et al. 2006, 2011b); – Farah, Ebn-e Yamin [2], 2 September 1965: 2 m, 1 f, SMF (leg. D. Meyer-Oehme; cf. Benda et al. 2006, 2011b); – Kuh-e Siab Ab cave [3], 22 June 1962: 1 m, 1 ind., MHNG (leg. K. Lindberg); Kuh-e Siah Ab cave, 31 August 1965: 3 m, SMF (leg. D. Meyer-Oehme); – Kuh-e Dir, Mumlai cave [4], 1 September 1965: 1 m, SMF (leg. D. Meyer-Oehme). – H e l m a n d: Darweshan [5], 29 August 1965: 1 f, SMF (leg. D. Meyer-Oehme); – Qala-e Bust [6], 27 August 1965: 4 m, 3 f, SMF (leg. D. Meyer-Oehme). – P a r v a n: Firindjal [7], 2 April 1965: 1 ind., SMF (leg. D. Meyer-Oehme). – **Published data**: F a r a h: Dilaram, Grotte du Kouh-Dozd [1], 21 April 1958: 8 m, 2 f, [MHNG, MZLU] (Aellen 1959a, b, Lindberg 1961), 9 inds. (Vercammen-Grandjean 1963);

Table 7. Basic biometric data on the examined Afghanistani samples of *Hipposideros fulvus* Gray, 1838, *Asellia tridens* (Geoffroy, 1813), and *Taphozous nudiventris* Cretzschmar, 1830. For abbreviations see p. 272

	Hipposideros fulvus	*Asellia tridens*					*Taphozous nudiventris*				
	IVB af373	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	41.2	56	**53.78**	50.5	56.8	1.307	22	**74.46**	70.4	77.5	1.844
LCr	–	24	**19.05**	17.95	19.51	0.363	17	**26.18**	24.55	27.67	0.934
LOc	17.69	35	**18.86**	17.85	19.43	0.369	20	**27.29**	25.71	28.38	0.748
LCc	15.54	43	**16.79**	15.62	17.38	0.316	20	**24.20**	23.73	24.78	0.332
LaZ	9.07	163	**10.54**	9.72	11.24	0.289	20	**15.94**	15.33	16.46	0.370
LaI	2.43	177	**2.40**	2.13	2.64	0.103	22	**7.53**	6.81	8.19	0.436
LaPO	–	–	–	–	–	–	22	**4.87**	4.42	5.29	0.240
LaInf	4.59	197	**5.99**	5.48	6.68	0.248	22	**6.93**	6.43	7.79	0.327
LaN	8.15	132	**7.63**	7.14	8.21	0.203	22	**12.11**	11.53	12.69	0.340
LaM	9.08	117	**8.92**	8.38	9.47	0.178	21	**13.93**	13.02	14.71	0.434
ANc	5.91	108	**5.66**	5.16	6.19	0.195	21	**8.47**	7.57	9.26	0.456
LBT	2.84	23	**3.06**	2.88	3.33	0.123	20	**5.43**	5.17	5.84	0.141
CC	4.34	56	**5.48**	4.87	8.66	0.584	22	**5.88**	5.48	6.31	0.220
M^3M^3	6.45	136	**7.55**	6.93	8.03	0.216	22	**10.75**	10.28	11.32	0.198
CM^3	6.44	57	**6.90**	6.48	7.42	0.163	22	**11.26**	10.83	11.57	0.200
LMd	11.28	49	**12.74**	11.74	13.31	0.327	22	**20.07**	19.64	20.58	0.286
ACo	2.93	51	**4.10**	3.75	4.51	0.167	22	**7.50**	6.93	7.88	0.204
CM_3	6.81	38	**7.56**	7.31	7.88	0.160	22	**12.64**	12.13	13.04	0.243
M^3M^3/CM^3	–	–	–	–	–	–	21	**0.956**	0.927	0.986	0.015
CM^3/LCc	–	–	–	–	–	–	19	**0.465**	0.448	0.477	0.007

Kouh-Dozd cave, 21 April 1958 (Smit 1960); Koh-i-Duzdan Cave, 12 km NE of Dilaram, 14 November 1965: obs. ca. 5000 inds., coll. 3 m, 3 f, FMNH (Neuhauser 1969, Bates & Harrison 1997); – Grotte du Kouh-Siah Ab [3], entre Dilaram et Farah, 23 April 1958: 4 m, 1 f, [MHNG, MZLU] (Aellen 1959a, b), 4 inds. (Vercammen-Grandjean 1963); Siaou cave, 23 April 1958 (Smit 1960); Grotte du Kouh-Siaou Baba (Siah Ab), 23 & 28 April 1958 (Lindberg 1961); Sarai-Siah Ab Cave, 22.5 km W of Bakva, 14 November 1965: obs. ca. 1500 inds., coll. 1 m, 1 f (Neuhauser 1969). – K a n d a h a r: Qanat System [8], 24 km NW of Kandahar, 3 November 1965: obs. & exam. ca. 500 inds., coll. 20 m, 20 f (Neuhauser 1969); Kandahar, FMNH (Bates & Harrison 1997); – Shamshir Ghar [9], subfossil bone material, 3 inds. (Dupree 1958 [as *Hipposideros* sp., but see Neuhauser 1969: 93]); Shamshir Ghor, [cave], 23 May 1961: 2 f [SMF] (Meyer-Oehme 1965). – N i m r u z: Seistan [10], 1 ind., BMNH (Lay 1967, Bates & Harrison 1997, Benda et al. 2011b, 2012). – Afghanistan, three localities, 48 inds., FMNH (DeBlase 1980).

Distribution. *Asellia tridens* ranks among medium-frequent bats in Afghanistan, nine to ten localities of this bat are available from the country (Fig. 20). The prevailing number of records come from low situated (altitude range 480–1100 m a. s. l., mean altitude 836 m) and dry regions of the south-Afghanistani deserts. These sites are mostly situated in the central belt of the Farah, Helmand and Kandahar provinces at the margins of the Khash, Margow, and Rigestan deserts; an additional possible record in southern Afghanistan was reported from the Seistan basin, although it could originate from its Iranian side (see Lay 1967, Benda et al. 2012). However, one record of *A. tridens* comes from a quite extraordinary locality, the Firindjal mine in the Parvan province in eastern Afghanistan. This site is extreme in its altitude (2070 m a. s. l., increasing the overall mean altitude in the country to 965 m), latitude and longitude (35° 00' N, 68° 41' E), as well as its isolation from other areas of occurrence.

The occurrence areas of *A. tridens* in Afghanistan constitute parts of the northern and eastern margins of the species range in Asia. The northern border of the range continues to the west, it goes through southern and western Iran, Iraq, to northern Syria (Benda et al. 2006, 2012); the closest

records in Iran originate from the Kerman and Baluchistan provinces (40 km east of Bam, Kerman, Iranshahr, Espake; Lay 1967, DeBlase 1980, Etemad 1984, Benda et al. 2012). The occurrence of *A. tridens* in Afghanistan and Baluchistan of Iran and Pakistan as well as in Mesopotamia of Iraq and Syria represent two areas of Asia, where this bat lives in continental conditions far of the maritime climate at sea coasts.

In the east of Afghanistan, only one locality of *A. tridens* is known, Senacha & Dookia (2013) reported a record from the Gajroopsagar tunnel near Jaisalmer, Rajasthan, India (70° 56' E). However, the Afghanistani occurrence of this bat rather continues to the south-east, to Baluchistan and south-western Sindh (Bates & Harrison 1997), where at least four records were reported (Karachi, Nushki, Panjgur, Thatta; Roberts 1977). Nushki in northern Baluchistan is the closest locality, 24 km south of the Afghanistani border, and along with the two localities in the Kandahar environs in the north and Thatta (Sindh) in the south, it constitutes the eastern margin of the continuous range of *A. tridens* in Asia.

The exceptional record of *A. tridens* from Firindjal, Parvan, represents the northernmost point (34° 59' N) of the species range east of the Levant, where *A. tridens* reaches its northernmost distribution as well (Raqqa, 35° 55' N; Ebenau 1996) and is nearly the easternmost in the whole range, latitudinally exceeding the localities in southern Sindh (Thatta, 67° 56' E; Roberts 1977). Moreover, it perhaps represents the most elevated site of the species occurrence as well. Considering the whole distribution range of *A. tridens*, the site is so unusual that a question arises as to correct labelling of the respective SMF skull. If the data on the specimen are correct, the record perhaps represents a stray individual far away from the continuous range of the species. Most extremely, it could also indicate possible occurrence of *A. tridens* in the Pakistani areas east of Afghanistan, since the Parvan valley is a direct geographical continuation of the Jalalabad and Indus valleys.

Material examined. 1 ♀ (SMF 39165 [A]), Darweshan, Helmand, 29 August 1965, leg. D. Meyer-Oehme; – 7 ♂♂, 4 ♀♀, 1 ind. (SMF 39158, 39161, 39168 [S+A], 39935 [S], SMF 39159, 39160, 39169–39172, ZFMK 97.006, 97.007 [A]), Delaram, Farah, Höhle im Kuh-Dozd, 1050 m, 3 March 1965, leg. D. Meyer-Oehme & J. Niethammer; – 2 ♂♂, 1 ♀ (SMF 39167 [S+A], 39166, 39181 [A]), Ebn-e-Yamin, Farah, 590 m, 2 September 1965, leg. D. Meyer-Oehme; – 1 ind. (SMF 39936 [S]), Firindjal, Parwan, 2090 m, 2 April 1965, leg. D. Meyer-Oehme; – 1 ♂, 1 ind. (MHNG 1704.059 [S+B], 1704.058 [A]), Grotte de Siaon, 22 June 1962, leg. K. Lindberg; – 4 ♂♂, 1 ♀ (MHNG 952.096, 952.097, MZLU L58/3315 [A]), Grotte du Kouh Siah Ab, entre Dilaram et Farah, 23 April 1958, leg. K. Lindberg; – 8 ♂♂, 2 ♀♀ (MHNG 952.093, 952.094 [S+A], MHNG 952.095, MZLU L58/3316 [A]), Grotte du Kouh Dozd, Dilaram, 21 April 1958, leg. K. Lindberg; – 12 ♂♂ (MHNG 1704.060 [S+B], 1704.061–1704.069 [S+A], 1704.070, 1704.071 [A]), Grotte du Kouh Dozd, Dilaram, 3 June 1962, leg. K. Lindberg; – 192 inds. (ZFMK 97.018–97.022 [S]), Höhle bei Kuh-i-Duzd, bei Dilaram, 1965, leg. D. Meyer-Oehme & J. Niethammer; – 30 inds. (ZFMK 97.023 [Md]), Höhle bei Kuh-i-Duzd, bei Dilaram, 1965, leg. D. Meyer-Oehme & J. Niethammer; – 1 ind. (ZFMK 97.025 [Sk]), Höhle bei Kuh-i-Duzd, bei Dilaram, 1965, leg. D. Meyer-Oehme & J. Niethammer; – 3 ♂♂ (SMF 39177–39179 [A]), Höhle im Kuh-Siah Ab, Farah, 770 m, 31 August 1965, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39180 [A]), Höhle Moumlai (im Kuh-Dir), 835 m, 1 September 1965, leg. D. Meyer-Oehme; – 4 ♂♂, 3 ♀♀ (SMF 39175 [S+A], 39162–39174, 39176 [A]), Kala-e-Bust, Helmand, 870 m, 27 August 1965, leg. D. Meyer-Oehme; – 1 ind. (BMNH 6.1.2.1. [S]), Seistan, date and collector unlisted; – 2 ♀♀ (SMF 39156 [S+A], 39157 [A]), Shamshir Ghar, Kandahar, Höhle, 1080 m, 23 May 1961, leg. D. Meyer-Oehme.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Asellia tridens* are shown in Table 7. For the material examined see above.

A recent revision of the genus *Asellia* (considering also the Afghanistani samples) by Benda et al. (2011b), based on the results of morphological and molecular genetic analyses, has suggested to divide *A. tridens* into two subspecies in geographically clearly separated ranges, *A. t. tridens* in Africa (from Gambia and Morocco to Ethiopia and Egypt) and *A. t. murraiana* (Anderson, 1881) in Asia (from the Levant and Yemen to Afghanistan, Pakistan and Oman). Since *A. t. murraiana* was described from the southern areas of Pakistan and Iran (Karachi and Bushehr; Anderson 1881:

113) and the Afghanistani populations are morphologically very similar to the populations from these neighbouring countries, the conclusion by Benda et al. (2011b) concerning the taxonomic affiliation of the bats from Afghanistan is in accordance with the opinions by a number of previous authors (Aellen 1959a, Neuhauser 1969, Gaisler 1971, Owen & Qumsiyeh 1987, Corbet & Hill 1992, Koopman 1994, Srinivasulu & Srinivasulu 2012). The metric characters of the Afghanistani samples of *A. tridens* (Table 7) conform to those of bats from Syria, Iraq, Iran, and Pakistan (see Benda et al. 2006: 91; Benda et al. 2011b: 250; Benda et al. 2012: 253).

Traditionally, based on morphological traits, *A. t. murraiana* was separated from the nominotypical form (and some other subspecies recognised at that time, see Ellerman & Morrison-Scott 1951 and Simmons 2005) due to its large body size and reported to occur in the northern part of the Middle East from Syria to Pakistan and in various parts of North Africa, most frequently in Lower Egypt or the Maghreb (Harrison 1957, 1964, Aellen 1959a, Hatt 1959, Kock 1969, Siddiqi 1969, Owen & Qumsiyeh 1987, Harrison & Bates 1991, Corbet & Hill 1992, Koopman 1994, Bates & Harrison 1997, Horáček et al. 2000, Benda et al. 2006).

Taphozous nudiventris Cretzschmar, 1830

Records. **New data**: N a n g a r h a r: 5 km north of Jalalabad [1], 28 November 1965: 1 ind., ZFMK (leg. J. Niethammer; cf. Benda et al. 2006). – **Published data**: H e l m a n d: Lashkari Bazar [2], 880 m, 28 August 1965: 2 m (Meyer-Oehme 1968); Nahr-i-Seraj, 28 August 1965: 2 m, SMF (Kock 1981). – N a n g a r h a r: Chak-Naur [3], a cave on the left bank of the Kabul River, about 12 km W from the Pakistan boundary, 7 & 19 April 1967: coll. 5 m, 16 f, [IVB, NMP] (Gaisler et al. 1968, Hůrka & Povolný 1968, Baruš & Tenora 1970, Gaisler 1970a, Groschaft & Tenora 1971b, Benda et al. 2006; Figs. 3, 4); – "in einem Kalkfelsspalt 6 km nördlich Jalalabad" [1], 24 October 1965: 1 ind. (mummy) (Meyer-Oehme 1968).

Distribution. *Taphozous nudiventris* is a rather rare bat in Afghanistan, three localities are known from the country (Fig. 21). The records were made in two regions, in the Jalalabad valley of eastern Afghanistan (two records from north of Jalalabad most probably represent one site) and in an arid steppe/desert area of southern Afghanistan. The sites of *T. nudiventris* occurrence lie in rather low situated areas, in eastern Afghanistan (Nangarhar province) at ca. 450 m and 600 m a. s. l. (Figs. 3, 4), in the southern part of the country (central Helmand province) at ca. 785 m a. s. l.

Bates & Harrison (1997) and Srinivasulu & Srinivasulu (2012) reported the occurrence of *T. nudiventris* also in the Kandahar province and the latter authors also in the Kabul province. On the other hand, they did not mention Helmand among the inhabited provinces. These authors perhaps misplaced Lashkar-e Bazar to the Kandahar instead of Helmand province, where it is actually situated. However, we do not know any record of *T. nudiventris* from the Kabul province; most probably, this report is erroneous.

T. nudiventris is distributed broadly in the arid zone of the southern Palaearctic (with an extension to the northern Afro-tropics) and the western part of the Oriental region (Corbet 1978, Corbet & Hill 1992, Horáček et al. 2000). Its range in southern Asia covers most of the Middle East and the rather low situated parts of the Indian subcontinent from Afghanistan to Burma, with a particularly abundant occurrence in the arid regions of western India (Bates & Harrison 1997, Benda et al. 2006). In Afghanistan, *T. nudiventris* reaches the northernmost limit of its distribution in the Indian subcontinent (north of Jalalabad, ca. 34° 29' N), which is at a very similar latitude as Soltan Abad, the northernmost point of the whole species range in north-western Iran (37° 49' N; Benda et al. 2012).

The occurrence in the Jalalabad valley in Nangarhar constitutes a northern continuation of *T. nudiventris* distribution from the Indus lowland of Pakistan (Roberts 1977, Bates & Harrison 1997). Numerous records of this bat were made in southern Punjab and throughout Sindh, at least fifteen records are available from this broad area (Wroughton 1916, Siddiqi 1969, Sinha 1970, Roberts

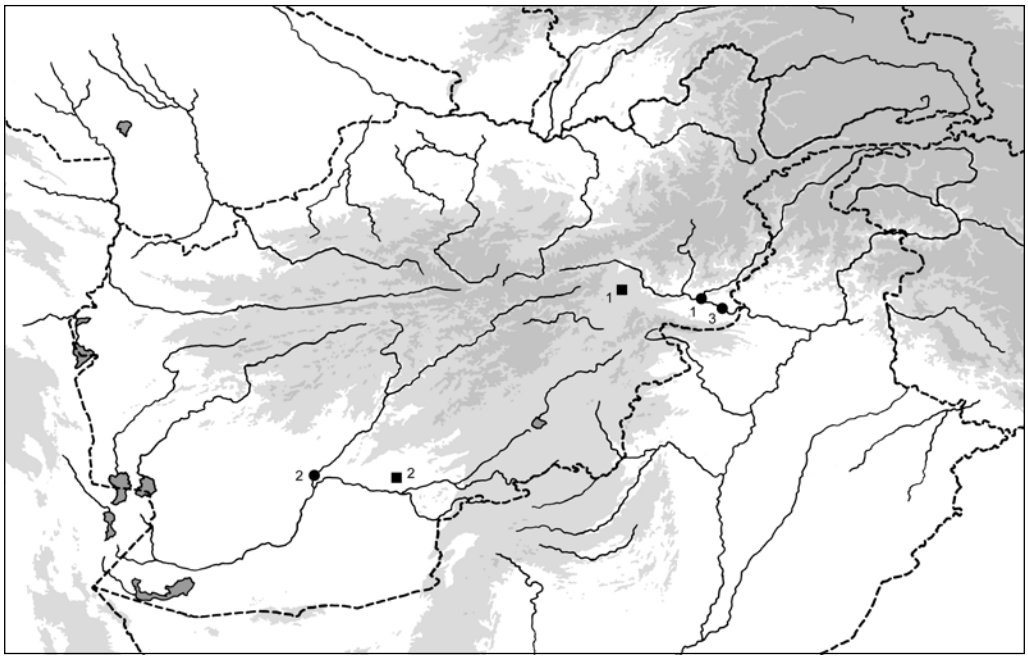

Fig. 21. Records of *Taphozous nudiventris* Cretzschmar, 1830 (circles) and *Myotis emarginatus* (Geoffroy, 1806) (squares) in Afghanistan.

1977, Javid 2011). Northern Punjab represents a separate area of occurrence, from where four record sites were reported (Jhelum, Ratowal/Tanaza dam, Rohtas, Salt Range; Lindsay 1927b, Roberts 1977, Mahmood-ul-Hassan et al. 2012). The locality of Ratowal is situated some 180 km south-east of Chak Naur, the closest site in the Jalalabad valley of Afghanistan.

The single locality of *T. nudiventris* situated at the northern margin of the Rigestan desert in central Helmand represents a somewhat isolated spot of the species occurrence in south-western Asia. The closest record (ca. 290 km westwards) is known from Zabol in the Iranian part of the Seistan basin (Ziaie 2008), located in very similar biogeographical conditions and at a similar longitude as the Helmand site. These two sites are similarly isolated from the continuous range of *T. nudiventris*, in the west from the Mesopotamian range in western Iran (more than 950 km) and in the east from the Indus lowland of Pakistan (more than 600 km). Since no records of *T. nudiventris* are known from Iranian or Pakistani Baluchistan, the Helmand record constitutes a part of the southern as well as northern margin of the species range in Asia.

Material examined. 1 ind. (ZFMK 96.545 [S+Sk]), 5 km N Jalalabad, 28 November 1965, leg. J. Niethammer; – 2 ♂♂ (SMF 38737, 38738 [A]), Nahr-i-Seraj, Helmand, Lashkari Bazar, 880 m, 28 August 1965, leg. D. Meyer-Oehme; – 2 ♂♂, 6 ♀♀ (IVB af588–595 [S+B]), Chak-Naur, caves above the Kabul river, 7 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 3 ♂♂, 10 ♀♀ (IVB af935–940, af943–947, NMP 95429 [S+B], NMP 95430 [S]), Chak-Naur, caves above the Kabul river, 19 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Taphozous nudiventris* are shown in Table 7. For the material examined see above.

T. nudiventris is considered a polytypic species, up to five subspecies are recognised within its current distribution range (Dobson 1875, 1876, 1878, Thomas 1915b, Tate 1941a, Ellerman & Morrison-Scott 1951, Harrison 1964, Kock 1969, Gaisler 1970a, Corbet 1978, Harrison & Bates 1991, Koopman 1994, Horáček et al. 2000, Simmons 2005, etc.), viz. *T. n. nudiventris* Cretzschmar, 1830 (northern part of Africa and western part of the Middle East), *T. n. zayidi* Harrison, 1955 (Oman and UAE), *T. n. magnus* (Mesopotamia from Turkey to Iran), *T. n. kachhensis* Dobson, 1872 (Indian subcontinent), and *T. n. nudaster* Thomas, 1915 (Burma); the delimitation of the subspecies ranges here follows Koopman (1994). Some authors considered the current content of the species to represent two species, *T. nudiventris* in Africa and *T. kachhensis* in Asia (Dobson in Stoliczka 1872, Thomas 1915b, Tate 1941a, Ellerman & Morrison-Scott 1951, Brosset 1962a, Hatt 1959, Siddiqi 1969, Hayman & Hill 1971, Khajuria 1979, Sinha 1976, 1980, 1986). Sinha (1970) considered both these "species" to occur in Asia, *T. nudiventris* in Pakistan and *T. kachhensis* in India; however, Sinha (1980) abandoned this view, mentioning *T. kachhensis* to be distributed in the most of the Asian range, from Iraq to Burma, as suggested already by Thomas (1915b).

Nevertheless, most of the recent authors follow the opinion by Felten (1962), who doubted the presence of the gular sac as a character useful for differentiation of two species, and consider *kachhensis* to be a synonym of *T. nudiventris* and a name of its Indian subspecies (Harrison 1964, Gaisler 1970a, Corbet 1978, Corbet & Hill 1980, Qumsiyeh 1985, Nader 1990, Harrison & Bates 1991, Corbet & Hill 1992, Koopman 1994, Bates & Harrison 1997, Roberts 1997, Horáček et al. 2000, Alfred et al. 2002, Simmons 2005, Srinivasulu & Srinivasulu 2012).

Taxonomic status of two subspecies (sensu e.g. Harrison & Bates 1991, Koopman 1994, and Simmons 2005), *T. n. zayidi* and *T. n. magnus*, was questioned by Benda et al. (2006). They considered the colouration traits of *T. n. zayidi*, described on the basis of the ashy grey colouration

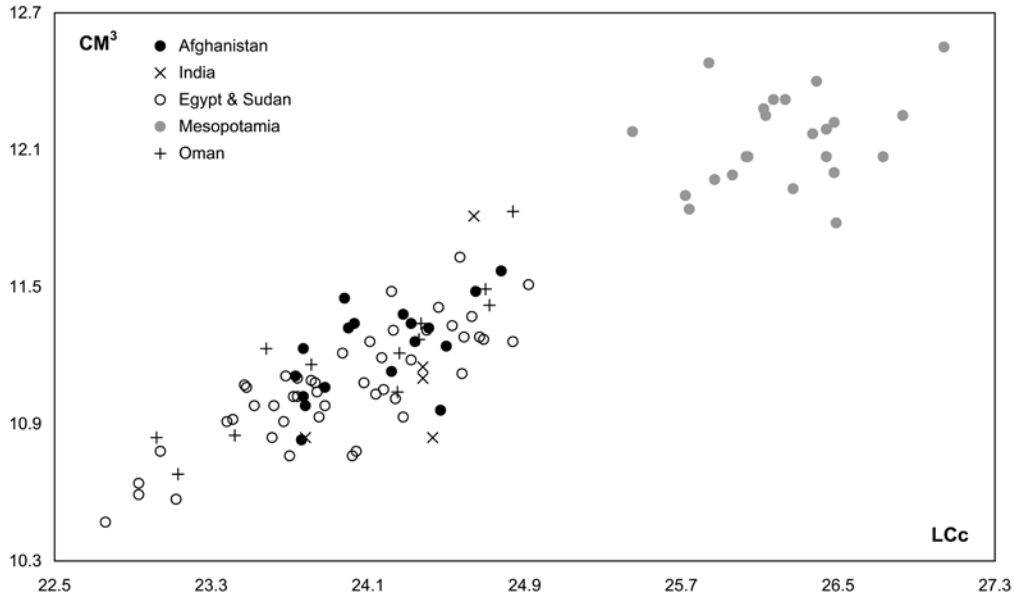

Fig. 22. Bivariate plot of the examined Afghanistani and comparative samples of *Taphozous nudiventris* Cretzschmar, 1830: condylocanine length of skull (LCc) against the length of upper tooth-row (CM^3).

Table 8. Comparison of biometric data on four sample sets of *Taphozous nudiventris* Cretzschmar, 1830 from southern Asia and north-eastern Africa. For abbreviations see p. 272

	India					Egypt & Sudan				
	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	3	**71.00**	68.0	73.0	2.646	41	**70.36**	65.0	76.9	2.724
LCr	3	**26.24**	25.54	26.74	0.623	33	**25.52**	23.38	27.88	1.196
LCc	5	**24.32**	23.78	24.64	0.321	48	**23.95**	22.76	24.92	0.523
LaZ	5	**16.04**	15.61	16.95	0.534	48	**15.34**	14.11	16.44	0.614
LaN	5	**11.94**	11.38	12.97	0.619	48	**11.53**	10.69	12.92	0.492
AN	5	**8.38**	7.88	8.78	0.367	47	**8.04**	7.17	9.02	0.522
CC	5	**5.87**	5.43	6.07	0.266	52	**5.67**	5.19	6.17	0.270
M^3M^3	5	**10.67**	10.38	11.13	0.283	50	**10.56**	9.94	11.22	0.287
CM^3	5	**11.15**	10.84	11.81	0.397	52	**11.06**	10.47	11.63	0.240
LMd	5	**20.14**	19.56	21.01	0.565	52	**19.70**	18.74	20.89	0.525
ACo	5	**7.32**	7.08	7.75	0.268	51	**7.37**	6.73	7.97	0.311
CM_3	5	**12.36**	11.92	12.92	0.390	52	**12.40**	11.84	12.98	0.250
M^3M^3/CM^3	5	**0.957**	0.935	0.981	0.019	50	**0.954**	0.909	1.020	0.023
CM^3/LCc	5	**0.458**	0.444	0.479	0.013	48	**0.462**	0.448	0.474	0.006
	Mesopotamia					Oman				
LAt	19	**79.66**	77.3	82.7	1.279	15	**74.81**	70.5	79.0	2.259
LCr	22	**29.04**	26.11	30.05	0.934	11	**26.41**	24.95	27.68	0.995
LCc	25	**26.23**	25.45	27.04	0.365	12	**24.04**	23.02	24.84	0.630
LaZ	25	**17.43**	16.99	18.10	0.321	12	**15.68**	15.02	16.43	0.450
LaN	27	**12.42**	11.73	13.13	0.391	12	**11.45**	10.84	12.27	0.502
AN	25	**9.39**	7.97	10.40	0.581	12	**8.30**	7.78	8.91	0.373
CC	25	**6.69**	5.97	6.97	0.206	12	**5.80**	5.46	6.24	0.241
M^3M^3	25	**11.57**	10.96	11.98	0.277	12	**10.67**	10.24	11.28	0.275
CM^3	26	**12.17**	11.78	12.71	0.223	12	**11.20**	10.68	11.83	0.317
LMd	27	**21.94**	21.38	22.73	0.368	12	**20.07**	19.15	21.03	0.677
ACo	24	**8.36**	7.95	8.74	0.211	12	**7.47**	7.09	8.04	0.251
CM_3	26	**13.65**	12.95	14.40	0.325	12	**12.51**	11.98	13.23	0.388
M^3M^3/CM^3	25	**0.952**	0.908	0.999	0.020	12	**0.953**	0.913	1.000	0.027
CM^3/LCc	23	**0.463**	0.445	0.483	0.009	12	**0.466**	0.455	0.476	0.006

of the bats from Oman/UAE by Harrison (1955), too weak for delimitation of a separate taxon, as the ashy colouration (that should be typical for *zayidi*) is common also among the individuals of the nominotypical form. On the other hand, Benda et al. (2006) suggested to considered *T. n. magnus* rather a full species, since the body and skull size of this Mesopotamian form is significantly above the metric traits of all other subspecies, which more or less conform in size to each other (Fig. 22).

The populations of *T. nudiventris* from eastern Afghanistan were assigned by Gaisler (1970a) to the Indian form, *T. n. kachhensis*, based on the metric comparison with the Iraqi, Pakistani and Indian samples of this species. This conclusion was accepted by DeBlase (1980), Koopman (1994), Bates & Harrison (1997), and Srinivasulu & Srinivasulu (2012), and is in line with the identification of the neighbouring populations in Pakistan and India, from where the subspecies *kachhensis* is consistently reported (being described from Kachh [= Cutch, Gujarat, India]; Stoliczka 1872: 221; Dobson 1875: 554), see Thomas (1915b), Ellerman & Morrison-Scott (1951), Siddiqi

(1969), Sinha (1976, 1980, 1986), Roberts (1977), Khajuria (1979), DeBlase (1980), Koopman (1994), Bates & Harrison (1997), Alfred et al. (2002), and Srinivasulu & Srinivasulu (2012). On the other hand, Gaisler (1970a) stressed the temporal unavailability of the south-Afghanistani samples (cf. Meyer-Oehme 1968) for the subspecies identification.

Despite the above Gaisler's (1970a) conclusion, Horáček et al. (2000: 104) mentioned the following doubts, concerning the taxonomic status of the Afghanistani populations of *T. nudiventris*: "It is not clear whether the Afghan specimens belong to *magnus* or the Oriental *T. n. kachhensis* […]." However, the comparison of skull dimensions of the examined east-Afghanistani samples (Fig. 22) shows the metric similarity of these bats with the specimens from Egypt, Sudan, Oman and India, while an absolute dissimilarity with the Mesopotamian samples, i.e. the populations of *T. n. magnus*. The skull size of the latter specimens exceeds on average the Afghanistani samples by more than 2 mm in the skull lengths (comp. Tables 7 and 8) and in the condylo-canine length of skull a gap of 0.5 mm exists between the range minimum of the large-sized Mesopotamian specimens and range maximum of all other samples belonging to the small-sized populations (Fig. 22). This result clearly indicates that *T. n. magnus* does not occur among the samples from eastern Afghanistan.

Two SMF specimens of *T. nudiventris* from Lashkar-e Bazar, southern Afghanistan, are available only as alcoholic specimens without extracted skulls (see Material examined). The forearm lengths of these male bats are 75.5 and 77.0 mm according to Meyer-Oehme (1968: 99) and 76.0 and 77.1 mm according to our examination. These values correspond to forearm lengths of male bats from eastern Afghanistan (range 75.5–77.5 mm; mean 76.3 mm; n=4), while lie below the range of *T. n. magnus* from Mesopotamia (males: range 79.5–82.7 mm; mean 80.8 mm; n=3; all specimens 77.3–82.7 mm; mean 79.7 mm; n=19). So, there is no reason to expect occurrence of different subspecies of *T. nudiventris* in southern Afghanistan than in eastern Afghanistan. Based on geographical and morphometric grounds, *T. n. kachhensis* is the only subspecies distributed in Afghanistan, in agreement with the conclusion by Gaisler (1970a).

Myotis blythii (Tomes, 1857)

Records. **New data**: P a k t i a: Kaougan [1], Gorat, 10 June 1962: 1 m, 10 f, MHNG (leg. K. Lindberg); – Peiwar Kotal [2], 17 June 1965: 1 m, ZFMK (coll. J. Niethammer). – V a r d a k: cave above the Maidar valley [3], 2700 m, 20 km east of the Unai Pass, 30 April 1965: 1 f, ZFMK (coll. J. Niethammer; cf. Benda et al. 2006, 2011a, 2012). – **Published data**: B a l k h: Aq Kupruk [4], [Darra Band-i-Haba, cave, 11 April 1965: 5 f,] SMF (Felten et al. 1977); – Darra Ajer [5], SW Mazar-i-Sharif, 11 April 1965 (Lewis 1973). – F a r y a b: Grotte Kham Zindan [6], Darreh-Chakh, Beltchiragh, 29 October 1957: 1 f, [MZLU] (Aellen 1959a, b, Cooreman 1960, Lindberg 1961, Vercammen-Grandjean 1963); – Grotte Zarmast [7], Maimaneh, 18 October 1957: 3 f, [MHNG] (Aellen 1959a); Grotte de Zarmast, 18 October 1957 & 5 July 1959 [3 f, 3 inds., MHNG] (Lindberg 1961); Zarmast Cave, 16 km SE of Maimana, 14 September 1965: net. 3 m, 2 f (Neuhauser 1969); Zarmast Cave, 16 km SE of Maimana, 13 September 1965 (DeBlase 1971b); Pashtunkot, [Zarmast cave, 27 August 1964: 11 m, 3 f,] SMF (Felten et al. 1977); Maimaneh, Grotte Zarmast, 5 July 1959: 2 inds., MHNG (Benda et al. 2006, 2011a, 2012). – G h a z n i: Ghazni [8], 1 m, BMNH (Gaisler 1971). – K a b o l: Kabul [9], [12 May 1962: 1 f,] SMF (Felten et al. 1977). – N u r i s t a n: unter einem Hausdach im Baschgar-Tal [= Bashgal valley] [10], Nuristan, 11 April 1953: 1 f, [SMF] (Zimmermann 1956). – P a r v a n: Grotte Nayak [11], W de Kaboul, 8 August 1957: 1 m, 1 f, [MZLU] (Aellen 1959a, b, Vercammen-Grandjean 1963); Samotch Nayak, vallée du Ghourband, 7 August 1957 & 12 May 1959 (Lindberg 1961); – Mine de plomb à Firindjal [12], W de Kaboul, 29 July 1957: 2 m, [MHNG, MZLU] (Aellen 1959a), 1 ind. (Vercammen-Grandjean 1963); Madan-Sorb à Firindjal, vallée du Ghourband, 29 July 1957 (Lindberg 1961); Firindjal, lead mine 2 km W of Ghorband, 3 October 1965: obs. ca. 50 inds., coll. & net. 2 m, 1 f (Neuhauser 1969); Firindjal, FMNH (Bates & Harrison 1997); Finidjal, W of Kabul, 29 July 1957: 1 m, MHNG (Benda et al. 2006, 2011a, 2012). – S a m a n g a n: Grotte Kaftar Khaneh [13], 17 May 1959 (Lindberg 1961). – Z a b o l: Qalat, Grotte Boulan [14], 9 April 1958: 1 ind., MHNG (Aellen 1959a, Benda et al. 2006, 2011a, 2012); Grotte de Boulan, à l'est de Qalat, 9 & 10 April 1958 (Lindberg 1961); Bolan Ghar, [cave, 11 June 1964: 1 m, 3 f, 12 June 1964: 2 m, 5 f, 13 June 1964: 1 m,] SMF (Felten et al. 1977). – Afghanistan (Ellerman & Morrison-Scott 1951 [as *M. myotis*]); Afghanistan, 9 inds., FMNH, 1 ind., BMNH (DeBlase 1980).

Distribution. *Myotis blythii* ranks among rather common bat species in Afghanistan, 14 record sites are available from the country (Fig. 23). The findings come from areas situated in various altitudes of the northern and eastern parts of Afghanistan (altitude range 470–2750 m a. s. l., mean altitude 1830 m); this altitude range (2280 m) is absolutely widest among the Afghanistani bats. However, while in northern Afghanistan, *M. blythii* was recorded in medium altitudes of the provinces of Faryab, Balkh and Samangan (mean 1083 m, range 470–1760 m), in the eastern part of the country it was documented in very elevated sites of the provinces of Nuristan, Kabul, Parvan, Vardak, Paktia, Ghazni, and Zabol (range 1750–2750 m; mean 2245 m). (Srinivasulu & Srinivasulu (2012) reported occurrence of *M. blythii* in Laghman; however, we did not find any record available from this province.) In eastern Afghanistan, *M. blythii* represents a similar montane faunal element as *Plecotus strelkovi* (see below), which shows an almost identical altitude range and only a slightly higher altitude mean (2358 m). Generally, the distribution pattern of *M. blythii* in Afghanistan resembles that in the neighbouring Iran, where more than two thirds of the records come from areas above 1500 m a. s l. (Benda et al. 2012).

M. blythii is distributed mainly in the southern Palaearctic (Corbet 1978, Horáček et al. 2000); in Asia it occurs in the Mediterranean zone of the Middle East, in Transcaucasia, West Turkestan, in the southern Himalayas, Altai Mts. and several parts of northern China (Bates & Harrison 1997, Horáček et al. 2000, Benda et al. 2006, 2011a, 2012). The Afghanistani occurrence of *M. blythii* constitutes a part of the southern margin of its whole distribution range, although the southernmost point of the species range lies in Iranian Baluchistan (Benda et al. 2012). However, the closest record available from southern Iran is known from Deh Bakri at the south-eastern edge of the

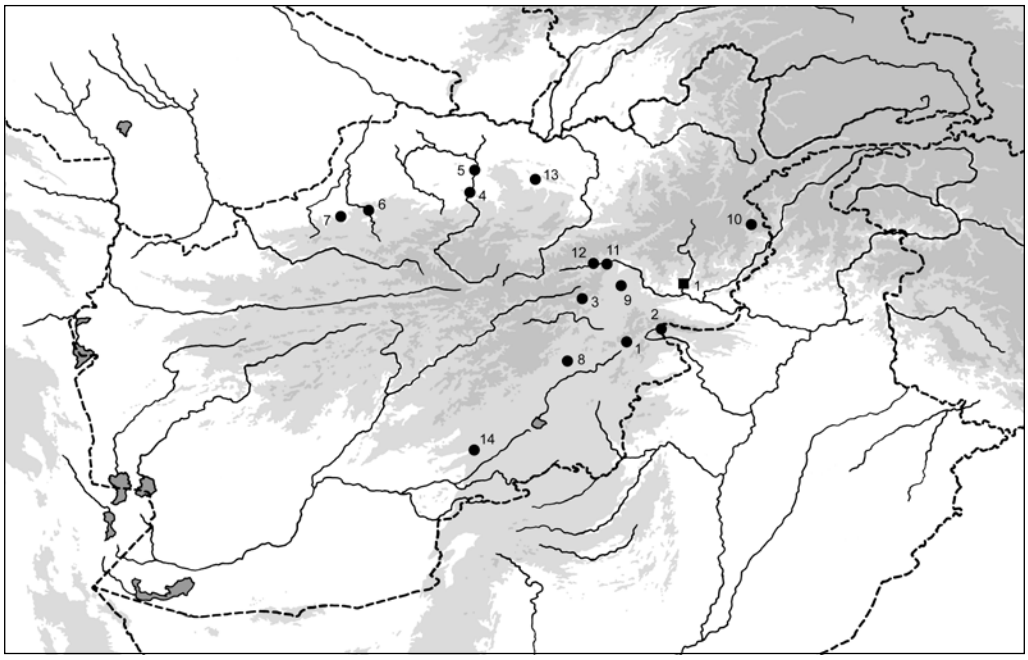

Fig. 23. Records of *Myotis blythii* (Tomes, 1857) (circles) and *M. formosus* (Hodgson, 1835) (square) in Afghanistan.

Zagros Mts. (Benda et al. 2012), some 300 km south-west of the Afghanistani border and 920 km from the Bulan cave (Zabol), the closest site of *M. blythii* in Afghanistan.

In the Indian subcontinent, the occurrence of *M. blythii* continues from eastern Afghanistan to the east along the southern slopes of the Hindu Kush and Himalayas to eastern Nepal, where it belongs to the rarest bats (Bates & Harrison 1997). Only one site of *M. blythii* is known from Pakistan (Karakar Pass in Khyber Pakhtunkhwa; Bates & Harrison 1997) and four sites are available from south-western Kashmir (6 miles from Achabal, Baramula, Kashmir Valley, Shar; True 1894, Chakraborty 1983, Bates & Harrison 1997, Ghosh 2008), four records were reported from Himachal Pradesh (Chamba, Dalhousie, Karool hill, Shimla; Saikia et al. 2011), and two from Uttarakhand (Balna, Masuri; Bates & Harrison 1997). The nine records of *M. blythii* known from eastern Afghanistan thus represent the most abundant occurrence of this bat in the countries of the Indian subcontinent.

North and north-west of Afghanistan, the occurrence of *M. blythii* continues in West Turkestan and northern Iran (Bogdanov 1953, Strelkov et al. 1978, Rybin et al. 1989, Habilov 1992, Benda et al. 2012) and in both these territories this spacies ranks among common bats. From West Turkestan, several records of this bat are available even from the areas adjacent to the Afghanistani border (Tagtabazar, Gurşunmagdan Käni [Svincovyj Rudnik], Termiz, surroundings of Šôrči, Ok-Bulak in the Aktau Mts., Kulob, Dahana, Âhči-Sar in the Darvaz range; Bogdanov 1953, Ŝerbin 1968, Strelkov et al. 1978, Habilov 1992, Kaškarov & Mitropol'skaâ 2004). Sixteen records of *M. blythii* are available from north-eastern Iran, most of them from the Kopetdagh Mts. (Benda et al. 2012); the closest record to the Afghanistani border is known from the Mozduran cave, some 90 km away (DeBlase 1980, Steiner & Gaisler 1994). The frequent records in the areas neighbouring Afghanistan in the north suggest that the occurrence of *M. blythii* in the northern part of the country documented by only five findings is certainly undersampled and this bat is perhaps more common in the sub-montane landscape of the belt between the provinces of Herat and Badakhshan (inclusive).

Material examined. 5 ♀♀ (SMF 38894–38898 [S]), Aq Kupruk, Balkh, Höhle im Darra Band-i-Haba, 725 m, 11 April 1965, leg. D. Meyer-Oehme; – 1 ♀ (SMF 49233 [S+B]), Baschgul-Tal, Nuristan, 1100 m, 11 April 1953, leg. J. Klapperich; – 1 ♂, 3 ♀♀ (SMF 38881–38883, 38899 [S]), Bolan Ghar, Zabul, Höhle, 1850 m, 11 June 1964, leg. D. Meyer-Oehme; – 2 ♂♂, 5 ♀♀ (SMF 38884–38888, 38900, 38901 [S]), Bolan Ghar, Zabul, Höhle, 1850 m, 12 June 1964, leg. D. Meyer-Oehme; – 1 ♂ (SMF 38904 [S]), Bolan Ghar, Zabul, Höhle, 1850 m, 13 June 1964, leg. D. Meyer-Oehme; – 1 ind. (MHNG 953.002 [S]), Grotte Boulan, Qalat, 9 April 1958, leg. K. Lindberg; – 1 ♀ (MZLU L57/3114, L57/3180 [S+A]), Grotte Kham Zindan, 29 October 1957, leg. K. Lindberg; – 1 ♂, 1 ♀ (MZLU L57/3115, L57/3179 [S+A], L57/3179 [A]), Grotte Nayak, 8 August 1957, leg. K. Lindberg; – 3 ♀♀ (MHNG 952.099 [S+Mu], 952.100, 953.001 [Mu]), Grotte Zarmast, Maïmaneh, 18 October 1957, leg. K. Lindberg; – 3 inds. (MHNG 974.007, 974.008 [S+Mu], 974.009 [Mu]), Grotte Zarmast, Maïmaneh, 5 July 1959, leg. K. Lindberg; – 1 ♀ (ZFMK 97.138 [S+B]), Höhle oberhalb Maidar-Tal, 2700 m, 20 km E Unai-Pass, 30 April 1965, coll. J. Niethammer; – 1 ♀ (SMF 38880 [S]), Kabul, 1800 m, 12 May 1962, leg. D. Meyer-Oehme; – 1 ♂, 10 ♀♀ (MHNG 1704.072, 1704.073 [S+A], 1704.074–1704.081, unnumbered [A]), Kaougan, Gorat, 10 June 1962, leg. K. Lindberg; – 2 ♂♂ (MHNG 952.098 [S+A], MZLU L57/3158 [A]), Mine de Plomb, Firindjal, W de Kaboul, 29 July 1957, leg. K. Lindberg; – 11 ♂♂, 3 ♀♀ (SMF 38891–38893, 38905–38915 [S]), Pashtunkot, Fariab, Grotte Zarmast, 1295 m, 27 August 1964, leg. D. Meyer-Oehme; – 1 ♂ (ZFMK 78.122 [B]), Peiwar Kotal, 17 June 1965, coll. J. Niethammer.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Myotis blythii* are shown in Table 9. For the material examined see above.

M. blythii is regarded a polytypic species, four subspecies are most frequently recognised throughout its distribution range, defined mostly by the body and skull size and skull shape (see the reviews by Benda et al. 2006, 2011a); viz. *M. b. blythii* (north-western part of the Indian subcontinent and most of West Turkestan), *M. b. oxygnathus* (Monticelli, 1885) (southern and central Europe, Crimea, western Anatolia), *M. b omari* Thomas, 1906 (Levant, Caucasus region, Iran),

Table 9. Basic biometric data on the examined Afghanistani samples of *Myotis blythii* (Tomes, 1857), *M. emarginatus* (Geoffroy, 1806), and *M. formosus* (Hodgson, 1835). For abbreviations see p. 272

	Myotis blythii					*Myotis emarginatus*		*Myotis formosus*		
	n	**M**	min	max	SD	SMF 38916	SMF 38917	SMF 38751	SMF 38752	SMF 38753
LAt	16	**57.97**	55.1	61.5	1.879	44.1	43.2	48.6	45.0	47.5
LCr	40	**21.32**	20.62	21.98	0.297	–	16.42	18.09	16.52	–
LCb	41	**20.23**	19.74	21.11	0.312	–	15.48	17.03	15.54	–
LaZ	36	**13.72**	13.11	14.25	0.291	–	10.17	11.68	10.80	–
LaI	41	**5.02**	4.65	5.38	0.161	3.78	3.80	4.44	4.07	–
LaInf	41	**5.71**	5.37	6.21	0.205	3.87	4.22	4.87	4.82	–
LaN	41	**9.53**	5.42	10.14	0.683	7.72	7.46	8.47	7.85	–
LaM	41	**9.97**	7.28	10.41	0.467	8.42	7.98	9.27	8.48	–
ANc	41	**7.48**	7.02	7.88	0.205	–	5.83	6.64	5.93	–
LBT	38	**3.65**	3.37	3.88	0.129	3.17	3.04	3.26	3.02	–
CC	40	**5.67**	5.01	6.03	0.202	4.08	4.25	5.92	5.75	–
M^3M^3	41	**8.93**	8.52	9.45	0.233	6.02	6.63	7.42	7.08	–
CM^3	41	**8.77**	8.29	9.34	0.224	6.62	6.75	7.06	6.51	–
LMd	41	**16.18**	15.64	16.86	0.257	12.17	12.28	13.52	12.68	–
ACo	41	**5.23**	4.55	6.44	0.291	3.57	3.63	4.39	4.12	–
CM_3	41	**9.43**	8.93	9.98	0.222	7.07	7.32	7.56	6.88	–

and *M. b. ancilla* Thomas, 1910 (southern Siberia, northern China). Since the distribution of *M. blythii* covers a continuous belt along the southern margin of the arboreal zone of the Palaearctic, some size-transient populations were documented, e.g. in Crete and the Aegean islands, between the small-sized European *M. b. oxygnathus* and large-sized Levantine *M. b omari* (see Benda et al. 2009b), and in southern Turkmenistan, between the large-sized Iranian *M. b omari* and small-sized West Turkestani *M. b. blythii* (Benda et al. 2011a, 2012).

By most authors (Topál 1971, Strelkov 1972, Felten et al. 1977, Strelkov et al. 1978, Koopman 1994, Bates & Harrison 1997, Evin et al. 2008, Benda et al. 2006, 2011a, Srinivasulu & Srinivasulu 2012), the Afghanistani populations of *M. blythii* were assigned to the small-sized nominotypical form, described from northern India (Nassenabad [?], India; Tomes 1857: 54). (The type locality was mentioned as Nusserabad by Thomas (1915a) and finally as Nasirabad, Rajputana [= Rajasthan] by Ellerman & Morrison-Scott (1951) and this was accepted by various other authors, although it certainly is an error – *M. blythii* does not occur in Rajasthan, see e.g. Bates & Harrison (1997).) The only different opinion was presented by Aellen (1959a: 380), as follows: "Il est possible que les deux formes *b. blythi* et *b. oxygnathus* (si vraiment elles sont différentes) se rencontrent en Afghanistan; la première serait celle trouvée par J. Klapperich dans la zone orientale du pays et déterminée par Zimmermann [1956] comme *M. blythi*, la seconde [*M. b. oxygnathus*] habiterait le reste du pays, ou K. Lindberg l'a découverte aussi bien dans le N, le centre et le S." However, it should be noted that no general view of taxonomy of the large-sized *Myotis* was available at that time and the first taxonomic revisions concerning the whole range of *M. blythii* were published by Topál (1971) and Strelkov (1972).

The Afghanistani specimens of *M. blythii* agree in their body and skull size to the neighbouring Indian, Kashmiri and West Turkestani samples (Fig. 24, Table 10), according to metric characters, all these population could be regarded *M. b. blythii* (holotype specimen of *Vespertilio Blythii* Tomes, 1857 is included into comparison, Fig. 24). Although slightly overlapping in dimension ranges, the prevailing majority of the samples from Iran are larger in skull size than the samples

Table 10. Comparison of biometric data on three sample sets of *Myotis blythii* (Tomes, 1857) from central and southern Asia. For abbreviations see p. 272

	India & Kashmir					E West Turkestan					Iran				
	n	**M**	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	1	56.1				141	**57.01**	53.2	61.0	1.761	65	**60.26**	56.1	66.7	1.897
LCr	4	**20.76**	20.25	21.07	0.363	138	**21.08**	20.20	22.47	0.384	81	**22.23**	20.97	23.20	0.415
LCc	4	**19.64**	18.98	20.02	0.455	136	**20.05**	19.28	21.32	0.378	81	**21.24**	19.98	22.20	0.427
LaZ	2	**13.40**	13.28	13.51	0.163	123	**13.61**	12.82	19.89	0.655	73	**14.24**	13.22	14.85	0.352
LaI	5	**4.98**	4.82	5.18	0.141	140	**5.00**	4.55	5.42	0.175	83	**5.18**	4.82	5.49	0.154
LaInf	5	**5.68**	5.49	6.04	0.228	140	**5.65**	5.03	6.07	0.207	83	**5.78**	5.40	6.19	0.188
LaN	3	**9.35**	9.07	9.52	0.247	140	**9.56**	9.02	10.07	0.190	84	**9.81**	9.29	10.32	0.208
LaM	3	**10.14**	9.75	10.92	0.676	140	**9.91**	9.35	10.47	0.220	80	**10.31**	9.78	10.72	0.194
ANc	4	**7.32**	7.18	7.45	0.150	135	**7.41**	6.94	7.96	0.203	82	**7.71**	7.24	8.22	0.216
CC	5	**5.68**	5.42	6.02	0.229	140	**5.63**	4.83	6.13	0.218	82	**5.94**	5.43	6.43	0.201
M^3M^3	5	**8.81**	8.73	8.95	0.090	140	**8.84**	8.08	9.98	0.298	83	**9.20**	8.43	9.88	0.284
CM^3	5	**8.60**	8.48	8.77	0.117	140	**8.71**	8.27	9.27	0.196	84	**9.30**	8.93	9.75	0.187
LMd	5	**15.67**	15.42	15.96	0.203	140	**16.01**	15.08	16.97	0.350	84	**17.05**	15.97	17.87	0.322
ACo	5	**4.99**	4.74	5.12	0.152	140	**5.09**	4.67	5.62	0.171	85	**5.50**	5.08	5.89	0.215
CM_3	5	**9.07**	8.22	9.38	0.489	140	**9.44**	8.86	10.92	0.234	82	**10.03**	9.63	10.59	0.209

from Afghanistan, thus, the Iranian *M. b. omari* does not occur in Afghanistan (Fig. 24). This conforms to the conclusions by Felten et al. (1977) and Evin et al. (2008) who also examined and compared the Afghanistani specimens, although in a lesser number.

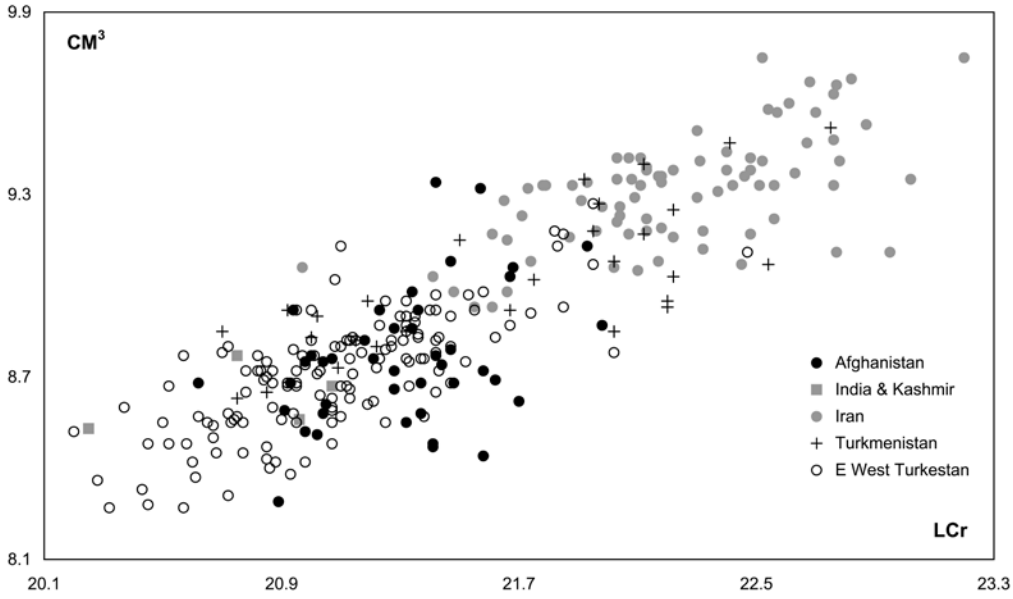

Fig. 24. Bivariate plot of the examined Afghanistani and comparative samples of *Myotis blythii* (Tomes, 1857): greatest length of skull (LCr) against the length of upper tooth-row (CM^3).

Recently, Furman et al. (2014) have carried out a comprehensive molecular genetic study of *M. blythii*, using samples from a large part of its distribution range, but did not include the populations of the Indian subcontinent and West Turkestan. The results of their study did not support fully the traditional division of the species into subspecies in the western part of the range (Europe, Middle East). Although the classical view of the Afghanistani populations of this bat has not been affected by Furman et al. (2014), their results may suggest that the traditional divisions in the Asian populations of *M. blythii* could be modified, when a proper genetic comparison of all respective populations is available. Due to the close position of the type locality of *M. blythii* to the Afghanistani populations, their subspecies affiliation could not be changed, with most probability.

Myotis emarginatus (Geoffroy, 1806)

Records. **Published data**: K a b o l: Kabul [1], 2 f (Meyer-Oehme 1965); Kabul, 18 July 1962: 1 f, 8 May 1963: 1 f, SMF (Benda et al. 2006). – K a n d a h a r: Kandahar [2], 1 ind., IMC (Anderson 1881 [as *Vespertilio desertorum*]).

Distribution. *Myotis emarginatus* is a rare bat in Afghanistan, two record sites were reported from the country (Fig. 21). Meyer-Oehme (1965) published a collection of two females in Kabul (at ca. 1800 a. s. l.) and data on the respective SMF specimens were noted by Benda et al. (2006). A specimen from Kandahar housed in IMC was reported by Anderson (1881: 141) under a junior synonym *Vespertilio desertorum* Dobson, 1875; it was mentioned in a slightly confusing way as follows "*f*. A skull marked *V. lepidus*, Blyth. Kandahar. No history". Nevertheless, this specimen was introduced as a sixth item (*f*) after five specimens (*a–e*) from Jalk, Baluchistan, i.e. the type series of *V. desertorum*. Confusion with a different species (e.g. *Vespertilio lepidus* = *Pipistrellus kuhlii*) is thus in the case of this item (*f*) rather less probable. However, with the exception of two authors, nobody accepted the record of *M. emarginatus* from Kandahar. Blanford (1891: 207) wrote, perhaps with a reference to the Kandahar record, as follows: "A bat which will probably be found hereafter in Baluchistan and Southern Afghanistan is *V. desertorum*" and Kuzâkin (1950: 267) marked a dot in the map of *M. emarginatus* distribution in the approximate place of Kandahar. However, the latter author also marked a record somewhere near Herat, although he mentioned Iran and Baluchistan as the eastern border of the distribution of the species and did not mention Afghanistan (p. 270). Niethammer (1983) reported *M. emarginatus* only from Kabul.

Additionally, Srinivasulu & Srinivasulu (2012) mentioned the Afghanistani occurrence of *M. emarginatus* only in the Badakhshan province, from where no record of this or other bat species is available (Table 25). Corbet & Hill (1992) and Bates & Harrison (1997) did not consider this species to occur in the Indian subcontinent either.

Anyway, despite the real number of records in Afghanistan, the occurrence of *M. emarginatus* in the country constitutes the south-eastern margin of its distribution range. *M. emarginatus* is a bat distributed mainly in the Mediterranean zone of the south-western Palaearctic, with some extensions to Central Europe, Transcaucasia, West Turkestan, and the Middle East including southern Arabia (Horáček et al. 2000, Benda et al. 2006); the species reaches the eastern margin of its range in southern Kirghizstan (Rybin et al. 1989). In the areas neighbouring Afghanistan in the west and north, it is not regarded as a rare species (see Strelkov et al. 1978, Habilov 1992, Benda et al. 2012) and the absence of its records in the western and northern areas of the country is rather surprising.

Benda et al. (2012) summarised twenty localities of *M. emarginatus* from Iran in total; two sites are known from eastern Baluchistan, very close to the Pakistani border and relatively close to the Afghanistani border (Jalk, 197 km; Shastun, 227 km; Blanford 1875, Thomas 1920). These records represent a part of the south-eastern delimitation of the species range in Asia and

indicate the occurrence of *M. emarginatus* in the Kandahar area to be well possible from the biogeographical point of view. The arid habitats of southern and south-eastern Iran continue to western Pakistan and southern Afghanistan and host a similar species range in the whole area (cf. *Rhinopoma microphyllum*, *R. muscatellum*, *Rhinolophus blasii*, *Hipposideros fulvus*, *Asellia tridens*, *Pipistrellus kuhlii*, etc.).

M. emarginatus occurs continuously in north-eastern Iran and southern West Turkestan, in several areas its records were made close to the border of Afghanistan. Strelkov et al. (1978) summarised three regions of the species occurrence in Turkmenistan, viz. northern slopes of the Kopetdagh Mts., western slopes of the Köytendagh Mts., and the Morghab river basin. In the latter area, two records of *M. emarginatus* come from sites situated very close to the north-western border of Afghanistan, Mörgunov [Morgunovskij] and Tagtabazar [Tahta-Bazar], 6 km and 20 km from the border, respectively (Geptner 1956, Strelkov et al. 1978). In the Köytendagh Mts., records are available from the distances of 26 km and 60 km from the border, respectively (Garlyk [Karlûk], Gurşunmagdan Käni [Svincovyj Rudnik]; Strelkov et al. 1978). In the north-eastern corner of Iran, a record made closest to the Afghanistani border (98 km) comes from Bazangan (Benda et al. 2012). Also the sites reported by Bogdanov (1953) from south-eastern Uzbekistan (Surhondarë river valley at Šôrči, 82 km) and by Bobrinskoj (1918) and Ŝerbin (1968) from western Tajikistan (Gandžina, 76 km; Dagana, 91 km; Kafirnigan river valley at Činor; 119 km) are found in similar distances. All these records indicate a rather frequent occurrence of *M. emarginatus* in most of the northern provinces of Afghanistan, i.e. Herat, Badghiz, Jowzjan, Balkh, Kondoz, and Takhar.

Material examined. 1 ♀ (SMF 38916 [S+A]), Kabul, 1800 m, 18 July 1962, leg. D. Meyer-Oehme; – 1 ♀ (SMF 38917 [S+A]), Kabul, 1800 m, 8 May 1963, leg. D. Meyer-Oehme.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Myotis emarginatus* are shown in Table 9. For the material examined see above.

The respective specimens of *M. emarginatus* from Afghanistan were examined by Benda et al. (2006), who included them into their broad scale analysis of the whole species taxonomy. According to this revision, *M. emarginatus* comprises two subspecies, the rather small-sized nominotypical form (LCr 14.58–16.60 mm; n=263), distributed in the western part of the species range (Maghreb, Europe, Levant), and the rather large-sized *M. e. desertorum* (Dobson, 1875) (LCr 15.33–16.79 mm; n=65), occurring in the eastern part of the range, from Crimea, Transcaucasia and Oman to Kirghizstan, Tajikistan and Afghanistan (see Benda et al. 2006: 128, Fig. 78). The representatives of the Afghanistani populations were thus assigned, based on their body size and geographical origin, to the latter subspecies and this is in agreement with the opinions of other authors (Meyer-Oehme 1965, Gaisler 1971, Koopman 1994, Srinivasulu & Srinivasulu 2012).

Most previous authors evaluated pelage colouration as the main character of the geographical variability in *M. emarginatus* (see Bobrinskoj 1925, Ognev 1927, 1928, Kuzâkin 1934, 1935, Strelkov 1963, Kuzâkin 1965, DeBlase 1980, Butovskij et al. 1985). Based on such evidence, up to four subspecies were recognised in the Asian part of the species range, viz. *M. e. desertorum*, *M. e. turcomanicus* Bobrinskoj, 1925, and *M. e. kuzyakini* Rossolimo et Pavlinov, 1979 [= *M. e. saturatus* Kuzâkin, 1934 nec *M. yumanensis saturatus* Miller, 1897] – besides the nominotypical form in the Levant (Ellerman & Morrison-Scott 1951, Kuzâkin 1965, Corbet 1978, DeBlase 1980, Strelkov 1981, Koopman 1994, Horáček et al. 2000, Simmons 2005). However, the pelage colouration is extremely variable throughout the Asian range of the species and creates a geographical mosaic (including transition forms in colouration) in accordance to the local environmental conditions – in more arid environments significantly paler individuals are found, similarly as in other species. Thus, the colouration tinge was found an unuseful character for evaluation of the phylogenetic relations in this species (see Strelkov et al. 1978, Benda et al. 2006, 2012).

Interestingly, type localities of three names that are regarded to come in account with *M. emarginatus* are situated close to the territory of Afghanistan (183–227 km from the border), viz. *Vespertilio desertorum* Dobson, 1875 (t.l. Jalk, Baluchistan [Iran]; Blanford 1875: 309), *Myotis lanaceus* Thomas, 1920 (t.l. Shastun, Dizak district, Persian Baluchistan [Iran]; Thomas 1920: 934), and *M. e. turcomanicus* Bobrinskoj, 1925 (t.l. Morghab river valley, Türkmengala, [Turkmenistan]; Bobrinskoj 1925: 359). These names are currently considered synonyms of the former one, i.e. the respective populations represent a part of the eastern subspecies, *M. e. desertorum.*

Myotis formosus (Hodgson, 1835)

Records. **Published data**: L a g h m a n: Kalat-us-Seraj [= Mihtar Lam, Qalat us Sirai] [1], 24 June 1965: 1 ma, 2 August 1965: 1 ma, 7 October 1965: 1 f (Meyer-Oehme 1965, 1968, cf. Uchikawa et al. 1994, Csorba et al. 2014).

Distribution. *Myotis formosus* is a very rare bat in Afghanistan, three subsequent records were made at a single site situated at ca. 900 m a. s. l. in the eastern part of the country, in the northern part of the broader Jalalabad valley (Laghman province; Fig. 23). The locality represents the westernmost extension of the species distribution range, which stretches mostly across the northern margin of the Oriental region along the slopes of the Hindu Kush and Himalayas and adjacent mountains, from Afghanistan and Kashmir to Nepal, Tibet, and eastern India, few isolated records are known also from central India (Bates & Harrison 1997); one record is known from northern Vietnam and eastern China each, numerous records are available from Taiwan (Csorba et al. 2014, Ruedi et al. 2015).

Most recently, Mahmood-ul-Hassan & Salim (2015) have reported three records of *M. formosus* from the northern part of Khyber Pakhtunkhwa, Pakistan (Chinai Ghaz, Wach Khwar, Barcharai Diram), situated between 40 and 75 km from the Afghanistani border. These new findings interconnect the occurrence spot in Afghanistan with those in Himachal Pradesh (Dharamsala, Drang; Thomas 1915a, Ghosh 2008) and Indian Punjab (Hoshiarpur; Sinha 1986) and constitute the northernmost spot of the *M. formosus* distribution range (Chinai Ghaz being the most extreme at 35° 01' N; Mahmood-ul-Hassan & Salim 2015).

Material examined. 1 ♂ (SMF 38751 [S+A]), Kalat-us-Seraj, Laghman, 900 m, 24 June 1965, leg. D. Meyer-Oehme; – 1 ♂ (SMF 38752 [S+A]), Kalat-us-Seraj, Laghman, 900 m, 2 August 1965, leg. D. Meyer-Oehme; – 1 ♀ (SMF 38753 [A]), Kalat-us-Seraj, Laghman, 900 m, 7 October 1965, leg. D. Meyer-Oehme.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Myotis formosus* are shown in Table 9. For the material examined see above.

M. formosus was for a long time considered a widespread and very diversified species (Ellerman & Morrison-Scott 1951, Findley 1972, Corbet & Hill 1980, 1992, Koopman 1994, Simmons 2005, Sedláček et al. 2006), distributed across the whole Oriental region, from the north-western edge of the Indian subcontinent to Java, Celebes, Philippines and Korea. Within this extensive range, up to eight subspecies were recognised (cf. Ellerman & Morrison-Scott 1951, Koopman 1994, Simmons 2005), viz. *M. f. formosus* (Hodgson, 1935) in Afghanistan, northern India and Nepal; *M. f. rufoniger* (Tomes, 1858) in southern China; *M. f. tsuensis* Kuroda, 1922 in Korea and Tsushima islands; *M. f. watasei* Kishida, 1924 in Taiwan; *M. f. hermani* Thomas, 1923 in Sumatra; *M. f. bartelsi* (Jentink, 1910) in Java and Bali; *M. f. rufopictus* (Waterhouse, 1845) in the Philippines; and *M. f. weberi* (Jentink, 1890) in Celebes; the delimitation of the subspecies ranges here follows Koopman (1994).

The comprehensive review by Csorba et al. (2014) revised the taxonomic arrangement of the species and demonstrated it to represent a complex of six species; while four of them (*M. bartelsi*,

M. hermani, *M. rufopictus*, *M. weberi*) were shown to be endemics in limited and mostly island ranges (Great Sunda islands, Philippines, Malaya), two others, *M. formosus* and *M. rufoniger*, are spread over large parts of the Oriental region. To *M. formosus*, Csorba et al. (2014) referred all populations of the complex from the Indian subcontinent (including Tibet), with additional records from northern Vietnam, south-eastern China and Taiwan. In the eastern part of the Oriental region, it lives in sympatry with *M. rufoniger*, distributed from Laos and central Vietnam to North Korea.

M. formosus is characterised by these authors as a small- to medium-sized form of the complex, with skull distinctly elevated in the frontal region, and relatively well reduced premolars. The Afghanistani specimens agree with this description, being rather small-sized and the adult male SMF 38752 represents one of the smallest specimens of the species. Since *M. formosus* was described from the Central hilly region of Nepal (Hodgson 1835: 700; Gray & Gray 1847: 4), the Afghanistani populations are consistently suggested to belong to the nominotypical subspecies (Meyer-Oehme 1965, Gaisler 1971, Corbet 1978, Koopman 1994, Srinivasulu & Srinivasulu 2012). Csorba et al. (2014) reported only one subspecies within *M. formosus* besides the nominotypical one, the large-sized *M. f. flavus* Shamel, 1944 occurring in Taiwan. Some authors recognised another subspecies from the Indian subcontinent, named either *M. f. auratus* (Dobson, 1871) or *M. f. andersoni* (Trouessart, 1897), based on the larger body size (Ellerman & Morrison-Scott 1951, Sinha 1986, Bates & Harrison 1997, Alfred et al. 2002). Anyway, this subspecies is reported to be large-sized and geographically centered to north-eastern India (Bihar, West Bengal), neither of these characters is the case of the samples from Afghanistan.

Nomenclatorial note. Csorba et al. (2014: 669) reported the name combination *Myotis formosus* to have been used first by Tate (1941b: 541). However, this name combination was mentioned already by Bianki (1917: lxxviii) in his description of the subgenus name *Dichromyotis* (= *Chrysopteron* Jentink, 1910), for which *M. formosus* (Hodgson, 1835) is a type species. Csorba et al. (2014) also overlooked the combinations *Kerivoula formosa* used by Gray (1843: 27) and Gray & Gray (1847: 4) and *Murina formosa* used by Jerdon (1867: 42; 1874: 42); see e.g. Dobson (1878).

Myotis davidii (Peters, 1869)

Records. **New data**: K a b o l: Kabul [1], 11 September 1965: 2 f, SMF (leg. D. Meyer-Oehme). – **Published data**: B a l k h: 3 km west of Mazar-i-Sharif [2], government agricultural station, 2 September 1965: net. 1 f, FMNH (Neuhauser 1969, Bates & Harrison 1997 [as *M. mystacinus*]). – F a r y a b: Maimana [3], 870 m, 29 August 1964: 1 f, SMF (Meyer-Oehme 1965, Niethammer 1983, Kock 1996 [as *M. mystacinus*]). – K a b o l: Kabul [1], FMNH (Bates & Harrison 1997 [as *M. mystacinus*]); – Paghman [4], 19 April 1962: 1 m, ZFMK (Niethammer 1983 [as *M. mystacinus*], Benda 2010 [as *M. nipalensis*]). – K o n d o z: Kunduz [5], FMNH (Bates & Harrison 1997 [as *M. mystacinus*]). – Afghanistan (Kuzâkin 1944, 1950, 1965 [as *M. mystacinus*]); Afghanistan, 3 inds., FMNH (DeBlase 1980 [as *M. mystacinus*]).

Distribution. Bats of the *Myotis mystacinus* morpho-group (sensu Benda & Karataş 2005) belong to rather infrequent faunal elements in Afghanistan, five sites are known from the northern part of the country (Fig. 25). The records were made at a wide range of altitudes, in sites situated between 405–2300 m a. s l. (mean altitude 1165 m). Despite the low number of records, the group shows a very wide range of altitudinal distribution (1895 m), the third widest after two very widespread species, *Myotis blythii* and *Pipistrellus pipistrellus* (more than 2000 m in both species). However, in the provinces of Balkh, Faryab and Kondoz in the northernmost areas of the country, the records of the *Myotis mystacinus* morpho-group were reported from low steppe territories below 900 m a. s. l., while in the Kabul province in eastern Afghanistan the records come from localities situated at and above 1800 m a. s. l.

The Afghanistani records represent a part of the southern margin of distribution of *M. mystacinus* morpho-group in Asia. In the countries neighbouring Afghanistan from the west and east, these bats

occur only in their northernmost areas (Bates & Harrison 1997, Benda et al. 2012). This pattern suggests that this bat group is most probably absent from the southern areas of Afghanistan.

West of Afghanistan, the occurrence of the *M. mystacinus* morpho-group continues to northern Iran; Benda et al. (2012) reported 20 sites of these bats from a belt stretching across the northern mountainous areas of the country. A finding made closest to the western border of Afghanistan was reported from north-eastern Khorasan (71 km SE of Mashhad; DeBlase 1980), some 80 km away.

The distribution of this bat group continues from the Kabul region of Afghanistan to the east along the southern slopes of the Hindu Kush and Himalayas to northern Pakistan, Kashmir and north-western India (Corbet & Hill 1992, Bates & Harrison 1997); in all these countries, these bats seem to be relatively widespread. Four record sites are available from Khyber Pakhtunkhwa (Dir, Dunga Gali, Kaghan Valley, Shorgan; Roberts 1977) – Dir being situated only 17 km east of the Afghanistani border – and one site from the northernmost part of Punjab (Murree Hills; Roberts 1977). Another four localities were reported from Kashmir: junction of Nubra and Shyok rivers in Ladakh (Thomas 1926), Rambon, Shikargarh (Chakraborty 1983, Ghosh 2008), and Sirguffara (Bates & Harrison 1997). Three sites are known from Himachal Pradesh (Chirot in the Pattan Valley, Happy Valley and Karool Hill near Solan; Lindsay 1927a, Bates & Harrison 1997, Saikia et al. 2011). However, all these records were reported as of *M. mystacinus* in its broader sense, some of them thus may represent findings of *Myotis muricola* or *Submyotodon caliginosus* (cf. Bates & Harrison 1997, see below).

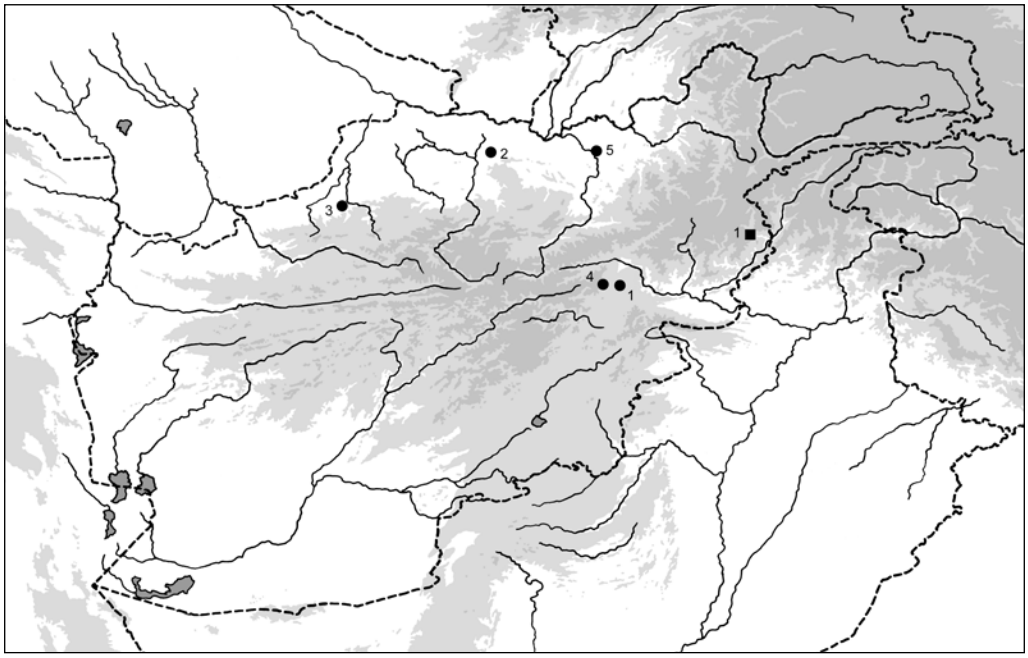

Fig. 25. Records of *Myotis davidii* (Peters, 1869) (circles) and *Submyotodon caliginosus* (Tomes, 1859) (square) in Afghanistan.

Bats of the *M. mystacinus* morpho-group belong to the most common faunal elements in certain parts of West Turkestan (Strelkov 1983a) as well as in mountains of East Turkestan (Bobrinskoj 1926, 1929, Strelkov 1983a). This group is widespread namely in the eastern mountain areas of West Turkestan and almost over the whole territory and altitudinal zones of Tajikistan (Habilov 1992). It perhaps represents the most frequently recorded bat in the mountainous areas of this country bordering with north-eastern Afghanistan – Habilov (1992) reported at least ten records of bats of the *M. mystacinus* group from the Panj river valley and the adjacent 50 km wide belt of the Tajikistani territories. With the exception of the Tigrovaâ balka, all the respective record sites lie in the Pamirs (Âšikul lake, Bartang valley, Horugh, Qal'ai Humb, Šitharv, Sindev; Satunin 1910, Kuzâkin 1935, Ŝerbin 1968, Habilov 1992, Kaškarov & Mitropol'skaâ 2004). On the other hand, these bats are very rarely found in the lowland desert and steppe areas of the south-eastern parts of Turkmenistan and Uzbekistan (Bogdanov 1953, Strelkov et al. 1978), i.e. in areas bordering Afghanistan in the north-west. From this extensive territory only two records were published, from the Tamerlana gorge near Bojsun (Bobrinskoj 1918) and from Termiz (Strelkov et al. 1978), both in Uzbekistan.

This evidence suggests possible broader occurrence of the *M. mystacinus* morpho-group mostly in the mountains of north-eastern Afghanistan, namely in the provinces of Badakhshan, Baghlan and Takhar, which connect the frequently inhabited areas of southern Tajikistan.

Material examined. 1 ♀ (SMF 38918 [S+A]), Maimana, Fariab, 870 m, 29 August 1964, leg. D. Meyer-Oehme; – 2 ♀♀ (SMF 39146, 39147 [S+A]), Kabul, 1800 m, 11 September 1965, leg. D. Meyer-Oehme; – 1 ♂ (ZFMK 97.131 [S+B]), Paghman bei Kabul, 19 April 1962, coll. J. Niethammer.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Myotis davidii* are shown in Table 11. For the material examined see above. The characters of the mesial part of the tooth-row in two properly examined specimens (SMF 38918, ZFMK 97.131) are as follows: SMF 38918:, mesio-distal length of the second upper premolar [P^3] 0.33 mm; P^3 positioned in the axis of the tooth-row, length of the upper premolar row [P^2P^3] 0.64 mm, length of the second lower premolar [P_3] 0.35 mm, height of the cingulum cusp on the third upper premolar [P^4] 0.03 mm, relative height of P^3 larger than that of the P^4 cingulum cusp, (for comparison: greatest length of skull [LCr] 13.55 mm); ZFMK 97.131 (Fig. 26): P^3 0.30 mm, P^3 positioned in the axis of the tooth-row, P^2P^3 0.67 mm, mesio-distal length of the upper canine crown [LC^1] 0.89 mm, palato-labial width of the upper canine crown [LaC^1] 0.63 mm, LC^1/LaC^1 1.416, (LCr 14.07 mm). With the exception of the position of P^3, which rather tends to be situated out of the tooth-row in the palatal direction, all characters (very long and relatively very narrow crown of the upper canine, very small first and second premolars in both jaws, absolutely and relatively very low cingulum cusp on the third upper premolar) show the conditions common in *M. davidii* sensu Benda & Karataş (2005) and Benda et al. (in press).

Interpretation of the geographical variation in the *Myotis mystacinus* morpho-group represents one of the most complex topics of bat systematics (see e.g. the review by Benda & Karataş 2005), the taxonomy of the group in south-western Asia is only partly solved (see Hill 1983, Strelkov 1983b, Benda et al. 2012). The geographical variation of the group in this region was first examined in detail by Strelkov (1983b), who found two species there, similarly as in the whole Palaearctic; monotypic *M. brandtii* (Eversmann, 1845) and polytypic *M. mystacinus* (Kuhl, 1817), with at least two subspecies. Later on, based on examination of the cranial and dental characters, Benda & Tsytsulina (2000) demonstrated an existence of a number of morphotypes in the region that they co-identified with five species, viz. *Myotis brandtii*, *M. mystacinus*, *M. nipalensis* (Dobson, 1871), *M. aurascens* Kuzâkin, 1935, and *M. hajastanicus* Argiropulo, 1939. Recently, Tsytsulina et al. (2012) have performed a geographically very broadly sampled comparison of the morpho-

Table 11. Basic biometric data on the examined Afghanistani samples of *Myotis davidii* (Peters, 1869), *Myotis longipes* (Dobson, 1873), and *Rhyneptesicus nasutus* (Dobson, 1877). For abbreviations see p. 272; indices I = CM^3/LCr; II = CC/CM^3; III = ANc/LCr; IV = ANc/LaN

	Myotis davidii					*Myotis longipes*					*Rhyneptesicus nasutus*				
	n	**M**	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	4	**37.38**	35.6	39.5	1.605	294	**35.79**	33.0	39.2	1.037	26	**38.03**	34.1	40.8	1.769
LCr	4	**13.80**	13.54	14.07	0.289	340	**13.90**	13.27	14.49	0.224	24	**13.10**	11.96	13.98	0.439
LCb	4	**13.08**	12.61	13.45	0.403	336	**13.09**	12.42	13.86	0.237	25	**12.74**	11.66	13.56	0.433
LaZ	3	**8.29**	8.25	8.34	0.047	270	**8.49**	7.89	8.93	0.168	12	**8.87**	8.55	9.15	0.202
LaI	4	**3.31**	3.25	3.37	0.050	341	**3.33**	2.82	3.68	0.107	25	**3.08**	2.86	3.41	0.132
LaInf	4	**3.42**	3.32	3.57	0.108	341	**3.86**	3.34	4.20	0.121	25	**4.21**	3.83	4.74	0.191
LaN	4	**6.57**	6.44	6.73	0.132	340	**6.90**	6.54	7.33	0.135	25	**6.34**	6.05	6.61	0.142
LaM	4	**7.00**	6.83	7.15	0.132	336	**7.12**	6.76	7.45	0.134	25	**7.02**	6.74	7.38	0.181
ANc	4	**4.71**	4.64	4.82	0.084	331	**5.35**	5.03	5.71	0.121	22	**4.47**	4.21	4.75	0.118
LBT	4	**2.84**	2.58	3.11	0.223	331	**2.83**	2.48	9.97	0.420	24	**2.84**	2.58	3.04	0.114
CC	4	**3.51**	3.37	3.68	0.136	335	**3.55**	3.27	3.84	0.093	25	**4.17**	3.74	4.41	0.176
M^3M^3	4	**5.36**	5.02	5.50	0.229	337	**5.57**	5.24	5.92	0.128	25	**6.00**	5.54	6.36	0.218
CM^3	4	**5.19**	5.02	5.37	0.169	340	**5.23**	4.85	5.64	0.113	25	**4.77**	4.35	5.05	0.163
LMd	4	**9.84**	9.48	10.17	0.334	338	**10.15**	9.29	10.66	0.210	24	**9.46**	8.64	10.21	0.362
ACo	4	**2.77**	2.70	2.88	0.083	336	**2.60**	2.28	2.86	0.094	24	**3.12**	2.68	3.49	0.183
CM_3	4	**5.65**	5.43	5.91	0.202	338	**5.55**	5.23	5.88	0.115	24	**5.08**	4.64	5.38	0.191
I	4	**0.375**	0.371	0.378	0.003	–	–	–	–	–	24	**0.364**	0.340	0.380	0.009
II	–	–	–	–	–	–	–	–	–	–	25	**0.875**	0.807	0.938	0.028
III	4	**0.341**	0.337	0.343	0.003	–	–	–	–	–	–	–	–	–	–
IV	4	**0.717**	0.701	0.734	0.014	–	–	–	–	–	–	–	–	–	–

group based on two mitochondrial markers. They found four separate lineages in the western Palaearctic, which they co-identified with three species in Europe, *M. mystacinus*, *M. brandtii*, and *M. alcathoe* von Helversen et Heller, 2001, and one species from a very broad area between southern Europe and Korea, *M. aurascens*. Thus, this analysis did not prove a separate existence of the form recognised by Benda & Tsytsulina (2000) as *M. nipalensis*. Tsytsulina et al. (2012) included the respective samples under the name *M. aurascens*, although it represents a junior synonym among the names applicable to the respective lineage (see Benda & Tsytsulina 2000, Benda & Karataş 2005). This lineage was the only taxon of the morpho-group proved by the mo-

Fig. 26. Occlusal view of the upper unicuspidal tooth-row (C–P^4) of the Afghanistani specimen (ZFMK 97.131) of *Myotis davidii* (Peters, 1869). Scale bar = 1 mm. Note the size and position of the second premolar (P^3) and the shape of the canine crown.

lecular genetic analysis (and its limited sampling there, respectively) by Tsytsulina et al. (2012), from the south-western part of Asia (Caucasus, Iran, West Turkestan).

Benda et al. (2012) examined some specimens of the morpho-group coming from Iran, both morphologically and genetically, and compared them with the known Palaearctic forms. They found three separate morphotypes there, each of them belonging to a separate genetic lineage. Two of them were co-identified by these authors with the existing taxa *M. mystacinus* and *M. davidii* (a prior name in the lineage comprising the morphotypes *nipalensis* and *aurascens* sensu Benda & Tsytsulina 2000), while the third form, a lineage of its own closely positioned by its genetic and morphological traits to the European *M. alcathoe*, was described as a new species, *M. hyrcanicus* Benda, Reiter et Vallo, 2012.

Subsequently, Benda et al. (in press) analysed a series of ca. 150 specimens of the group originating from the broader Caucasus region (including adjacent areas of south-western Asia and south-eastern Europe) with the help of both genetic and morphological approaches and identified five species to occur in the respective region; (1) *M. hyrcanicus* is known only from the Hyrcanian forest zone of northern Iran; (2) *M. mystacinus* and (3) *M. davidii* were shown to be widely distributed in the region, between the northern Caucasus, Anatolia and north-western Iran (*M. davidii* also in Crimea and adjacent steppes, and in deserts of Turkmenistan); (4) *M. brandtii* was found in Crimea, in the western Caucasus and Transcaucasia, and in central and north-eastern Anatolia; and (5) *M. alcathoe* in the western part of the Greater Caucasus and in north-eastern Anatolia. According to the results of this revision, *M. davidii* was documented to be the most widespread, morphologically plastic and ecologically universal of the five species of the morpho-group known from south-western Asia.

However, the populations of the *M. mystacinus* morpho-group occurring in Afghanistan were not concerned by the above analyses and revisions. In accordance with the development of opinions on the taxonomic arrangement of the group, *M. mystacinus* (s.l.) was reported from Afghanistan by most authors (Kuzâkin 1944, 1950, 1965, Aellen 1959a, Meyer-Oehme 1965, Neuhauser 1969, Gaisler 1971, DeBlase 1980, Niethammer 1983, Kock 1996, Bates & Harrison 1997); later on, as a consequence of the results by Benda & Tsytsulina (2000), *M. nipalensis* was mentioned from the country by Benda (2010) and Srinivasulu & Srinivasulu (2012), see also Simmons (2005).

Although very few specimens of bats of the group are available from Afghanistan, a series of authors presented their opinion on the taxonomic position of the Afghanistani populations of *M. mystacinus* sensu lato. Aellen (1959a) suggested possible occurrence of *M. mystacinus pamirensis* Kuzâkin, 1935 in Afghanistan. Meyer-Oehme (1965) first recorded a bat of this group from the country (from Maimana in the Faryab province) and referred it to *M. mystacinus sogdianus* Kuzâkin, 1934, based on its body size (LAt 35.5 mm), pelage colouration (dorsal and ventral hair bases black), and tooth characters (second lower premolar large, second upper premolar very small and situated palatally from the tooth row), which he found to conform to the description of the subspecies by Kuzâkin (1934). Neuhauser (1969) tended to rather accept the Aellen's (1959a) preliminary opinion. Concerning the populations of the northern part of the Indian subcontinent, Corbet & Hill (1992: 123) concluded as follows: "Available specimens are too few for any assessment but possibly two subspecies, *M. m*[*ystacinus*]. *meinertzhageni*, paler, and *M. m. nipalensis*, somewhat darker, might be recognized in N India." Koopman (1994) reported *M. mystacinus nipalensis* to occur in the area between Tajikistan, Tibet and Nepal (i.e. including the territory of Afghanistan) and Bates & Harrison (1997: 124) provisionally referred all populations from the Indian subcontinent to this subspecies. Finally, Srinivasulu & Srinivasulu (2012) reported *M. nipalensis nipalensis* to occur in Afghanistan, Pakistan, Kashmir, northern India, and Nepal.

We compared the four examined specimens of the *M. mystacinus* morpho-group from Afghanistan with more than two hundred specimens of the group from other parts of south-western

Table 12. Comparison of biometric data on five sample sets of the *Myotis mystacinus* group from south-western Asia; *M. davidii* (Peters, 1869), *M. mystacinus* (Kuhl, 1817), *M. brandtii* (Eversmann, 1845) and *M. alcathoe* von Helversen et Heller, 2001 sensu Benda et al. (in press) and two other sets of *M. davidii*. For details see text, for abbreviations see p. 272; indices I = CM^3/LCr; II = ANc/LCr; III = ANc/LaN

	Myotis davidii					West Turkestan					Himalayas				
	n	**M**	min	max	SD	n	**M**	min	max	SD	n	M	min	max	SD
LAt	45	**34.71**	31.2	37.3	1.190	61	**34.57**	33.0	36.8	0.980	0	–	–	–	–
LCr	83	**13.84**	13.16	14.65	0.353	68	**13.60**	13.02	14.28	0.293	6	**13.60**	13.30	13.88	0.249
LCb	83	**13.11**	12.35	13.87	0.338	67	**12.87**	12.18	13.46	0.283	5	**12.84**	12.34	13.17	0.340
LaI	83	**3.48**	3.22	3.92	0.147	68	**3.44**	3.17	3.85	0.122	6	**3.52**	3.32	3.73	0.140
LaInf	83	**3.42**	3.13	3.82	0.139	68	**3.42**	3.03	3.82	0.160	6	**3.78**	3.56	4.03	0.159
LaN	83	**6.77**	6.35	7.27	0.191	68	**6.72**	6.18	7.25	0.178	5	**6.85**	6.68	7.05	0.153
ANc	83	**4.87**	4.52	5.24	0.166	68	**4.74**	4.40	5.17	0.160	4	**4.96**	4.88	5.02	0.069
CC	81	**3.42**	3.12	3.71	0.133	68	**3.41**	3.02	3.63	0.127	6	**3.54**	3.31	3.75	0.159
M^3M^3	82	**5.37**	4.92	5.74	0.164	65	**5.34**	4.68	5.73	0.193	6	**5.59**	5.35	5.84	0.174
CM^3	82	**5.10**	4.82	5.45	0.124	66	**4.99**	4.63	5.25	0.141	6	**5.06**	4.78	5.37	0.222
LMd	83	**9.73**	9.07	10.40	0.260	66	**9.61**	9.18	10.12	0.228	6	**9.80**	9.25	10.18	0.317
ACo	83	**2.77**	2.50	3.08	0.135	65	**2.70**	2.45	3.02	0.121	6	**2.87**	2.70	3.00	0.113
CM_3	81	**5.50**	5.18	5.85	0.127	65	**5.40**	4.97	5.67	0.148	6	**5.38**	5.00	5.80	0.292
I	83	**0.369**	0.354	0.384	0.008	66	**0.367**	0.345	0.381	0.008	6	**0.372**	0.358	0.387	0.010
II	83	**0.352**	0.328	0.371	0.009	68	**0.349**	0.325	0.375	0.010	5	**0.365**	0.354	0.375	0.008
III	83	**0.719**	0.649	0.772	0.021	68	**0.706**	0.642	0.753	0.022	5	**0.722**	0.692	0.750	0.022
	Myotis mystacinus					*Myotis brandtii*					*Myotis alcathoe*				
LAt	12	**34.96**	33.7	36.1	0.671	5	**35.16**	34.4	35.7	0.503	18	**32.29**	30.1	34.2	0.940
LCr	18	**13.61**	12.91	14.57	0.415	13	**14.06**	13.66	14.57	0.276	23	**12.86**	12.48	13.22	0.242
LCb	18	**13.06**	12.33	14.15	0.479	13	**13.44**	12.92	14.03	0.295	23	**12.28**	11.84	12.74	0.279
LaI	19	**3.45**	3.16	3.94	0.220	13	**3.61**	3.40	3.74	0.106	23	**3.20**	2.87	3.60	0.167
LaInf	19	**3.33**	2.96	3.62	0.168	13	**3.52**	3.38	3.67	0.081	23	**3.23**	3.01	3.42	0.121
LaN	19	**6.73**	6.28	7.62	0.332	13	**6.89**	6.66	7.14	0.120	23	**6.27**	5.94	6.57	0.156
ANc	17	**4.80**	4.41	5.52	0.256	13	**4.73**	4.52	4.96	0.150	23	**4.59**	4.44	4.74	0.099
CC	18	**3.37**	3.07	3.60	0.149	13	**3.39**	3.27	3.62	0.095	23	**3.19**	3.05	3.33	0.090
M^3M^3	17	**5.30**	5.07	5.80	0.231	13	**5.34**	5.08	5.76	0.174	22	**5.14**	4.91	5.37	0.118
CM^3	19	**5.27**	4.97	5.80	0.240	13	**5.29**	5.08	5.71	0.171	23	**4.87**	4.63	5.11	0.122
LMd	18	**9.79**	9.39	10.83	0.389	12	**10.09**	9.76	10.42	0.219	20	**9.28**	8.93	9.63	0.206
ACo	18	**2.73**	2.52	3.05	0.164	11	**2.82**	2.58	2.98	0.128	21	**2.72**	2.45	2.94	0.098
CM_3	19	**5.62**	5.34	6.03	0.215	13	**5.71**	5.47	6.11	0.188	23	**5.25**	4.93	5.48	0.143
I	19	**0.386**	0.375	0.398	0.006	13	**0.377**	0.362	0.397	0.010	23	**0.379**	0.367	0.392	0.006
II	19	**0.355**	0.337	0.379	0.012	13	**0.337**	0.324	0.349	0.008	23	**0.357**	0.342	0.375	0.009
III	19	**0.720**	0.689	0.777	0.024	13	**0.687**	0.659	0.723	0.021	23	**0.732**	0.688	0.766	0.019

Asia, most of them (ca. 120 specimens) being identified in the profound revision by Benda et al. (in press). The Afghanistani bats represent a single homogeneous morphotype, fitting by its body and skull size to the variation ranges of the three large-sized species, *M. davidii*, *M. mystacinus*, and *M. brandtii* (Tables 11, 12, Fig. 27), as well as of the group from West Turkestan and northern India; on the other hand, they are larger than the bats of the small-sized *alcathoe* morphotype (i.e. *M. alcathoe* and *M. hyrcanicus*; Table 12). The skull size and shape and tooth characters of the Afghanistani bats are very similar to the samples from Tajikistan and Kashmir, including the

type specimens of *M. meinertzhageni* Thomas, 1926 (described from the junction of the Nubra and Shiyok rivers, Ladak, Kashmir; Thomas 1926: 609) and *M. mystacinus pamirensis* Kuzâkin, 1935 (described from Âšikul lake, Pamir, Tajikistan; Kuzâkin 1935: 431). All these bats are typical by their relatively low braincase and relatively medium-sized length of rostrum (Fig. 28), falling in both these relative dimensions within the variation ranges of *M. davidii* (but also close to *M. brandtii*, from which they differ by a narrower braincase). The Afghanistani bats differ from *M. mystacinus* s.str. by their relatively short and rather wide rostrum, and a relatively low and narrow braincase. However, they also differ from the series of bats from Hasimara, West Bengal, India (i.e., originating from the areas close to the type locality of *Vespertilio nipalensis* Dobson, 1871) by a lower and narrower braincase (although these bats generally conform to *M. davidii*).

The Afghanistani bats of the *M. mystacinus* morpho-group, along with the populations of the neighbouring Tajikistan and Kashmir, represent a peculiar (and in the variation ranges rather marginal) morphotype of *M. davidii*, differing in some aspects from the populations of this species from the Caucasus as well as from the Himalayas and staying morphologically relatively close to the populations of West Turkestan. This comparison conformed again to the view presenting *M. davidii* as the most widespread, morphologically plastic and ecologically universal of the south-western Asian members of the *M. mystacinus* morpho-group. The close morphological position of type specimens of *meinertzhageni* and *pamirensis* to the bats from the mountains adjacent to the Hindu Kush suggest the area of Afghanistan and closely neighbouring countries to be inhabited by a unique taxon, for which *meinertzhageni* seems to be the prior available name (as *M. davidii meinertzhageni*). However, the geographical variation of *M. davidii* is only poorly

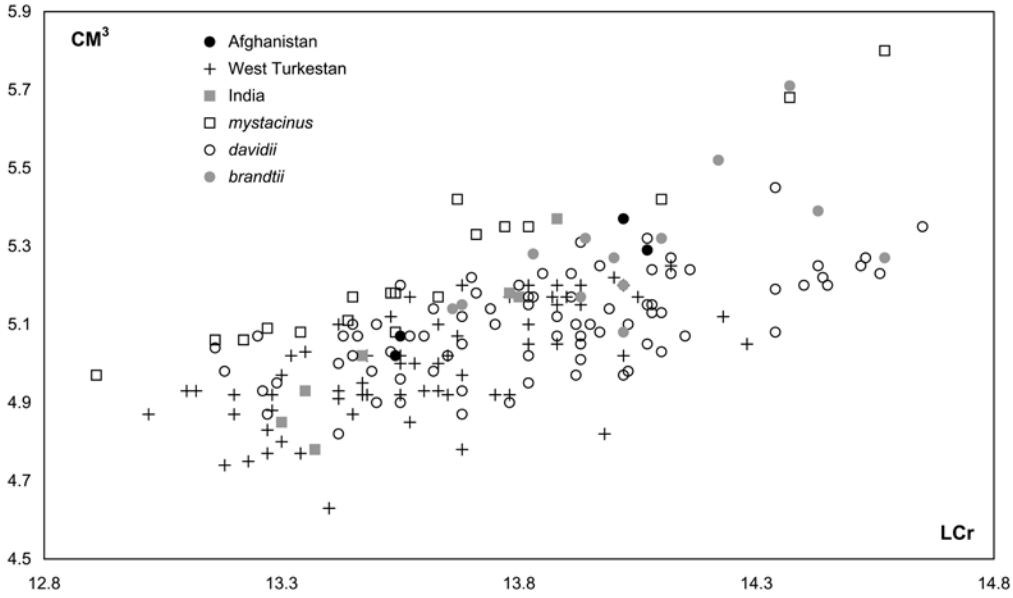

Fig. 27. Bivariate plot of the examined Afghanistani and comparative samples of the *Myotis mystacinus* group from south-western Asia: greatest length of skull (LCr) against the length of upper tooth-row (CM^3); the taxon names refer to specimens identified by Benda et al. (in press).

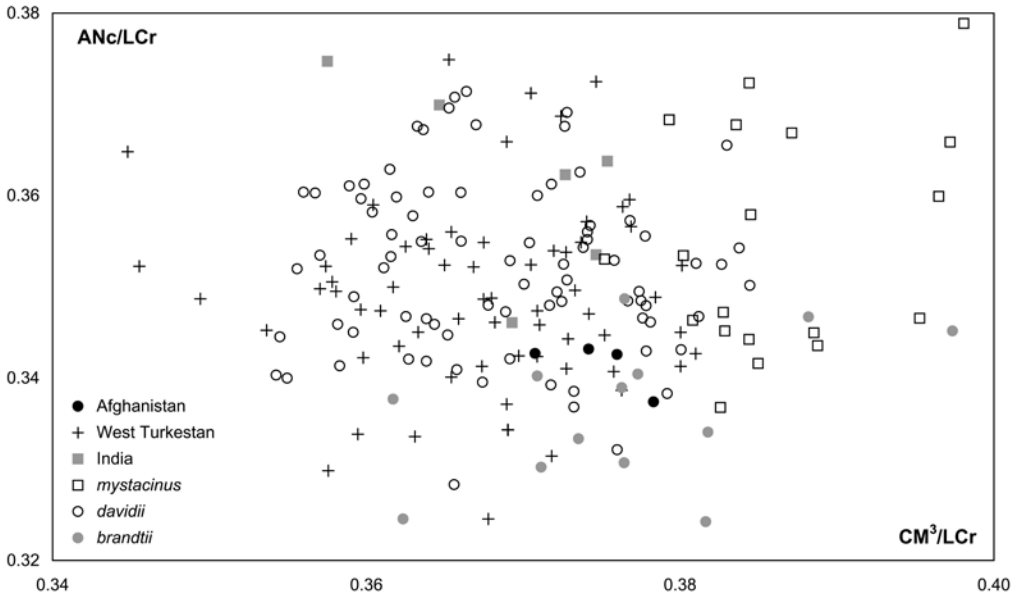

Fig. 28. Bivariate plot of the examined Afghanistani and comparative samples of the *Myotis mystacinus* group from south-western Asia: relative length of rostrum (CM^3/LCr) against the relative height of skull (ANc/LCr); the taxon names refer to specimens identified by Benda et al. (in press).

documented and justification of this taxonomic view needs to be verified by a wide-scale revision of populations from the whole distribution range, i.e. based on a material coming from areas between south-eastern Europe and the Far East. On the other hand, this preliminary conclusion seems to conform to the opinions by several previous authors (Scully 1887b, Hill 1983, Corbet & Hill 1992, Bates & Harrison 1997, Roberts 1997), regarding *meinertzhageni* and *nipalensis* as two separate taxa (contra e.g. Ellerman & Morrison-Scott 1951, Simmons 2005, or Srinivasulu & Srinivasulu 2012).

According to the results of the above comparison and namely of the analysis by Tsytsulina et al. (2012), the West Turkestani populations of the *M. mystacinus* morpho-group represent *M. davidii*. Most of authors who evaluated taxonomic position of the bats from West Turkestan (Kuzâkin 1950, 1965, Bogdanov 1953, Hanák 1965, Strelkov 1981, 1983b, Butovskij et al. 1985, Habilov 1992), referred them to *M. mystacinus przewalskii* Bobrinskoj, 1926, described from East Turkestan (Molja [Molcha] river gorge, northern slope of the Kunlun (Hotan-tag) Mts.; Bobrinskoj 1926: 95), with the names *transcaspicus* Ogneff et Heptner, 1928, *sogdianus* Kuzâkin, 1934, and *pamirensis* Kuzâkin, 1935 as synonyms. Although the respective populations from the mountain plateaus of East Turkestan most probably belong to *M. davidii* (see Benda & Tsytsulina 2000, Tsytsulina et al. 2012), their close similarity to the West Turkestani bats remains to be proven. Anyway, the name *Myotis meinertzhageni* Thomas, 1926 has a priority over the name *Myotis mystacinus przewalskii* Bobrinskoj, 1926 and remains available for the populations of *M. davidii* from the south-western margins of the Central Asian high mountain region (Pamir, Hindu Kush, Karakoram).

Myotis bucharensis Kuzâkin, 1950

Comments. *Myotis bucharensis* was erroneously reported to occur in Afghanistan by Horáček et al. (2000), Simmons (2005), and Srinivasulu & Srinivasulu (2012); however, no record is available from this country.

M. bucharensis is an endemic of West Turkestan, it is a very rare bat species, only three record sites are known in Tajikistan and Uzbekistan so far (Tsytsulina & Strelkov 2001, Benda et al. 2011a). Kuzâkin (1950) described this taxon on the basis of a single female specimen collected in 1915 at Ajvadž [Айвадж], south-western Tajikistan, 3 km north of the border with Afghanistan. Maybe because of this close location to the border, Horáček et al. (2000: 112) used the following formulation of their comments: "The populations isolated in Uzbekistan, Tadzhikistan and Afghanistan […] are known by few records only and possibly are extinct." Simmons (2005: 504) interpreted this as the countries of the known occurrence of *M. bucharensis*.

Myotis longipes (Dobson, 1873)

Records. **New data**: N a n g a r h a r: Jalalabad [1], 14 May 1965: 15 f, ZFMK (coll. J. Niethammer), 15 May 1965: 3 f, 1 ind., ZFMK (coll. J. Niethammer), May 1965: 4 inds., ZFMK (coll. J. Niethammer), 4 March 1966: 1 m, 1 f, ZFMK (coll. J. Niethammer), 18 March 1972: 1 f, ZFMK (coll. J. Niethammer). – **Published data**: K a b o l: Dahnan-ghar cave [2], Lalandar, 20 km SW of Kabul, 5 October 1965: net. 3 m, 7 f (Neuhauser 1969; Fig. 10); Lalanda, FMNH (Bates & Harrison 1997, cf. Uchikawa et al. 1994). – L a g h m a n: [Alishing, Kuh-Pialeh], Grotte Pialeh [3], 1600 m, 24 August 1961: 1 ma, 3 fa, [SMF] (Meyer-Oehme 1965, 1968). – N a n g a r h a r: Jalalabad [1], May 1965: obs. a colony (ca. 1000 inds.), 2 July 1965: 6 m, 8 f, [SMF] (Meyer-Oehme 1965, 1968, cf. Uchikawa et al. 1994); Jalal-Abad, a low gallery or canal, 1966/1967: obs. a colony of ca. 2000 inds., coll. 162 m, 176 f, [IVB, NMP, ZFMK] (Gaisler et al. 1968); Jalalabad, May 1965, 2 July 1965, 1 March 1966, 15 March – 7 May 1967: obs. a locality of mass occurrence (Hůrka & Povolný 1968, Hanák & Gaisler 1969, Dusbábek 1970); Jalalabad, 3 March 1966: coll. 65 m, 11 f, 15 March 1967: coll. 44 m, 17 f, 18 April 1967: coll. 58 m, 139 f, 3 May 1967: coll. 4 m, 9 f (Dusbábek 1970, Gaisler 1970a, Hůrka 1970, Uchikawa et al. 1994); Jallal-Abad / Jalal-abad (Groschaft & Tenora 1971b, 1973, cf. Groschaft & Tenora 1974); Afghanistan, SMF [= Jalalabad, 2 July 1965] (Uchikawa et al. 1994); – Jalal-Abad [4], over irrigation canals, 1966/1967: obs. foraging inds. (Gaisler et al. 1968).

Distribution. *Myotis longipes* is a rather rare bat in Afghanistan, three to four localities are available from the eastern part of the country (Fig. 29). Its occurrence sites are situated in rather low to montane areas in the broad altitude range of 570–2090 m a. s. l. (mean altitude 1211 m), in the Kabol, Laghman, and Nangarhar provinces. A colony of 1000–2000 individuals of this bat was observed several times in a short passage (ca. 20 m long) under a square near the Royal Palace in Jalalabad along with a colony of *Miniopterus fuliginosus* (Meyer-Oehme 1965, 1968, Gaisler et al. 1968, new data; Figs. 30, 31).

M. longipes is an endemic of the Oriental region, its distribution range is composed of two separate areas, western (Afghanistan and Kashmir) and eastern one (Nepal and Meghalaya) (Bates & Harrison 1997, Sinha 1999, Simmons 2005); but see Morphology and variation for a note on the latter populations.

Four records of this bat were made in Kashmir, however, from a very limited area of the south-eastern part of the Kashmir valley (Matar Nag, Bhima Devi, Bumzov cave, Bahmajo cave; Dobson 1872, 1876, Topál 1974, Chakraborty 1983, Bates & Harrison 1997); no records are available from Pakistan (Roberts 1997, Mahmood-ul-Hassan et al. 2009). The much larger Afghanistani area of occurrence constitutes the westernmost and northernmost extension of the whole distribution range of this bat (Corbet & Hill 1992, Bates & Harrison 1997).

Concerning the distribution of *M. longipes*, a noteworthy record of *M. capaccinii* (Bonaparte, 1837) from Karakalpakstan, north-western Uzbekistan shoud be mentioned; one specimen was collected at Nukus, Amu Darya delta, in 1875 (Kuzâkin 1944, 1950, Bogdanov 1953). Interestin-

gly, so far it has been the only record of this species from West Turkestan. The identification of the bat as *M. capaccinii* by Kuzâkin (1950) was accepted by subsequent authors as *M. capaccinii* s.str. (see the review by Benda et al. 2006), although the distribution of the latter bat in Asia is restricted to southern Anatolia, Mesopotamia, and the Levant (Benda et al. 2006, 2012). The localities in Iran lie more than 1400 km from Nukus (Benda et al. 2012), the sites in Turkey, Iraq and the Levant are even more distant (Karataş et al. 2003, Benda et al. 2006). Since Bogdanov (1953) reported the respective specimen to be housed in the ZIN collection, Benda et al. (2006) suggested its examination with the aim to revise its species identification – Kuzâkin (1944, 1950) identified this bat under the older taxonomic concept of *M. capaccinii* (see Ellerman & Morrison-Scott 1951: 148), which covered several currently separate species (Simmons 2005), i.e. *M. capaccinii* s.str., *M. macrodactylus* (Temminck, 1840), *M. fimbriatus* (Peters, 1871) as well as *M. longipes*. The identification of the bat as *M. longipes* could be geographically similarly reasonable as *M. capaccinii*. The distance from Nukus, Uzbekistan, to the closest locality of *M. longipes* in Afghanistan is almost 1200 km (Tang-e Lalandar, see Fig. 10) and to the closest locality of *M. capaccinii* in Iran it is almost 1400 km (Bisotun; Benda et al. 2012). However, according to our best knowledge, the specimen has not yet been re-examined.

Material examined. 3 ♀♀ (SMF 38761, 38762 [S+A], 38763 [A]), Alishing, Laghman, Höhle Pialeh (im Kuh-Pialeh), 1550 m, 24 August 1961, leg. D. Meyer-Oehme; – 15 ♀♀ (ZFMK 96.480, 96.481, 96.483–96.487, 96.520–96.526 [S+B], 96.482 [B], 96.527 [E]), Jalalabad, 14 May 1965, coll. J. Niethammer; – 3 ♀♀, 1 ind. (ZFMK 78.123–78.125 [S+B], 96.488 [B]), Jalalabad, 15 May 1965, coll. J. Niethammer; – 4 inds. (ZFMK 96.528, 96.529 [S+Sk]), Jalalabad, May 1965, coll. J. Niethammer; – 7 ♂♂, 8 ♀♀ (SMF 38756–38758, 38764–38767 [S+A], 38754, 38755, 38759, 38760,

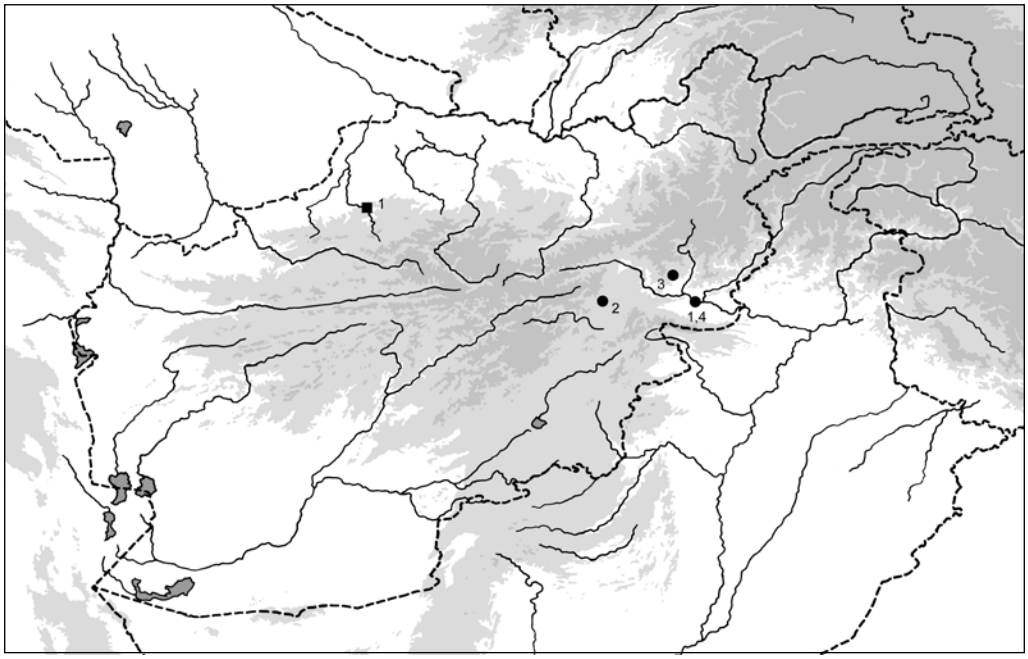

Fig. 29. Records of *Myotis longipes* (Dobson, 1873) (circles) and *Vespertilio murinus* Linnaeus, 1758 (square) in Afghanistan.

Figs. 30, 31. Views of the entrance and of the inside of a low and short passage (ca. 20 m long) situated under a square near the Royal Palace in Jalalabad (Nangarhar province). A large colony of *Myotis longipes* (1000–2000 individuals during various checks) and a colony of *Miniopterus fuliginosus* (500 individuals at maximum) were documented to roost there.

38768–38771 [A]), Jalalabad, Nangarhar, 650 m, 2 July 1965, leg. D. Meyer-Oehme; – 67 ♂♂, 11 ♀♀, 11 inds. (IVB af1491, af1493, af1496, af1498, af1506, af1512, af1527, af1549, NMP 95339, ZFMK 96.489–96.503, 96.505–96.516 [S+B], IVB af1489, af1490, af1492, af1494, af1495, af1497, af1500, af1503, af1505, af1507–1511, af1513–1526, af1528, af1529, af1531, af1533–1536, af1539–1548, af1550–1555, NMP 95419 [S], 96.504 [B]), Jalal Abad, 1 March 1966, leg. D. Povolný & F. Tenora, coll. J. Niethammer; – 1 ♂, 1 ♀ (ZFMK 96.518, 96.519 [S+A]), Jalalabad, 4 March 1966, coll. J. Niethammer; – 43 ♂♂, 16 ♀♀ (IVB af418–432, af434–438, af440–457, af459–477, NMP 95421 [S+B], NMP 95420 [B]), Jalal Abad, gallery under the Royal Palace, 15 March 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂ (IVB af491 [S+B]), Jalal Abad, 20 March 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 45 ♂♂, 116 ♀♀ (IVB af715–752, af754–788, af797–839, af841–846, af849–852, af854, af857, af858, af861, af862, af864–873, af876, af878–882, af885, af887, af888, af891, af893–896, af898–901 [S+B], af753 [S], af840 [B]), Jalal Abad, gallery under the Royal Palace, 18 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♀ (IVB af1018 [S+B]), Jalal Abad, gallery under the Royal Palace, 3 May 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♀ (ZFMK 96.517 [S+B]), Jalalabad, 18 March 1972, coll. J. Niethammer.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Myotis longipes* are shown in Table 11. For the material examined see above.

All authors who mentioned *M. longipes*, considered it a separate species (Dobson 1872, 1876, Blanford 1891, Tate 1941b, Ellerman & Morrison-Scott 1951, Meyer-Oehme 1965, 1968, Gaisler et al. 1968, Hanák & Gaisler 1969, Neuhauser 1969, Gaisler 1970a, b, Findley 1972, Topál 1974, 1997, Roberts 1977, 1997, Corbet 1978, Corbet & Hill 1980, 1992, Parkinson et al. 1982, Chakraborty 1983, Koopman 1993, 1994, Borisenko & Pavlinov 1995, Bates & Harrison 1997, Bates et al. 1999, Csorba et al. 1999, Horáček et al. 2000, Alfred et al. 2002, Simmons 2005, Srinivasulu & Srinivasulu 2012, etc.). Also Ellerman & Morrison-Scott (1951: 148), who tentatively listed this bat under *M. capaccinii*, retained it as a full species, with the following note: "The following named species [= *M. longipes* and *M. fimbriatus*] are allied to *M. capaccinii*, and possibly represent it." This bat was regarded as a full species, allied to other trawling forms of *Myotis* (i.e. *M. capaccinii*, *M. daubentonii* (Kuhl, 1817), *M. macrodactylus* (Temminck, 1840), *M.*

fimbriatus (Peters, 1871), *M. laniger* (Peters, 1871), and *M. csorbai* Topál, 1997), also by other authors, who evaluated its taxonomic position (Tate 1942, Hanák & Gaisler 1969, Findley 1972, Topál 1997). All the respective authors (Gaisler 1970a, Koopman 1994, Bates & Harrison 1997, Topál 1997, Simmons 2005, Srinivasulu & Srinivasulu 2012) considered *M. longipes* a monotypic species (described from the Bhima Devi caves, Kashmir; Dobson 1872: 209).

Besides the Afghanistani and Kashmiri occurrence, Sinha (1994, 1999) and Bates & Harrison (1997) published records of *M. longipes* from Nepal and Meghalaya. The record from Nepal was revised by Topál (1997) who described the respective bats as a new species, *M. csorbai* (type locality: 4 km E of Syangja; Topál 1997: 377); this species is characterised by close morphological similarity to *M. longipes*, but showing a smaller size of body and skull (LAt 34.8–37.5 mm, LCr 12.81–13.64 mm, LaZ 7.59–8.19 mm, LaM 6.49–6.97 mm in *M. csorbai*, vs. LAt 36.1–39.7 mm, LCr 13.52–14.74 mm, LaZ 8.31–9.02 mm, LaM 7.00–7.56 mm in *M. longipes* from Kashmir; Topál 1997), and much darker (almost black) dorsal pelage colouration (vs. greyish brown in *M. longipes*, see Meyer-Oehme 1965, Hanák & Gaisler 1969). Csorba et al. (1999) reported this species from four localities in western Nepal (and Borisenko et al. 2008 suggested its occurrence in Sechuan, China). Sinha (1999) described the specimen of *M. longipes* he collected at Mausami cave near Cherrapunji, Meghalaya, as relatively small-sized (LAt 35.0 mm, LCr 13.0 mm, LaZ 8.0 mm, LaM 7.0 mm) with black dorsal pelage colouration. This description indicates clearly to *M. csorbai*, while *M. longipes* could be excluded. *M. longipes* thus remains an endemic of the mountains in the north-western part of the Indian subcontinent, as reported by e.g. Koopman (1994).

Submyotodon caliginosus (Tomes, 1859)

Records. **Published data**: N u r i s t a n: Kamu [1], King's Garden, 8 km W of Kamdesh, October 1965: shot 1 m (Neuhauser 1969 [as *Myotis mystacinus*]); Kamu, 17 October 1965: shot 1 ma, FMNH (Neuhauser & DeBlase 1974 [as *Myotis muricola*]); Kamdesh, FMNH (Bates & Harrison 1997 [as *M. muricola*]).

Distribution. *Submyotodon caliginosus* is a very rare bat in Afghanistan, only one specimen was collected in a montane area of the eastern part of the country, at the southern slope of the main Hindu Kush range (Nuristan province; Fig. 25). An adult male was shot in an evergreen oak forest in the Bashgal valley, at the altitude of 1350 m a. s. l. (Neuhauser 1969).

The distribution range of *S. caliginosus* is poorly known, since the species status of this form has been defined only recently (Benda 2010), and until then, this species had been broadly confused with *Myotis mystacinus* (Kuhl, 1817) or with *M. muricola* (Gray, 1846) (Thomas 1915a, Tate 1941b, Hill 1983, Simmons 2005, Ghosh 2008, see also Records). Since the origins of the available type specimens of *S. caliginosus* were not sufficiently localised (*Vespertilio caliginosus*: India; *V. blanfordi*: Himalayas; Tomes 1859, Hill 1983, Benda 2010), the only geographically specified specimens of this species come generally from Indian Punjab, Sikkim, Kashmir, and Pakistan at the altitudes of 6,500–10,700 ft. [= ~2000–3250 m] a. s. l. (Hill 1983) and specifically, from Dunga Gali in the Murree Hills in northern Punjab (Hill 1983, Benda 2010, cf. Roberts 1977, 1997), from Chatri, Dalhousie and Shimla in Himachal Pradesh (Dobson 1871, Hill 1983, Ghosh 2008), and Pindar Valley, Uttarakhand (Hill 1983). Nevertheless, Hill (1983) and Bates & Harrison (1997) referred all the records of "*Myotis muricola*" made west of Nepal, i.e. from the mountainous areas of eastern Afghanistan, Kashmir, northern Pakistan (Khyber Pakhtunkhwa, Punjab), and north-western India (Himachal Pradesh, Uttarakhand), to the taxon *caliginosus* (including *blanfordi* Dobson, 1871). When we tentatively consider this area as a whole species distribution range of *S. caliginosus*, the Afghanistani locality at Kamu represents its westernmost and northernmost extension.

Table 13. Basic biometric data on the examined Afghanistani samples of *Eptesicus pachyomus* (Tomes, 1857), *E. serotinus* (Schreber, 1774), and *E. gobiensis* Bobrinskoj, 1926, and on the Afghanistani samples of *Vespertilio murinus* Linnaeus, 1758 and *Submyotodon caliginosus* (Tomes, 1859) after Neuhauser & DeBlase (1974) [N&DB]. For abbreviations see p. 272

	Eptesicus pachyomus					*Eptesicus serotinus*	*Eptesicus gobiensis*	*Vespertilio murinus*	*S. caliginosus*
	n	**M**	min	max	SD	IVB af1062	SMF 38879	[N&DB]	[N&DB]
LAt	34	**52.70**	48.9	55.4	1.533	–	42.2	46	34
LCr	36	**20.49**	19.57	21.19	0.413	–	15.76	15.6	13.1
LCb	37	**19.70**	18.83	20.51	0.422	–	15.18	15.4	12.6
LaZ	37	**14.43**	13.44	15.22	0.421	–	–	10.0	8.1
LaI	38	**4.40**	4.11	4.68	0.137	–	4.07	4.3	3.5
LaInf	38	**6.71**	6.26	7.24	0.228	–	4.74	–	–
LaN	38	**9.48**	8.88	9.98	0.254	9.08	7.83	7.9	6.5
LaM	37	**10.91**	10.49	11.54	0.254	10.64	8.33	–	–
ANc	36	**6.95**	6.47	7.31	0.218	6.48	5.10	–	–
LBT	37	**3.79**	3.43	4.09	0.183	3.98	3.55	–	–
CC	38	**6.50**	5.98	6.91	0.211	–	4.58	–	–
M^3M^3	38	**8.67**	8.15	9.53	0.265	–	6.51	–	–
CM^3	39	**7.68**	7.19	8.18	0.230	–	5.52	5.6	5.1
LMd	39	**15.41**	14.52	16.37	0.397	–	10.76	–	–
ACo	39	**5.62**	5.28	6.24	0.230	5.13	3.31	11.3	9.7
CM^3	39	**8.50**	7.95	8.96	0.234	–	6.15	5.7	5.5
LaZ/LCb	36	**0.732**	0.683	0.774	0.021	–	–	–	–
CC/CM^3	37	**0.847**	0.764	0.913	0.034	–	–	–	–

Morphology and variation. We did not examine any museum material of *Submyotodon caliginosus* from Afghanistan. Forearm and cranial dimensions of the only Afghanistani specimen of this bat published by Neuhauser & DeBlase (1974) are shown in Table 13.

The species status of *S. caliginosus* (under the genus name *Myotis*) has been defined recently by Benda (2010), although it was suggested already by Findley (1972). However, this species had been broadly confused with *Myotis mystacinus* or with *M. muricola* (see Dobson 1876, 1878, Thomas 1915a, Tate 1941b, Hill 1983, Simmons 2005, and Benda 2010), and this is also the case of the Afghanistani specimen. Neuhauser (1969) reported the respective bat under *M. mystacinus*, while Neuhauser & DeBlase (1974) and Bates & Harrison (1997) under *M. muricola*. The latter species identification of the specimen from Afghanistan was accepted by Niethammer (1983), Koopman (1994), and Srinivasulu & Srinivasulu (2012).

However, despite the variable species position of the respective bat, its subspecific affiliation was assigned always identically to the name *caliginosus* Tomes, 1859 (Neuhauser 1969, Neuhauser & DeBlase 1974, Koopman 1994, Srinivasulu & Srinivasulu 2012). *M. mystacinus caliginosus* or later *M. muricola caliginosus* were reported from the north-western Himalayas by Ellerman & Morrison-Scott (1951), Tate (1941b), Hill (1983), Koopman (1994), Kock (1996), Bates & Harrison (1997), Roberts (1997), etc. Perhaps based mainly on the geographical grounds and with a reference to Ellerman & Morrison-Scott (1951), the name *caliginosus* was applied by Neuhauser & DeBlase (1974) to the respective Afghanistani specimen.

Benda (2010) examined skulls of the type specimens of *Vespertilio caliginosus* Tomes, 1859 and *V. blanfordi* Dobson, 1871 (three BMNH specimens in total) and of four BMNH specimens of *M. muricola* from the Murree Hills in northern Pakistan, and compared them with other *M.*

muricola samples (n=52) from various parts of southern Asia, including Sumatra and Borneo. He found all the seven bats of the former group to represent a unique morphotype, substantially distinct from the other samples of *M. muricola* in skull size, being significantly smaller, and in the skull shape, being significantly smaller in the relative width of rostrum and relative height of braincase, and larger in the relative width of braincase. This morphotype was found unique and distinct also in comparison with other small-sized and small-footed *Myotis* bats of the Oriental region, viz. *M. siligorensis* (Horsfield, 1855), *M. ater* (Peters, 1866), *M. davidii* (Peters, 1869), *M. montivagus* (Dobson, 1874), and *M. gomantongensis* Francis et Hill, 1998. Therefore, Benda (2010) suggested these populations to represent a separate species, *Myotis caliginosus* (Tomes, 1859). The synonymy of the names *caliginosus* and *blanfordi*, being obvious from the results of the comparison by Benda (2010), was suggested already by a series of previous authors (Thomas 1915a, Tate 1941b, Ellerman & Morrison-Scott 1951, Hill 1983, Bates & Harrison 1997, Simmons 2005).

Ruedi et al. (2015) reported the unusual combination of dental characters (two nyctalodont and one submyotodont lower molars) and skull shape (flattened frontal region, vs. long, narrow and flattened rostrum) of *Myotis latirostris* Kishida, 1932 from Taiwan to be present also in *M. caliginosus* and *M. moupinensis* (Milne-Edwards, 1872); at the same time, they suggested to consider this group of taxa, i.e. *M. latirostris* genetic lineage sensu Ruedi et al. (2013), to represent a separate genus, sister to the genus *Myotis*. Since Ruedi et al. (2015) found this state of characters also in (at that time fossil) taxon *Submyotodon* Ziegler, 2003, they suggested to refer the respective separate genus to this name. Hence, the population originally referred to *Vespertilio caliginosus* by Dobson (1871) and later to *Myotis mystacinus caliginosus* or *M. muricola caliginosus* by various authors, should be named *Submyotodon caliginosus*.

The cranial dimensions of the only Afghanistani specimen of *S. caliginosus* presented by Neuhauser & DeBlase (1974: 89, Table 2), see Table 13, conform almost exactly to the dimensions of the series of seven specimens as presented by Benda (2010: 64, Table 4). At least according to the skull size, the identification by Neuhauser (1969) and Neuhauser & DeBlase (1974) of the respective bat as *M. muricola caliginosus* = *Submyotodon caliginosus* seems to be correct.

Vespertilio murinus Linnaeus, 1758

Records. **Published data**: F a r y a b: 8 km NW of Belchiragh on the Maimana–Belchiragh road [1], 13 September 1965: shot 1 m (Neuhauser 1969); 8 km. northwest of Belchiragh, 12 September 1965: shot 1 ma, FMNH (Neuhauser & DeBlase 1974); Maimana, 40 km. E, 12 September 1965 (Lewis 1973); 25 miles east of Maimana, FMNH (Bates & Harrison 1997). – Afghanistan, 1 ind., FMNH (DeBlase 1980).

Distribution. *Vespertilio murinus* is an extremely rare bat in Afghanistan, only one verified record is available from the north-western part of the country (Fig. 29). An adult male was shot in a dry montane habitat at Belchiragh, Faryab province, at 1225 m a. s. l. (Neuhauser 1969).

DeBlase (1980: 181, Fig. 108), depicting the records of *V. murinus* in Iran and the surrounding countries of the Middle East, marked two points in the map of Afghanistan; one, situated in north-central Afghanistan, roughly corresponds with the above record from Belchiragh, and the other one in the southern part of the Kabul river valley south of Jalalabad. On the other hand, in the text describing the general distribution range of this bat, DeBlase (1980: 179) wrote: "Eastern Europe west to France; scattered records west to Britain and north to northern Sweden […]. USSR from Europe to the Pacific south of 60°N latitude […]. Afghanistan (Neuhauser and DeBlase, 1974). Japan, Mongolia, Kashmir, and Chinese Turkestan […]." Nevertheless, Neuhauser & DeBlase (1974) reported a single record from Afghanistan from Belchiragh as the first (and only) record for the country (see Records). Hence, the point marked in the vicinity of Jalalabad (just on the right

margin of the picture) certainly represents a mere misprint and has no sense as a known site of *V. murinus* occurrence in Afghanistan. However, Bates & Harrison (1997: 159) noted concerning the respective point: "south of Jalalabad (mapped by DeBlase, 1980 but locality not listed)". This note was accepted as an occurrence report by Srinivasulu & Srinivasulu (2012), who reported the Afghanistani distribution of *V. murinus* in the provinces of Faryab and Nangarhar; the latter obviously being an error. Moreover, in their map of *V. murinus* records in the Indian subcontinent, Bates & Harrison (1997: 159) marked three points in the area of Afghanistan, one corresponding with Belchiragh, other (erroneous) with Jalalabad and the third one situated in central Afghanistan (approximately in the northern part of the Oruzgan province). In the corresponding text the authors mentioned only the above two discussed records/points. So, by two cartographical mistakes, one real specimen of *V. murinus* subsequently spread into three records, two of them apparently erroneous.

The Belchiragh record of *V. murinus* in Afghanistan represents a part of the south-eastern margin of the whole species range. Only one possible site is known to be situated east of the Afghanistani territory, the Nultar valley in Gilgit, northern Kashmir (Scully 1881a); this site constitutes the eastern margin of the species range in southern Asia. Although Chakraborty (1983) and Ghosh (2008) reported the two respective specimens as *Eptesicus nilssoni kashgaricus* (= *E. gobiensis*), the record was accepted as of *V. murinus* by Bates & Harrison (1997).

On the other hand, *V. murinus* is a rather uncommon but not extremely rare faunal element in the areas north and west of Afghanistan. Six records are known from Iran (Benda et al. 2012); however, from the areas rather distant from the Afghanistani territory. The Iranian range creates a crescent-shaped belt in the mountains surrounding the north-western margin of the basin of the Dasht-e Kavir desert (Benda et al. 2012: 354, Fig. 111), without direct continuation to Afghanistan – the closest Iranian record is available from Dasht, North Khorasan (Lay 1967), some 510 km west of the Afghanistani border.

However, the record of *V. murinus* in northern Afghanistan well continues the occurrence of this bat in West Turkestan; almost twenty records were reported from the southern parts of Turkmenistan, Uzbekistan and Tajikistan (Bogdanov 1953, Strelkov et al. 1978, Habilov 1992). At least ten records are available from sites situated less than a hundred kilometres from the Afghanistani border (Sandykgaçy, Daşkopri, Goçar well, Kerkiçi, Gurşunmagdan Käni [Svincovyj Rudnik], Tangi-duvan in the Tamerlana gorge, Aktau foothills, Lalmikar, Staraâ pristan' [old port] in the Tigrovaâ balka, Žerge-Tal [Džirgatal']; Bobrinskoj 1918, Bogdanov 1953, Ŝerbin 1968, Strelkov et al. 1978, Habilov 1992, Gricina et al. 2013). This evidence from the southernmost areas of West Turkestan clearly indicates the range of *V. murinus* in northern Afghanistan as certainly undersampled; this bat should be found more commonly in the lowland and medium elevated parts of the provinces of Herat, Badghis, Faryab, Jowzjan, Balkh, Kondoz, and Takhtar, when an appropriate research effort is made.

Moreover, the recent record of *V. murinus* in UAE (Monadjem et al. 2015), representing undoubtedly a stray individual, suggests a possibility of a finding of this bat far behind the border of its regular occurrence range perhaps in any direction.

Morphology and variation. We did not examine any museum material of *Vespertilio murinus* from Afghanistan. Forearm and cranial dimensions of the only Afghanistani specimen of this bat published by Neuhauser & DeBlase (1974) are shown in Table 13.

With the exception of the Far East of Russia and China, where an eastern form *V. m. ussuriensis* Wallin, 1969 is regarded to occur, from the prevailing majority of the distribution range only the nominotypical subspecies of *V. murinus* is reported (Wallin 1969, Corbet 1978, Koopman 1994, Rydell & Baagøe 1994, Horáček et al. 2000, Simmons 2005). Naturally, the Afghanistani and

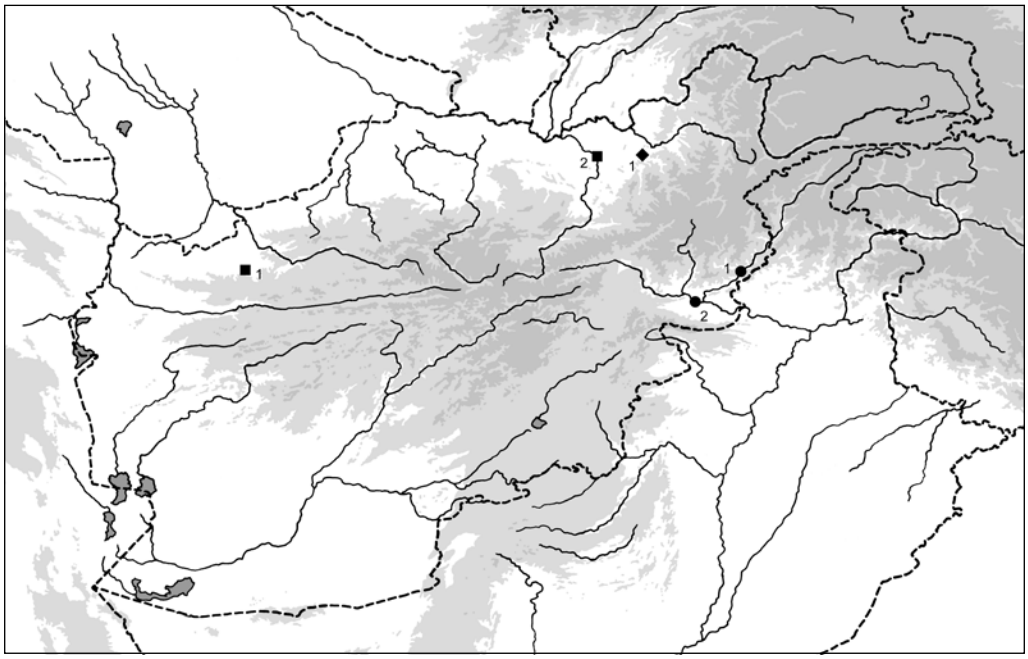

Fig. 32. Records of *Eptesicus serotinus* (Schreber, 1774) (squares), *E. pachyomus* (Tomes, 1857) (circles), and *E. ognevi* Bobrinskoj, 1918 (diamond) in Afghanistan.

Kashmiri populations were also assigned to the latter form (Neuhauser & DeBlase 1974, Koopman 1994, Bates & Harrison 1997, Srinivasulu & Srinivasulu 2012).

Considering metric characteristics, the values of the Afghanistani specimen of *V. murinus* (Table 13) conform to those reported by e.g. Rydell & Baagøe (1994: 1), but lie above those reported from Iran by DeBlase (1980: 399–400) and Benda et al. (2012: 357, Table 21), and most of them also above the values of the samples from Turkmenistan (Strelkov et al. 1978: 64, Table 9) and Tajikistan (Habilov 1992: 304, Table 34). However, from the comparison of the dimensions of a single specimen, taken perhaps in a different way, no relevant conclusion can be made.

Eptesicus serotinus (Schreber, 1774)

Records. **Published data**: B a d g h i s: [Qades,] SE. de Qal'eh Naon [1], 1 July 1959: 1 ind. [= 1 m, MZLU] (Vercammen-Grandjean 1963 [as *E. sodalis*]). – K o n d o z: Kunduz [2], over the orchards and fields, 14 May 1967: obs. & shot 1 m (Gaisler et al. 1968, Gaisler 1970a).

Distribution. Considering the available records, *Eptesicus serotinus* is a rare bat in Afghanistan. Only two specimens originating from two localities in the northern part of the country are known (Fig. 32). The records were made at very different altitudes of 405 m and 1320 m a. s l., respectively, in the provinces of Badghis and Kondoz.

In his maps of *E. serotinus* distribution, Kuzâkin (1944, 1950) marked a point corresponding with the position of Fayzabad, Badakhshan, north-eastern Afghanistan. However, in the descriptions

of the distribution of this bat he mentioned the record from Fejzabad (= Faizobod), Tajikistan, ca. 45 km east of Dushanbe (originally published by Bobrinskoj [1918: 2] in Russian as "kišlak Fejzabad v gornoj oblasti Karategin"), while Afghanistan is not reported as an area of its occurrence at all. Thus, the respective points in Kuzâkin's maps seem to be rather an error than an evidence from Afghanistan (Kuzâkin [1944, 1950] made the same mistake also concerning the distribution maps of *Eptesicus ognevi*, see below). However, the erroneous "record" from Fayzabad/Afghanistan was accepted as a real evidence of the species occurrence by Aellen (1959a), Neuhauser (1969), Gaisler (1970a), Bates & Harrison (1997), and Srinivasulu & Srinivasulu (2012).

E. serotinus is one of the most common bats in West Turkestan and north-western Iran (Strelkov et al. 1978, Rybin et al. 1989, Habilov 1992, Benda et al. 2012) and the scarcity of its records in northern Afghanistan is surprising. Although the occurrence of this bat in north-eastern Iran constitutes a part of the southern margin of the species range, at least twelve records are available from this area (DeBlase 1980, Benda et al. 2012) and the localities closest to the north-western border of Afghanistan lie less than a hundred kilometres away (Bazangan, 98 km; Rubat-e Sharaf caravanserai, 90 km; Benda et al. 2012). *E. serotinus* is absolutely the most frequently recorded bat in the south-eastern areas of Turkmenistan (Strelkov et al. 1978) and a commonly found bat also in south-eastern Uzbekistan and south-western Tajikistan (Bogdanov 1953, Habilov 1992), i.e. in the areas directly adjacent to northern Afghanistan. In the 150 km wide belt of areas along some 1100 km long border of Afghanistan with West Turkestan (i.e. from the eastern border of Iran to south-western Tajikistan, incl.), 35 sites of occurrence of this bat were reviewed by Bogdanov (1953), Strelkov et al. (1978), and Habilov (1992). Some records of *E. serotinus* were made

Fig. 33. The hilly agricultural landscape at Kunduz (Kondoz province), northern Afghanistan, ca. 420 m a. s. l. Three species of bats typical for the dry areas of West Turkestan were documented from this area, *Myotis davidii*, *Eptesicus serotinus*, and *Pipistrellus pipistrellus.*

very close to the border, just between 1–6 km from it (Ajvadž, Çarşanga, Işmetpest, Başbeden [Karaul-Hana], Mörgunov [Morgunovskij], Panči-Poen [Nižnyj Pândž], Şiram-Kuyu [Šaramkui], Serhetabad [Kuška], Taraşek [Tarašinka], Tigrovaâ balka (Bil'kevič' 1918, Kuzâkin 1939, Strelkov et al. 1978, Malinovskij 1988, Habilov 1992). This available evidence clearly indicates the range of *E. serotinus* in Afghanistan as extremely undersampled, namely in comparison with *Pipistrellus pipistrellus* (see below), a species similarly common in the southern part of West Turkestan as *E. serotinus* and much more frequent in Afghanistan, according to the known records (Fig. 42).

Anyway, despite the very small number of confirmed records of *E. serotinus*, the landscapes of low and medium altitudes (i.e. those below ca. 1500 m a. s. l.; Fig. 33) of Afghanistan north of the Hindu Kush range represent a part of the southern margin of the species range and are certainly broadly inhabited by this bat, analogically with the more northward areas in West Turkestan. The southern border of *E. serotinus* distribution continues from Afghanistan eastwards to western Tajikistan, southern Kirghizstan, East Turkestan and southern Mongolia (see Benda et al. 2011a).

Material examined. 1 ♂ (IVB af1062 [S+B]), Kunduz, Spinzar Hotel, 14 May 1967, leg. D. Povolný; – 1 ♂ (MZLU L59/3166, L59/3183 [S+A]), Qades, SE de Qal'eh Naou, alt. 1320 m, 1 July 1959, leg. K. Lindberg.

Morphology and variation. Several cranial dimensions of the only adult Afghanistani specimen of *Eptesicus serotinus* from Kunduz are shown in Table 13. In the juvenile specimen from Qades, only two standard dimensions could be taken, the forearm length (LAt 44.9 mm) and the length of the lower tooth-row (CM_3 7.38 mm).

The north-Afghanistani populations of *E. serotinus* represent the southernmost part of the species distribution in the Central Asian arid region, whose centre lies in the lowland deserts of West Turkestan (see Distribution). This range, delimited in the west by the lower Volga river basin in Russia, in the east by the Gobi desert in southern Mongolia and East Turkestan, and in the south by the northern slopes of the Hindu Kush and Kopetdagh Mts. in northern Afghanistan and Iran, was consistently reported to be inhabited by *E. serotinus turcomanus* (Eversmann, 1840) (Bobrinskoj 1925, 1929, Ognev 1927, 1928, Kuzâkin 1950, 1965, Ellerman & Morrison-Scott 1951, Strelkov 1963, 1981, Corbet 1978, Koopman 1994, Horáček et al. 2000, Benda et al. 2006, etc.). This form is reported to be smaller in body and skull size and markedly paler in pelage colouration than the nominotypical subspecies from Europe and the Caucasus region or *E. s. mirza* (De-Filippi, 1863) from the Levant and south-western Iran (see the reviews by Benda et al. 2006, 2012, Juste et al. 2013).

The records of the species (including the erroneous ones, see Distribution) from northern Afghanistan were mostly referred to *E. s. turcomanus* (Aellen 1959a, Gaisler et al. 1968, Gaisler 1970a, Bates & Harrison 1997). The dimension values of the only comparable (= adult) specimen from Kunduz (IVB af1062; Table 13) lie within the ranges of this form from West Turkestan and northern Iran (see Table 14). Vercammen-Grandjean (1963) assigned the specimen from Qades (MZLU L59/3166, 3183) to *E. sodalis* (Barrett-Hamilton, 1910), a species name formerly used for *E. ognevi* (see e.g. Ellerman & Morrison-Scott 1951). However, the juvenile stage of the latter specimen is obvious from the cartilaginous epiphyses of its wing segments, which indicate an unfinished growth and thus, a smaller size than in adult bats. The dimension values of the specimen from Qades are only slightly below the respective dimension ranges of the *turcomanus* form and are above (CM_3) or at the upper range margin (LAt), respectively, of the respective dimensions of adult specimens of *E. ognevi* from West Turkestan (see Benda et al. 2006: 162, Table 23). The length of the lower tooth-row in this specimen is larger by 0.2 mm than that in the largest adult specimen of *E. ognevi* found among the series of 62 bats from West Turkestan and Transcaucasia examined by Benda et al. (2006). Thus, the belonging of the two specimens to the form *turcomanus* seems to be undoubted.

The recent molecular genetic analyses by Artyushin et al. (2012a) and Juste et al. (2013) surprisingly showed the form *turcomanus*, well defined in its morphological traits (see above) and mitochondrial genome (Juste et al. 2010, 2013), to be in fact a part of the nominotypical form of *E. serotinus*. Concerning the nuclear genetic traits, no signs of clustering of haplotypes according to the *serotinus* and *turcomanus* morphotypes were found. Therefore, the pale coloured and small-sized morphotype, for a long time considered a separate taxon (subspecies or even species), which inhabits also the northern parts of Afghanistan, represents merely an ecological morph of the subspecies *E. s. serotinus* (see also Benda et al. 2012).

Eptesicus pachyomus (Tomes, 1857)

Records. **Published data** [all as *E. serotinus*]: K o n a r: Tschaga Serail [= Chaghasarai] [1], [2 July 1965:] 3 inds. [= 3 f], SMF (Felten 1971). – N a n g a r h a r: Jalal-Abad [2], 1967: coll. 1 m, 36 f; fissure between two logs in the ruins of the former Habibula Palace, obs. a female colony; another fissure, coll. 1 m; over the orchards and fields, obs. & shot inds. (Gaisler et al. 1968, Groschaft & Tenora 1971b, cf. Groschaft & Tenora 1973, 1974; Figs. 34, 35); Jalalabad, 7 km north of town, at the edge of cultivated fields, 11 October 1965: shot 3 m (Neuhauser 1969); Jalalabad, 8, 13, 22, 24, & 26 April 1967: coll. 1 m, 36 f, [BMNH, IVB, NMP] (Baruš & Tenora 1970, Dusbábek 1970, Gaisler 1970a, Hůrka 1970), 15 March 1967 (Dusbábek 1970); Jalalabad, 2 inds. [= 17 September 1964: 1 f, 2 July 1965: 1 m, 1 f], SMF (Felten 1971). – Afghanistan, 3 inds., BMNH, 3 inds., FMNH (DeBlase 1980).

Distribution. *Eptesicus pachyomus* is a rare bat in Afghanistan, only two localities are known from the eastern part of the country (Fig. 32), from the broader Jalalabad valley of the Konar and Nanagarhar provinces. On the other hand, in the city of Jalalabad it seems to be a rather common bat, it was recorded there several times by various authors (see Records). The records come from the altitudes of 570 m and 830 m a. s. l. (Figs. 34, 35).

Figs. 34, 35. Ruins of the residence of Amir Habibullah in Jalalabad (Nangarhar province); a roosting site and a foraging habitat of *Eptesicus pachyomus*, *Pipistrellus pipistrellus*, *P. kuhlii*, and *Scotophilus heathii*. A female colony of *E. pachyomus* was localised in a fissure between two logs (36 ♀♀ were collected there in April 1967; Fig. 35), 17 individuals of *P. pipistrellus* were collected from a large colony hidden in various fissures there on three occasions in April 1967, and two females of *S. heathii* were found in a fissure behind a column on 25 April 1967. On 24 April 1967, two males of *P. kuhlii* were shot foraging over the yard of the former residence.

The occurrence of *E. pachyomus* in Afghanistan constitutes a part of the north-western margin of the species range, the record from Chaghasarai represents the northernmost site of the species occurrence in the Indian subcontinent. *E. pachyomus* occurs in the Oriental region at the southern slopes of the Himalayas and Hindu Kush from Afghanistan to north-eastern India, and further from northern Indochina to central China, Taiwan, Korea and Japan (Corbet & Hill 1992, Bates & Harrison 1997). It has been recently discovered in southern Iran and the two Iranian localities are the only sites situated west of the Afghanistani range; Chahar Dahaneh, the eastern one of the Iranian sites, lies some 435 km south-west of the Afghanistani border and ca. 1470 km of Jalalabad, Nangarhar (Benda et al. 2012). The occurrence of *E. pachyomus* in Afghanistan continues directly to the east, where the records are more frequent (Bates & Harrison 1997); two records are available from northern Pakistan (Dunga Gali in the Murree Hills, Karakar Pass; Roberts 1977, Bates & Harrison 1997) and four in Kashmir (Akhnoor, Bhaderwah, Pahlgam, Shar; Roberts 1977, Chakraborty 1983). A single old record is available from northern India, Blanford (1891) reported it from near Masuri, Uttarakhand (no record is actually available from Himachal Pradesh, see Saikia et al. 2011). The latter record constitutes the eastern margin of *E. pachyomus* range in the north-western segment of the Oriental region, separated by a thousand kilometres from the east Indian range – eastern Nepal, Assam, Nagaland, Tibet, see Bates & Harrison (1997).

Material examined. 1 ♀ (SMF 38862 [S]), Jalalabad, Nangarhar, 650 m, 17 September 1964, leg. D. Meyer-Oehme; – 1 ♂, 1 ♀ (SMF 38863, 38874 [S]), Jalalabad, Nangarhar, 650 m, 2 July 1965, leg. D. Meyer-Oehme; – 1 ♀ (IVB af652 [S+B]), Jalal Abad, university campus, 8 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 15 ♀♀ (BMNH 69.786, IVB af689–693, af696–704 [S+B], incl. the holotype of *Eptesicus serotinus pashtonus* Gaisler, 1970), Jalal Abad, Habibula Palace, 13 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂, 10 ♀♀ (IVB af957–967 [S+B], incl. the allotype [= paratype] of *Eptesicus serotinus pashtonus* Gaisler, 1970), Jalal Abad, Habibula Palace, 22 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 7 ♀♀ (IVB af990, af991, af993, af994, af996, af997, NMP 95431 [S+B]), Jalal Abad, Habibula Palace, 26 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 3 ♀♀ (SMF 38866–38868 [S]), Tschaga Serail, Konar, 875 m, 2 July 1965, leg. D. Meyer-Oehme.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Eptesicus pachyomus* are shown in Table 13. For the material examined see above.

As we reviewed earlier in more detail (see Benda et al. 2012), *E. pachyomus* has been recently recognised as a full species and separated from the species rank of *E. serotinus*, based on the results of the molecular genetic analysis by Juste et al. (2013). Within the distribution range of this newly established species, five subspecies could be recognised (cf. Corbet 1978, Koopman 1994, Simmons 2005); viz. *E. p. pachyomus* (Tomes, 1857) in Pakistan and north-western India, *E. p. andersoni* (Dobson, 1871) in southern mainland China, *E. p. pallens* Miller, 1911 in Korea and northern China, *E. p. horikawai* Kishida, 1924 in Taiwan, and *E. p. pashtonus* Gaisler, 1970 in eastern Afghanistan. The revision by Juste et al. (2013) validated three of them as relevant taxa within the species, *pachyomus*, *andersoni* and *pallens*, while samples of the two remaining forms were not included in the analysis, including those of *pashtonus* from Afghanistan.

The large-sized *Eptesicus* populations of the broader Jalalabad valley in eastern Afghanistan were originally referred to *E. serotinus pachyomus* (Gaisler et al. 1968, Neuhauser 1969). Later on, Gaisler (1970a: 27, 32–33) examined these bats thoroughly and described their final taxonomic evaluation as follows: "As for the material from Jalalabad, I had believed […] that it belongs to the ssp. *E. serotinus pachyomus*, described from Rajputana [= Rajasthan, India]. However, my examination of this subspecies from Kashmir has revealed such striking differences that it has been necessary to examine this species in greater detail. […] The colouration of all 36 females and one male from Jalalabad differs from that of the hitherto described subspecies of *E. serotinus*. Essentially, it is greyish on the dorsal surface, greyish white or yellowish white on the ventral one, most specimens showing a conspicuous tawny blotch on their throat […]. Apart from the

Table 14. Comparison of biometric data on six sample sets of the *Eptesicus serotinus* group from southern Asia; *E. pachyomus* (Tomes, 1857) from Iran, Pakistan, Kashmir and China, *E. serotinus serotinus* (Schreber, 1774) (*serotinus* morphotype) from the Caucasus and Middle East, *E. s. serotinus* (*turcomanus* morphotype) from Iran and West Turkestan, and *E. s. mirza* (De-Filippi, 1863) from the Middle East. For abbreviations see p. 272; indices: I = LaZ/LCb; II = CC/CM^3

	pachyomus Iran, Pakistan & Kashmir					*pachyomus* China					*serotinus* SW Asia				
	n	**M**	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	7	**52.19**	50.2	55.3	1.747	7	**51.71**	49.9	54.6	1.596	53	**51.99**	48.1	55.0	1.592
LCr	9	**20.17**	19.81	21.12	0.400	6	**20.66**	20.09	21.25	0.498	64	**20.62**	19.53	21.62	0.492
LCb	8	**19.28**	18.87	20.11	0.394	5	**19.92**	19.45	20.27	0.310	62	**19.83**	18.87	21.22	0.478
LaZ	8	**14.01**	13.43	14.62	0.364	5	**14.72**	14.42	15.02	0.257	63	**14.00**	13.04	14.72	0.393
LaI	10	**4.24**	3.83	4.77	0.310	7	**4.48**	4.08	4.64	0.205	66	**4.30**	4.03	4.54	0.125
LaInf	9	**6.68**	6.19	7.07	0.274	7	**6.81**	6.42	7.18	0.271	66	**6.50**	5.97	6.96	0.238
LaN	9	**9.04**	8.52	9.71	0.382	7	**9.93**	9.51	10.29	0.276	65	**9.48**	9.03	10.03	0.224
LaM	8	**10.63**	10.28	11.16	0.261	5	**11.37**	10.85	11.58	0.295	63	**10.99**	10.28	11.64	0.306
ANc	8	**6.90**	6.48	7.42	0.348	5	**6.72**	6.47	6.87	0.150	62	**6.79**	6.27	7.27	0.240
CC	9	**6.38**	6.17	6.75	0.187	7	**6.57**	6.38	6.82	0.174	64	**6.65**	6.21	7.00	0.198
M^3M^3	9	**8.51**	8.18	8.97	0.241	7	**8.80**	8.35	9.20	0.295	66	**8.52**	7.83	9.02	0.259
CM^3	10	**7.57**	7.11	7.95	0.217	7	**7.59**	7.42	7.81	0.139	66	**7.75**	7.16	8.27	0.219
LMd	8	**15.13**	14.68	15.60	0.320	7	**15.52**	15.11	15.93	0.332	66	**15.29**	14.38	16.25	0.385
ACo	8	**5.66**	4.92	6.04	0.345	7	**5.78**	5.55	6.27	0.285	66	**5.68**	5.22	6.32	0.239
CM_3	10	**8.29**	7.88	8.64	0.194	7	**8.29**	7.95	8.53	0.201	66	**8.59**	8.02	9.52	0.253
I	9	**0.727**	0.704	0.748	0.012	6	**0.739**	0.725	0.752	0.009	59	**0.706**	0.667	0.737	0.016
II	9	**0.849**	0.819	0.886	0.019	7	**0.865**	0.829	0.893	0.022	64	**0.859**	0.808	0.909	0.023
	turcomanus Iran					*turcomanus* West Turkestan					*mirza* SW Asia				
LAt	20	**49.05**	46.8	51.1	1.218	37	**50.28**	46.7	55.0	1.983	21	53.62	50.1	55.9	1.896
LCr	16	**19.74**	18.77	20.62	0.518	42	**19.78**	18.52	21.08	0.528	22	21.44	19.95	22.47	0.715
LCb	16	**19.25**	18.56	19.83	0.388	39	**19.31**	18.22	20.34	0.502	22	20.60	19.27	21.70	0.628
LaZ	15	**12.98**	12.63	13.40	0.245	42	**13.13**	11.47	14.04	0.547	22	14.61	13.50	15.56	0.511
LaI	16	**4.23**	3.88	4.38	0.120	42	4.24	3.92	4.62	0.172	22	4.28	3.97	4.58	0.155
LaInf	16	**6.28**	5.82	6.54	0.203	42	6.37	5.67	6.97	0.272	21	6.69	6.12	7.02	0.217
LaN	16	**8.97**	8.64	9.34	0.198	42	9.04	8.08	9.64	0.306	22	9.68	9.28	10.20	0.233
LaM	16	**10.15**	9.23	10.61	0.329	41	10.37	9.28	10.93	0.369	22	11.60	11.18	12.02	0.248
ANc	16	**6.27**	5.85	6.74	0.236	39	6.39	5.55	6.90	0.305	22	7.18	6.42	7.82	0.308
CC	16	**6.29**	5.98	6.52	0.175	42	6.28	5.53	7.08	0.290	21	6.93	6.48	7.31	0.267
M^3M^3	16	**8.10**	7.63	8.32	0.168	42	8.23	7.47	8.86	0.325	21	8.80	8.22	9.26	0.302
CM^3	16	**7.48**	7.11	7.73	0.152	42	7.48	7.02	8.11	0.190	22	8.00	7.45	8.56	0.286
LMd	15	**14.39**	14.07	15.00	0.261	42	14.57	13.67	15.25	0.353	22	15.99	14.82	16.97	0.541
ACo	15	**5.17**	4.77	5.39	0.157	42	5.34	4.73	5.82	0.300	22	6.04	5.49	6.40	0.260
CM_3	15	**8.11**	7.69	8.36	0.188	42	8.17	7.56	8.88	0.223	22	8.87	8.33	9.38	0.286
I	15	**0.674**	0.647	0.700	0.016	39	0.681	0.630	0.716	0.021	22	0.709	0.680	0.739	0.016
II	16	**0.841**	0.809	0.864	0.019	42	0.840	0.763	0.885	0.027	21	0.869	0.825	0.926	0.025

different colouration, the specimens from Jalalabad differ in some skull dimensions, above all, in the ZB [= zygomatic width] […], from both neighbouring geographic forms, *E. s. turcomanus* and *E. s. pachyomus*. For this reason, I consider them to belong to a new subspecies for which I propose the name of *Eptesicus serotinus pashtonus* n. ssp. […]. Diagnosis – Colour […]: upper parts from near light ochre-gray to olive-drab or near medium gray; under parts from near buff-white to near light ochre-brown, with a tawny gular patch in most individuals. Skull heavy and broad, especially the rostrum and zygomatic arches."

The existence of this new subspecies, endemic to eastern Afghanistan (or also to the adjacent area in Pakistan), was accepted by most of the subsequent authors (Felten 1971, Corbet 1978, Sinha 1980, Koopman 1994, Bates & Harrison 1997, Roberts 1997, Simmons 2005, Srinivasulu & Srinivasulu 2012). Felten (1971) assigned also five SMF specimens collected by D. Meyer-Oehme in Jalalabad and Chaghasarai in 1965 to this taxon (see Records and/or Material examined).

Gaisler (1970a) defined *E. s. pashtonus* within the broadly considered species concept of *E. serotinus* after Ellerman & Morrison-Scott (1951) and compared the respective samples with a large series of specimens covering the whole distribution range of this taxon (from Europe to the Far East), although sets of the Asian taxa from the critical neighbouring populations were relatively limited in the numbers of specimens examined. We compared again the IVB and SMF samples from the Jalalabad valley (including the type and paratype of *E. s. pashtonus*) with other south-Asian specimens of the *serotinus* complex, identified in accordance with the results by Juste et al. (2013). The Afghanistani bats were similar in many aspects to other samples of *E. pachyomus*, i.e. of the nominotypical form from Iran, Kashmir and Pakistan and also of *E. p. andersoni* from China. This similarity was most pronounced in the body and skull size and in skull shape (see Table 14 and Figs. 36, 37). All these three populations are medium-sized compared to the samples of *E. serotinus* (i.e. similar in size also to the *serotinus* morphotype of *E. s. serotinus*, but larger than the *turcomanus* morphotype and smaller than *E. s. mirza*), and also possess relatively very broad skulls in all their regions, i.e. across rostrum, zygomatic arches, and neurocranium, as well as a relatively high neurocranium. In the skull shape, the sample sets of *E. pachyomus* differ from the three sets of *E. serotinus* (in which the *turcomanus* morphotype is the most distinct by its narrow skull and low neurocranium; Table 14, Fig. 37), but do not differ significantly from each other. Concerning the skull shape and size, the taxa *pachyomus* s.str., *pashtonus*, and *andersoni* represent

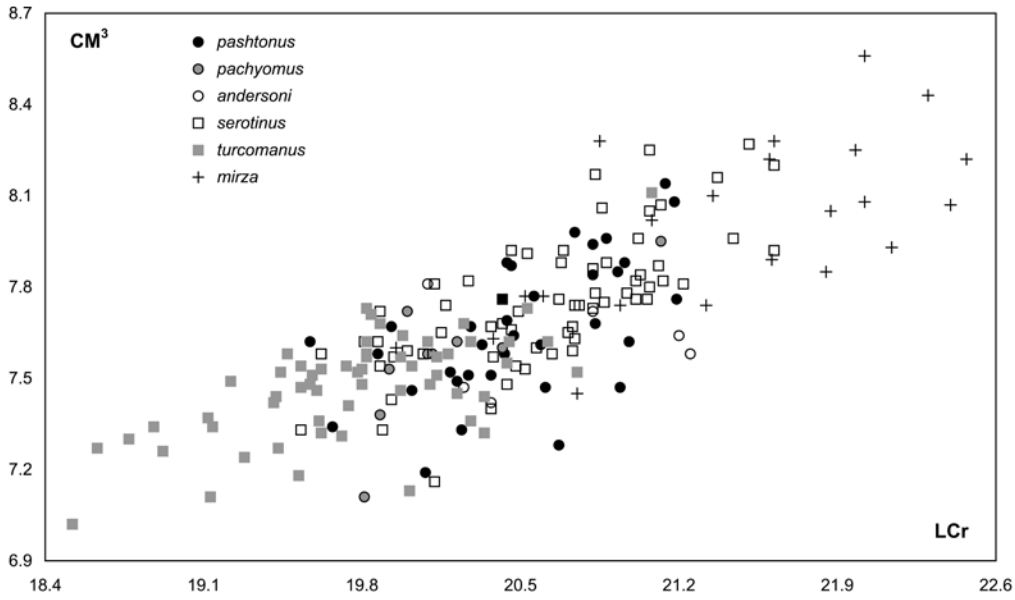

Fig. 36. Bivariate plot of the examined Afghanistani (*pashtonus*) and comparative samples of the *Eptesicus serotinus* group from southern Asia: greatest length of skull (LCr) against the length of upper tooth-row (CM^3). See text for details.

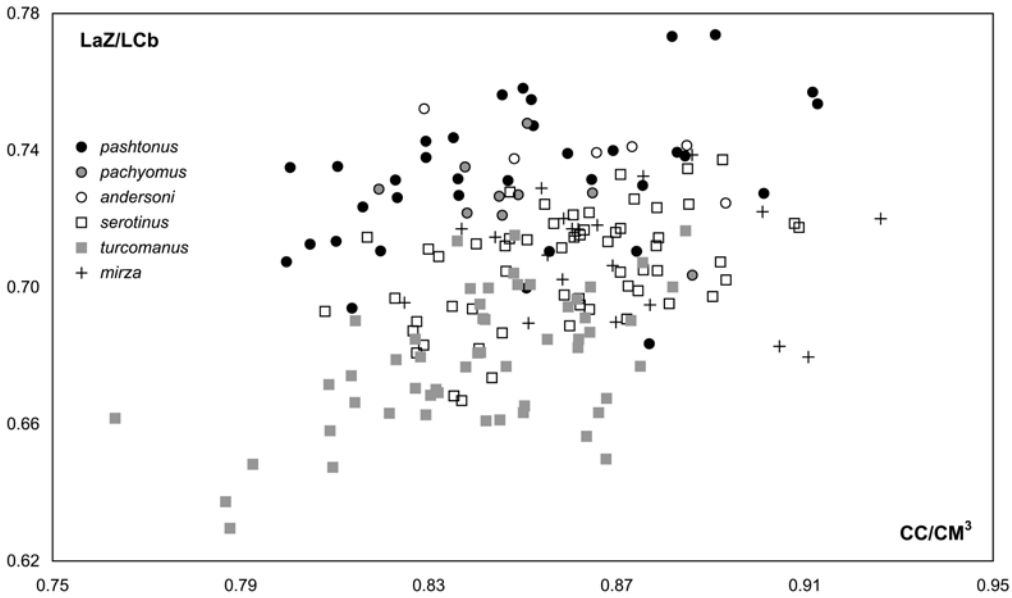

Fig. 37. Bivariate plot of the examined Afghanistani (*pashtonus*) and comparative samples of the *Eptesicus serotinus* group from southern Asia: relative width of rostrum (CC/CM^3) against the relative width of skull (LaZ/LCb). See text for details.

almost identical morphotypes. We found the only significant difference in the pelage colouration; however, this difference is apparent only between the Chinese form *andersoni*, which is dark brown (similarly as in European *E. serotinus*), and the remaining two taxa, which both conform to the original description by Tomes (1857: 51): "The fur is markedly and singularly bicoloured, very much resembling that of *S. discolor* [= *Vespertilio murinus*]. That of the upper parts is of a dark brown, conspicuously tipped with whitish brown. Beneath, it is brown at its base, with the terminal half yellowish brown."; see the above description of *pashtonus* by Gaisler (1970a) and of the Iranian *pachyomus* by Benda et al. (2012: 368, Figs. 120, 121). It should be also noted that two specimens (BMNH 8.7.6.5., 8.7.6.6.) out of the four bats from Kashmir used by Gaisler (1970a) as comparative samples of *E. serotinus pachyomus* represent subadult females; therefore, their skulls were not as wide as in full grown adult individuals, and gave a false impression about the skull shape of the Kashmiri populations, when average values are considered.

In conclusion, the samples of *Eptesicus serotinus pashtonus* are very similar in all compared characters (body and skull size, skull shape, pelage colouration) to the Iranian, Pakistani and Kashmiri samples of *E. pachyomus*, regarded as the nominotypical populations of this species (in other words, the less numerous Iranian, Pakistani and Kashmiri samples fall into the variation ranges of dimensions of rather abundant Afghanistani samples). Thus, the comparison did not support an unusual position of the eastern Afghanistani populations of *E. pachyomus* among other populations of this species living at the Palaearctic-Oriental transition in the region between Iran and India. The separate taxonomic status of *Eptesicus pachyomus pashtonus* Gaisler, 1970 still remains to be proved.

Eptesicus ognevi Bobrinskoj, 1918

Records. **Published data** [as *E. bottae*]: T a k h a r: 7 km E of Taliq-an [1], 21 August 1965: coll. 1 ind. (mummy) (Neuhauser 1969).

Distribution. If the identification of the only available specimen is correct (see Comments below), *Eptesicus ognevi* ranks among the rarest bats of Afghanistan (otherwise, it remains unknown from the country). The specimen in question was reported from the altitude of 895 m in the Takhar province, north-eastern Afghanistan (Fig. 32), close to the border of Tajikistan (Neuhauser 1969).

In his maps of *E. ognevi* distribution, Kuzâkin (1944, 1950) marked a point corresponding with the position of Fayzabad, Badakhshan, north-eastern Afghanistan. However, in the descriptions of distribution of this bat he mentioned the record from Fejzabad (= Faizobod), Tajikistan, ca. 45 km east of Dushanbe (originally published by Bobrinskoj (1918: 2) in Russian as "kišlak Fejzabad v gornoj oblasti Karategin"), while Afghanistan is not reported as an area of its occurrence at all (the same also Kuzâkin 1965). Thus, the points in Kuzâkin's maps represent rather an error than an evidence from Afghanistan (Kuzâkin [1944, 1950] made the same mistake also concerning the distribution maps of *Eptesicus serotinus*, see above). However, the erroneous "record" from Fayzabad/Afghanistan was accepted as an evidence of the species occurrence by Aellen (1959a), Harrison (1964), Neuhauser (1969), Gaisler (1971), Hanák & Gaisler (1971), Niethammer (1983), Bates & Harrison (1997), and Srinivasulu & Srinivasulu (2012). The problem of the "record" from Fayzabad, Badakhshan, was discussed in detail already by Nader & Kock (1990), however, these authors did not reject the mismarked record in full, perhaps as they did not identify it with the original report by Bobrinskoj (1918); see also the footnote by Benda et al. (2006: 155).

Kullmann (1970) and Gaisler (1971) introduced (independently of each other) another erroneous record of *E. ognevi* from Afghanistan; to this species they referred a specimen from Kabul, reported and preliminary identified as *Eptesicus* sp. by Meyer-Oehme (1965). The latter author added the following note on the specimen (p. 55): "*Eptesicus bottae ognevi* (Unterarmlaenge 45–46,6 [mm]) konnte der Verfasser bislang nicht sammeln, wohl aber am 3.5.65 in Kabul ein *Eptesicus* mit der Unterarmlaenge 41,5 [mm]. Ein von M. S. Siddiqi [1961] als *E. isabellinus bottae* Peters verzeichnetes Maenn. aus Astor, Kashmir […] hat die Unterarmlaenge 42,2 [mm]." Subsequently, Hanák & Gaisler (1971: 18) mentioned two records of *E. ognevi* from the country: "In Afghanistan, there are two more or less uncertain records in Faizabad and Kabul (Gaisler, 1971)." Nevertheless, the Kabul record was accepted by Niethammer (1983) and with a question mark also by Bates & Harrison (1997) and Srinivasulu & Srinivasulu (2012). Anyway, the respective specimen is currently deposited in the SMF collection and its species identification was revised already by Felten (1971), who referred it to *Eptesicus nilssonii kashgaricus* Bobrinskoj, 1926. Later on, Nader & Kock (1990) introduced the identification into the current taxonomic picture (Strelkov 1986, Simmons 2005) and referred the specimen to *E. gobiensis* (see also below), these authors were the first who reported on the whole story of the Kabul record.

Srinivasulu & Srinivasulu (2012) reported *E. ognevi* (under *E. bottae*) from the Balkh province. This reference perhaps represents a mislocalised site of the record by Neuhauser (1969).

The only record originating from an area east of Afghanistan is available from Shenkagarh in the Astor district of western Kashmir (Roberts 1977, cf. Siddiqi 1969). However, the dimensional data on the respective BMNH specimen, given by Bates & Harrison (1997), cover the zone of overlap between the dimensions of *E. ognevi* and of *E. gobiensis*, they could thus indicate similarly both species. Moreover, the altitude of the Kashmiri record (3200 m a. s. l.) is rather extreme for *E. ognevi* but corresponds more with the known habitat preference of *E. gobiensis* (Strelkov 1986). The Kashmiri occurrence of *E. ognevi*, based on a single record, still remains to be confirmed by a profound examination of the respective specimen.

The territory of Afghanistan lies at the southern margin of the distribution range of *E. ognevi*. It is a bat occurring in the southern part of West Turkestan, with minor range extensions into adjacent areas, south-eastern Transcaucasia, northern Iran, and western Inner Mongolia (Hanák & Gaisler 1971, Nader & Kock 1990, Benda et al. 2006, 2011a). The southern border of its distribution range goes from Armenia through northern Iran to southern Tajikistan, and perhaps also through northern Afghanistan to Kashmir. Three localities of *E. ognevi* are known from north-eastern Iran, from northern slopes or foothills of the Kopetdagh Mts.; the closest record to the Afghanistani border was made at Shurlaq, 97 km north-west of it (Benda et al. 2012). In the lowlands of the southern part of West Turkestan, adjacent to the north-western and northern areas of Afghanistan, *E. ognevi* is not a rare species (Bogdanov 1953, Strelkov et al. 1978, Habilov 1992); from a 60 km broad belt along the Afghanistani border at least 16 sites of occurrence were reported. Three sites (Ajvadž, Karaçop, Rabatkaşan) are known just from the border areas of Turkmenistan and Tajikistan, within 8 km from the border of Afghanistan (Kuzâkin 1939, Strelkov et al. 1978, Habilov 1992).

This occurrence in Iran and West Turkestan indicates *E. ognevi* in neighbouring Afghanistan to be extremely undersampled (even if the above record really exists). Since there are no significant geographical barriers between the dry and low landscapes of all these areas, similar habitats of northern Afghanistan certainly represent a part of the southern margin of the species range.

Comments. We did not examine any museum material of *Eptesicus ognevi* from Afghanistan. The only specimen from Afghanistan, attributable to this species was collected by Neuhauser (1969) at Taliqan, see Records and Distribution.

Neuhauser (1969: 84) added the following note on the respective bat: "The identification of the Street Expedition specimen is tentative, as it was received in a mummified condition. The skull had been crushed; nothing more than the *Eptesicus* dental formula, the C–M^3 measurement (6.9 mm) and the forearm and phalanx could be determined with accuracy." These circumstances certainly justify to consider the identification as very tentative, because of (1) the collection conditions, and (2) the size of the individual. Unfortunately, the respective specimen has been probably lost, since neither DeBlase (1980) nor Bates & Harrison (1997) mentioned it, although the remaining two specimens collected at Taliqan on the same occasion were reported from the FMNH collection (where the collections of the Street Expeditions are housed), see Neuhauser & DeBlase (1971), DeBlase (1980), Bates & Harrison (1997), or Csorba et al. (2003).

Ad (1), Neuhauser (1969: 53) described the collection of the bats as follows: "Single mummified specimens of *Rhinolophus clivosus* [= *R. bocharicus*], *Pipistrellus pipistrellus* and *Eptesicus bottae* were purchased from a local boy. He stated that they had been found in cracks of the walls around his house." These described conditions suggest the finding was made in a synanthropic roost and it may be related to remains of a nursery colony. The collected *Eptesicus* specimen might have been a mummified carcass of a juvenile, whose body and skull size was not fully developed. Disarranged bones, which were perhaps not fully ossified, also say for the juvenile growth of the specimen.

Ad (2), the value of the only reported dimension (CM^3 6.9 mm) is larger than values known for this measurement in adult *E. ognevi* from West Turkestan and Transcaucasia, it exceeds them by 0.3 mm (CM^3 5.72–6.58 mm; n=62; Benda et al. 2006: 162, Table 23). On the other hand, the respective value is close (difference only 0.1 mm) to the lower margin of the range of CM^3 of adult specimens of the *turcomanus* morphotype of *E. serotinus* from West Turkestan and Iran (CM^3 7.02–8.11 mm; n=42; Benda et al. 2006: 147, Table 22, Benda et al. 2012: 363, Table 22).

Hence, based on the only dimension available, the size of the respective specimen rather indicates *E. serotinus* than *E. ognevi*. If the respective specimen represents a juvenile, which cannot be confirmed or excluded, but the conditions suggest so, the indication of *E. serotinus* is

even stronger. The evidence of *E. ognevi* occurrence in Afghanistan thus remains very tentative. Anyway, as it was reviewed above, even in the case that Neuhauser's (1969) specimen represents *E. serotinus* instead of *E. ognevi*, the latter species should occur in Afghanistan, as it is apparent from its frequent distribution in the adjacent parts of West Turkestan (see Distribution).

According to the available morphological evidence (Benda et al. 2006), *E. ognevi* is a monotypic species, the populations of Transcaucasia and West Turkestan do not show any remarkable differences in metric and colouration characters. Even if any differences are proven and the taxonomy of the species is changed, the north-Afghanistani populations (not yet confirmed for sure) should belong to the nominotypical form, since the type locality of *E. ognevi* (Sohta-Činar, western Tajikistan; Bobrinskoj 1918: 12) lies some 120 km north of the Afghanistani border.

Srinivasulu & Srinivasulu (2012) erroneously reported the subspecies *E. bottae taftanimontis* de Roguin, 1988 from Afghanistan ("Badakshan, Balkh, probably also Kabul" provinces). However, this form remains known only from two sites in south-eastern Iran (de Roguin 1988, Benda et al. 2012). This error was perhaps caused by desinterpretation of the following sentence by Corbet & Hill (1992: 131): "the type locality of *E. b. taftanimontis* [de] Roguin, 1988: 598 (Kasheh, W slope of Kuh[-]e Taftan, Province Seistan and Baluchistan, Iran, 28°35'N, 61°E) is very close to the Iran-Pakistan border and this subspecies may be found in Pakistan."

Eptesicus gobiensis Bobrinskoj, 1926

Records. **Published data**: K a b o l: Kabul, 1800 m, 3 May 1965: 1 f, SMF (Meyer-Oehme 1965 [as *Eptesicus* sp.], Gaisler 1971 [as *E. bottae*], Felten 1971 [as *E. nilssoni*], Nader & Kock 1990).

Distribution. *Eptesicus gobiensis* is a very rare bat in Afghanistan, only one specimen of this species is available from this country, collected from Kabul at ca. 1800 m a. s. l. (Meyer-Oehme 1965, Nader & Kock 1990; Fig. 1).

E. gobiensis ranks among the rarest bats throughout its range, which covers a large part of the continental arid areas of Central Asia, stretching from lowland deserts of the north of West Turkestan (central and western Kazakhstan) to elevated plateaus of East Turkestan and Mongolia (Bobrinskoj 1926, Strelkov 1986, Artyushin et al. 2012b). Only sporadic records are known from the surrounding mountain ranges (Caucasus, Talysh, Alborz, Tibet), including the finding from the central part of the Hindu Kush at Kabul. This Afghanistani record constitutes a part of the southern margin of the distribution range of *E. gobiensis*; it continues to the west, three records are available from Iran – one site of repeated findings in the Talysh Mts. (Harrison 1963, Benda & Reiter 2006), two other sites in the central part of the Alborz Mts. (Lay 1967, Benda et al. 2012), almost 900 km from the Afghanistani border. Only one (or two?) uncertain record is known from areas lying east of Afghanistan, Scully (1881a) reported a finding of a specimen of *Vesperugo borealis* (= *Eptesicus nilssonii* s.l.) in the Gilgit district of northern Kashmir, and Chakraborty (1983) and Ghosh (2008) two specimens of *Eptesicus nilssoni kashgaricus* (= *E. gobiensis*) collected in Gilgit at the altitudes of 3200 m and 3350 m a. s. l., respectively. A possible record was also reported from western Nepal, however, its affiliation to *E. gobiensis* is not fully clear (see Mitchell 1978, Hanák & Horáček 1986).

Nevertheless, *E. gobiensis* was only exceptionally found in the southern part of West Turkestan, where three records are known (Habilov 1992); Bobrinskoj (1926) and Ognev (1928) reported an old finding from Fargona in eastern Uzbekistan and suggested its real origin in the Pamirs, Strelkov (1986) and Habilov (1992) mentioned another old specimen from Iskanderkul lake in western Tajikistan, and Habilov (1992) the only relatively recent record from the Pamirs of eastern Tajikistan.

The accidental (and mostly very old) evidence of the distribution of *E. gobiensis* in the mountains of southern and Central Asia suggests an occurrence of this bat in remote and very elevated areas; however, it may not indicate its real abundance and range limits in Afghanistan and neighbouring areas.

Material examined. 1 ♀ (SMF 38879 [S+A]), Kabul, 1800 m, 3 May 1965, leg. D. Meyer-Oehme.

Morphology and variation. Forearm and cranial dimensions of the only known Afghanistani specimen of *Eptesicus gobiensis* are shown in Table 13.

The taxonomic history of the single Afghanistani specimen of *E. gobiensis* is rather complicated (see also under *E. ognevi* above). The bat was originally reported by its collector Meyer-Oehme (1965: 55) as *Eptesicus* sp., but with a preliminary note introducing a possibility to identify it as *E. bottae ognevi* (= *E. ognevi*). This record/specimen was reported under *E. bottae* by Kullman (1970), Gaisler (1971) and Niethammer (1983), and with a question mark also by Bates & Harrison (1997) and Srinivasulu & Srinivasulu (2012). However, already Felten (1971) examined properly the respective specimen and identified it as *E. nilssoni kashgaricus* Bobrinskoj, 1926. This report remained overlooked for a certain time and was reminded by Hanák & Horáček (1986) and Nader & Kock (1990). The latter authors assigned this specimen to the rank of another species, *E. gobiensis*, in accordance with Strelkov (1986).

The populations of small-sized *Eptesicus* bats inhabiting Central Asian mountains and upper plateaus were originally assigned to *E. nilssonii* (Keyserling et Blasius, 1839). Under this species name, Bobrinskoj (1926: 96–97) described three subspecies characterised by their pelage colouration; these descriptions were based on a very limited number of specimens (collected by the old Russian explorers, N. M. Prževal'skij, M. V. Pevcov, and P. K. Kozlov); viz. *E. n. gobiensis*

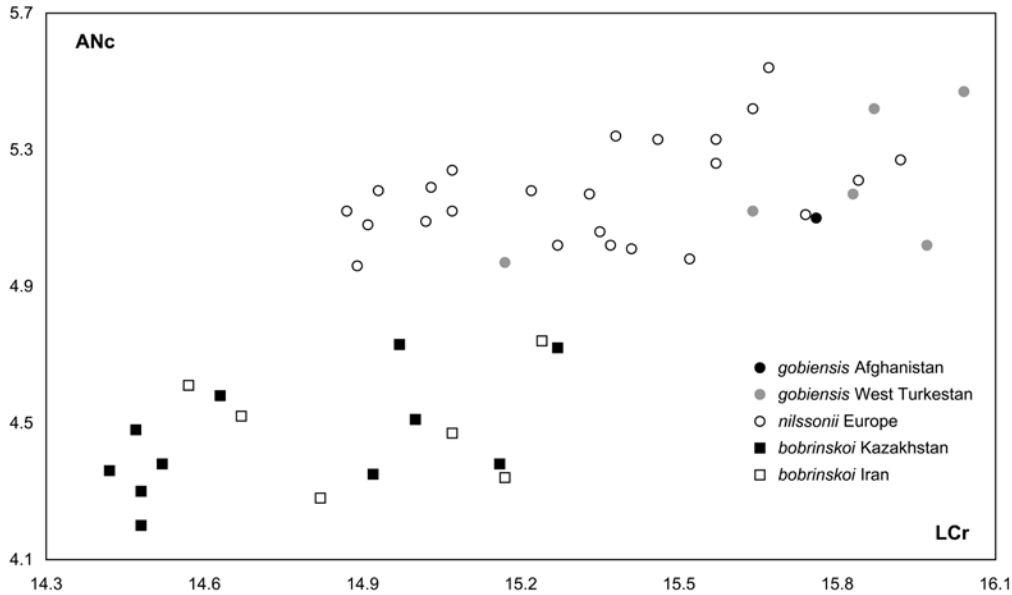

Fig. 38. Bivariate plot of the examined Afghanistani and comparative samples of the *Eptesicus nilssonii* group: greatest length of skull (LCr) against the braincase height (ANc).

from Burhastej-tala (eastern margin of the Gobi Altai, Mongolia); *E. n. centrasiaticus* from the Hatu gorge near the Orin-Nur lake (Tibet [Qinghai], China); and *E. n. kashgaricus* from Karasaj, northern slopes of the Kunlun (Hotan-tag) Mts. (East Turkestan, China). *E. n. gobiensis* was described on the basis of one specimen being typical by "ochraceous-tawny" dorsal pelage colouration and black face, ears and wings (LAt 38.5 mm, CM^3 5.5 mm); *E. n. centrasiaticus* on the basis of six specimens, typical by pale "warm buff" colouration of dorsal pelage and blackish naked parts (LAt 39.0–41.5 mm, CM^3 5.5–6.0 mm); and *E. n. kashgaricus* on the basis of eight specimens, typical by very pale "light buff" dorsal pelage colouration and pale grey naked parts (LAt 40.2–42.0 mm, LCr 16.0 mm, CM^3 5.3–6.0 mm). Felten (1971) assigned the Afghanistani specimen to the latter name, originating from the geographically closest region, the south-western part of East Turkestan (ca. 800 km across the Karakoram and Kunlun Mts.); this also conforms to the dimensions given by Bobrinskoj (1926), see Table 13. Felten (1971: 375) described its colouration as follows: "Die lange Behaarung ist oben gelbbraun, unten stark kontrastierend weißlich; das Einzelhaar ist deutlich zweifarbig. Ohr und Flughaut sind schwärzlich." Since the bat represents a specimen submerged in alcohol, we did not examine the colour properly. Anyway, the description given by Felten (1971) conforms to the description by Bobrinskoj (1926). Felten's (1971) identification of the Afghanistani bat was later mentioned by Koopman (1994).

Horáček & Hanák (1986) suggested to put all three names created by Bobrinskoj (1926) into synonymy of *E. n. gobiensis* and regarded this as the only Central Asian subspecies of *E. nilssonii*, which concerned also the Afghanistani record (Horáček & Hanák 1986: 305). However, based on differences found in morphological characters (baculum, skull size and structure, pelage colouration) as well as sympatric occurrence in several regions (northern Kirghizstan, eastern Kazakhstan, Mongolia), Strelkov (1986) suggested to separate *E. gobiensis* from the rank of *E. nilssonii* and regard both of them as full species. Within *E. gobiensis* he tentatively suggested to design two subspecies, the northern and darker *E. g. gobiensis* and the southern and paler *E. g. centrasiaticus* (with *kashgaricus* as a synonym). However, *E. g. kashgaricus* was mentioned as a valid subspecies, also of the Afghanistani populations, by Corbet & Hill (1992), Bates & Harrison (1997), Simmons (2005), and Srinivasulu & Srinivasulu (2012).

The taxonomic analysis of small-sized Asian forms of *Eptesicus* by Artyushin et al. (2012b), combining molecular genetic and morphological analyses, revealed close phylogenetic positions of *E. gobiensis* and *E. bobrinskoi* Kuzâkin, 1935. The latter form was until then considered a species endemic to lowland deserts of central and western Kazakhstan (Koopman 1994, Horáček et al. 2000, Simmons 2005); the revision by Artyushin et al. (2012b) demonstrated it to represent just a small-sized lowland subspecies of *E. gobiensis*, *E. g. bobrinskoi*, while the former content of *E. gobiensis* (sensu Strelkov 1986) to represent a mountane large-sized form, *E. g. gobiensis*. The latter subspecies thus should include also the Afghanistani populations of *E. gobiensis*.

To be summarised, during fifty years after its collection, the single specimen of *E. gobiensis* from Afghanistan changed its name at least five times. However, it cannot be excluded that the change introduced by Artyushin et al. (2012b) is not the last one concerning the bats today named *E. gobiensis* s.l. Although the Afghanistani specimen conforms in its skull size and shape to the bats from West Turkestan (Figs. 38, 39), the status of other populations still remains unresolved. The populations of *E. gobiensis* from the chain of mountains in the southern parts of Central Asia, from the eastern part of the Lesser Caucasus to the eastern Hindu Kush (i.e. of Azerbaijan, Iran, Tajikistan, Afghanistan, and Kashmir) represent rather a mosaic of morphotypes. Harrison (1963) and Benda & Reiter (2006) reported *E.* [*g.*] *bobrinskoi* from the Talysh Mts. of north-western Iran, i.e. bats morphologically conforming to *E. g. bobrinskoi* from the lowland deserts of Kazakhstan, but inhabiting the alpine zone of high mountains. On the other hand, DeBlase (1980) reported a record of one *E. gobiensis* (under *E. nilssonii gobiensis*) from the central Alborz Mts. of Iran,

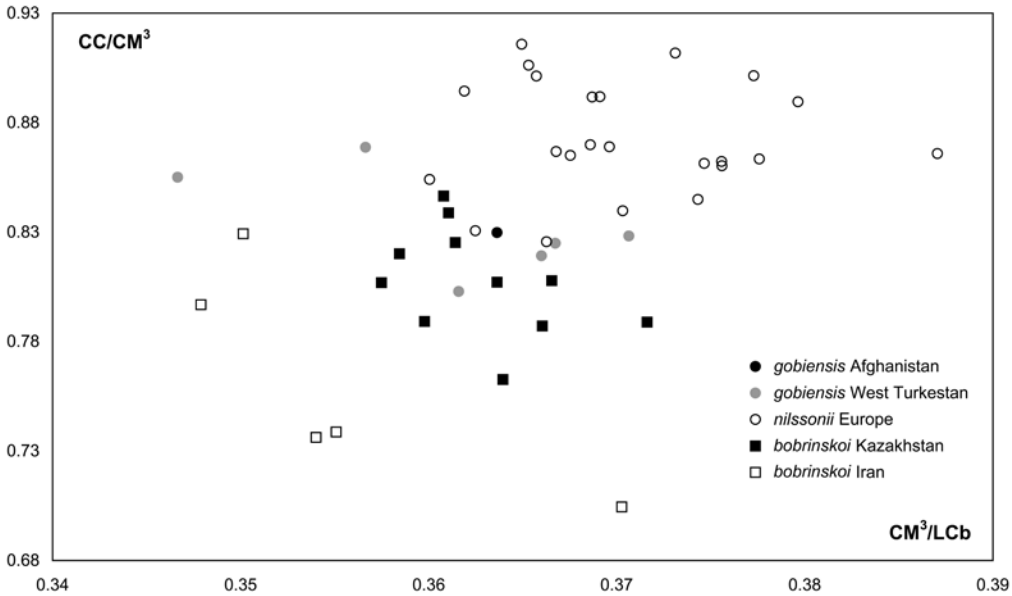

Fig. 39. Bivariate plot of the examined Afghanistani and comparative samples of the *Eptesicus nilssonii* group: relative length of rostrum (CM^3/LCr) against the relative width of rostrum (CC/CM^3).

in dimensions close to the specimens from Afghanistan and West Turkestan (see also Benda et al. 2012: 372, Table 23). Thus, this presumable population morphologically and perhaps also ecologically conforms to the Central Asian populations of *E. gobiensis*, but geographically it is widely separated from them, while situated close to *E. g. bobrinskoi* from the Talysh Mts. These apparent differences suggest that further detailed studies of the southern populations currently attributed to *E. gobiensis* may bring some new surprises, which may concern also the status of the Afghanistani populations.

Rhyneptesicus nasutus (Dobson, 1877)

Records. **Published data**: K o n a r: Nurgul [1], 8 km W of Kunar, near the entrance to Qachqar cave, 23 October 1965: shot 3 f (Neuhauser 1969). – L a g h m a n: Laghman [2], citrus garden, 21 October 1965: shot 1 m, FMNH (Neuhauser 1969, Bates & Harrison 1997). – N a n g a r h a r: Bisut near Jalalabad [3], 31 March, 2, 4, [5], 7 & 19 April 1967: coll. 14 m, 12 f, [BMNH, IVB, NMP] (Gaisler et al. 1968, Baruš & Tenora 1970, Dusbábek 1970, Gaisler 1970a, Groschaft & Tenora 1971a, b, cf. Groschaft & Tenora 1973, 1974), 9–10 April 1967 (Dusbábek 1970); – Jalalabad [4], 7 km north of town, at the edge of cultivated fields, 11 October 1965: shot 2 m, 3 f, 19 October 1965: shot 4 m, 7 f, 1 ind., 24 October 1965: shot 1 m, 1 ind., 25 October 1965: shot 1 m, 3 f (Neuhauser 1969); vicinity of Jalalabad, 11–25 October 1965: 9 m, 16 f, 2 inds., FMNH (DeBlase 1980). – N i m r u z: Seistan [5], SW Afghanistan, 1 ind., BMNH (DeBlase 1980). – Afghanistan, 1 ind., BMNH (DeBlase 1980).

Distribution. *Rhyneptesicus nasutus* is a rather infrequent bat in Afghanistan, five sites are known from the country (Fig. 40). The records were reported from two separate areas; four records are available from eastern Afghanistan, from the broader area of the Jalalabad valley of the Konar, Laghman and Nangarhar provinces, and one specimen was collected from the Seistan basin in the south-western corner of the country (Nimruz province). The records were made at low situated

localities, at a very narrow altitude range of 480–850 m a. s l. (mean altitude 656 m, range span 370 m).

R. nasutus is an endemic of south-western Asia (southern and eastern Arabia, Mesopotamia, southern parts of Iran, Afghanistan, and Pakistan) and the Afghanistani occurrence represents the north-easternmost margin of the known distribution range of this bat. While the distribution of *R. nasutus* in Seistan more or less continues in Baluchistan, the occurrence spot in eastern Afghanistan lies some 700–800 km away from the geographically closest records in central Pakistan (Bates & Harrison 1997). The broader Jalalabad valley thus represents an area of the species distribution widely separated from the rest of the species range. On the other hand, the known range of *R. nasutus* in the Middle East represents a mosaic of isolated occurrence patches rather than a continuous belt of occurrence (Harrison & Bates 1991, Benda et al. 2011c, 2012). The distribution in central Pakistan represents another such patch; Bates & Harrison (1997) summarised three records from central Baluchistan (Kharan, Rajbar, junction of the Razhai and Sichk rivers; Roberts 1977, Bates & Harrison 1997) and one from northern Sindh (near Rohri; Blanford 1891). The geographically inaccurate record from the Seistan basin, lying less than 400 km away, seems to adjoin to the latter area. However, DeBlase (1980: 187) mentioned the following text from the label of the respective BMNH specimen from Seistan: "If any question should arise about this specimen, there is a *possible* doubt as to its origin, as it was mislaid and afterwards found in debris."

On the other hand, in Iran, *R. nasutus* is distributed solely in arid lowlands along the southern border, both coastal areas and Mesopotamian plains (Benda et al. 2012). Two records situated

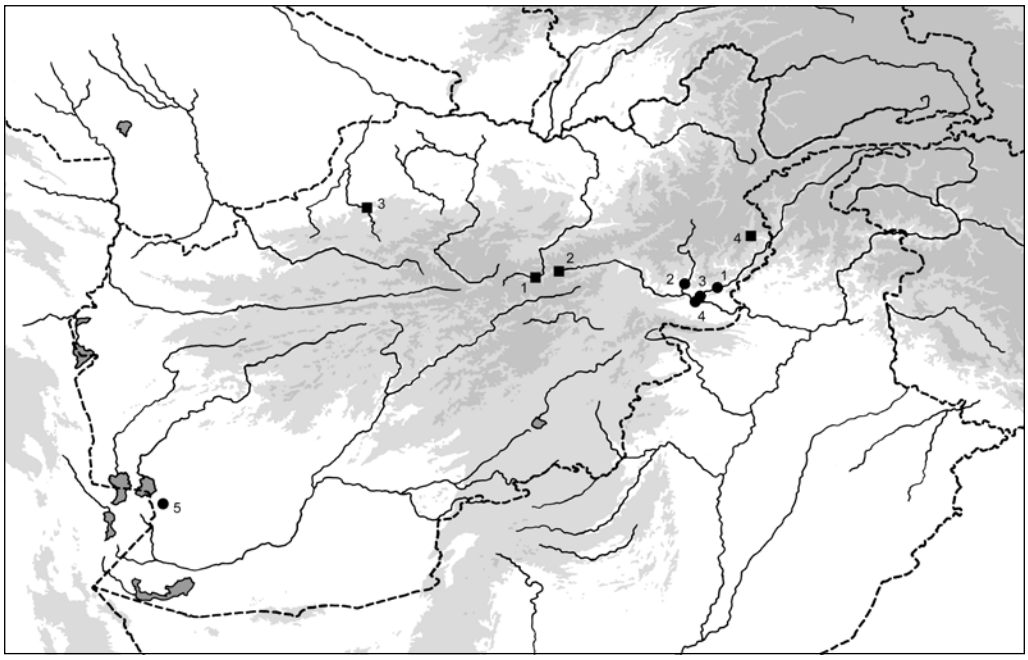

Fig. 40. Records of *Rhyneptesicus nasutus* (Dobson, 1877) (circles) and *Hypsugo savii* (Bonaparte, 1837) (squares) in Afghanistan.

Table 15. Comparison of biometric data on four sample sets of *Rhyneptesicus nasutus* (Dobson, 1877) from the Middle East. For abbreviations see p. 272

	nasutus Iran					*pallucens* Iran, Iraq & UAE				
	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	8	**38.39**	37.2	39.9	0.861	4	**36.68**	35.5	37.9	1.078
LCr	7	**13.10**	12.81	13.39	0.213	6	**13.37**	12.93	13.95	0.383
LCb	7	**12.77**	12.45	13.18	0.287	6	**13.03**	12.48	13.65	0.451
LaZ	6	**8.79**	8.53	8.98	0.151	5	**8.78**	8.11	9.83	0.653
LaI	7	**3.00**	2.75	3.13	0.131	6	**2.87**	2.62	3.13	0.193
LaInf	7	**4.34**	4.27	4.43	0.067	6	**4.48**	4.02	5.09	0.348
LaN	7	**6.31**	6.17	6.42	0.077	5	**6.41**	6.19	6.64	0.192
LaM	7	**6.90**	6.82	7.11	0.110	6	**7.20**	6.91	7.54	0.220
ANc	7	**4.54**	4.42	4.75	0.134	6	**4.53**	4.34	4.74	0.152
CC	7	**4.28**	4.11	4.40	0.131	6	**4.41**	4.04	4.74	0.231
M^3M^3	7	**5.93**	5.68	6.17	0.163	6	**6.06**	5.68	6.58	0.290
CM^3	7	**4.95**	4.72	5.13	0.141	6	**4.88**	4.65	5.18	0.220
LMd	7	**9.41**	9.24	9.59	0.135	6	**9.61**	9.11	10.32	0.449
ACo	7	**3.22**	3.12	3.37	0.091	6	**3.33**	3.18	3.48	0.116
CM_3	7	**5.20**	4.88	5.40	0.171	6	**5.24**	4.82	5.76	0.332
CM^3/LCr	7	**0.378**	0.364	0.389	0.010	6	**0.365**	0.355	0.372	0.007
CC/CM^3	7	**0.865**	0.842	0.890	0.017	6	**0.906**	0.856	0.951	0.034
	matschiei SW Arabia					*batinensis* Oman				
LAt	4	**34.90**	33.5	35.7	0.966	6	**33.78**	31.3	37.1	1.993
LCr	2	**12.00**	11.52	12.47	0.672	6	**12.32**	11.58	12.96	0.507
LCb	2	**11.55**	11.12	11.98	0.608	6	**11.96**	11.27	12.55	0.482
LaZ	2	**7.70**	7.58	7.82	0.170	6	**8.25**	7.93	8.61	0.292
LaI	4	**2.51**	2.35	2.63	0.122	6	**2.80**	2.66	2.92	0.094
LaInf	2	**3.67**	3.62	3.72	0.071	6	**4.20**	3.93	4.48	0.188
LaN	4	**5.76**	5.33	6.02	0.304	6	**6.03**	5.84	6.34	0.186
LaM	3	**6.30**	5.98	6.47	0.275	6	**6.76**	6.44	7.11	0.246
ANc	2	**4.05**	3.88	4.21	0.233	6	**4.35**	4.20	4.52	0.150
CC	4	**3.75**	3.57	3.92	0.143	6	**4.05**	3.81	4.41	0.240
M^3M^3	4	**5.27**	4.89	5.47	0.262	6	**5.59**	5.47	5.88	0.174
CM^3	4	**4.40**	4.23	4.54	0.128	6	**4.48**	4.42	4.57	0.059
LMd	4	**8.63**	8.19	8.87	0.300	6	**8.77**	8.34	9.37	0.395
ACo	4	**2.89**	2.60	3.12	0.229	6	**3.11**	2.93	3.39	0.192
CM_3	4	**4.68**	4.53	4.95	0.193	6	**4.76**	4.68	4.84	0.060
CM^3/LCr	2	**0.360**	0.354	0.367	0.010	6	**0.364**	0.352	0.382	0.011
CC/CM^3	4	**0.852**	0.828	0.887	0.025	6	**0.903**	0.858	0.965	0.043

closest to the Seistan basin, Pir Sohrab in Baluchistan and Chahar Dahaneh in Hormozgan, are ca. 600 km from the Afghanistani record site and ca. 430 km from the border of south-western Afghanistan, also showing a wide geographic separation.

Material examined. 4 ♂♂, 6 ♀♀ (IVB af548–557 [S+B]), Bisut, 31 March 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂, 1 ♀ (IVB af558, af559 [S+B]), Bisut, 2 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂, 3 ♀♀ (IVB af561–564 [S+B]), Bisut, 4 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 4 ♂♂, 1 ♀ (IVB af568, af570, af571, NMP 95423 [S+B], NMP 95422 [B]), Bisut, 5 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 2 ♂♂, 1 ♀ (BMNH 68.475, IVB af653, af654 [S+B]), Bisut, 7 April 1967, leg. J. Gaisler, D. Povolný,

Z. Šebek & F. Tenora; – 2 ♂♂ (IVB af912, af913 [S+B]), Darunta (locality uncertain), 19 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Rhyneptesicus nasutus* are shown in Table 11. For the material examined see above.

R. nasutus is considered a polytypic species, four subspecies in geographically well separated ranges are recognised throughout the Middle East, Pakistan and Afghanistan (Corbet 1978, Nader 1990, Koopman 1994, Horáček et al. 2000, Simmons 2005, Juste et al. 2013); viz. *R. n. nasutus* (Dobson, 1877) living in south-western Pakistan, Afghanistan, and south-eastern Iran, *R. n. matschiei* (Thomas, 1905) in south-western Arabia, *R. n. pellucens* (Thomas, 1905) occurring in Iranian and Iraqi Mesopotamia, and *R. n. batinensis* (Harrison, 1968) in eastern Arabia (Oman and Saudi Arabia). The Afghanistani populations are consistently assigned to the nominotypical form (Gaisler 1970a, Koopman 1994, Bates & Harrison 1997, Srinivasulu & Srinivasulu 2012), being described from the east of Rohri, northern Sindh, Pakistan (Blanford 1891: 304; cf. Dobson 1877).

These four subspecies differ from each other mainly due to geographical separation of their ranges; the significance of this isolation for the recognition of the respective populations as separate taxa was supported also by results of a molecular genetic analysis (Juste et al. 2013). Several authors, however, tried to find also differences among the subspecies in their morphological traits. Gaisler (1970a) reported only the differences in the pelage and wing membrane colouration between *R. n. nasutus* (based on the series from Afghanistan) and *R. n. pellucens*, while he found both forms to be similar in body size. DeBlase (1980: 186) reviewed the differences among all four subspecies as follows: "The form *matschiei* […] is the smallest *E. nasutus* (FA 33.1, 35.4 mm.;

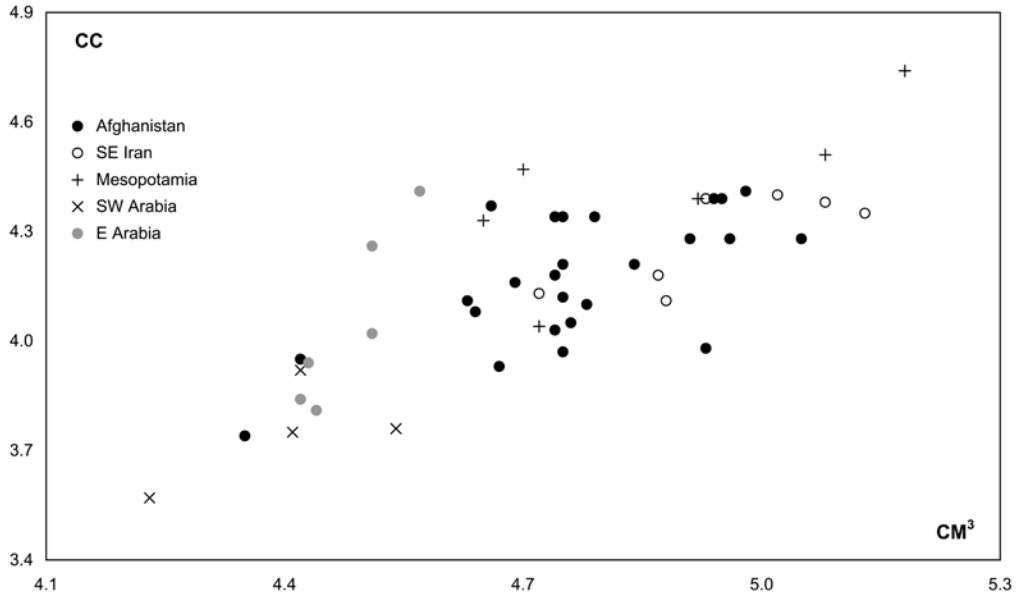

Fig. 41. Bivariate plot of the examined Afghanistani and comparative samples of *Rhyneptesicus nasutus* (Dobson, 1877): length of upper tooth-row (CM^3) against the rostrum width across upper canines (CC).

CBL 11.1, 11.2 mm.) and has dark, opaque wing and interfemoral membranes. The form *batinensis* […] is a medium-sized *E. nasutus* (FA 33 to 36.7 mm.; CBL 11.6 to 12.9 mm.) and has lighter, translucent membranes. The nominate form […] is large sized (FA 34.5 to 42.0 mm.; CBL 11.8 to 13.4 mm.) and has dark, relatively opaque membranes […]. The form *pellucens* […] is a large *E. nasutus* (FA 34.5 to 41.1 mm.; CBL 12.6 to 13.8 mm.) and has membranes that are relatively dark near their bases and become very light and transparent near their edges […].” These differences were similarly reported also by Harrison & Bates (1991), concerning the three forms occurring Arabia, i.e. all besides the nominotypical one.

These reports suggest that, besides the colouration differences, the particular populations follow a cline in the increase of body size from the south to the north, the smallest individuals living in south-western Arabia and the largest in Mesopotamia, Iran, and Afghanistan. As already counted by DeBlase (1980: 186), the nominotypical form is the best represented in the collections, with a majority of specimens coming from Afghanistan (54 bats in total), while other subspecies are known from few specimens only. Approximately a half of the existing Afghanistani specimens (23 IVB, 2 NMP, 1 BMNH) was collected by Gaisler et al. (1968) in the Jalalabad valley; these bats were examined here and compared with some representatives of the other subspecies. The body and skull size (Fig. 41, Table 15) of the three Arabian forms (*pellucens*, *batinensis*, *matschiei*) more or less follow the subspecies size definitions by DeBlase (1980) as quoted above. The most numerous set of the samples of the nominotypical form, i.e. those from Afghanistan and south-eastern Iran (cf. DeBlase 1980 and Benda et al. 2012), shows on average the largest size of body and skull. However, the dimension ranges of these bats overlap with the ranges of all three remaining subspecies (Table 15), not only those of the Mesopotamian bats (i.e. *pellucens*), as mentioned by DeBlase (1980). It suggests that the individual variation within particular subspecies is much more extensive than can be observed from the limited sets of these population samples and the actual size differences among them are much less pronounced.

Hypsugo savii (Bonaparte, 1837)

Records. **Published data**: B a m y a n: Sayedabad [1], 4 km. southeast of Bamiyan, 30 August 1968: 1 m, USNM (Neuhauser & DeBlase 1974); Bamiyan, FMNH (Bates & Harrison 1997); – Shombul [2], 12 km W of Shibar Pass, over a wheat field adjacent to the Shombul river, 25 July 1965: shot 1 m (Neuhauser 1969 [as *Eptesicus bobrinskoi*]); Shombul, 25 July 1965: shot 1 m, FMNH (Neuhauser & DeBlase 1974). – F a r y a b: 8 km NW of Belchiragh on the Maimana–Belchiragh road [3], 13 September 1965: shot 1 f (Neuhauser 1969 [as *Eptesicus bobrinskoi*]); 8 km. northwest of Belchiragh, 12 September 1965: shot 1 f, FMNH (Neuhauser & DeBlase 1974); Maimana, FMNH (Bates & Harrison 1997). – N u r i s t a n: Kamu [4], King’s Garden, 8 km W of Kamdesh, 15 October 1965: shot 1 m (Neuhauser 1969 [as *Eptesicus bobrinskoi*]); Kamu, 15 October 1965: shot 1 m, FMNH (Neuhauser & DeBlase 1974); Kamdesh, FMNH (Bates & Harrison 1997). – Afghanistan, 3 inds., FMNH (DeBlase 1980).

Distribution. *Hypsugo savii* is a rather rare bat in Afghanistan, four localities of its occurrence were reported from the northern part of the country (Neuhauser & DeBlase 1974; Fig. 40). The records were made only in elevated sites of the central Hindu Kush range and adjacent northern slopes, at the altitude range of 1225–2750 m a. s. l. of the Bamyan, Faryab and Nuristan provinces. With the mean altitude of occurrence at 1956 m a. s. l., *H. savii* is the second most montane species of Afghanistan, after *Plecotus strelkovi* (see below).

The Afghanistani records of *H. savii* constitute parts of the southern and eastern margins of its known distribution range, the massif of Hindu Kush seems to represent a natural border of the species occurrence in southern Asia. The only record which could be considered as a real crossing of this mountain barrier is the finding from Kamu, Nurisatn, eastern Afghanistan (see above). On the other hand, in the elevated areas lying north and west of Afghanistan, in Iran and West Turkestan, *H. savii* belongs to rather frequent faunal elements (Strelkov et al. 1978, Rybin

Table 16. Basic biometric data on the examined Afghanistani samples of *Pipistrellus pipistrellus* (Schreber, 1774) and *P. kuhlii* (Kuhl, 1817), and the Afghanistani samples of *Hypsugo savii* (Bonaparte, 1837) after Neuhauser & DeBlase (1974). For abbreviations see p. xx; index: I = CC/CM^3

	Pipistrellus pipistrellus					*Pipistrellus kuhlii*					*Hypsugo savii* [N&DB]				
	n	**M**	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	280	**31.79**	29.2	34.4	0.995	9	**34.71**	33.1	35.9	1.058	4	**36.20**	35.0	39.0	1.904
LCr	216	**11.85**	11.04	12.53	0.250	15	**12.89**	12.22	13.33	0.318	3	**13.53**	13.2	13.8	0.306
LCb	202	**11.36**	10.61	12.02	0.244	15	**12.47**	11.88	12.92	0.314	3	**12.87**	12.7	13.1	0.208
LaZ	124	**7.45**	6.97	7.83	0.172	8	**8.35**	8.12	8.48	0.128	2	**8.30**	8.2	8.4	0.141
LaI	225	**3.22**	2.93	3.56	0.108	15	**3.12**	2.82	3.42	0.138	4	**3.60**	3.4	3.7	0.141
LaInf	226	**3.56**	3.19	3.96	0.125	15	**3.78**	3.54	4.07	0.152	–	–	–	–	–
LaN	216	**6.12**	5.78	6.48	0.136	14	**6.37**	6.22	6.52	0.103	3	**6.80**	6.7	6.9	0.100
LaM	206	**6.67**	6.19	7.14	0.159	7	**7.27**	7.07	7.54	0.200	–	–	–	–	–
ANc	201	**4.22**	3.92	6.09	0.170	14	**4.58**	4.34	4.78	0.124	–	–	–	–	–
LBT	208	**2.95**	2.32	3.37	0.164	9	**3.07**	2.96	3.18	0.082	–	–	–	–	–
CC	219	**3.56**	3.21	3.98	0.121	15	**3.99**	3.77	4.21	0.147	–	–	–	–	–
M^3M^3	222	**4.92**	4.62	5.35	0.137	13	**5.49**	5.22	5.75	0.169	–	–	–	–	–
CM^3	232	**4.22**	3.92	4.52	0.114	15	**4.78**	4.46	5.02	0.173	3	**4.50**	4.4	4.6	0.100
LMd	224	**8.31**	7.69	8.92	0.210	15	**9.29**	8.75	9.62	0.260	4	**9.33**	9.0	9.8	0.340
ACo	219	**2.38**	2.08	2.74	0.113	15	**2.81**	2.58	2.96	0.095	–	–	–	–	–
CM_3	229	**4.48**	4.02	4.76	0.112	14	**5.16**	4.83	5.36	0.167	4	**4.90**	4.4	5.2	0.346
I	219	**0.844**	0.747	0.934	0.025	15	**0.835**	0.793	0.873	0.021	–	–	–	–	–

et al. 1989, Habilov 1992, Benda et al. 2012). Although three other records of *H. savii* were reported from the Indian subcontinent (Corbet & Hill 1992, Korad & Yardi 2004), they are not currently considered reliable (cf. Bates & Harrison 1997). Neuhauser (1970) reported a specimen identified as *Pipistrellus savii* (= *Hypsugo savii*) originating from Ambala, Indian Punjab (today the Haryana state), i.e. in the deep lowland region of the Great Plains of northern India, where an occurrence of this bat is absolutely unlikely. Later on, Chakraborty (1983) and Ghosh (2008) reported a specimen collected in Gilgit, Kashmir, as *Pipistrellus savii tamerlani* and *Eptesicus caucasicus tamerlani* (= *H. savii*), respectively (that was originally identified as *Vesperugo borealis* (= *Eptesicus nilssonii* s.l.) by Scully (1881a). The identification of the latter bat as *H. savii* was doubted by Hill (in Roberts 1997) without giving details, e.g. its real taxonomic affiliation. Korad & Yardi (2004) reported a record of *H. savii* from Pune, Maharashtra. Anyway, all these reports from western part of Indian subcontinent were not accepted as occurrence records of *H. savii*, also without giving details, by Bates & Harrison (1997), Alfred et al. (2002), and Srinivasulu & Srinivasulu (2012).

In Iran, *H. savii* ranks among moderately frequent bats, Benda et al. (2012) summarised 19 sites of records distributed mostly in mountains throughout the whole country. Some records were made relatively close to the border with Afghanistan, both in the north-west and south-west (de Roguin 1988, Benda et al. 2012), viz. Shurlaq (Khorasan; 97 km west of the Afghanistani border), Chenarbu (Khorasan; 102 km), and Kusheh (Baluchistan; 130 km). These records suggest possible occurrence of *H. savii* in elevated areas in the whole western part of Afghanistan, including the provinces of Farah, Ghowr, Herat, etc.

In West Turkestan, the occurrence of *H. savii* is restricted to mountainous areas of the south-western and eastern parts of the region (Kopetdagh, Köytendagh, Pamirs, Tian Shan), the highest number of records is known from Tajikistan, southern Kirghizstan and south-eastern Kazakhstan (Strelkov et al. 1978, Strelkov & Šajmardanov 1983, Rybin et al. 1989, Habilov 1992). On the

other hand, only few records are available from areas closely adjacent to the northern border of Afghanistan. Strelkov et al. (1978) reported a record from Gurşunmagdan Käni [Svincovyj Rudnik] in the Köytendagh range in easternmost Turkmenistan (ca. 60 km north of the Afghanistani border) and Bobrinskoj (1918) from the Tamerlana gorge near Bojsun on the opposite side of the same range (Kugintangtau), in south-eastern Uzbekistan (92 km). Habilov (1992) summarised three records (among 13 records from Tajikistan in total) made in localities situated relatively close to the border of Afghanistan, viz. Gandžina in the Vakhsh river valley (76 km; Ŝerbin 1968), Čučaly in the Babatag range (ca. 75 km; Habilov 1992) and in the Pamirs (unspecified; Kuzâkin 1950).

The pattern of *H. savii* distribution both in West Turkestan and Afghanistan suggests a rather frequent but not common occurrence of this bat in a wide area of the mountains of northern Afghanistan, namely in the provinces of Badakhshan, Baghlan, Balkh, Samangan, Sar-e Pol, and Takhar.

Morphology and variation. We did not examine any museum material of *Hypsugo savii* from Afghanistan. Forearm and cranial dimensions of the Afghanistani specimens of this bat published by Neuhauser & DeBlase (1974) are shown in Table 16. Three bats collected by the Street Expedition in 1965 were originally reported as *Eptesicus bobrinskoi* [= *E. gobiensis*] by Neuhauser (1969).

H. savii is traditionally considered a polytypic species with a various number of subspecies recognised within its range (Ognev 1927, 1928, Kuzâkin 1950, 1965, Ellerman & Morrison-Scott 1951, Strelkov 1963, 1981, Corbet 1978, Horáček & Hanák 1984, Yoshiyuki 1989, Koopman 1994, Horáček et al. 2000, Simmons 2005). The populations of the Middle East, Crimea, West Turkestan and adjacent areas were consistently assigned to *H. s. caucasicus* (Satunin, 1902) by most authors (Ognev 1928, Kuzâkin 1950, 1965, Ellerman & Morrison-Scott 1951, Bogdanov 1953, Lewis & Harrison 1962, Harrison 1961, 1964, Strelkov 1963, 1981, Ânuševič et al. 1972, Neuhauser & DeBlase 1974, Corbet 1978, Strelkov et al. 1978, Butovskij et al. 1985, Harrison & Bates 1991, Corbet & Hill 1992, Habilov 1992, Koopman 1994, Horáček et al. 2000, Srinivasulu & Srinivasulu 2012). Naturally, also the populations of Afghanistan were assigned to this form (Neuhauser & DeBlase 1974, Strelkov et al. 1978, Koopman 1994, Horáček et al. 2000, Srinivasulu & Srinivasulu 2012).

H. s. caucasicus was reported to be typical by its very pale, ochre or yellowish, dorsal pelage colouration and the tendency to miss the small upper premolar (P^3), see the review by Benda et al. (2006). However, these two characters were shown to be invalid for the differentiation of population groups in *H. savii*, and similarly, the differences in skull and/or body size between European and Asian populations were not confirmed by the comparison of extensive sets of specimens (Benda et al. 2006). Thus, Benda et al. (2006) considered the classical morphological characters (body and skull size, dentition structure, pelage colouration) regarded by various authors to be useful for taxonomic division in *H. savii* as markedly variable in all populations formerly defined as separate forms and concluded that the morphological delimitation of taxa within this species was unsubstantiated. Anyway, besides the body and skull dimensions (see Table 16), Neuhauser & DeBlase (1974) did not mention any morphological characters of the four specimens of *H. savii* examined from northern Afghanistan and included them into *H. s. caucasisus* solely on the geographical grounds.

Moreover, a cryptic diversity has been recently documented in *H. savii* in its circum-Mediterranean range (Ibáñez et al. 2006, Mayer et al. 2007, García-Mudarra et al. 2009, Çoraman et al. 2013). Four separate genetic lineages were recorded and preliminarily interpreted as possibly representing separate species, for details see the review by Benda et al. (2012). Thus, as *H. savii* in its present sense could represent a complex of more forms (from which two were reported to occur in sympatry in south-western Asia, cf. Mayer et al. 2007, García-Mudarra et al. 2009), the

taxonomic position of the populations inhabiting Central Asia (Iran, West Turkestan, Afghanistan) remains uncertain. However, this needs to be solved only by a profound molecular genetic analysis, covering populations of the whole species distribution range.

It should be noted that the type localities of two names that are considered to come in account with of *H. savii* are situated relatively closely to the territory of Afghanistan (92 and ca. 150 km from the border), viz. *Eptesicus tamerlani* Bobrinskoj, 1918 (t.l. Tamerlana gorge near Bojsun, Uzbekistan; Bobrinskoj 1918: 13) and *Eptesicus caucasicus pallescens* Bobrinskoj, 1926 (t.l. Tohtahon, south of Yarkand, East Turkestan, China; Bobrinskoj 1926: 97). Although these names were regarded valid by Bobrinskoj (1925, 1926) and Ognev (1927, 1928), both are currently considered synonyms of the name *Vesperugo caucasicus* Satunin, 1902 (= *H. s. caucasicus*), described from Tbilisi, Georgia (Satunin 1902: 462), see Simmons (2005).

Pipistrellus pipistrellus (Schreber, 1774)

Records. **New data**: K a b o l: Kabul [1], 17 January 1961: 1 f, SMF (leg. D. Meyer-Oehme), 21 June 1961: 4 m, 2 f, SMF (leg. D. Meyer-Oehme), 27 April 1962: 1 m, SMF (leg. D. Meyer-Oehme), 4 June 1962: 8 f, SMF (leg. D. Meyer-Oehme), 18 June 1962: 1 f, SMF (leg. D. Meyer-Oehme), 19 June 1962: 1 f, SMF (leg. D. Meyer-Oehme), 24 June 1962: 1 f, SMF (leg. D. Meyer-Oehme), 28 June 1962: 1 f, SMF (leg. D. Meyer-Oehme; cf. Kock et al. 1972 [as *P.* "*coromandra*"]), 30 June 1962: 1 m, SMF (leg. D. Meyer-Oehme), 2 July 1962: 1 m, SMF (leg. D. Meyer-Oehme), 9 July 1962: 1 m, SMF (leg. D. Meyer-Oehme), 11 July 1962: 1 f, SMF (leg. D. Meyer-Oehme), 16 July 1962: 1 f, SMF (leg. D. Meyer-Oehme), 24 July 1962: 5 m, 2 f, SMF (leg. D. Meyer-Oehme), 25 July 1962: 1 m, 1 f, SMF (leg. D. Meyer-Oehme), 28 July 1962: 1 m, SMF (leg. D. Meyer-Oehme), 13 August 1962: 1 m, 2 f, SMF (leg. D. Meyer-Oehme), 19 August 1962: 1 f, SMF (leg. D. Meyer-Oehme), 3 September 1962: 1 m, 1 f, SMF (leg. D. Meyer-Oehme), 5 September 1962: 2 f, SMF (leg. D. Meyer-Oehme), 12 September 1962: 1 f, SMF (leg. D. Meyer-Oehme), 16 September 1962: 1 f, SMF (leg. D. Meyer-Oehme), 17 September 1962: 1 m, SMF (leg. D. Meyer-Oehme), 18 September 1962: 1 m, SMF (leg. D. Meyer-Oehme), 19 September 1962: 1 m, 1 f, SMF (leg. D. Meyer-Oehme), 20 September 1962: 1 f, SMF (leg. D. Meyer-Oehme), 22 September 1962: 3 m, 3 f, SMF (leg. D. Meyer-Oehme), 24 September 1962: 3 m, 2 f, SMF (leg. D. Meyer-Oehme), 25 September 1962: 1 f, SMF (leg. D. Meyer-Oehme; Kock et al. 1972 [as *P.* "*coromandra*"]), 26 September 1962: 1 m, SMF (leg. D. Meyer-Oehme; cf. Kock et al. 1972 [as *P.* "*coromandra*"]), 6 October 1962: 1 f, SMF (leg. D. Meyer-Oehme), 27 October 1962: 1 f, SMF (leg. D. Meyer-Oehme), 27 April 1963: 1 m, ZFMK (coll. J. Niethammer), 24 July 1963: 1 m, SMF (leg. D. Meyer-Oehme), 12 August 1963: 1 m, SMF (leg. D. Meyer-Oehme), 6 October 1963: 1 m, SMF (leg. D. Meyer-Oehme), 1 September 1963: 1 m, SMF (leg. D. Meyer-Oehme), 28 June 1964: 2 m, 14 f, ZFMK (coll. J. Niethammer), 24 September 1964: 1 f, SMF (leg. D. Meyer-Oehme), 14 November 1964: 1 m, SMF (leg. D. Meyer-Oehme), 26 June 1965: 1 m, 19 f, SMF (leg. D. Meyer-Oehme; cf. Kock et al. 1972 [as *P.* "*coromandra*"]), 27 June 1965: 1 m, SMF (leg. D. Meyer-Oehme), 12 September 1965: 1 m, SMF (leg. D. Meyer-Oehme), 4 October 1965: 1 m, SMF (leg. D. Meyer-Oehme), 17 October 1965: 1 m, SMF (leg. D. Meyer-Oehme); Kabul, Chemical Institute, 1 April 1965: 1 ind., ZFMK (leg. Jakob); – Kabul, Dar ul Aman [2], 28 April 1982: 1 f, SMF (leg. D. Meyer-Oehme); – Shewaki [3], 30 June 1962: 2 m, 2 f, SMF (leg. D. Meyer-Oehme); – Tang-e Lalandar [4], 18 September 1962: 1 m, 6 July 1963: 17 m, 21 f, SMF (leg. D. Meyer-Oehme). – K h o s t: Bagh-e Malaria [5], 6 August 1965: 3 m, 5 f, SMF (leg. D. Meyer-Oehme; cf. Kock et al. 1972 [as *P.* "*coromandra*"]); – Ismael Khel [6], 7 August 1965: 3 m, 4 f, SMF (leg. D. Meyer-Oehme); – Khost [7], 20 May 1963: 1 m, SMF (leg. D. Meyer-Oehme), 5 August 1965: 1 f, SMF (leg. D. Meyer-Oehme), 6 August 1965: 1 m, 1 f, SMF (leg. D. Meyer-Oehme), 7 August 1965: 2 m, 1 f, SMF (leg. D. Meyer-Oehme), August 1976: 3 f, ZFMK (leg. Heckel); – Khost, Band-e Barq [8], 5 August 1965: 2 m, 4 f, SMF (leg. D. Meyer-Oehme; cf. Kock et al. 1972 [as *P.* "*coromandra*"]). – K o n a r: Barikot [9], 22 July 1964: 5 m, 10 f, SMF (leg. D. Meyer-Oehme). – N u r i s t a n: Kamdesh [10], 19 July 1964: 1 f, SMF (leg. D. Meyer-Oehme). – V a r d a k: Maidan [11], 21 August 1962: 1 m, SMF (leg. D. Meyer-Oehme), 4 September 1962: 1 m, SMF (leg. D. Meyer-Oehme. – **Published data**: B a g h l a n: Bachlan [12], Province de Qutaghan, 17 February [= August] 1960: 1 ind. [= 1 m, MZLU] (Vercammen-Grandjean 1963); Baghlan, 15 May 1967: coll. 2 m, 17 f (Gaisler et al. 1968, Gaisler 1970a); Baghlan, [13 March 1961: 1 m, 1 f, 13 August 1961: 1 m, 1 f,] SMF (Kock et al. 1972, cf. Meyer-Oehme 1965, 1968); Baghlan, 2 inds., BMNH (Neuhauser & DeBlase 1971); – 6 km north of Doshi [13], 10 August 1965: shot 1 m (Neuhauser 1969); 6 km N of Doshi, 1 ind., FMNH (Neuhauser & DeBlase 1971); – Saijad [14], Samangan, [12 April 1965: 1 m, 6 f,] SMF (Kock et al. 1972). – B a l k h: Balkh [15], crevices in buildings, 4–5 September 1965: exam. 350 inds. (250 inds. in one colony), coll. 3 m, 3 f (Neuhauser 1969); Wazirabad (= Balkh), 6 inds., FMNH (Neuhauser & DeBlase 1971); Balkh, 4 September 1965 (Lewis 1973 [as *P. kuhlii*]); Balk, FMNH (Bates & Harrison 1997); – [Kala near] Tschell Ghar [16], [cave, 11 April 1965: 1 ind.,] SMF (Kock et al. 1972, cf. Meyer-Oehme 1965, 1968); – Mazar-i-Sharif [17], 5 September 1965: 1 ind. (Lewis 1973 [as *P. kuhlii*]); Mazar-

i-Sharif, FMNH (Bates & Harrison 1997); – Mohmandan [18], [10 April 1965: 1 ind.,] SMF (Kock et al. 1972, cf. Meyer-Oehme 1965, 1968); – 3 km west of Mazar-i-Sharif [19], government agricultural station, over an irrigation ditch and under a canopy of sycamore trees, 2 September 1965: shot & net. 2 m, 4 September 1965: net. 2 m, 1 f, 5 September 1965: net. 1 m, 6 September 1965: net. 2 m, 3 f (Neuhauser 1969); 3 km W of Mazar-i-Sharif, 10 inds., FMNH (Neuhauser & DeBlase 1971); – Tangi-Shadian ravine [20], about 16 km. S of Mazar-i-Sharif, 5 September 1965: shot 2 inds. (Neuhauser 1969); 16 km S of Mazar-i-Sharif, 2 inds., FMNH (Neuhauser & DeBlase 1971). – F a r y a b: 8 km NW of Belchiragh on the Maimana–Belchiragh road [21], 13 September 1965: 1 m, 2 f (Neuhauser 1969); 8 km NW of Belchiragh, 3 inds., FMNH (Neuhauser & DeBlase 1971); – Maimana [22], Maimana Hotel, fissures under tin roof, 9 September 1965: obs. ca. 50 inds., coll. 4 m, 4 f, house, 12 September 1965: coll. 1 m (Neuhauser 1969); Maimana, [29 August 1964: 1 f,] SMF (Kock et al. 1972, cf. Meyer-Oehme 1965, 1968); Maimana, 9 inds., FMNH (Neuhauser & DeBlase 1971, Bates & Harrison 1997). – H e r a t: Herat [23], banks of the Hari Rud river, 22 September 1965: net. & shot 2 m (Neuhauser 1969); Herat, 2 inds., FMNH (Neuhauser & DeBlase 1971, Bates & Harrison 1997); Herat, 11 km. S, 22 September 1965: 1 ind. (Lewis 1973 [as *P. kuhlii*]). – K a b o l: 5 km E of Kabul [24], Pagman to Kabul road, 1 October 1965: coll. 1 m (Neuhauser 1969); – Kabul [1], 1 m, 1 f, BMNH (Gaisler 1970a); Kabul, 1 ind., FMNH (Neuhauser & DeBlase 1971); – Paghman [25], 23 km NW of Kabul, crevices in an abandoned building, 13 July 1965: coll. 1 m, 14 July 1965: coll. 1 m, 15 July 1965: coll. 1 m, 22 July 1965: coll. 1 m, near an abandoned building, 16 July 1965: shot 1 m (Neuhauser 1969); Paghman, 5 inds., FMNH (Neuhauser & DeBlase 1971). – K a n d a h a r: Baba Wali [26], 7 km NW of Kandahar, 3 November 1965: shot 1 f, 5 November 1965: shot 1 f, 10 November 1965: shot 1 m (Neuhauser 1969); 7 km NW of Kandahar, 3 inds., FMNH (Neuhauser & DeBlase 1971). – K o n a r: Nurgul [27], 8 km W of Kunar, near river, 19 October 1965: shot 1 f, near the entrance to Qachqar cave, 23 October 1965: shot 1 ind. (Neuhauser 1969). – K o n d o z: Kunduz [28], 1967: coll. 5 m, 25 f [IVB] (Gaisler et al. 1968), 4 & 5 September 1965: coll. 24 m, 6 f, 14 & 15 May 1967: coll. 5 m, 25 f, [IVB, NMP] (Dusbábek 1970, Gaisler 1970a, Hůrka 1970, cf. Smit & Rosický 1973); Kunduz, many buildings (including the provincial government office, a school, and the governor's private residence), 22 August 1965: 1 m, 1 ind., 24 August 1965: 3 m, 9 f, 13 inds., 27 August 1965: obs. a colony of ca. 500 inds., coll. 29 m, 17 f, 28 August 1965: 23 m (Neuhauser 1969); Kunduz, 29 August 1965: 1 ind. (Lewis 1973 [as *P. kuhlii*]); Kunduz, 91 inds., FMNH (Neuhauser & DeBlase 1971); – eight kilometers south of Kunduz [29], agricultural farm, 21–26 August 1965: shot several inds. (Neuhauser 1969); 8 km S of Kunduz, 5 inds., FMNH (Neuhauser & DeBlase 1971). – L a g h m a n: Laghman [30], on a low hill adjacent to the town, 21 October 1965: shot 1 m, 1 f (Neuhauser 1969). – N a n g a r h a r: Jalal-Abad [31], fissures of the former Habibula Palace, 24, 25 & 26 April 1967: obs. a big colony, coll. 1 m, 16 f, [IVB] (Gaisler et al. 1968, Dusbábek 1970, Gaisler 1970a); Jalalabad, hollow spaces behind window frames, crevices in ceilings, and a hollow tree, 3 August 1965: 1 m, 1 f, 1 ind., 4 August 1965: 1 m, 1 f, 22 October 1965: 1 m, 6 f (Neuhauser 1969); Jalalabad, 1 ind., FMNH (Neuhauser & DeBlase 1971); – 7–8 km north of Jalalabad [32], at the edge of cultivated fields, 19 October 1965: shot 6 m, 25 October 1965: shot 5 m, 11 f, at shallow dry caves, 24 October 1965: shot 3 m, 10 f (Neuhauser 1969). – N u r i s t a n: Moschee im Baschgar-Tal [= Bashgal valley] [33], Nuristan, 14–17 April 1953: 1 m, 9 f, [SMF, ZFMK] (Zimmermann 1956); Bashgul-Tal, Nuristan, 1100 m, 14 April 1953 (Peus 1957); Baschgar-Tal, 1 ind., FMNH (Neuhauser & DeBlase 1971); Baschgaltal, FMNH (Bates & Harrison 1997); – Kamu [34], King's Garden, 8 km W of Kamdesh, 15 October 1965: shot 2 m, 1 f, 17 October 1965: shot 4 m (Neuhauser 1969); Kamu, 7 inds., FMNH (Neuhauser & DeBlase 1971); Kamdesh, FMNH (Bates & Harrison 1997). – T a k h a r: 7 km E of Taliq-an [35], 21 August 1965: coll. 1 ind. (mummy) (Neuhauser 1969); 7 km E of Taliq-an, 1 ind., FMNH (Neuhauser & DeBlase 1971); Taliqan, FMNH (Bates & Harrison 1997).

Distribution. *Pipistrellus pipistrellus* is a common bat in Afghanistan, 35 record sites are known mostly from the northern and eastern parts of the country (Fig. 42). This species represents by far the most frequently documented bat in Afghanistan (Table 1), it was recorded from the largest area of the country (14 provinces in total) and from the second widest range of altitudes (350–2450 m a. s. l., mean altitude 1131 m) after *Myotis blythii*. While in northern Afghanistan (15 sites in the provinces of Baghlan, Balkh, Faryab, Herat, Kondoz, and Takhar), *P. pipistrellus* represents a rather lowland faunal element (altitude range 350–930 m a. s. l., mean altitude 621 m), in the eastern part of the country (19 localities in the provinces of Kabol, Khost, Konar, Laghman, Nangarhar, Nuristan, and Vardak), this bat is a rather sub-montane or montane species (altitude range 570–2450 m a s l., mean altitude 1488 m); the only record known from southern Afghanistan (Kandahar province) was made at a medium elevated site, at ca. 1100 m a. s. l. The distribution of *P. pipistrellus* in Afghanistan was first reviewed by Neuhauser & DeBlase (1971); although they reported 17 localities from the country in total (i.e., less than a half of those currently known), the picture of the species distribution remains unchanged in its general outlines (see Neuhauser

& DeBlase 1971: 275, Fig. 1). Srinivasulu & Srinivasulu (2012) mentioned an occurrence of *P. pipistrellus* also in Badghis and Jowzjan; however, no records of this bat are available from these provinces of Afghanistan.

P. pipistrellus is distributed throughout the temperate zone of the western Palaearctic, from the Maghreb and western Europe to the Caucasus, Levant and West Turkestan (Horáček et al. 2000). Occurrence of this bat in Afghanistan constitutes parts of the southern and partially also eastern margins of the species range in Asia. The continuation of the range from eastern Afghanistan to the east is limited (Bates & Harrison 1997). This bat is known from three sites in northern Pakistan, all situated in north-western Khyber Pakhtunkhwa and relatively close to the Afghanistani border (Chitral, Dir, Kululai; Bates & Harrison 1997, cf. Walton 1974). This species was also reported from three sites in western Kashmir (Gilgit, Srinagar, Padritton; Scully 1881a, Topál 1974, Roberts 1977, Bates & Harrison 1997), where it finds its easternmost occurrence spots.

On the other hand, *P. pipistrellus* represents a common faunal element in the areas west and north of Afghanistan (Benda et al. 2011a: 195, Fig. 21). This species is the absolutely commonest bat of the north-eastern part of Iran, twenty records are available from the areas adjacent to the Iranian-Turkmenistani border (Benda et al. 2012); the records situated closest to the border with Afghanistan are known from Chenarbu (102 km away of the border; Benda et al. 2012), Shurlaq (97 km; Benda et al. 2012), and 71 km SE of Mashhad (ca. 80 km; DeBlase 1980).

P. pipistrellus ranks among the most common bats in West Turkestan, namely in the lowlands along big rivers (Morghab, Amu Darya, Syr Darya, Panj, large artificial channels) and foothills of extensive mountain massifs (Kopetdagh, Pamirs, Tian Shan), see Benda et al. (2011a). The

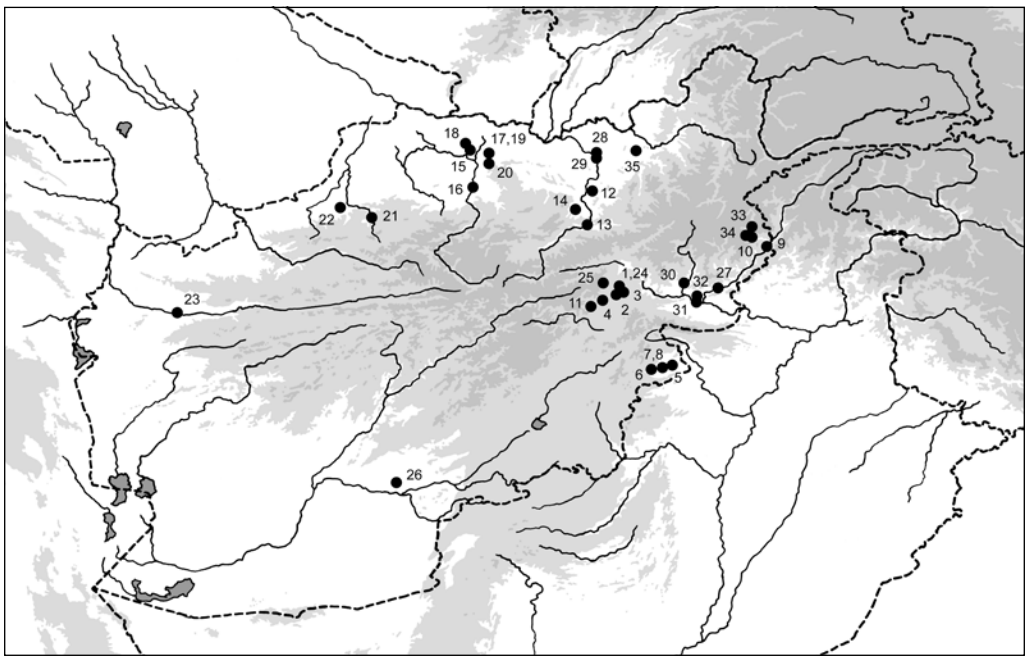

Fig. 42. Records of *Pipistrellus pipistrellus* (Schreber, 1774) in Afghanistan.

high density of *P. pipistrellus* records in the southern parts of West Turkestan corresponds well to that documented in northern Afghanistan (Fig. 42); Bogdanov (1953), Strelkov et al. (1978), Habilov (1992) and Gricina et al. (2013) summarised altogether 51 records (from 38 sites) made in the southern lowland areas of West Turkestan, situated very close to the border with Afghanistan, less than 100 km from it (viz. Ajvadž, Akkapčigaj, Amyderya, Âraklûk, Atamurat [Kerki], Babatag Mts., Başbeden [Karaul-Hana], Bathyz reserve, Bojsun, Çarşanga, Dahana, Daşkopri, Dehqonobod, Dusti, Eged, Galaymor [Kalai-Mor], Gandžina, Gurgon, Gurşunmagdan Käni [Svincovyj Rudnik], Hocapil, Hodža-Beh-Ob, Imam Baba mausoleum, Karluk, Kulob, Mörgunov [Morgunovskij], Panž [Pândž], Panči-Poen [Nižnyj Pândž], Rabatkaşan, Sandykgaçy, Sarahs, Serhetabad [Kuška], Šerobod, Šôrči, Tagtabazar, Taraşek [Tarašinka], Termiz, Tigrovaâ balka, 101-yj raz"ezd near Šôrči).

Material examined. 3 ♂♂, 5 ♀♀ (SMF 39037, 39039–39041, 39139 [S+A], 39038 [S], 39140, 39141 [A]), Bagh-e-Malaria, Khost, Paktia, 1240 m, 6 August 1965, leg. D. Meyer-Oehme; – 1 ♂ (MZLU L60/3730 [S+A]), Baghlan, prov. Quataghan, 17 August 1960, leg. K. Lindberg; – 1 ♂, 1 ♀ (SMF 38934, 38946 [S]), Baghlan, 500 m, 13 March 1961, leg. D. Meyer-Oehme; – 1 ♂, 1 ♀ (SMF 38933, 38947 [S]), Baghlan, 500 m, 13 August 1961, leg. D. Meyer-Oehme; – 2 ♂♂, 13 ♀♀ (IVB af1121, af1123, af1130–1133, af1136 [S+B], af1122, af1124–1127, af1129, af1134, af1135 [S]), Baghlan, agriculture school, attic, 15 May 1967, leg. J. Gaisler & D. Povolný; – 1 ♀ (IVB af1139 [S]), Baghlan, agriculture school, attic, 16 May 1967, leg. J. Gaisler & D. Povolný; – 5 ♂♂, 10 ♀♀ (SMF 39015, 39016, 39018, 39019, 39021, 39024, 39124–39126 [S+A], 39017, 39020, 39022, 39023, 39122, 39123 [A]), Barikot, Konar, 1180 m, 22 July 1964, leg. D. Meyer-Oehme; – 1 ♂, 10 ♀♀ (SMF 49236–49246 [S+B]), Baschgul-Tal, Nuristan, 14 April 1953, leg. J. Klapperich; – 1 ♀ (ZFMK 97.211 [S+B]), Bashgul-Tal, Nuristan, 17 April 1953, leg. J. Klapperich; – 3 ♂♂, 4 ♀♀ (SMF 39042, 39043, 39045, 39143, 39144 [S+A], 39044, 39145 [A]), Ismael Khel, Paktia, 1335 m, 7 August 1965, leg. D. Meyer-Oehme; – 1 ♀ (IVB af968 [S+B]), Jalal Abad, Habibula Palace, 24 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂, 11 ♀♀ (IVB af970–981 [S+B]), Jalal Abad, Habibula Palace, 25 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 4 ♀♀ (IVB af986–989 [S+B]), Jalal Abad, Habibula Palace, 26 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂ (ZFMK 97.167 [Mu]), Kabul, 27 April 1963, coll. J. Niethammer; – 2 ♂♂, 14 ♀♀ (ZFMK 97.150–97.166 [S+B]), Kabul, 28 June 1964, coll. J. Niethammer; – 1 ♀ (SMF 38949 [A]), Kabul, 1800 m, 17 January 1961, leg. D. Meyer-Oehme; – 4 ♂♂, 2 ♀♀ (SMF 38950, 38951, 39068–39071 [A]), Kabul, 1800 m, 21 June 1961, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39072 [A]), Kabul, 1800 m, 27 April 1962, leg. D. Meyer-Oehme; – 8 ♀♀ (SMF 38953–38957, 38959, 38960 [S+A], 38958 [S]), Kabul, 1800 m, 4 June 1962, leg. D. Meyer-Oehme; – 1 ♀ (SMF 38961 [S+A]), Kabul, 1800 m, 18 June 1962, leg. D. Meyer-Oehme; – 1 ♀ (SMF 38962 [A]), Kabul, 1800 m, 19 June 1962, leg. D. Meyer-Oehme; – 1 ♀ (SMF 38963 [A]), Kabul, 1800 m, 24 June 1962, leg. D. Meyer-Oehme; – 1 ♀ (SMF 38964 [S+A]), Kabul, 1800 m, 28 June 1962, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39076 [A]), Kabul, 1800 m, 30 June 1962, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39077 [S+A]), Kabul, 1800 m, 2 July 1962, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39078 [A]), Kabul, 1800 m, 9 July 1962, leg. D. Meyer-Oehme; – 1 ♀ (SMF 38967 [A]), Kabul, 1800 m, 11 July 1962, leg. D. Meyer-Oehme; – 1 ♀ (SMF 38968 [A]), Kabul, 1800 m, 16 July 1962, leg. D. Meyer-Oehme; – 5 ♂♂, 2 ♀♀ (SMF 39080–39083 [S+A], 38969, 38970, 39079 [A]), Kabul, 1800 m, 24 July 1962, leg. D. Meyer-Oehme; – 1 ♂, 1 ♀ (SMF 39084 [S+A], 38971 [A]), Kabul, 1800 m, 25 July 1962, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39085 [A]), Kabul, 1800 m, 28 July 1962, leg. D. Meyer-Oehme; – 1 ♂, 2 ♀♀ (SMF 38972, 38973, 39086 [S+A]), Kabul, 1800 m, 13 August 1962, leg. D. Meyer-Oehme; – 1 ♀ (SMF 38974 [S+A]), Kabul, 1800 m, 19 August 1962, leg. D. Meyer-Oehme; – 1 ♂, 1 ♀ (SMF 38975, 39088 [S+A]), Kabul, 1800 m, 3 September 1962, leg. D. Meyer-Oehme; – 2 ♀♀ (SMF 38976, 38977 [S+A]), Kabul, 1800 m, 5 September 1962, leg. D. Meyer-Oehme; – 1 ♀ (SMF 39911 [A]), Kabul, 1800 m, 12 September 1962, leg. D. Meyer-Oehme; – 1 ♀ (SMF 38978 [S+A]), Kabul, 1800 m, 16 September 1962, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39090 [S+A]), Kabul, 1800 m, 17 September 1962, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39091 [A]), Kabul, 1800 m, 18 September 1962, leg. D. Meyer-Oehme; – 1 ♂, 1 ♀ (SMF 39093 [S+A], 38979 [A]), Kabul, 1800 m, 19 September 1962, leg. D. Meyer-Oehme; – 1 ♀ (SMF 38980 [A]), Kabul, 1800 m, 20 September 1962, leg. D. Meyer-Oehme; – 3 ♂♂, 3 ♀♀ (SMF 38981–38983, 38094–39096 [S+A]), Kabul, 1800 m, 22 September 1962, leg. D. Meyer-Oehme; – 3 ♂♂, 2 ♀♀ (SMF 38984, 38985, 39097, 39099 [S+A], 39098 [A]), Kabul, 1800 m, 24 September 1962, leg. D. Meyer-Oehme; – 1 ♀ (SMF 38986 [S+A]), Kabul, 1800 m, 25 September 1962, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39100 [S+A]), Kabul, 1800 m, 26 September 1962, leg. D. Meyer-Oehme; – 1 ♀ (SMF 38987 [S+A]), Kabul, 1800 m, 6 October 1962, leg. D. Meyer-Oehme; – 1 ♀ (SMF 38988 [S+A]), Kabul, 1800 m, 27 October 1962, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39119 [A]), Kabul, 1800 m, 24 July 1963, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39120 [S+A]), Kabul, 1800 m, 12 August 1963, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39121 [S+A]), Kabul, 1800 m, 6 October 1963, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39128 [S+A]), Kabul, 1800 m, 1 September 1963, leg. D. Meyer-Oehme; – 1 ♀ (SMF 39029 [A]), Kabul, 1800 m, 24 September 1964, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39135 [A]), Kabul, 1800 m, 14 November 1964, leg. D. Meyer-

Oehme; – 1 ♂, 19 ♀♀ (SMF 39048, 39049–39061 [S+A], 39047, 39062–39065, 39155 [A]), Kabul, 1800 m, 26 June 1965, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39066 [A]), Kabul, 1800 m, 27 June 1965, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39151 [S+A]), Kabul, 1800 m, 12 September 1965, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39152 [S+A]), Kabul, 1800 m, 4 October 1965, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39154 [S+A]), Kabul, 1800 m, 17 October 1965, leg. D. Meyer-Oehme; – 1 ind. (ZFMK 97.181 [S+Sk]), Kabul, Chemisches Institut, 1 April 1965, leg. Jakob; – 1 ♀ (SMF 38952 [S+A]), Kabul, Dar-ul-Aman, 1800 m, 28 April 1962, leg. D. Meyer-Oehme; – 1 ind. (SMF 39927 [S]), Kala bei Tschell Ghar, Balkh, Höhle, 500 m, 11 April 1965, leg. D. Meyer-Oehme; – 1 ♀ (SMF 39014 [A]), Kamdesh, Konar, 1950 m, 19 July 1964, leg. D. Meyer-Oehme; – 2 ♂♂, 4 ♀♀ (SMF 39032–39035, 39136, 39137 [S+A]), Khost (Band-e-Barq), Paktia, 1200 m, 5 August 1965, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39101 [A]), Khost, Paktia, 1230 m, 20 May 1963, leg. D. Meyer-Oehme; – 1 ♀ (SMF 39031 [S+A]), Khost, Paktia, 1240 m, 5 August 1965, leg. D. Meyer-Oehme; – 1 ♂, 1 ♀ (SMF 39036, 39138 [S+A]), Khost, Paktia, 1240 m, 6 August 1965, leg. D. Meyer-Oehme; – 2 ♂♂, 1 ♀ (SMF 39929, 39930, 39932 [S]), Khost-Wazir Bagh, Paktia, 1240 m, 7 August 1965, leg. D. Meyer-Oehme; – 50 ♂♂, 29 ♀♀ (NMP 95340–95343, 95345–95369 [S+B], 95344 [B], 95370–95418 [A]), Kunduz, 4–5 September 1965, leg. M. Daniel; – 4 ♂♂, 24 ♀♀ (IVB af1063–1078, af1080–1088, af1090 [S+B], af1079, af1089 [S]), Kunduz, building attic, 14 May 1967, leg. J. Gaisler & D. Povolný; – 1 ♀ (IVB af1092 [S]), Kunduz, 15 May 1967, leg. J. Gaisler & D. Povolný; – 1 ♂ (SMF 39087 [S+A]), Maidan, Wardak, 2400 m, 21 August 1962, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39089 [S+A]), Maidan, Wardak, 2400 m, 4 September 1962, leg. D. Meyer-Oehme; – 1 ♀ (SMF 38936 [S]), Maimana, Fariab, 870 m, 29 August 1964, leg. D. Meyer-Oehme; – 3 ♀♀ (ZFMK 97.196–97.198 [A]), Khost, August 1976, leg. Heckel; – 1 ind. (SMF 39925 [S]), Mohmandan, Balkh, 350 m, 10 April 1965, leg. D. Meyer-Oehme; – 1 ♂, 6 ♀♀ (SMF 38937–38942, 38948 [S]), Saijad, Samangan, 770 m, 12 April 1965, leg. D. Meyer-Oehme; – 2 ♂♂, 2 ♀♀ (SMF 38965, 38966, 39074, 39075 [A]), Shewaki (Chonna), Kabul, 1800 m, 30 June 1962, leg. D. Meyer-Oehme; – 1 ♂ (SMF 39092 [A]), Tangi-e-Lalandar, Wardak, 2100 m, 18 September 1962, leg. D. Meyer-Oehme; – 17 ♂♂, 21 ♀♀ (SMF 38989, 38990, 38991–38997 [S+A], 38998–39009, 39102–39118 [A]), Tangi-e-Lalandar, Wardak, 2100 m, 6 July 1963, leg. D. Meyer-Oehme.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Pipistrellus pipistrellus* are shown in Table 16. For the material examined see above.

P. pipistrellus has been traditionally considered a polytypic species, two forms were basically distinguished within its range in accordance with the pelage colouration of the respective populations, the dark reddish brown nominotypical subspecies inhabiting relatively humid and forested areas of Europe, the Caucasus and the Mediterranean, while the pale brown to greyish-ochre form from the deserts and dry steppes of Central Asia, named initially *P. p. bactrianus* Satunin, 1905, later *P. p. aladdin* Thomas, 1905 (Bobrinskoj 1925, Ognev 1927, 1928, Kuzâkin 1950, 1965, Ellerman & Morrison-Scott 1951, Strelkov 1963, 1981, Neuhauser & DeBlase 1971, Corbet 1978, Koopman 1994, etc.), see also the review by Benda et al. (2011a, 2012). This view was not changed even when a sister species, *P. pygmaeus* (Leach, 1825), was separated from the species rank of *P. pipistrellus* (see Simmons 2005).

This simple picture of two clearly geographically west-east delimited subspecies of *P. pipistrellus* is rather complicated by the populations occurring at the eastern margin of the species distribution range, i.e. in eastern Afghanistan. Zimmermann (1956) identified a series of specimens collected in the Bashgal valley in Nuristan as *P. p. pipistrellus*, comparable in dimensions and pelage colouration with the European samples. Aellen (1959a) accepted the identification of *P. p. pipistrellus* from eastern Afghanistan by Zimmermann (1956) but suggested also a presence of another form, *P. p. bactrianus*, in northern Afghanistan, in accordance with its rich occurrence in West Turkestan sensu Kuzâkin (1950). This premise was fulfilled by Meyer-Oehme (1965), who reported records of *P. p. bactrianus* (as of the most common bat) from Afghanistan north of the Hindu Kush range, while the dark nominotypical form in the areas south-east of the main Hindu Kush range. Similar observations were reported by Gaisler et al. (1968: 45), see as follows: "[…] our material comprises probably two different subspecies. The individuals from Kunduz and Baghlan belong indubitably to *P. p. bactrianus* […], while those from Jalal-Abad should belong to *P. p. pipistrellus* […]. However the colour of the pelage of the Jalal-Abad specimens is quite different from that of the European *P. p. pipistrellus*." Neuhauser (1969: 78–79) added the following observations concerning the colouration and geographical delimitation of the respective

forms: “Two distinct sub-species occur in Afghanistan. One found north of the Hindu Kush and extending to Paghman (Kabul Province, approximately 17 km NW of Kabul) represents *P. p. bactrianus* Satunin. The other, much darker form, and without the white wing-margins, represents *P. p. pipistrellus* (Schreber). This form is found south of the Hindu-Kush, extending to Kabul (Kabul Province). The Street Expedition specimens from Kamu (Konar Province) are browner than the Jalalabad (Nangarhar Province) forms.” Gaisler (1970a: 38) presented the following alternative opinion concerning the south-eastern Afghanistani populations: “[…] the specimens from Jalalabad differ distinctly by their colour from those from Central Europe. […] This colouration is in full agreement with the Mediterranean specimens examined, including one specimen from Lebanon, as well as with the […] description of ssp. *mediterraneus*. […] Also, there are no significant differences between the dimensions of individuals from Jalalabad and those from Central Europe, similarly as between ssp. *bactrianus* and the nominate subspecies […].” Gaisler (1970a: 39–40) finally concluded: “The populations inhabiting the east of the country, including the Kabul Province, are tentatively arranged under ssp. *Pipistrellus pipistrellus mediterraneus* Cabrera, 1904.” In conclusion, all these authors agree in the presence of two subspecies (colour-morphs) of *P. pipistrellus* in Afghanistan, whose distribution ranges are bordered by the Hindu Kush range. While all of them agree also in the name designation of the northern populations, *P. p. bactrianus*, they do not concur in naming of the south-eastern populations.

Neuhauser & DeBlase (1971) revised taxonomy of the Asian population referred to *P. pipistrellus*. In the subspecific division of this species, they agreed with the previous authors, but suggested to use the name *aladdin* instead of *bactrianus*, because of priority, i.e. *aladdin* being a senior synonym of *bactrianus*. Concerning these subspecies in Central Asia, Neuhauser & DeBlase (1971: 278) mentioned: “The bat [= *P. p. aladdin*] is abundant in the area immediately north of the Hindu Kush mountains in Afghanistan and west of the Pamirs in the Soviet Union; […]. In general, the distribution is confined to areas receiving less than 400 mm annual precipitation. […] Where *aladdin* comes in contact with other races of *P. pipistrellus*, there is considerable intergradation in color. […] Specimens of *aladdin* from southwest Iran are generally darker than those from northern Afghanistan; these in turn are far lighter than the dark *P. pipistrellus* form from Konar and Nangarhar Provinces of Afghanistan, and from Kashmir. Intergrades are found in Kabul, Afghanistan.” However, they did not suggest any taxonomic solution concerning “the dark *P. pipistrellus* form” occurring in Afghanistan south-east of the Hindu Kush, in the provinces of Kabul, Konar, and Nangarhar. The conclusion by Neuhauser & DeBlase (1971) on the nomeclature of the pale desert form of *P. pipistrellus* was accepted by Kock et al. (1972), and Bates & Harrison (1997), but was refused, at least concerning the West Turkestani populations, by Strelkov et al. (1978), Strelkov (1981), Butovskij et al. (1985), and Habilov (1992). Finally, Corbet (1978), Corbet & Hill (1992), Koopman (1994), and Srinivasulu & Srinivasulu (2012) referred the Central Asian populations including all from Afghanistan to *P. p. aladdin*, while Alfred et al. (2002) considered the north-Indian populations to belong to *P. p. bactrianus*.

So, except for the authors who assign all Afghanistani populations despite their colouration characters arbitrarily to the north-Afghanistani pale form (named either *P. p. aladdin* or *P. p. bactrianus*), no solution of the taxonomic position of the dark coloured bats inhabiting south-eastern Afghanistan is available (besides the preliminary suggestion by Gaisler (1970a), see above). For the time being, it can be only concluded that the taxonomic position of the Afghanistani populations of *P. pipistrellus* remains open and could be responsibly resolved only with the help of molecular genetic methods. However, it should be noted that the genetic comparisons by Hulva et al. (2004) and Benda et al. (2012) did not support the separation of any of the Asian populations of *P. pipistrellus* to a separate subspecies, the bats from Iran and West Turkestan are a part of a common Euro-Asian lineage with very shallow separation of particular haplotypes. Most probably this could

Table 17. Numbers of specimens of the genus *Pipistrellus* Kaup, 1829 from Afghanistan housed in particular collections, according to the original labelling and the final identification (see text). For explanations see Fig. 43

	originally labelled specimens [skulls]						re-identified specimens [all preparations]					
collection	IVB	MZLU	NMP	SMF	ZFMK	total	IVB	MZLU	NMP	SMF	ZFMK	total
P. pipistrellus N	39	1	27	12	–	79	45	1	79	14	–	139
P. pipistrellus SE	5	–	–	12	2	19	17	–	–	198	23	238
P. kuhlii	2	–	–	13	1	16	2	–	–	13	1	16
P. coromandra	18	–	–	99	15	132	19	–	2	21	2	44
P. javanicus	–	–	–	3	–	3	–	–	–	–	–	0
P. tenuis	–	–	–	8	–	8	–	–	–	20	1	21
total	64	1	27	147	18	257	83	1	81	266	27	458

also be the case of the north-Afghanistani populations of this bat, being undoubtedly connected with the Iranian and West Turkestani populations; however, the situation of the south-eastern Afghanistani dark coloured populations, separated from the West Turkestani populations by the Hindu Kush range, cannot be predicted either. Anyway, the metric comparison of the samples of *P. pipistrellus* coming from northern and south-eastearn Afghanistan did not reveal any remarkable differences between these population groups (Gaisler 1970a; see also Fig. 44).

Note on identification. The particular collections of pipistrelle bats (*Pipistrellus* sp.) originating from south-eastern Afghanistan are interesting in differences in the species contents. A summary of the prepared skulls available for examination – with their original identification labelling – is given in Table 17. There is an apparent disproportion in the diversity between the two largest collections (SMF, IVB) as well as a disproportion in the numbers of the particular small-sized pipistrelle species (*P. pipistrellus*, *P. coromandra*, *P. javanicus*, *P. tenuis*) between these collections. Considering the extreme scarcity of other museum material of bats obtained from Afghanistan (cf. Table 1), such disproportions could be regarded as accidental, caused just by a different effort in different sites and time periods. However, it should be noted here that the IVB and NMP specimens were compared with materials of other populations and species and their labelling was published (Gaisler 1970a), while most of the SMF and ZFMK specimens were identified rather preliminarily in the field and most of these specimens/records remained unpublished or some of them were published using their field identification, respectively (Meyer-Oehme 1965, 1968).

Anyway, the skull dimensions of these four nominate species overlap very broadly and only the dimensions taken from the specimens labelled *P. tenuis* create a more or less separate group of small-sized bats with a relatively broad skull. Specimens assigned to three other species create two morphological groups, representing two distinct morphotypes, (1) medium-sized bats with relatively narrow skulls and (2) large-sized bats with relatively wide skulls (Fig. 43).

The group (1) includes all *P. pipistrellus* specimens from northern Afghanistan; since only this species of the genus *Pipistrellus* occurs in this part of the country, most probably all these specimens were identified correctly. Again, the group (1) comprises all the IVB and SMF specimens and one ZFMK specimen from south-eastern Afghanistan identified as *P. pipistrellus* and the prevailing majority of the SMF and ZFMK specimens identified as *P. coromandra*. The group (2) includes all the IVB specimens identified as *P. coromandra*, all the SMF specimens identified as *P. babu/javanicus*, and some of the SMF and ZFMK specimens identified as *P. coromandra*. One ZFMK specimen identified originally as *P. pipistrellus* grouped with the cluster created by the specimens of *P. tenuis* (Fig. 43). Hence, although the specimens of *Pipistrellus* bats from south-eastern Afghanistan were originally assigned to four species (*P. pipistrellus*, *P. coromandra*, *P.*

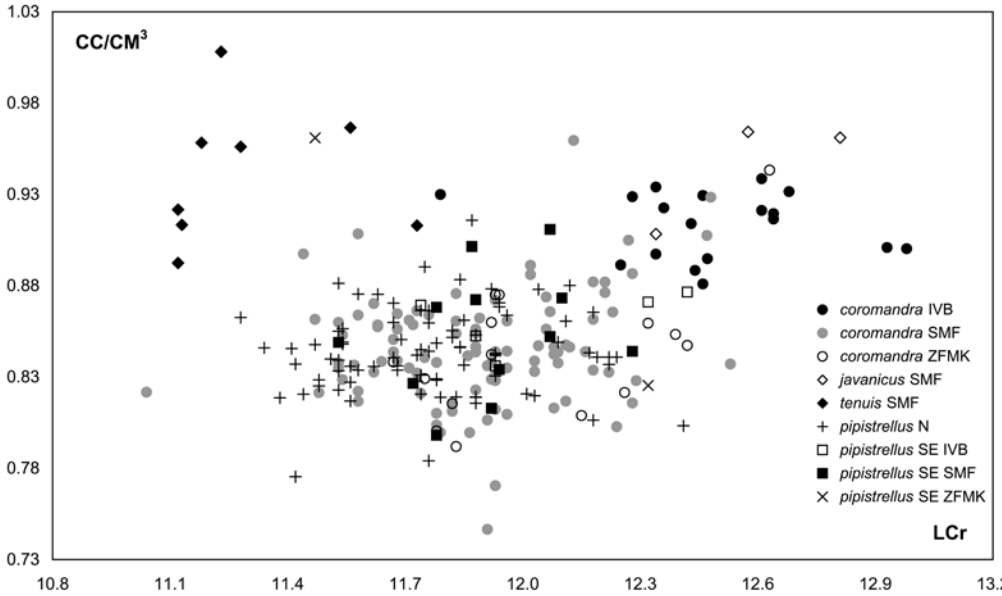

Fig. 43. Bivariate plot of the examined Afghanistani samples of the genus *Pipistrellus* Kaup, 1829: greatest length of skull (LCr) against the relative width of rostrum (CC/CM^3). Species identification according to the particular collection labelling (for collection acronyms see p. 272). Explanantions: N = specimens of the populations living north of the Hindu Kush; SE = specimens of the populations living south-east of the Hindu Kush.

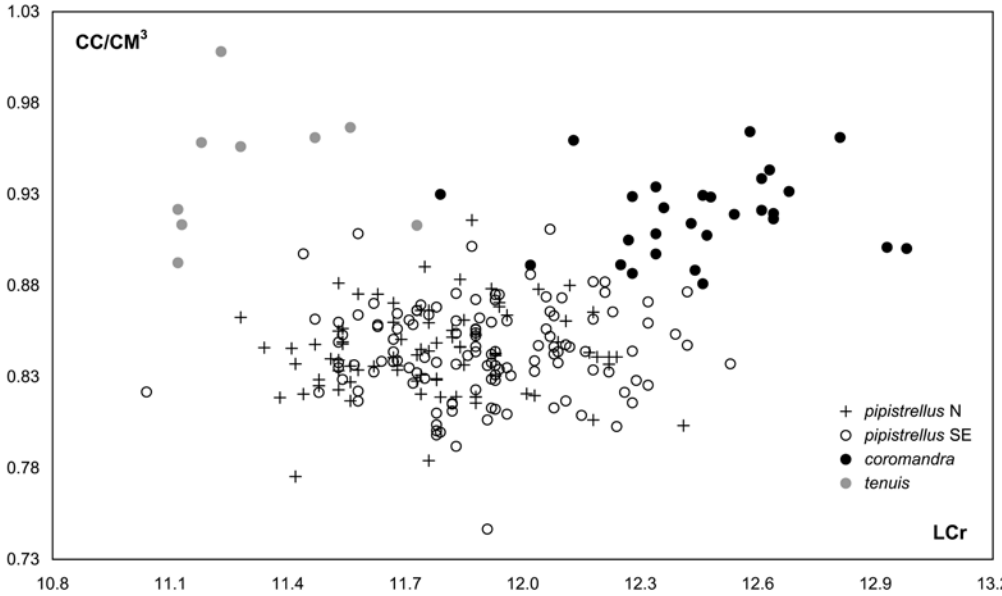

Fig. 44. Bivariate plot of the examined Afghanistani samples of the genus *Pipistrellus* Kaup, 1829: greatest length of skull (LCr) against the relative width of rostrum (CC/CM^3). Revised species identification. For explanations see Fig. 43.

javanicus, *P. tenuis*), only three clearly separated morphotypes were found among them (Fig. 43), and we attribute these three morphotypes to the particular species, viz. *P. tenuis* (small-sized bat with a wide skull), *P. pipistrellus* (medium-sized bat with a narrow skull), and *P. coromandra* (large-sized bat with a wide skull), see Fig. 44 and Tables 16, 18. (A fourth morphotype, large-sized bats with a relatively narrow skull, was represented by *P. kuhlii*, typical also by its pelage colouration and tooth characters; not shown in Figs. 43, 44, but see Table 16.) Besides the size and skull characters, the latter two morphotypes (2) and (3) also differ in their pelage colouration, the pelage of the *coromandra* morphotype is very dark brown with a marked greyish tinge, while the *pipistrellus* morphotype is dark brown with a reddish tinge. The *P. tenuis* specimens were also typical by their ear structure, their tragus being small (ca. 3.5 mm long) and relatively wide. Where alcoholic specimens or dry skins were available only without extracted/associated skulls, the respective specimens were identified with respect to their origin, colouration and forearm size (Tables 16, 18). Anyway, from a majority of catches, frequently represented by a series of specimens from one site and one day (collected most probably as specifically homogeneous groups from their roosts), at least one specimen was available as a skull ready for a proper examination.

This comparison did not confirm a presence of the morphotype assignable to *P. javanicus*; three SMF specimens labelled as the latter species conformed fully to the *coromandra* morphotype and differed in size from *P. javanicus* from India as reported by numerous authors (see under *P. javanicus* below). Meyer-Oehme (1965) mentioned two idetification characters for his specimen of *P. babu* (= *P. javanicus*), unicuspid first upper incisors and the body size larger than in *P. pipistrellus* (see also Gaisler 1971). However, *P. coromandra* is also larger in size than *P. pipistrellus* (see above) and the shape of its incisors is very variable, unicuspid, bicuspid as well as intermediate individuals were documented (Hill & Harrison 1987, Corbet & Hill 1992, own data); the structure of upper incisors is thus a character unuseful for delimitation of *P. coromandra* from other *Pipistrellus* species from the Indian subcontinent. Thus, *P. javanicus* has not been confirmed to occur in Afghanistan, as the respective SMF specimens represent *P. coromandra* (see under *P. javanicus* below for more details).

Finally, most of the SMF and ZFMK specimens identified as *P. coromandra* (some of them were mentioned as *P*. "*coromandra*" by Kock et al. 1972) belong to the *pipistrellus* morphotype and thus, we identify them here as *P. pipistrellus*, similarly as Zimmermann (1956), Gaisler et al. (1968), Gaisler (1970a), and/or Neuhauser & DeBlase (1971) did for other specimens of this morphotype from south-eastern Afghanistan. (Moreover, two specimens (SMF 39146, 39147) from this series of "*P. coromandra*" were identified as *Myotis davidii*, see above.) On the other hand, some records of *P. pipistrellus* reported from this part of Afghanistan by Neuhauser (1969) were confirmed by the revisions of the FMNH specimens neither by Neuhauser & DeBlase (1971) nor Bates & Harrison (1997); this concerns 17 bats from the Kabul, Konar, Laghman, and Nangarhar provinces (see Records). Theoretically, some of these latter specimens may represent a species other than *P. pipistrellus*, including *P. coromandra*, which has not been reported from the catch of the Street Expedition 1965 (Neuhauser 1969).

D. Meyer-Oehme and J. Niethammer collected large series of pipistrelles in eastern Afghanistan in 1961–1965, which they identified and labelled for the SMF and ZFMK collections as *P. coromandra*, but did not report them in the respective papers (Meyer-Oehme 1965, 1968). Some of these specimens from the SMF collection were mentioned as *P*. "*coromandra*" by Kock et al. (1972), perhaps considering an uncertain identification. Thus, the former authors made an error, when they identified the individuals of *P. coromandra* as *P. babu* and the dark individuals of the eastern Afghanistani populations of *P. pipistrellus* as *P. coromandra*. Due to this identification shift, *P. babu* / *P. javanicus* was erroneously introduced into the list of bat fauna of Afghanistan (see also below).

Pipistrellus kuhlii (Kuhl, 1817)

Records. **New data**: K a n d a h a r: Kandahar [1], eastern periphery, 26 August 1965: 1 m, SMF (leg. D. Meyer-Oehme; cf. Kock et al. 1972). – K h o s t: Mardkhel [2], August 1976: 1 m, ZFMK (leg. Heckel). – **Published data**: H e l m a n d: Qala Bist [3], fortress, fissures between bricks, 14 November 1965: coll. 3 m, 20 f (Neuhauser 1969); Qala Bist, FMNH (Bates & Harrison 1997). – K a n d a h a r: Candahar [1] (Blyth in Hutton 1845* [as *P. lepidus*]); city of Kandahar, March: 1 m (Scully 1881b); – Spin Boldak [4], Kandahar, [25 August 1965: 1 m, 1 f,] SMF (Kock et al. 1972); Spin Boldak, Kandahar, 25 August 1965: 1 m, 1 f, SMF (Benda et al. 2006). – K h o s t: Khost [5], Paktia, [(Band-e-Barq), 5 August 1965: 1 m, 3 f,] SMF (Meyer-Oehme 1965, Kock et al. 1972); Khost (Band-e-Barq), Paktia, 5 August 1965: 1 m, SMF (Benda et al. 2006). – N a n g a r h a r: Basawal [6], 32 km E of Jalalabad, 22 October 1965: shot 2 f, 25 October 1965: shot 2 m, 1 f (Neuhauser 1969); – Jalal-Abad [7], 1967: coll. 2 m; over the yard of the former Habibula Palace, shot 1 flying ind. (Gaisler et al. 1968); Jalalabad, 24 April 1967: 1 m, 1 May 1967: 1 m, [IVB] (Gaisler 1970a, cf. Baruš & Tenora 1970); – 8 km north of Jalalabad [8], at shallow dry caves, 25 October 1965: 2 m (Neuhauser 1969). – N i m r o z: Dilaram [9], Farah, [3 March 1965: 1 f, 30 August 1965: 2 f,] SMF (Meyer-Oehme 1965, Kock et al. 1972); Dilaram, Farah, 3 March & 30 August 1965: 2 f, 1 ind., SMF (Benda et al. 2006). – Affghanistan, 1 ma (Dobson 1878); Afghanistan (Ellerman & Morrison-Scott 1951); Afghanistan, 30 inds., FMNH (DeBlase 1980).

Distribution. *Pipistrellus kuhlii* ranks among medium-frequent bats of Afghanistan, nine sites are available from the country (Fig. 45). The range of this bat in Afghanistan is divided into two parts, the low areas of the Nangarhar and Khost provinces in the eastern part of the country, and the Khash, Zamindavar and Rigestan deserts of the provinces of Helmand, Kandahar and Nimroz in southern Afghanistan. All localities are situated at low altitudes up to 1200 m a. s. l. (altitude range 550–1200 m, mean altitude 921 m) and the Toba Kakar range creates a barrier between the two occurrence areas in south-eastern Afghanistan (Fig. 45). The pattern of *P. kuhlii* distribution in Afghanistan is in accordance with that in the neighbouring Turkmenistan, Iran and Pakistan, where this bat was only exceptionally recorded at sites above 1500 m a. s. l. (Strelkov et al. 1978, Roberts 1997, Benda et al. 2012).

Lewis (1973) reported four sites of *P. kuhlii* occurrence also from northern Afghanistan (in the Balkh, Herat, and Kondoz provinces), as localities of the host of the bat flea *Ischnopsyllus octactenus* (Kolenati, 1856). However, concerning the host identification he added (p. 60): "It is mainly a parasite of *Pipistrellus pipistrellus*, […]. The true identity of *Pipistrellus* species in Afghanistan is still questionable […]. A separate report on the bats collected by the Street Expedition is in preparation, and until it is completed, the taxonomic status of the pipistrelle hosts must remain questionable." Moreover, all the respective specimens of *P. kuhlii* reported by Lewis (1973) as hosts of this flea were identified as *P. pipistrellus* by Neuhauser (1969), Neuhauser & DeBlase (1971) and/or Bates & Harrison (1997); therefore, these records are here referred to the latter species (see also above). An uncertain reference to a *P. kuhlii* record from Afghanistan was published by Kuzâkin (1944). In a distribution map of this bat he marked a point that roughly corresponds with the position of the Kabul basin, but did not provide any other information concerning a possible record. This point was marked with a question mark in the map of *P. kuhlii* distribution by Strelkov (1973), who doubted credibility of the record. Kuzâkin (1950: 359–360) again marked this enigmatic point in his map of *P. kuhlii* distribution, however, he also mentioned a record from Adži-Kabul [= Hajiqabul], eastern Azerbaijan (see also Rahmatulina 2005), in the description of the species distribution. The respective point may thus represent only a misplaced locality of a similar name lying in a different country (Kabul vs. Hajigabul) – see similar problematics also in *Eptesicus serotinus* and *E. ognevi* above.

* Hutton (1845: 340–341) gave the first historical report on bats from Afghanistan: "Two species of Bats are common in Candahar, a large and a small kind; the latter I preserved in spirits and have send you [= to Edward Blyth, then a Curator of the Asiatic Society Museum at Calcutta], though I fear they are spoiled [Blyth noted in a footnote on the same page: "They arrived in excellent condition, and may be thus characterized"]. This species is very common, and may be seen from February till towards the end of October, flitting about in crowds in the twilight hours of evening; they shelter during the day in holes of houses, walls, and rocks."

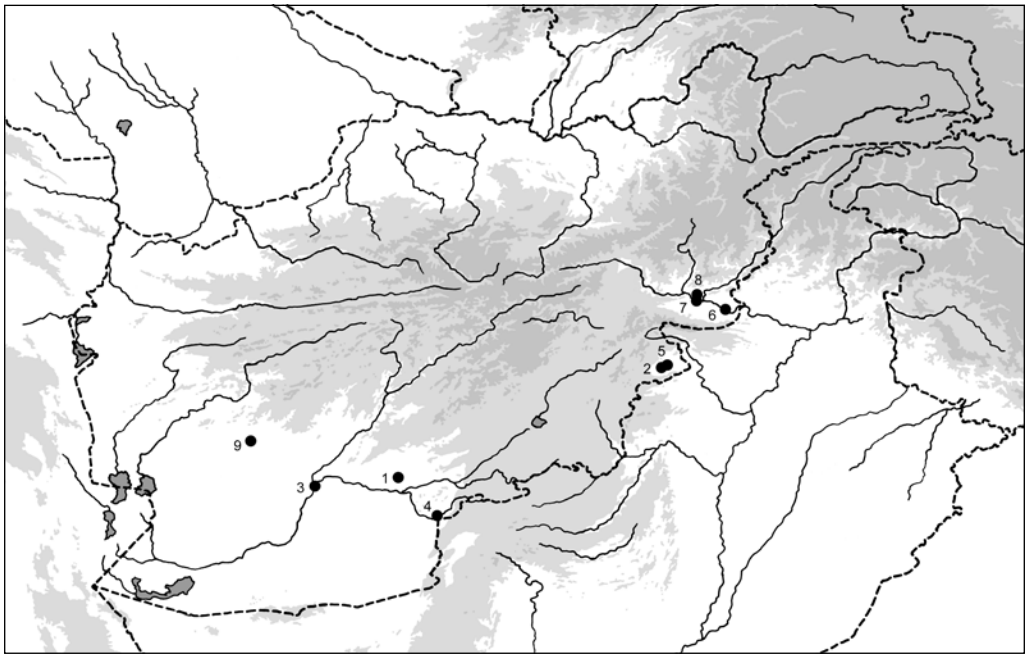

Fig. 45. Records of *Pipistrellus kuhlii* (Kuhl, 1817) in Afghanistan.

The occurrence of *P. kuhlii* in Afghanistan represents a part of the northern margin of the species distribution range, in Asia this bat is distributed throughout arid lowlands of the south-western part of the continent. The known northern limits of this bat in southern Asia stretch from south-western Turkmenistan, through northern Iran, southern and eastern Afghanistan to Pakistan (Strelkov et al. 1978, Bates & Harrison 1997, Benda et al. 2012). In Pakistan, *P. kuhlii* is distributed mainly in the Indus lowland of Sindh and Punjab, where at least twelve records were reported (Wroughton 1916, Taber et al. 1967, Roberts 1977, Bates & Harrison 1997) and where Faisalabad in central Punjab is the northernmost known site (31° 25' N). The occurrence in the Jalalabad valley of eastern Afghanistan (ca. 34° 29' N) thus represents the northernmost limits of the species in the Indian subcontinent (although Chakraborty 1983 and Alfred et al. 2002 mentioned presence of *P. kuhlii* in Kashmir – without a reference to any records – this occurrence thus does not seem probable, see also Roberts 1997 and/or Bates & Harrison 1997*).

Roberts (1977) and Rafique et al. (2010) reported five localities of *P. kuhlii* from Pakistani Baluchistan, four of them situated in the Chagai desert just on the border with southern Afghanistan (Chagai, Dalbandin, Darzi Chach, Zangi Nawar). This distribution continues directly the occurrence of this bat in the deserts of southern Afghanistan (see above) as well as in Iranian Sistan & Baluchistan and South Khorasan. In the latter two provinces, Benda et al. (2012) re-

* the report of *P. kuhlii* from Jammu and Kashmir (Chakraborty 1983: 37; Alfred et al. 2002: 68) perhaps refers to the record from Kashmor, Sindh, Pakistan (erroneously reported as Kashmir also by e.g. Corbet & Hill 1992, Sinha 1999).

viewed 13 records and *P. kuhlii* represents the most common bat in this part of Iran. However, *P. kuhlii* was documented as a common species also in north-eastern Iran (Benda et al. 2012), where this range continues only to the south (i.e. to South Khorasan, see above); in the neighbouring north-western Afghanistan or south-eastern Turkmenistan, this bat remains unknown. In West Turkestan, *P. kuhlii* was recorded in two regions rather distant from the Afghanistani border, in the arid Turkmen steppe of western Turkmenistan adjacent to the Caspian Sea, where five records are available (Strelkov et al. 1978), and in the Karakum desert of central Turkmenistan and western Uzbekistan, where two records were made within a period of 120 years (Bianki 1918, Strelkov & Sosnovceva 1994). However, some records from eastern Iran were made in sites situated very close to the western border of Afghanistan (see Benda et al. 2012), e.g. Zabol (27 km; Etemad 1969), Durna (35 km; DeBlase 1980), Bamrud (43 km; Benda et al. 2012), etc. This common and geographically close occurrence suggests a more dense distribution of *P. kuhlii* in the low situated steppe and desert parts of the western and south-western regions of Afghanistan as very probable, namely in the provinces of Farah, Helmand, Herat, Kandahar, and Nimroz.

Material examined. 1 ♀ (SMF 38919 [S+A]), Dilaram, Farah, 850 m, 3 March 1965, leg. D. Meyer-Oehme; – 2 ♀♀ (SMF 38926, 38927 [S+A]), Dilaram, Farah, 850 m, 30 August 1965, leg. D. Meyer-Oehme; – 1 ♂ (IVB af969 [S+B]), Jalal Abad, Habibula Palace, 24 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂ (IVB af1008 [S+B]), Jalal Abad, 1 May 1967, leg. Mrs. Baldwin; – 1 ♂ (SMF 38932 [S]), Kandahar, östl. Peripherie, 1000 m, 26 August 1965, leg. D. Meyer-Oehme; – 1 ♂, 3 ♀♀ (SMF 38928 [S+A], 38920–38922 [S]), Khost (Band-e-Barq), Paktia, 1200 m, 5 August 1965, leg. D. Meyer-Oehme; – 1 ♀ (ZFMK 97.195 [A]), Martichel, Khost-Gebiet, August 1976, leg. Heckel; – 3 ♂♂, 2 ♀♀ (SMF 38925, 38931 [S+A], 38924, 38929, 38930 [S]), Spin Boldak, Kandahar, 1205 m, 25 August 1965, leg. D. Meyer-Oehme.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Pipistrellus kuhlii* are shown in Table 16. For the material examined see above. The colouration of the Afghanistani specimens is described as very pale, Blyth (in Hutton 1845: 340) used the following words: "General colour a light yellowish-clay, pale sandy or isabella-brown; underneath paler; the volar membrane light dusky, and the inter-digital at base towards the wrist, also the tip of the wing, and a broad border between the leg and proximate finger, with the fingers themselves, of the same light hue as the fur of the body." Gaisler (1970a) concurred with this description, concerning the specimens collected by him in the Jalalabad area (cf. Gaisler et al. 1968).

In their skull dimensions, the Afghanistani specimens of *P. kuhlii* conform to the populations of this bat from southern Iran (Fig. 46), but are smaller than *P. kuhlii* populations from the circum-Mediterranean region, including northern and central Iran (see Benda et al. 2006: 207, Table 29 and Benda et al. 2012: 444, Table 31). In their dimensions, the Afghanistani and south-Iranian bats approach those of the Saharan *deserti* morphotype, in body and namely skull size the smallest population of *P. kuhlii* (Benda et al. 2014, 2015). So, in the arid areas of Afghanistan and southern Iran there is a similar tendency in *P. kuhlii* to reduce the body and skull size as in other desert regions of the southern Palaearctic.

P. kuhlii was formerly considered a species widespread over Africa, the western Palaearctic and westernmost Oriental region, in which a various number of subspecies was recognised (see e.g. Ellerman & Morrison-Scott 1951, Kock 1969, Corbet 1978, Koopman 1994, Horáček et al. 2000); currently it is regarded as a rather less variable species distributed in the Mediterranean region and adjacent areas (Kock 2001, Simmons 2005, Benda et al. 2006, 2012). However, despite the geographical variation and distribution extent considered, the populations of *P. kuhlii* from Afghanistan, Pakistan, West Turkestan and the eastern part of the Middle East are more or less consistently assigned to *P. k. lepidus* Blyth, 1845 (Ellerman & Morrison-Scott 1951, Aellen 1959a, Kuzâkin 1965, Etemad 1969, Neuhauser 1969, Gaisler 1970a, Kock et al. 1972, Strelkov et al. 1978, DeBlase 1980, Strelkov 1981, Butovskij et al. 1985, Corbet & Hill 1992, Koopman 1994,

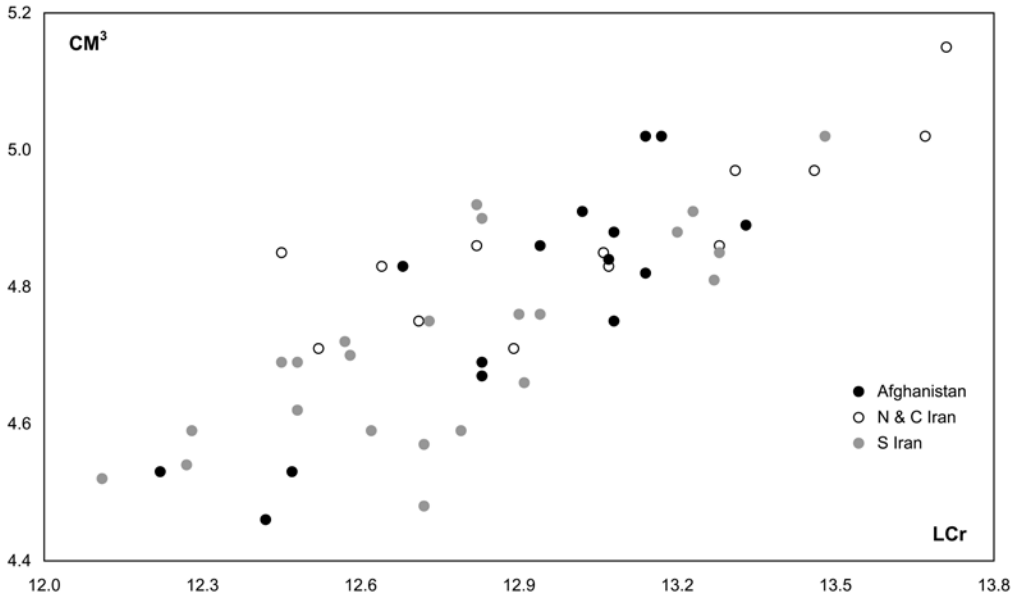

Fig. 46. Bivariate plot of the examined Afghanistani and comparative samples of *Pipistrellus kuhlii* (Kuhl, 1817): greatest length of skull (LCr) against the length of upper tooth-row (CM^3).

Bates & Harrison 1997, Alfred et al. 2002, Benda et al. 2006, 2012, Srinivasulu & Srinivasulu 2012). This form was described as *Pipistrellus lepidus* Blyth, 1845 from Candahar [= Kandahar, Afghanistan] (Hutton 1845: 340), i.e. it belongs to the few bats discovered directly in Afghanistan. The delimitation of this subspecies was originally justified by differences in the pale colouration of pelage and wing membranes (Gaisler 1970a, Strelkov et al. 1978, 1985, DeBlase 1980); it was, however, supported by the results of several molecular genetic comparisons, which unfortunately did not include the samples from Afghanistan (Mayer et al. 2007, Bray et al. 2013, Çoraman et al. 2013, Benda et al. 2014, 2015).

Concerning the *Pipistrellus* populations of the type locality of *P. k. lepidus*, Neuhauser (1969: 81) gave the following note: "In Kandahar (Kandahar province), type locality of *P. k. lepidus* Blyth, Street Expedition members collected three pipistrelles, but they were the externally-similar *P. pipistrellus bactrianus* Satunin. As both this form and *P. k. lepidus* have white wing margins and a pale straw-brown fur color, it is possible that Blyth (1845, p. 340) confused his forms for *P. p. bactrianus*. Unfortunately the type specimen has been lost. […] In the event that a neotype be designated, it should fall to either the specimen collected by Scully (1881, p. 223) from Kandahar, providing that this specimen was not confused with *P. p. bactrianus*, or with the adult male collected by Horsfield from Afghanistan (Dobson, 1878, p. 231). Unless this latter specimen is provided with a more detailed collecting area, it seems wise to designate the Scully specimen as neotype." However, it should be noted here that the reason to designate a neotype of *Pipistrellus lepidus* Blyth, 1845 has not yet arised.

Pipistrellus coromandra (Gray, 1838)

Records. **New data**: K o n a r: Chaghasarai [1], 24 April 1964: 1 f, SMF (leg. D. Meyer-Oehme), 23 July 1964: 1 m, 2 f, SMF (leg. D. Meyer-Oehme). – L a g h m a n: Mihtar Lam, Qalat us Sirai [2], 12 September 1965: 2 m, 1 f, SMF (leg. D. Meyer-Oehme). – N a n g a r h a r: Jalalabad, Pol-e Bisut [3], 18 September 1964: 6 m, 3 f, SMF (leg. D. Meyer-Oehme; cf. Meyer-Oehme 1965, Kock et al. 1972 [as *P. babu*]); – Nimla [4], 21 March 1972, 2 f, ZFMK (coll. J. Niethammer). – **Published data**: K o n a r: Changa Sarai [1], Konar, [17 July 1964: 3 f,] SMF (Kock et al. 1972 [as *P*. "*coromandra*"]). – L a g h m a n: Kalat-us-Seraj [= Mihtar Lam, Qalat us Sirai] [2], Laghman, [7 October 1965: 2 m,] SMF (Meyer-Oehme 1968 [as *P. babu*], Kock et al. 1972 [as *P.* "*coromandra*" and *P. babu*]). – N a n g a r h a r: Dar-i-Nur [5], a cavity in a mullbery tree, 19 March 1967: 1 m (Gaisler et al. 1968, Gaisler 1970a; Fig. 48); – Jalal-Abad [6], 1965/1967: coll. 9 m, 12 f; a small colony obs. behind a plank of the house of the wardens at the University of Jalal-Abad; behind the scales of a date palm, 2 inds. (Gaisler et al. 1968, Groschaft & Tenora 1971b); Jalalabad, 5 March 1965: coll. 1 m, 1 f, 12–30 April 1967: 9 m, 10 f (Dusbábek 1970, Gaisler 1970a), 22 inds. (Baruš & Tenora 1970, Groschaft & Tenora 1971a, cf. Groschaft & Tenora 1973, 1974).

Distribution. *Pipistrellus coromandra* is a rather infrequent but not rare bat in Afghanistan, six localities are known from the eastern part of the country (Fig. 47). The record sites are concentrated to low and medium altitudes at the range of 550–1650 m a. s. l. (mean altitude 943 m) in and around the broader Jalalabad valley of the provinces of Konar, Laghman, and Nangarhar (Fig. 48).

P. coromandra is an Oriental species, distributed all over the Indian subcontinent (India, Ceylon, Nepal, Bangladesh) with an extension to the Indochinese peninsula (Thailand, Vietnam) and Nicobar islands (Corbet & Hill 1992, Bates & Harrison 1997, Kruskop 2013). In north-western

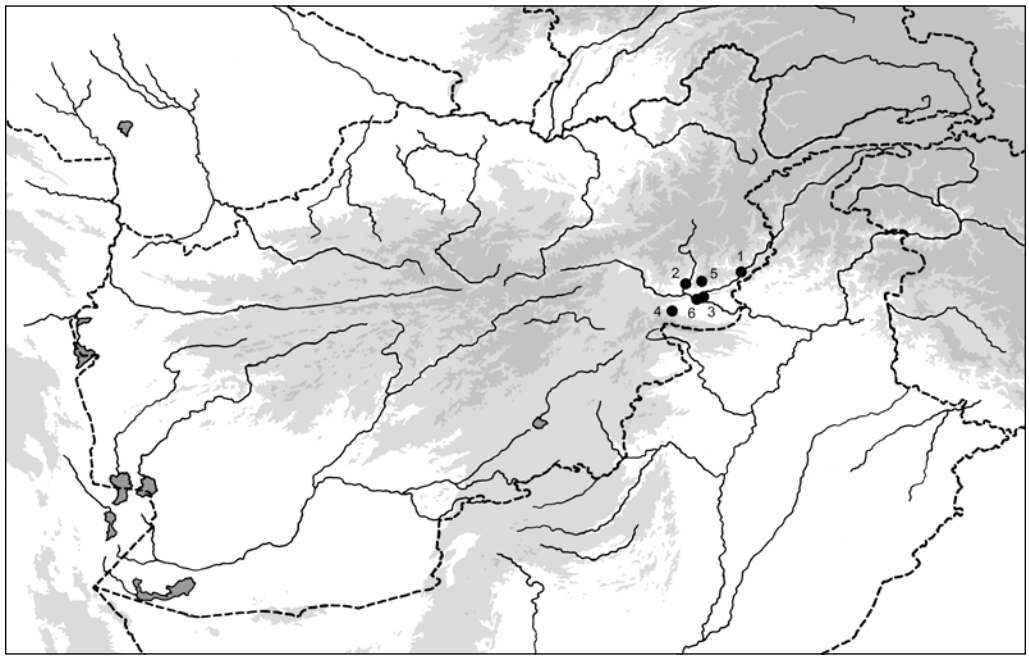

Fig. 47. Records of *Pipistrellus coromandra* (Gray, 1838) in Afghanistan.

India (Himachal Pradesh, Uttarakhand), Kashmir, northern Pakistan and eastern Afghanistan, this species creates an island of occurrence separated from the main Indian range (Bates & Harrison 1997).

The extension of *P. coromandra* range to Afghanistan represents the westernmost spot of occurrence of this bat as well. In the neighbouring Pakistan, the records of *P. coromandra* were reported from four sites in Khyber Pakhtunkhwa (Chitral, Dir, Saidu-Sharif, Yakh Tangai; Walton 1974, Roberts 1977, Bates & Harrison 1997) and from one site in northern Punjab (Chakri; Bates & Harrison 1997). This bat was reported from three sites in Kashmir (Rambon, Shar, Srinagar; Chakraborty 1983, Ghosh 2008) and from three sites in Himachal Pradesh (Bakloh, Narkanda, Shaur; Ghosh 2008, Saikia et al. 2011). In all these areas adjacent to Afghanistan, *P. coromandra* was recorded mostly at altitudes similar or even higher than in Afghanistan.

Material examined. 1 ♂ (IVB af492 [S+B]), Dar-i-Nur, Nangarhar, hollow in the mulberry tree, 19 March 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♀ (SMF 39010 [A]), Chagha Sarai, Konar, 875 m, 24 April 1964, leg. D. Meyer-Oehme; – 3 ♀♀ (SMF 39011, 39012 [S+A], 39013 [A]), Chagha Sarai, Konar, 875 m, 17 July 1964, leg. D. Meyer-Oehme; – 1 ♂, 2 ♀♀ (SMF 39025, 39026, 39127 [A]), Chagha Sarai, Konar, 875 m, 23 July 1964, leg. D. Meyer-Oehme; – 1 ♂, 1 ♀ (IVB af1387 [S+B], af1386 [S]), Jalal Abad, 5 March 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂ (IVB af535 [S]), Jalal Abad, 30 March 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂, 2 ♀♀ (IVB af648 [S+B], af649 [S], NMP 95425 [B]), Jalal Abad, 8 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂, 1 ♀ (IVB af687, af688 [S+B], Jalal Abad, 13 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂, 1 ♀ (IVB af399, af400 [S+B]), Jalal Abad, university campus, 12 March 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂ (IVB af523 [S+B]), Jalal Abad, university campus, 29 March 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♀ (IVB af560 [S]), Jalal Abad, university campus, 3 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 2 ♀♀ (IVB af656, af657 [S+B]), Jalal Abad, university campus, 9 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂, 2 ♀♀ (IVB af712, af714 [S+B], NMP 95428 [B]), Jalal Abad, university campus, 18 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂ (IVB af999 [S+B]), Jalal Abad, university campus, 29 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂, 1 ♀ (IVB af1000, 1001 [S+B]), Jalal Abad, university

Fig. 48. The village of Dar-e Nur (Nangarhar) with the Hindu Kush range on the background; a male of *Pipistrellus coromandra* was found to roost in a mulberry tree hollow in an orchard on 19 March 1967.

Table 18. Basic biometric data on the examined Afghanistani samples of *Pipistrelus coromandra* (Gray, 1838), *P. tenuis* (Temminck, 1840), and *Otonycteris leucophaea* (Severcov, 1873). For abbreviations see p. 272

	Pipistrellus coromandra					*Pipistrellus tenuis*					*Otonycteris leucophaea*	
	n	**M**	min	max	SD	n	**M**	min	max	SD	ZFMK 97.148	SMF 38778
LAt	35	**32.07**	29.8	34.4	1.111	8	**29.69**	28.8	31.7	0.960	61.5	62.9
LCr	27	**12.44**	11.79	12.98	0.313	9	**11.31**	11.12	11.73	0.222	22.03	–
LCb	27	**11.98**	11.37	12.62	0.297	9	**10.82**	10.47	11.38	0.290	20.87	–
LaZ	21	**8.02**	7.68	8.44	0.205	7	**7.38**	7.27	7.58	0.103	14.75	–
LaI	30	**3.36**	3.09	3.63	0.114	9	**3.13**	2.79	3.32	0.154	4.47	–
LaInf	30	**3.89**	3.67	4.33	0.176	9	**3.48**	3.37	3.63	0.074	6.04	–
LaN	28	**6.29**	6.08	6.64	0.132	9	**6.01**	5.74	6.40	0.178	9.48	–
LaM	27	**7.02**	6.69	7.42	0.179	8	**6.63**	6.47	6.78	0.117	10.62	–
ANc	27	**4.44**	4.18	4.68	0.134	8	**4.10**	3.98	4.21	0.081	6.97	–
LBT	26	**2.82**	2.66	3.02	0.102	8	**2.77**	2.58	2.97	0.129	4.97	–
CC	30	**4.10**	3.74	4.44	0.160	9	**3.63**	3.48	3.76	0.100	6.13	–
M^3M^3	30	**5.43**	5.18	5.68	0.144	9	**4.79**	4.58	5.11	0.156	9.42	–
CM^3	30	**4.46**	4.18	4.81	0.132	9	**3.87**	3.64	4.09	0.138	8.48	–
LMd	29	**8.96**	8.02	9.57	0.304	9	**7.87**	7.65	8.02	0.139	16.14	–
ACo	29	**2.50**	2.24	2.86	0.125	9	**2.39**	2.32	2.48	0.049	6.53	–
CM_3	29	**4.79**	4.44	5.56	0.204	9	**4.11**	3.94	4.26	0.100	9.62	–
CC/CM^3	30	**0.920**	0.881	0.984	0.025	9	**0.941**	0.868	1.008	0.041	–	–

campus, 30 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 6 ♂♂, 3 ♀♀ (SMF 38782, 39129, 39133, 39134 [S+A], 39027, 39028, 39130–13132 [A]), Jalalabad, Nangarhar, 650 m, 18 September 1964, leg. D. Meyer-Oehme; – 2 ♂♂ (SMF 38781, 39153 [S+A]), Kalat-us-Seraj, Laghman, 900 m, 7 October 1965, leg. D. Meyer-Oehme; – 2 ♂♂, 1 ♀ (SMF 39046, 39148, 39150 [S+A]), Kalat-us-Seraj, Laghman, 900 m, 12 September 1965, leg. D. Meyer-Oehme; – 2 ♀♀ (ZFMK 97.168 [S+B], 97.212 [S+Sk]), Nimla, 1000 m NN, 21 March 1972, coll. J. Niethammer.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Pipistrellus coromandra* are shown in Table 18. For the material examined see above.

The intraspecific taxonomy of *P. coromandra* remains unresolved, some authors considered this species polytypic (Ellerman & Morrison-Scott 1951, Sinha 1986, Corbet & Hill 1992, Koopman 1994), some others, mainly the recent authors, consider it monotypic (Simmons 2005, Srinivasulu & Srinivasulu 2012). However, despite the taxonomic conception of this species, the populations of *P. coromandra* inhabiting the Indian subcontinent are consistently assigned to the nominotypical subspecies (Sinha 1970, 1986, 1999, Khajuria 1980, Chakraborty 1983, Koopman 1994, Bates & Harrison 1997, Alfred et al. 2002, Das 2003, Ghosh 2008), described from Puducherry, south-eastern India (Cuvier 1832: 21).

Within the Indian subcontinent, the only populations that were thought to possibly represent a different taxon were those from its north-western part, i.e. from Afghanistan and north-western Pakistan (Gaisler 1970a, Corbet & Hill 1992, Bates & Harrison 1997, Srinivasulu & Srinivasulu 2012). This idea was introduced by Gaisler (1970a) who found the Afghanistani samples of *P. coromandra* slightly larger in body and skull size (LAt 30.0–34.0 mm, mean 32.2 mm; LCr 11.9–13.2 mm, mean 12.50 mm; n=22) than the samples of this bat from India (LAt 28.0–33.5 mm, mean 30.7 mm; LCr 11.8–12.6 mm, mean 12.16 mm; n=11), and the pelage colouration of the Afghanistani bats with a more greyish tinge compared to the more brownish pelage of the Indian samples. Gaisler (1970a: 44) concluded as follows: "According to the present taxonomic rules, the above differences are sufficient for the separation and description of a new subspecies for

which the name *Pipistrellus coromandra afghanus* n. ssp. could be proposed. However, I do not wish, for the time being, to introduce a new name, be it on the level of a subspecies or a species, in view of the confused systematics of *P. coromandra* and the Indian representatives of the genus *Pipistrellus* at all." Despite the Gaisler's statement in the last quoted sentence, Corbet & Hill (1992: 136) considered the name *afghanus* available for taxonomy and stated concerning the geographical variation of *P. coromandra* in the Oriental region as follows: "Specimens from NW Pakistan in the BMNH agree with the description of Afghan examples by Gaisler (1970[a]), who found these to be slightly larger and more greyish rather than brownish when compared with Indian specimens. Although it seems that he did not intend formally to recognise the Afghan population as a distinct subspecies, his proposal of *P. c. afghanus* (1970: 44; Afghanistan) appears to satisfy the requirements of the Code, and this name may prove applicable to these more westerly populations."

Although the name *afghanus* is associated with a description acceptable for considering it available as well as with a number of specimens which could be regarded as a syntype series, the name could hardly be accepted as available, because of the respective Gaisler's statement, which disqualified clearly the description ("I do not wish, for the time being, to introduce a new name"). However, Bates & Harrison (1997: 173) again quoted this name as available, see the following note: "[…] Corbet & Hill (1992) suggest those [specimens] from north-west Pakistan may prove to be subspecifically distinct being closely similar to specimens from Afghanistan. These individuals are characterised by a greyer pelage and larger cranial measurements. Gaisler (1970a) in his description of specimens from eastern Afghanistan included the name *P. c. afghanus* n. ssp. but did not formally recognise the population as a distinct subspecies. The availability of this name is discussed by Corbet & Hill (1992)." Anyway, the name *afghanus*, representing clearly an unavailable name (nomen nudum according to ICZN 1999: Art. 15.1), has appeared among the synonyms of *P. coromandra* already in a number of reviews (Hill & Harrison 1987, Koopman 1993, Borisenko & Pavlinov 1995, Alfred et al. 2002, Simmons 2005, Srinivasulu & Srinivasulu 2012).

For the time being, the intraspecific taxonomy of *P. coromandra* in the Indian subcontinent represents an unresolved topic. Until the geographical variation in this bat is properly studied, the delimitation of any subspecies is too preliminary. Nevertheless, if the Afghanistani populations are considered a separate taxon, the name *afghanus* Gaisler, 1970 cannot be used for it.

Pipistrellus tenuis (Temminck, 1840)

Records. **New data**: L a g h m a n: Badiabad [1] near Alingar, 21 February 1961: 1 m, SMF (leg. D. Meyer-Oehme; cf. Kock et al. 1972 [as *P.* "*coromandra*"]). – N a n g a r h a r: 15 km east of Jalalabad [2], 13 May 1965: 1 m, ZFMK (coll. J. Niethammer). – **Published data**: N a n g a r h a r: Kala-i-Shahi (NNE Jalalabad) [= Qala-e Shahi] [3], ueberdachten Veranda eines Bauernhauses, 27 August 1961: 1 ma, 5 fa, 1 faG, 8 mj, 5 fj, SMF (Meyer-Oehme 1965, 1968 [as *P. mimus*]); Kala-i-Shahai/Där-i-Nur, Shewa, Nangarhar (Kock et al. 1972 [as *P. mimus*]).

Distribution. *Pipistrellus tenuis* is a rather rare bat in Afghanistan, only three localities are available from the eastern part of the country (Fig. 49). The records were made at low situated areas (altitude range 700–850 m a. s. l., mean altitude 783 m) of two provinces, Laghman and Nangarhar, in the broader area of the Jalalabad valley. The record made by Meyer-Oehme (1965) at Qala-e Shahi (Nangarhar) in summer 1961 apparently represents a finding of a nursery colony.

P. tenuis is widely distributed throughout the Oriental region, except the northern mountainous areas, but including Ceylon, Sunda islands and southern Philippines (Corbet & Hill 1992, Bates & Harrison 1997). Its occurrence in Afghanistan represents almost the northernmost extension of the whole species distribution range – only one record was made further to the north – from Drosh, Chitral, northern Pakistan (Ghosh 2008).

P. tenuis seems to be rather an inhabitant of arid lowland areas, reaching only exceptionally higher altitudes. The limited occurrence of this bat in Afghanistan continues eastwards to the distribution in Pakistan and north-western India (Bates & Harrison 1997). *P. tenuis* ranks among common bats in the Punjab and Sindh provinces, as well as in the Islamabad area (Wroughton 1912a, Hinton & Thomas 1926, Siddiqi 1961, Taber et al. 1967, Walton 1974, Roberts 1977, Javid et al. 2012a), but only two records are available from Khyber Pakhtunkhwa (Chitral, Malakand; Roberts 1977, Sinha 1980). Five records of *P. tenuis* were reported from Himachal Pradesh (Saikia et al. 2011) but only one enigmatic record is available from Kashmir (Jammu; see Chakraborty 1983 and Bates & Harrison 1997).

Material examined. 1 ♂ (SMF 39067 [S+A]), Badiabad, Alingar, Laghman, 800 m, 21 February 1961, leg. D. Meyer-Oehme; – 1 ♂ (ZFMK 97.210 [S]), 15 km E Jalalabad, 700 m NN, 13 May 1965, coll. J. Niethammer; – 8 ♂♂, 11 ♀♀ (SMF 38783, 38792–38797 [S+A], 38784–38790, 38798–38802 [A]), Shewa, Nangarhar, Kala-i-Shani/Dăr-i-Nur, ca. 850 m, 27 August 1961, leg. D. Meyer-Oehme.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Pipistrellus tenuis* are shown in Table 18. For the material examined see above.

P. tenuis was introduced into the fauna of Afghanistan by Meyer-Oehme (1965), who reported this bat under the name *P. mimus* Wroughton, 1899 (following e.g. Ellerman & Morrison-Scott 1951, Siddiqi 1961, or Brosset 1962c). *P. mimus* was subsequently reported from Afghanistan by Meyer-Oehme (1968), Neuhauser (1969), Gaisler (1970b, 1971), Kock et al. (1972), Niethammer (1983), and Koopman (1994). Meyer-Oehme (1965) assigned the Afghanistani populations of

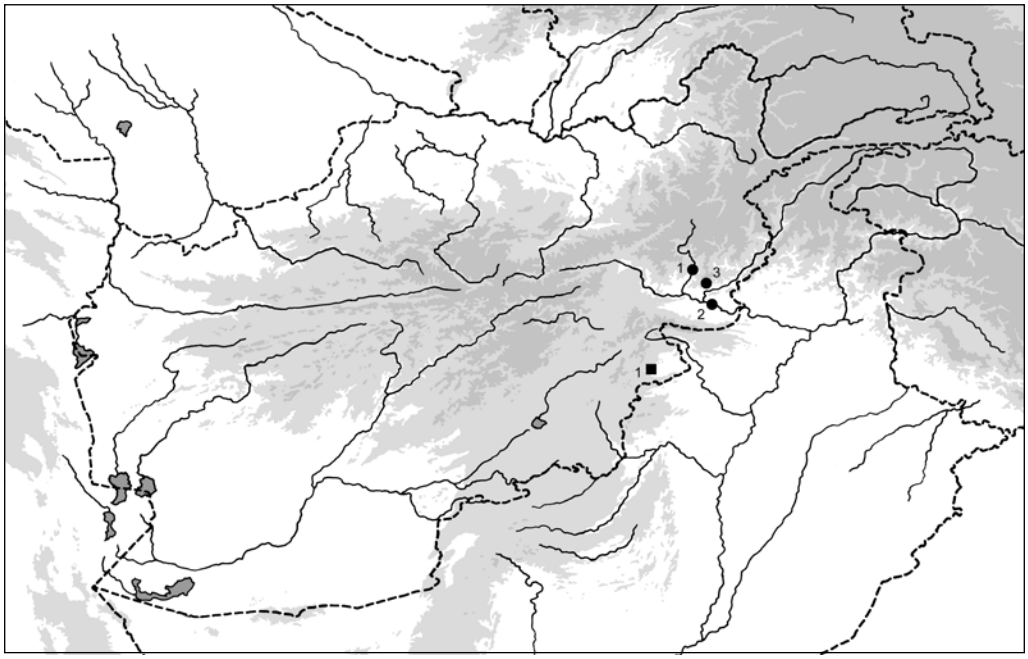

Fig. 49. Records of *Pipistrellus tenuis* (Temminck, 1840) (circles) and *Nyctalus noctula* (Schreber, 1774) (square) in Afghanistan.

this bat to the northern Pakistani form *P. m. glaucillus* Wroughton, 1912, and this opinion was accepted by Neuhauser (1969) and Gaisler (1971). Sinha (1980) revised the intraspecific taxonomy of *P. mimus* and recognised two forms within the species, *P. m. principulus* Thomas, 1915 in Assam and the nominotypical subspecies in the whole range between Pakistan to Burma, with the exception of north-eastern India. This concept was accepted by Koopman (1994), who assigned the Afghanistani populations to *P. m. mimus*.

Corbet & Hill (1992), without giving any explanation, joined *P. mimus* with *P. tenuis* into one species under the latter name. The former name, *P. t. mimus*, remained for the designation of the subspecies of *P. tenuis* living in Indochina, Ceylon, India, Pakistan, and Afghanistan (Bates & Harrison 1997, Roberts 1997, Simmons 2005, Srinivasulu & Srinivasulu 2012). On the other hand, Sinha (1999), Alfred et al. (2002), Das (2003), or Ghosh (2008) did not accept the taxonomic opinion by Corbet & Hill (1992), and referred the respective populations from India to *P. mimus*. Here, we follow the opinion presented by the last comprehensive compendium of bat taxonomy (Simmons 2005), and mention the respective bats under *P. tenuis* to keep the taxonomic stability without giving any alternative supported by results of a responsible revision. However, regarding the general biogeographic affinities of the bat fauna of the north-western section of the Oriental region, we consider the occurrence of a bat described from the Greater Sunda islands ("ils nous viènnent de Java comme de Sumatra; mais le *gréle* [= *P. tenuis*] habite aussi Bornéo"; Temminck 1835–1841: 230) in Afghanistan as rather problematic to be accepted without any explanation details (but see Simmons 2005).

Bates & Harrison (1997: 175) mentioned the following note concerning the populations of *P. tenuis* from the north-west of the Indian subcontinent: "The taxon *glaucillus* from the Punjab was differentiated from *mimus* from Gujarat on the basis of colour (bistre brown versus mouse-grey). However, pelage colour varies considerably even between individuals from the same colony and therefore all specimens from the Indian subcontinent are here referred to *P. t. mimus* (Sinha, 1980)." However, Wroughton (1912a: 769), describing the subspecies *P. mimus glaucillus*, mentioned – besides the differences in pelage colouration (cf. Bates & Harrison 1997) – also some metric characters for this new bat: "Size rather larger than *mimus*, but tail slightly shorter. […] The ears on the average longer and the tail shorter than in *mimus*. Skull with the braincase rather shallower, otherwise quite as in *mimus*." Indeed, the dimensions of the Afghanistani specimens (Table 18) seem to be slightly larger than those of populations from India reported by Brosset (1962c): LAt 25.0–28.0 mm, LCr 11.0 mm; Sinha (1970): LAt 25.0–29.7 mm, LCr 11.0–11.7 mm; Khajuria (1980): LAt 26.0–29.0 mm, LCr 9.8–11.8 mm; Sinha (1980): LAt 26.0–30.5 mm, LCr 10.8–11.5 mm; Sinha (1986): LAt 26.0–31.0 mm, LCr 10.5–11.8 mm; Das (2003): LAt 25.0–30.2 mm, 10.4–12.4 mm; or Bates & Harrison (1997): LAt 25.0–30.2 mm, LCr 10.7–12.1 mm. The slightly different size of the Afghanistani bats could be caused by a different taxonomic affiliation of the respective populations, by the cline shift of the body dimensions in the south-north direction (in accordance with Bergmann's rule), or by a different way of measurement taking. The geographical variability in the *P. tenuis* complex thus remains unresolved and waits for a profound revision with the help of analyses of all types of evidence.

Pipistrellus javanicus (Gray, 1838)

Comments. *Pipistrellus javanicus* was reported from Afghanistan by Meyer-Oehme (1965, 1968) under the name *P. babu* Thomas, 1915. Meyer-Oehme (1965: 49–50) assigned a female collected at Behsud near Jalalabad (Nangarhar) on 18 September 1964 to this species, and added the following details: "Das Tier wurde zusammen mit fuenf gewoehnlichen Zwergfledermaeusen (*Pipistrellus pipistrellus*) in der Eisenkonstruktion der ca. ein Jahr zuvor eingeweihten neuen

Bruecke Pul-e-Bisut gegriffen. Ausserlich sehr aehnlich, unterscheidet es sich von *P. pipistrellus* deutlich durch die groessere Unterarmlaenge […] und vor allem durch die Bezahnung: i^1 gross und wie bei *P. kuhli* 1-spitzig, i^2 relativ gross (2/3 der laenge von i^1), pm^1 relativ gross und vonder Seite gut sichtbar." Another record was reported by Meyer-Oehme (1968), a male was collected at Qalat us Sirai (Laghman) on 7 October 1965.

The occurrence of *P. javanicus* (under *P. babu*) in Afghanistan was accepted by Gaisler et al. (1968), Gaisler (1970b, 1971), Kock et al. (1972), Roberts (1977), Neronov & Arsen'eva (1982), Harrison & Vernier (1982), Niethammer (1983), Koopman (1993, 1994), Alfred et al. (2002), Das (2003), Ghosh (2008), and perhaps others; under a new taxonomic arrangement, i.e. as *P. javanicus* sensu Corbet & Hill (1992), by Corbet & Hill (1992), Bates & Harrison (1997), Roberts (1997), Simmons (2005), Srinivasulu & Srinivasulu (2012), etc.

The two bats published by Meyer-Oehme (1965, 1968) represented the only evidence of *P. javanicus* s.l. from Afghanistan, housed both at the SMF collection as alcoholic specimens with skulls extracted. These specimens were examined first by Kock et al. (1972: 211), who accepted their identification as *P. babu* and used them as a material for morphological comparison of Turkish pipistrelles (along with a series of Afghanistani *P. pipistrellus* mentioned as *P*. "*coromandra*", see above). However, Kock (1996) did not use these bats for comparative purposes, although he examined and mentioned Afghanistani specimens of numerous other species; this suggests that the identification of *babu/javanicus* of the respective SMF specimens is not completely clear.

During our examination of these specimens at SMF in 2014, in both tubes with the respective skulls we found a note "zu klein für *babu*! D. Kock, IV.93". Indeed, these bats were found too small to fit the dimensions of *P. javanicus* (including *P. babu*): SMF 38781 (♂): LAt 32.2 mm, LaN 6.18 mm, CM^3 4.47 mm, LMd 8.92 mm, CM_3 4.77 mm; SMF 38782 (♀): LAt 34.4 mm, LCr 12.34 mm, LaN 6.24 mm, CM^3 4.36 mm, LMd 9.13 mm, CM_3 4.82 mm. We found there also a third specimen labelled *P. babu* (still unpublished), collected by D. Meyer-Oehme also at Qalat us Sirai (Laghman) on 12 September 1965, with the following dimensions: SMF 39148 (♂): LAt 32.8 mm, LCr 12.81 mm, LaN 6.39 mm, CM^3 4.62 mm, LMd 9.16 mm, CM_3 5.05 mm.

Bates & Harrison (1997) reported dimensions of 23–29 specimens of *P. javanicus* from India, Pakistan, Nepal, and Bangladesh to be larger (LAt 30.0–36.0 mm, LCr 13.0–14.6 mm, LaN 6.3–7.1 mm, CM^3 4.6–5.2 mm, LMd 9.3–10.7 mm, CM_3 4.8–5.5 mm). The specimens from Uttar Pradesh and Nepal identified by Ghosh (2008) as *P. babu* were also larger (LAt 32.4–36.0 mm, LCr 13.2–14.0 mm, CM^3 4.6–5.7 mm, LMd 8.2–10.1 mm, CM_3 5.1–6.3 mm) as well as the specimens from various parts of India mentioned by this author as *P. javanicus* (LAt 31.0–35.5 mm, LCr 12.7–13.8 mm, CM^3 4.5–5.4 mm, LMd 8.9 mm, CM_3 5.7 mm); Das (2003) reported similarly large dimensions for *P. babu* from West Bengal (LAt 32.7–36.0 mm, LCr 13.3–14.1 mm, CM^3 4.7–5.1 mm, LMd 9.2–10.6 mm). On the other hand, we found the size and shape of the respective SMF skulls to fit those of the specimens of *P. coromandra* from Afghanistan (see above and Table 18), i.e. a species which was not mentioned by Meyer-Oehme (1965, 1968), but which was reported as common in the respective areas by Gaisler et al. (1968).

As concluded above (see Note on identification under *P. pipistrellus*), D. Meyer-Oehme and J. Niethammer made an identification error, when the individuals of *P. coromandra* they collected in south-eastern Afghanistan assigned to *P. babu* and the dark individuals from the *P. pipistrellus* populations from this region to *P. coromandra*. Due this identification shift, *P. babu* / *P. javanicus* was introduced into the list of bat fauna of Afghanistan erroneously and should be deleted from it.

Although *P. javanicus* does not belong currently among the members of the fauna of Afghanistan, this species could be really found to live in this country. Bates & Harrison (1997) reviewed the *P. javanicus* range in a belt along the southern slopes of the north-Indian mountains from

Pakistan to Burma, including one record in Khyber Pakhtunkhwa and two in Punjab, i.e. in the areas closely neighbouring Afghanistan from the east.

Nyctalus noctula (Schreber, 1774)

Records. **New data**: K h o s t: Meta Khan [1], 16 km WSW Khost, Ismael Khel, 9 July 1976: 1 m, SMF (leg. D. Meyer-Oehme), 23 July 1977: 1 m, SMF (leg. Kazimi). – **Published data**: "perhaps in Kandahar" (Blanford 1891).

Distribution. *Nyctalus noctula* is a very rare bat species in Afghanistan, only one locality is available from the eastern part of the country (Fig. 49). Two males of this bat were collected in two subsequent years at a single site, from a tree hole ca. 7 m above ground in a plane grove at Meta Khan in the Khost province, at 1330 m a. s. l. These two SMF specimens represent the first indisputable evidence of *N. noctula* from Afghanistan.

However, an additional older notice of *N. noctula* from Afghanistan was published (see Records). Blanford (1891: 309) summarised the distribution of this species as follows: "Found almost throughout the temperate Palæarctic region and widely spread in the Ethiopian [sic]. This bat has been found in Nepal and Sikkim, and perhaps in Kandahar; there are specimens in the British Museum labelled Ceylon and Singapore, and the species has been recorded from Sumatra and Java." This uncertain information of *N. noctula* from Kandahar is probably based on a speculative notice from 1845, given by Hutton and Blyth. Hutton (1845) reported on two forms of bats he observed in and around Kandahar, a smaller and a larger one; he collected the smaller form and it was subsequently described by Blyth as a new species, *Pipistrellus lepidus* (Blyth in Hutton 1845; see under *Pipistrellus kuhlii* for details). Concerning the larger form, Hutton (1845: 341) wrote: "The larger kind I have only seen occasionally on the wing, and never possessed a specimen. There is said to be another large kind found in the limestone caverns which occur in the mountains, but I suspect it to be the same." Blyth (in Hutton 1845: 340) added the following comments on the latter form: "Captain Hutton's large species is not improbably the *Noctulinia noctula*, v. *N. altivolans*, (White) Gray, common in Europe; for I doubt much the distinction of Mr. Hodgson's *Vesp. labiata* from the *noctula*, and a very closely allied species, if not the same, has been described by Mons. F. Cuvier from Sumatra." This speculation concerning the identification of the "large species" was accepted with certain doubts only by Blanford (1891). No other author considered this report as a valid evidence of *N. noctula* in Afghanistan (see e.g. Jerdon 1874, Dobson 1876, Ognev 1928, Ellerman & Morrison-Scott 1951, Gaisler 1970b, 1971, Roberts 1977, Corbet 1978, DeBlase 1980, Niethammer 1983, Corbet & Hill 1992, Koopman 1994, Bates & Harrison 1997, Horáček et al. 2000, Srinivasulu & Srinivasulu 2012).

N. noctula was previously reported to occur in Afghanistan also by Neronov & Arsen'eva (1982), even in two bioregions (which means based on at least two records), but without any source of the records. However, they reported this bat along with several species, which certainly cannot be members of the country's fauna, such as two Japanese bats *Rhinolophus cornutus* Temminck, 1834 or *M. hosonoi* Imaizumi, 1954. Hence, the report of *N. noctula* from Afghanistan by Neronov & Arsen'eva (1982) cannot be accepted.

The occurrence of *N. noctula* in eastern Afghanistan continues to the east, into the species distribution in the northern part of the Indian subcontinent along the southern slopes of the Hindu Kush and Himalayas, from northern Pakistan and Kashmir to Sikkim and West Bengal (Bates & Harrison 1997). The only record in Pakistan was made at Kohat in western Khyber Pakhtunkhwa (Roberts 1977), 62 km from the Afghanistani border and some 160 km east of Meta Khan in Afghanistan. Four localities of *N. noctula* were reported from Kashmir (Jammu, Pandrittan, Pompour, Punch; Chakraborty 1983, Bates & Harrison 1997), four from Himachal Pradesh

(Kangra, Mandi, Sissu, cf. Shimla; Dodsworth 1913, Lindsay 1927a, Chakraborty 1983) and one from Uttarakhand (Gwaldam; Bhat 1974). All these sites lie at a very broad altitude range of 330–3000 m a. s. l. (mean altitude 1342 m); the Afghanistani site thus shows an average position concerning its elevation. This also indicates a possibility of *N. noctula* broad occurrence in the montane and sub-montane habitats of eastern Afghanistan.

The distribution range of *N. noctula* in the north of the Indian subcontinent including the Afghanistani locality is geographically separated from the Palaearctic range, covering mostly Europe, West Turkestan, and in some patches also the Middle East (Levant and Caucasus incl. the Hyrcanian region); two records in the Middle East are extraordinary and represent most probably stray migratory individuals, one such finding was made at Bushehr on the Persian Gulf shore, south-western Iran (Benda et al. 2012), and another one in the Masirah island, south-eastern Oman (Harrison & Jennings 1980).

The geographical (longitudinal) gap across the territories of Afghanistan and Iran between the Indian and Euro-Caucasian ranges of *N. noctula* represents a distance of ca. 1445 km to the closest Iranian site of Gorgan in the Turkmen steppe (Strelkov et al. 1978), which is 620 km west of the Afghanistani border, or 1325 km to the closest Turkmenistani site of Magtymguly [Mahtum-Kala] in the western Kopetdagh Mts. (Laptev 1934). The range of *N. noctula* in West Turkestan is limited to southern and eastern Kazakhstan, eastern Uzbekistan, northern and western Kirghizstan and north-western Tajikistan, i.e. to the area demarcated by the eastern shore of the Aral Sea in the west, the western slopes of the Altai Mts. in the north-east and the northern slope of the Zeravšan Range in the south (Bogdanov 1953, Butovskij et al. 1985, Rybin et al. 1989, Habilov 1992). From the Indian (Afghanistani) distribution, this range is separated by at least 690 km long gap, covering all the high mountains of Afghanistan and western Tajikistan (from Meta Khan to Dardar in the Zeravšan river valley; cf. Habilov 1992).

These distances and geographical conditions suggest that the *N. noctula* populations of the Indian range do not communicate with the Palaearctic populations, i.e. with the Euro-Caucasian range in the west and with the West Turkestani range in the north. On the other hand, the strays collected in the eastern part of the Middle East suggest also a possibility of accidental presence of stray individuals anywhere in the distribution "gaps" across south-western Asia, including the area of Afghanistan.

Material examined. 1 ♂ (SMF 82982 [S+A]), Meta Khan, 16 km WSW Khost, Ismael Khel, Paktia, 9 July 1976, leg. D. Meyer-Oehme; – 1 ♂ (SMF 82981 [S+A]), Meta Khan, 16 km WSW Khost, Ismael Khel, Paktia, 23 July 1977, leg. Kazimi.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Nyctalus noctula* are shown in Table 19. For the material examined see above.

N. noctula is regarded a polytypic species, several subspecies are traditionally recognised within its Asian distribution range, although the taxonomic position of some of them remains unclear – some are regarded even as separate species (*plancyi*, *furvus*), while some were suggested to represent just synonyms of the others (*princeps*, *velutinus*, *lebanoticus*) (comp. Ellerman & Morrison-Scott 1951, Strelkov 1963, 1981, Kuzâkin 1965, Koopman 1994, Horáček et al. 2000, Simmons 2005, Benda et al. 2006, 2012). Based on the biogeographical grounds, the Afghanistani populations of *N. noctula* should represent a part of the north-Indian range of this species, stretching from northern Pakistan to Burma and Malaya (Koopman 1994, Bates & Harrison 1997). In this area, a separate Indian subspecies is reported to occur, *N. noctula labiatus* (Hodgson, 1835) (see Ellerman & Morrison-Scott 1951, Sinha 1970, 1999, Bhat 1974, Corbet 1978, Chakraborty 1983, Corbet & Hill 1992, Koopman 1994, Bates & Harrison 1997, Roberts 1997, Csorba et al. 1999, Alfred et al. 2002, Das 2003, Ghosh 2008, Srinivasulu & Srinivasulu 2012, etc.). This form

Table 19. Basic biometric data on the examined Afghanistani samples of *Nyctalus noctula* (Schreber, 1774), *N. leisleri* (Kuhl, 1817), and *N. montanus* (Barrett-Hamilton, 1906). Data on the FMNH specimen of *N. montanus* are added after Neuhauser & DeBlase (1974) [N&DB] and Neuhauser (1969) [*], respectively. For abbreviations see p. 272

	Nyctalus noctula		*Nyctalus leisleri*					*Nyctalus montanus*	
	SMF 82982	SMF 82981	n	**M**	min	max	SD	IVB af493	[N&DB]
LAt	56.6	55.7	3	**45.23**	44.4	46.1	0.851	42.6	44
LCr	18.58	18.11	2	**15.66**	15.53	15.78	0.177	16.47	16.3
LCb	18.81	18.38	3	**15.62**	15.39	15.84	0.318	16.21	16.0
LaZ	13.18	13.19	2	**10.31**	10.18	10.43	0.177	12.58	11.5
LaI	5.45	5.56	3	**4.68**	4.61	4.81	0.113	4.91	5.0
LaInf	7.28	7.18	3	**5.76**	5.69	5.87	0.095	6.34	–
LaN	10.08	10.02	3	**8.12**	8.06	8.19	0.065	8.83	8.6
LaM	12.19	12.27	3	**9.36**	9.15	9.59	0.221	10.43	*10.1
ANc	7.08	7.08	3	**5.53**	5.29	5.68	0.212	6.24	–
LBT	4.52	4.32	3	**4.13**	3.91	4.25	0.191	3.73	–
CC	7.44	7.33	3	**5.42**	5.27	5.57	0.150	6.22	–
M^3M^3	9.12	8.98	3	**6.99**	6.93	7.06	0.065	8.06	–
CM^3	7.26	7.43	3	**5.82**	5.76	5.87	0.055	6.47	6.5
LMd	14.48	14.42	3	**11.55**	11.43	11.71	0.144	12.74	13.1
ACo	4.41	4.35	3	**3.19**	3.19	3.20	0.006	4.34	–
CM_3	7.78	7.98	3	**6.13**	5.96	6.25	0.150	6.68	7.8

was described from the Central hilly region of Nepal (Hodgson 1835: 700; Gray & Gray 1847: 4) and sometimes regarded as a separate species (e.g. Dodsworth 1913, Mills 1923, Lindsay 1927a, Tate 1942), although its assignation to *N. noctula* was suggested already a long time ago (Dobson 1876, Scully 1887b, Blanford 1991).

N. n. labiatus is typical mainly by its isolated distribution on the southern slopes of the high south-Asian mountains, separated from other range segments – namely the Palaearctic ones – by the highest mountain chains (see Distribution), no peculiar morphological characters were reported. Bates & Harrison (1997) noted its relatively pale colouration in comparison with that of the Chinese subspecies *N. n. plancyi* (Gerbe, 1880), currently regarded a separate species (see Yoshiyuki 1989, Simmons 2005, Thabah et al. 2007, Heaney et al. 2012). However, the taxonomic valuability of colouration differences in *N. noctula* was doubted, see Benda et al. (2006). Only few specimens assigned to *N. n. labiatus* were collected and examined, their dimensions were published repeatedly (see Scully 1887b, Sinha 1970, 1999, Das 2003, Ghosh 2008).

The comparison of body and skull size indicates the two Afghanistani specimens of *N. noctula* to belong to the medium-sized category of the species (Fig. 50, Tables 19, 20), i.e. they conform in size to the European and Middle Eastern samples (representing the nominotypical subspecies and *N. n. lebanoticus* Harrison, 1962), are smaller than the samples from West Turkestan (referred to *N. n. meklenburzevi* Kuzâkin, 1934, see Benda et al. 2011a), and larger than the Chinese samples (i.e. *N. plancyi*). However, this result is in variance with the few data published on *N. n. labiatus*; viz. Scully (1887b): LAt 52 mm (Nepal); Sinha (1970): LAt 50 and 54 mm, LCr 17.5 mm (Burma); Csorba et al. (1999): LAt 52.0 mm, LCr 17.0 mm (Nepal); Sinha (1999): LAt 50.0, 54.0 mm (Darjeeling); Das (2003): LAt 53.6 and 54.2 mm, LCr 17.4 mm (Darjeeling); Ghosh (2008): LAt 52.0–54.2 mm (Darjeeling, Burma, Nepal), LCr 17.7 mm (Darjeeling). All these dimensions represent bats of the small-sized category, conforming to dimensions of *N. plancyi* (concerning

a specimen from Nepal, this was already noted by Csorba et al. 1999). Only the data on forearm length (LAt) by Lindsay (1927a: 55 mm; Himachal Pradesh) and Roberts (1977: 56 mm; Pakistan) conform to the dimensions of the Afghanistani specimens.

This simple comparison of several dimensions may suggest at least three alternative explanations (although they are very tentative, considering the number of compared samples); (1) the medium-sized populations of the mountains in the north-west of the Indian subcontinent (Afghanistan, Pakistan, Kashmir, Himachal Pradesh) represent *N. n. labiatus*, while the small-sized populations of the mountains in the north-east of the subcontinent (Nepal, Sikkim, West Bengal) and eastwards (Burma, China) represent *N. plancyi*, and both forms reach or even meet in Nepal; (2) *N. labiatus* is a name (senior synonym) for the small-sized populations known as *N. plancyi*, living in Nepal and further to the east, while the north-western medium-sized populations represent either a part of the Palaearctic (nominotypical) populations or a yet undescribed taxon, considering their geographical isolation; or (3) a cline shift of dimensions from the west to the east exists in the *N. noctula* populations of the north of the Indian subcontinent, the largest bats living in Afghanistan and Pakistan, the smallest in Burma and China and the species affiliation remains uncertain (either *N. noctula* or *N. plancyi*). However, whether one of these three hypothesis is valid, or another explanation should be taken into consideration, remains an open question until more specimens from the respective range are examined, both by morphological and molecular genetic methods. Since in the European range and at least in parts of the Asian range, *N. noctula* is a migratory bat travelling over large distances (see Strelkov 1969, Hutterer et al. 2005), more variants of population contacts and gene exchanges can be expected in this species or species complex (even in the Indian range), which certainly can influence its final taxonomic arrangement.

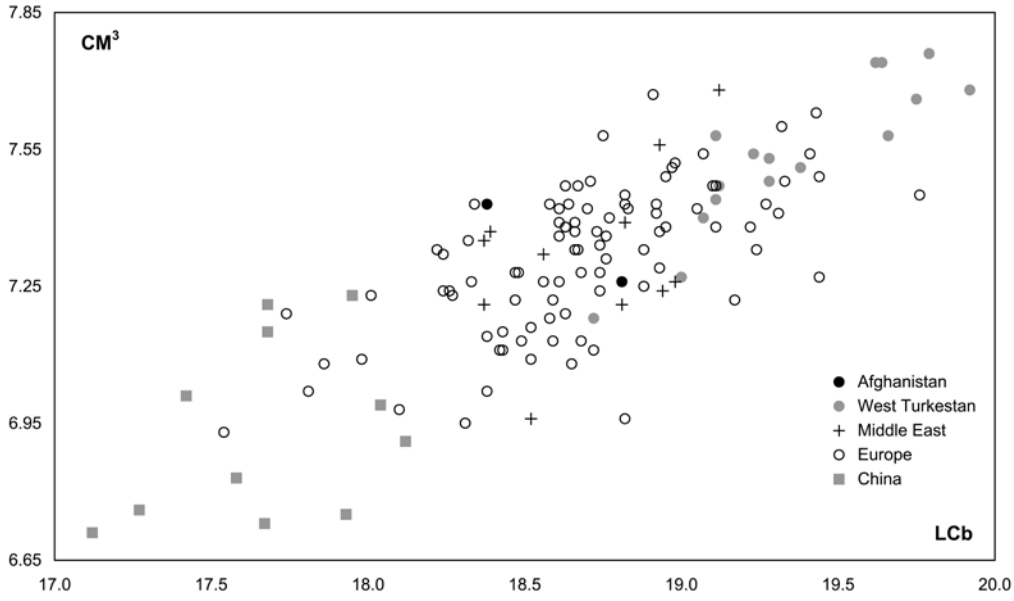

Fig. 50. Bivariate plot of the examined Afghanistani and comparative samples of *Nyctalus noctula* (Schreber, 1774): condylobasal length of skull (LCb) against the length of upper tooth-row (CM^3).

Table 20. Comparison of biometric data on three sample sets of *Nyctalus noctula* (Schreber, 1774) from the Palaearctic. For abbreviations see p. 272

	Europe and Middle East *noctula* (incl. *lebanoticus*)					West Turkestan *meklenburzevi*					China *plancyi*				
	n	**M**	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	62	**52.97**	49.30	56.80	1.513	17	**55.70**	53.6	57.4	1.006	11	**52.65**	49.7	55.1	1.837
LCr	103	**18.51**	17.52	19.53	0.390	16	**19.19**	18.58	19.61	0.341	11	**17.43**	16.58	17.77	0.378
LCb	106	**18.69**	17.54	19.76	0.386	17	**19.38**	18.72	19.92	0.345	11	**17.68**	17.12	18.12	0.319
LaZ	80	**13.19**	12.44	13.91	0.325	15	**13.59**	13.19	13.98	0.270	9	**12.63**	12.36	13.04	0.229
LaI	107	**5.10**	4.69	5.44	0.152	17	**5.20**	5.02	5.42	0.122	11	**5.29**	5.12	5.54	0.146
LaN	107	**9.98**	9.21	10.76	0.291	17	**10.28**	9.64	10.93	0.311	11	**9.56**	9.08	9.79	0.214
ANc	105	**6.76**	6.28	7.28	0.195	17	**7.09**	6.82	7.26	0.139	9	**6.68**	6.38	6.93	0.189
CC	104	**7.27**	6.71	7.74	0.195	17	**7.59**	7.08	7.89	0.236	11	**7.03**	6.35	7.26	0.285
M^3M^3	107	**8.71**	8.28	9.18	0.207	17	**8.98**	8.65	9.36	0.206	11	**8.56**	8.13	8.93	0.280
CM^3	105	**7.31**	6.93	7.68	0.162	17	**7.55**	7.18	7.76	0.169	11	**6.93**	6.71	7.23	0.197
LMd	102	**14.30**	13.43	15.18	0.305	17	**14.91**	14.53	15.53	0.268	10	**13.60**	13.23	13.93	0.213
ACo	99	**4.54**	4.19	5.42	0.186	17	**4.82**	4.60	5.11	0.122	10	**4.16**	4.04	4.33	0.107
CM_3	102	**7.74**	7.32	8.17	0.174	17	**8.05**	7.78	8.33	0.185	10	**7.37**	6.98	7.56	0.172

Nyctalus montanus (Barrett-Hamilton, 1906)

Records. **Published data**: N a n g a r h a r: Jalalabad [1], 7 km north of town, at the edge of cultivated fields, 19 October 1965: shot 1 f (Neuhauser 1969 [as *N. leisleri*]); 7 km. north of Jalalabad, 19 October 1965: 1 f, FMNH (Neuhauser & DeBlase 1974); – Jalal-Abad [2], 18 March 1967: coll. 1 m (Gaisler et al. 1968, Baruš & Tenora 1970, Gaisler 1970a, Groschaft & Tenora 1973, cf. Groschaft & Tenora 1974).

Distribution. *Nyctalus montanus* is a rare bat in Afghanistan, it was recorded from only two very closely situated sites in the eastern part of the country, in the Jalalabad valley at the altitudes of around 600 m a. s. l. (Nangarhar province; Fig. 51). These localities constitute the westernmost and northernmost extensions of the species distribution range, which stretches across the north-western margin of the Oriental region along the Hindu Kush and Himalayas, from Afghanistan to Nepal (Bates & Harrison 1997, Simmons 2005).

According to Bates & Harrison (1997), five localities of *N. montanus* are available within the respective belt of the southern slopes of these mountains, viz. Masuri in Uttarakhand (type locality, cf. Barret-Hamiton 1906), Chamba in Himachal Pradesh (fide Lindsay 1927a; as *N. leisleri*), Dang in Nepal (Mitchell 1978, 1980), and two sites in Afghanistan, Jalalabad and Ismael Khel (fide Gaisler 1970a). However, besides a description of his own finding of *N. montanus* from Jalalabad, Gaisler (1970a) also quoted a record by Meyer-Oehme (1965, 1968) under this species. Nevertheless, the latter author identified an individual from Ismael Khel as *N. leisleri* [s.l.], i.e., he considered the taxon *montanus* as a subspecies of *leisleri*. The affiliation to one of the two small-sized *Nyctalus* bats was not clear at that time (see Gaisler 1970a: 37; Neuhauser & DeBlase 1974: 90).

The respective SMF specimen from Ismael Khel reported by Meyer-Oehme (1965, 1968) represents *N. leisleri* s.str. (Benda et al. 2014, this review). The misidentification of this record as *N. montanus* has been reported until recently, see e.g. Kullmann (1970), Niethammer (1983), Bates & Harrison (1997), and Srinivasulu & Srinivasulu (2012). Thus, Bates & Harrison (1997) reported in fact only four sites of *N. montanus* from its whole distribution range. On the other hand, Bates & Harrison (1997) did not mention the specimen collected by Neuhauser (1969) 7 km

north of Jalalabad (although the latter author preliminarily identified this bat as *N. leisleri*, the record was finally published by Neuhauser & DeBlase (1974) under the correct name affiliation). Thus, this species indeed remains known from five localities, including two from Afghanistan, Jalalabad and north of Jalalabad (Gaisler et al. 1968, Neuhauser 1969).

Anyway, confusions concerning the records of small-sized species of *Nyctalus* in the Indian subcontinent appeared more frequently; e.g. Dodsworth (1913) reported a record of two specimens of *N. montanus* from Simla (present-days Shimla, Himachal Pradesh, India), based on the identification by Oldfield Thomas (BMNH) as follows (p. 740): "This Bat is the Indian representative of the European *Nyctalus leislii* [= *N. leisleri*]. It has recently been named *N. montanus* by Barrett-Hamilton [1906], and may be called by that name for the time being." However, the Shimla specimens, sent by Dodsworth to Thomas, remained in the BMNH collection and were revised by Gaisler (1970a) and Bates & Harrison (1997), who identified them as *N. leisleri* s.str. These revision acts were overlooked by Saikia et al. (2011), who reported both species from Shimla, *N. montanus* fide Dodsworth (1913) and *N. leisleri* fide Bates & Harrison (1997). On the contrary, Lindsay (1927a) reported a record of *N. leisleri* from Chamba in Himachal Pradesh and the respective BMNH specimen was re-identified by Gaisler (1970a) and Bates & Harrison (1997) as *N. montanus* (see above); again, Saikia et al. (2011) finally reported both species from Chamba, *N. leisleri* fide Lindsay (1927a) and *N. montanus* fide Bates & Harrison (1997). Similar confusion appeared also from the revision of two specimens collected by Bhat (1974) in Uttarakhand (Dogalbit, Katarmal) and referred to *N. leisleri montanus*; Bates & Harrison (1997) identified these

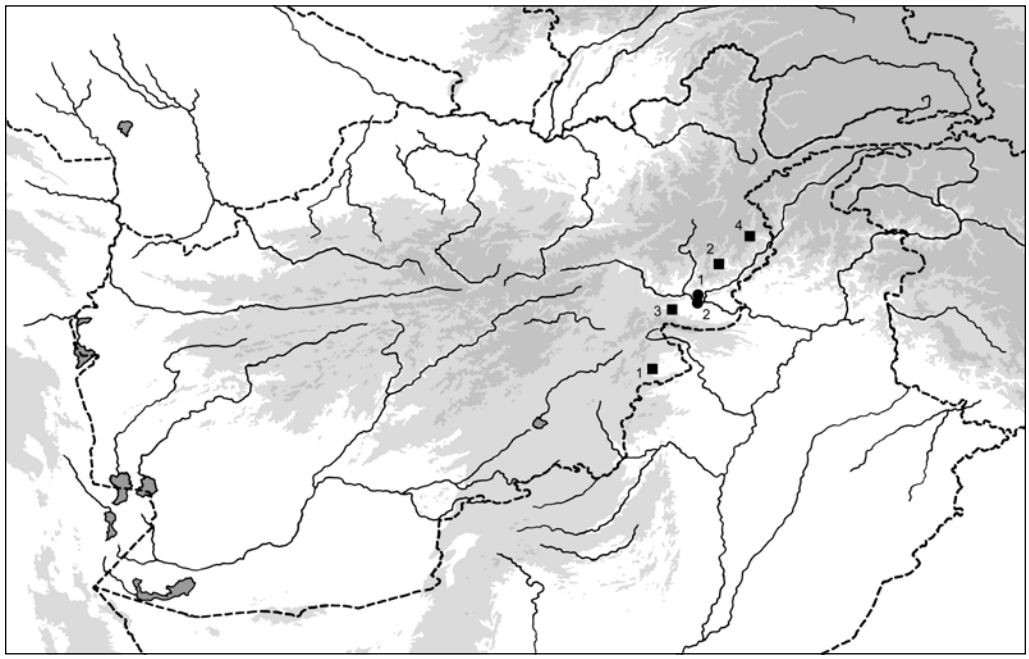

Fig. 51. Records of *Nyctalus montanus* (Barrett-Hamilton, 1906) (circles) and *N. leisleri* (Kuhl, 1817) (squares) in Afghanistan.

bats as *N. leisleri* s. str. Additionally, Bates & Harrison (1997) and Simmons (2005) reported an occurrence of *N. montanus* in Pakistan, although no record of this bat from this country is available (Bates & Harrison 1997, Roberts 1997, Mahmood-ul-Hassan et al. 2009). Most probably, the mentions by the former authors are a mere misinterpretation of the report of *N. leisleri montanus* from Pakistan by Roberts (1977), who, however, did not distinguish between the two species and reported all small-sized individuals of the genus *Nyctalus* under a single species, similarly as Meyer-Oehme several years earlier (1965, 1968). Anyway, for a description of the distribution ranges of both species in the zone of their sympatry in the Indian subcontinent, only revised data can be used (cf. Bates & Harrison 1997, this review).

Material examined. 1 ♂ (IVB af493 [S+B]), Jalal Abad, 18 March 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora.

Morphology and variation. Forearm and cranial dimensions of the examined Afghanistani specimen of *Nyctalus montanus* (see above) as well as the data on the FMNH specimen published by Neuhauser (1969) and Neuhauser & DeBlase (1974) are shown in Table 19.

N. montanus occurs in a geographically limited range, where only few specimens were collected (see above). No geographical variation was reported and the species is generally considered monotypic (Corbet & Hill 1992, Koopman 1994, Bates & Harrison 1997, Horáček et al. 2000, Simmons 2005, Srinivasulu & Srinivasulu 2012). Until its position of a separate species was confirmed (based on examination of the above Afghanistani specimen, see Gaisler 1970a), this bat was frequently confused with *N. leisleri* and regarded its Oriental subspecies (Ellerman

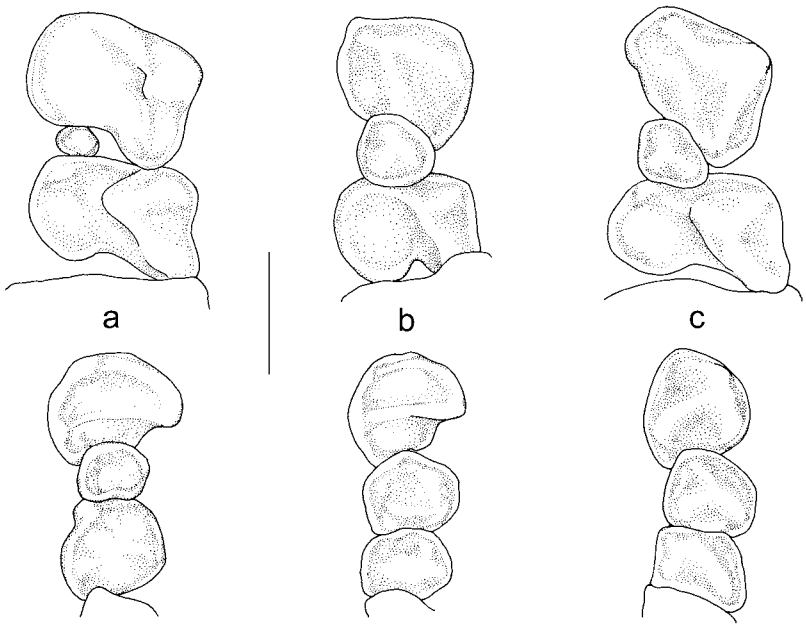

Fig. 52. Upper (top) and lower (below) occlusal views of the unicuspidal tooth-rows (C–P4) of the Afghanistani specimens of *Nyctalus montanus* (Barrett-Hamilton, 1906) (a – IVB af493) and *N. leisleri* (Kuhl, 1817) (b – ZFMK 97.145, c – ZFMK 83.11). Scale bar = 1 mm.

& Morrison-Scott 1951, Meyer-Oehme 1965, 1968, Neuhauser 1969, Roberts 1977). It should be noted that this bat was also originally described as a separate species, *Pterygistes montanus* (see Barrett-Hamilton 1906: 99).

Gaisler (1970a: 35) reviewed the differences between the two south-Asian small-sized *Nyctalus* species, *N. montanus* and *N. leisleri*, as follows: "As for the body dimensions, there is no marked difference between the two species […]. The skulls of *N. montanus* are slightly bigger and generally stouter than those of *N. leisleri* […]. So far as it is possible to conclude from the available material, there is a considerable difference, e.g. in the length of the mandible. There are, however, two main distinguishing criteria between the two species: (1) The fur of *N. montanus* shows a uniform brown colour like that of *N. noctula*. On the contrary, the fur of *N. leisleri* is distinctly two-coloured, the bases of the hairs being darker than their tips […]. (2) In *N. montanus*, the Pm^1 is very small, C and Pm^2 touching. Pm^1 of *N. leisleri* is at least four times as large as that of *N. montanus*, C and Pm^2 not touching."

The tooth characters and body and skull sizes of the Afghanistani specimens of both species examined here are in line with the above reported review, see Table 19 and Fig. 52.

Nyctalus leisleri (Kuhl, 1817)

Records. **Published data**: K h o s t: Ismael Khel [1], Matoon, 1340 m, 21 May 1963: 1 ma (Meyer-Oehme 1965 [as *N.* (?) *leisleri montanus*], 1968, Benda et al. 2014). – K o n a r: Petsh-Tal [2], June 1965: 1 f, ZFMK (Niethammer 1983, Schätti 1984, Benda et al. 2014). – N a n g a r h a r: Nimla [3], 21 March 1972: 1 m, ZFMK (Niethammer 1983, Benda et al. 2014). – N u r i s t a n: Kamu [4], King's Garden, 8 km W of Kamdesh, 17 October 1965: shot 1 m (Neuhauser 1969); Kamu, 16 October 1965: 1 fa, FMNH (Neuhauser & DeBlase 1974, cf. DeBlase 1980); Kamdesh, FMNH (Bates & Harrison 1997).

Distribution. *Nyctalus leisleri* is a rather rare bat in Afghanistan, four localities are available from the eastern part of the country (Fig. 51). Its occurrence sites are situated in the mountainous areas between the altitudes of 1100 and 1350 m a. s. l. (mean altitude 1224 m) in the Khost, Konar, Nangarhar and Nuristan provinces.

The occurrence of *N. leisleri* in eastern Afghanistan continues eastwards in the distribution of this bat in northern Pakistan, Kashmir and north-western India (Gaisler 1970a, Bates & Harrison 1997). Two records are known from Khyber Pakhtunkhwa (Kululai, Yakh Tangai; Walton 1974, Bates & Harrison 1997), one from northern Punjab (Gharial in the Murree Hills; Gaisler 1970a), one from Kashmir (Pahlgam; Gaisler 1970a), two records are available from Himachal Pradesh (Kothi, Shimla; Gaisler 1970a, Saikia et al. 2011, cf. Dodsworth 1913), and two (uncertain) from Uttarakhand (Dogalbita, Katarmal; Bhat 1974, cf. Bates & Harrison 1997). Thus, from Afghanistan, there is the largest number of localities and also the largest density of localities known from the whole Indian range of *N. leisleri*.

The Oriental range of *N. leisleri*, covering continuously the north-western part of the Indian subcontinent in a ca. 1000 km long belt along the southern slopes of the Himalayas and Hindu Kush between Uttarakhand and eastern Afghanistan (incl.), is separated by a more than 1100 km wide gap from the main distribution range of this bat in the western Palaearctic (Benda et al. 2012). This main range stretches from the Kopetdagh Mts. in north-eastern Iran westwards, up to the Maghreb, western Europe and British Islands (see Corbet 1978, Horáček et al. 2000, Benda et al. 2012). The Oriental part of the distribution range of *N. leisleri* has a similar geographical extent as the whole species range of the very similar congener *N. montanus* (see above); however, the former species is roughly twice more frequently found in this area than the latter species (Bates & Harrison 1997). The same relation is present also in Afghanistan, where four sites of *N. leisleri* occurrence are known compared to two of *N. montanus* (see above).

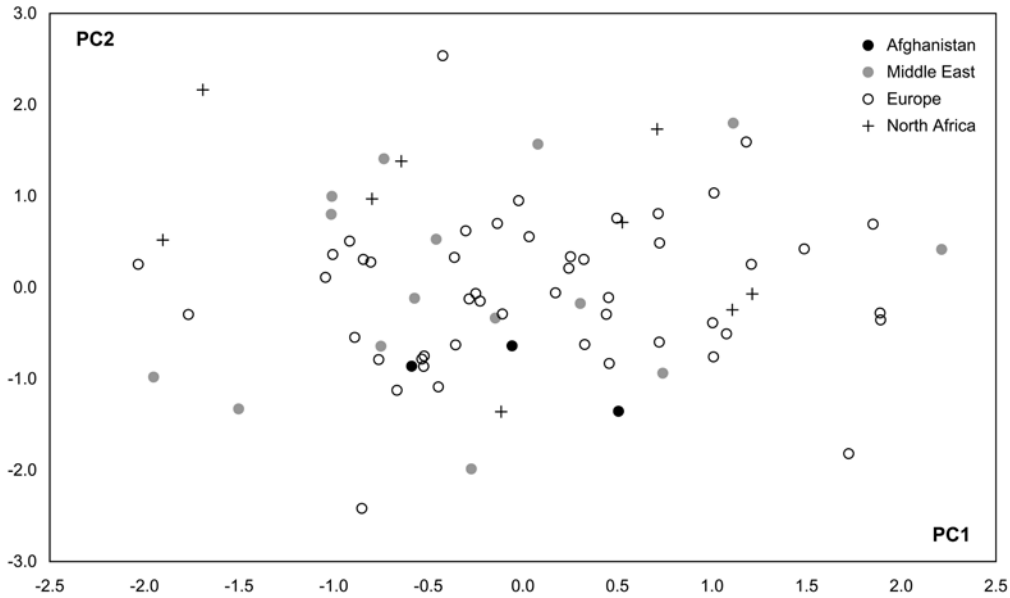

Fig. 53. Bivariate plot of the examined Afghanistani and comparative samples of *Nyctalus leisleri* (Kuhl, 1817): results of the principal component analysis of the forearm and skull dimensions (PC1=42.32% of variance; 11.07%).

N. leisleri is well known for its long-distance migrations in its European range (see Strelkov 1969, Hutterer et al. 2005); however, no signs of such behaviour are available from the limited data on this bat from its Oriental range.

Material examined. 1 ♂ (SMF 38750 [S+A]), Matoon, Paktia, Ismael Khel, 1340 m, 21 May 1963, leg. Seibel; – 1 ♂ (ZFMK 97.145 [S+B]), Nimla, 1000 m NN, 21 March 1972, coll. J. Niethammer; – 1 ♀ (ZFMK 83.11 [S+A]), Petsch-Tal, Nuristan, June 1965, leg. E. Kullman.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Nyctalus leisleri* are shown in Table 19. For the material examined see above.

As it was reviewed elsewhere (see e.g. Benda et al. 2012, 2014), *N. leisleri* is considered monotypic in the part of its distribution range covering Europe, British islands, North Africa, and southern Asia. Only the nominotypical subspecies is currently recognised in this range, while two other subspecies are known from the Atlantic islands (*N. l. verrucosus* Bowdich, 1825 in Madeira; *N. l. azoreum* (Thomas, 1901) in the Azores). The results of molecular genetic analyses of the whole complex (Salguiero et al. 2004, 2007) suggest an extremely low geographical variability in this species and thus, its monotypy in the range from Morocco to Turkey (the samples from the Middle East and Indian subcontinent were not available for the analyses), with the exception of the Atlantic insular populations, which significantly differ in morphology (see Palmeirim 1991).

The body and skull dimensions of the Afghanistani specimens of *N. leisleri* were compared with the samples of this species from other parts of southern Asia (Iran, Turkey, Cyprus) as well as from Europe and North Africa (Libya, Morocco) by Benda et al. (2014: 94–95, Fig 77, Table 19). The above enumerated three specimens (see also Table 19) from Afghanistan fall into the variation ranges of dimensions of *N. leisleri* populations from other parts of the species distribution

(only the rostrum width across upper canines was in one specimen [ZFMK 83. 11; CC 5.27 mm] below the range of 69 other specimens by 0.07 mm). There is no obvious geographical variation in body and skull size throughout the species range from Britain to Afghanistan, all compared samples of *N. leisleri* seem to represent one homogeneous morphotype (Fig. 53). The Afghanistani populations (along with other populations from the Indian subcontinent despite their apparent isolation from the remains of the range, see Distribution) most probably represent a part of the nominotypical subspecies, as already suggested by Neuhauser & DeBlase (1974), Corbet & Hill (1992), Koopman (1994), Bates & Harrison (1997), Horáček et al. (2000), Alfred et al. (2002), and Srinivasulu & Srinivasulu (2012).

Otonycteris leucophaea (Severcov, 1873)

Records. **Published data**: B a g h l a n: zwischen Doshi und Pul-i-Khumri [1], 6 September 1964: 1 m, ZFMK (Meyer-Oehme 1965 [as *O. hemprichi*], Benda & Gvoždík 2010). – B a l k h: Mazar-i-Sharif [2], crack in a mud wall in town, 5 September 1965: 2 f, FMNH (Neuhauser 1969 [as *O. hemprichi*], Bates & Harrison 1997 [as *O. hemprichii*]). – F a r y a b: Maimana [3], house, 11 September 1965: coll. 1 ind. (mummy), FMNH (Neuhauser 1969 [as *O. hemprichi*], Bates & Harrison 1997 [as *O. hemprichii*]). – H e r a t: 30 km S Herat [4], 10 April 1965: 2 inds., from owl pellets (Meyer-Oehme 1965, Niethammer 1982 [as *O. hemprichi*]). – K a b o l: Nauabad-Bagrami (13 km ESE Kabul) [5], Zimmer eines Bauerngehoeftes, ca. 1780 m, 1 July 1963: 1 ma, [SMF] (Meyer-Oehme 1965, 1968 [as *O. hemprichi*]). – L o w g a r: Logartal [6], 35 km S Kabul, from owl pellets (Meyer-Oehme 1965 [as *O. hemprichi*]). – Afghanistan, 2 inds., FMNH (DeBlase 1980 [as *O. hemprichi*]).

Distribution. *Otonycteris leucophaea* is a rather infrequent but not rare bat in Afghanistan, six localities are known from the northern part of the country (Fig. 54). Although the number of records of this bat in Afghanistan is rather low, its range in the country is extensive, covering six provinces, viz. Baghlan, Balkh, Faryab, Herat, Kabol, and Lowgar. With the exception of two records coming from the broader Kabul region, lying at the altitude of around 1800 m a. s. l., the records of *O. leucophaea* in Afghanistan were made in rather low situated localities adjacent to the central mountains from the north, at the altitude range of 350–1200 m a s l. (overall mean altitude 1136 m). Two findings are represented by bone material from owl pellets and all the remaining records seem to come from anthropogenous conditions (Meyer-Oehme 1965, Neuhauser 1969).

O. leucophaea ranks among endemics of the arid and mountainous regions of Central Asia, i.e. West Turkestan (including southern Kazakhstan), north-eastern Iran, northern parts of Afghanistan and Pakistan, and Kashmir (Bates & Harrison 1997, Benda et al. 2011a, 2012). The Afghanistani area of *O. leucophaea* occurrence constitutes a part of the southern margin of the species range. It continues to the west, in the distribution of this bat in north-eastern Iran, where three sites are known (Bazangan, Chelmir, Shurlaq; DeBlase 1980, Benda et al. 2012), and to the east, in the occurrence in northern Pakistan, with a single known locality situated very close (ca. 21 km) to the Afghanistani border (6 mi S of Chitral; Bates & Harrison 1997, Benda & Gvoždík 2010), as well as in Kashmir, where five sites were reported (Bhaderwah, Gilgit, Gupis Valley, Nagrota, Srinagar; Scully 1881a, Roberts 1977, Chakraborty 1983, Nath 1987).

O. leucophaea belongs to relatively frequently recorded bat species in the southern part of West Turkestan (Bogdanov 1953, Strelkov et al. 1978, Habilov 1992); numerous records (under *O. hemprichii*) are available even from the areas bordering Afghanistan from the north. Geptner (1956), Gorelov (1977) and Strelkov et al. (1978) reported three records of this bat in the Serhetabat [Kuška] region of south-eastern Turkmenistan, from sites localised 2–6 km from the border of Afghanistan; Bobrinskoj (1918) collected a female of this bat in the Tamerlana gorge in the Köytendagh Mts. and Bogdanov (1953) reported records from Salavat near Termiz and from Karluk, all sites lying in the Surxondarë region of south-eastern Uzbekistan; Bobrinskoj (1925) collected a male of this bat in the Kafirnigan river estuary near Ajvadž and Kornev (1941) repor-

ted this bat from Horugh, both sites are situated in southern Tajikistan just on the Afghanistani border. All these Turkestani records indicate abundant occurrence of *O. leucophaea* also in the northern flat and dry areas of Afghanistan, certainly more abundant than is documented by the available evidence.

Material examined. 1 ♂ (SMF 38778 [A]), Deh Sabz, Kabul, Nauabad-Begrami, 1780 m, 1 July 1963, leg. D. Meyer-Oehme; – 1 ♂ (ZFMK 97.148 [S+B], zw. Doschi und Pul-i-Khumri, 6 September 1964, coll. J. Niethammer.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Otonycteris leucophaea* are shown in Table 18. For the material examined see above.

All published records of the bats of the genus *Otonycteris* from Afghanistan were originally referred to *O. hemprichii* Peters, 1859, see Meyer-Oehme (1965, 1968), Kock (1969), Neuhauser (1969), Gaisler (1970b, 1971), Corbet & Hill (1980, 1992), DeBlase (1980), Niethammer (1982, 1983), Koopman (1994), Bates & Harrison (1997), and Srinivasulu & Srinivasulu (2012). This was for a long time the only species recognised within the genus (Bianki 1917, Ellerman & Morrison-Scott 1951, Corbet 1978, Corbet & Hill 1980, Knox Jones et al. 1982, Horáček 1991, Koopman 1993, 1994, Borisenko & Pavlinov 1995, Gharaibeh & Qumsiyeh 1995, Pavlinov & Rossolimo 1998, Simmons 2005, etc.). The taxonomic view by several Russian authors (Satunin 1910, Bobrinskoj 1925, Ognev 1928, Kuzâkin 1950, Strelkov 1963, 1981), who considered the local Iranian form a separate species, *O. cinerea* Satunin, 1910, while all other populations of the genus representing *O. hemprichii*, is quite exceptional and not followed by other authors.

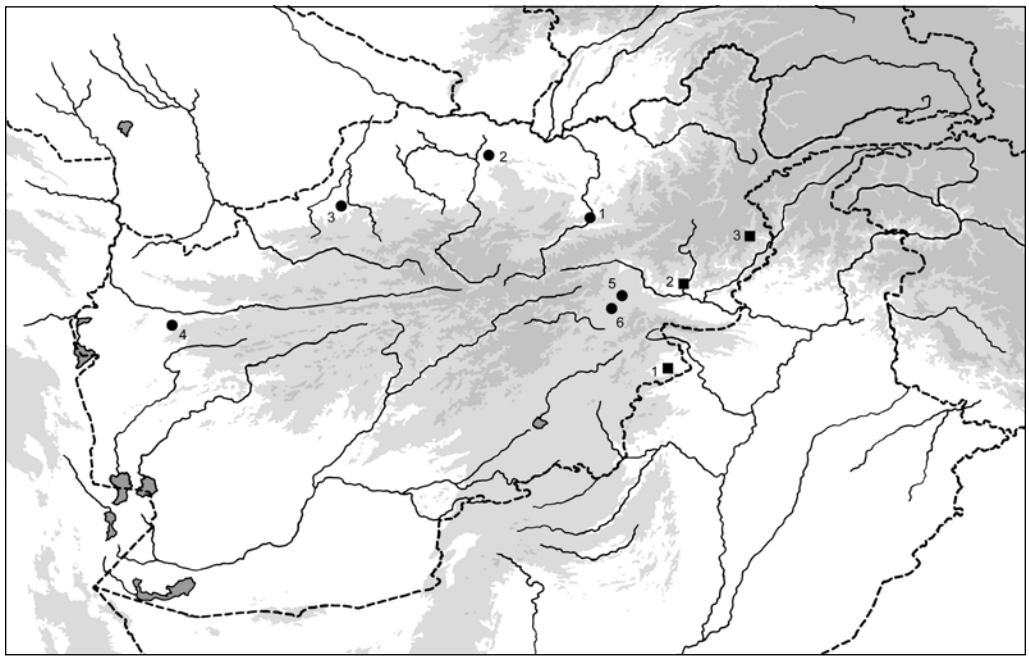

Fig. 54. Records of *Otonycteris leucophaea* (Severcov, 1873) (circles) and *Barbastella darjelingensis* (Hodgson, 1855) (squares) in Afghanistan.

The taxonomic revision by Benda & Gvoždík (2010), based on the results of morphological and molecular genetic analyses, suggested to split the content of the genus *Otonycteris* into two species, *O. hemprichii*, distributed in North Africa and the Middle East, and *O. leucophaea*, occurring in Central Asia, viz. in West Turkestan, north-eastern Iran, Afghanistan, northern Pakistan and Kashmir (see Distribution above).

Although only one specimen of *Otonycteris* from Afghanistan (ZFMK 97.148) was included into the morphological analysis by Benda & Gvoždík (2010), who identified it as *O. leucophaea*, other species of the genus (i.e. *O. hemprichii*) may hardly be expected to be found in the country. In the areas neighbouring the Afghanistani range of *Otonycteris* (Fig. 54), only *O. leucophaea* was found (north-eastern Iran, West Turkestan, northern Pakistan, Kashmir), while the occurrence of *O. hemprichii* was confirmed in the south-eastern part of Iranian Baluchistan (and westwards), more than 700 km south-west of the closest Afghanistani record of *Otonycteris* made near Herat (Benda & Gvoždík 2010, Benda et al. 2012).

According to Benda & Gvoždík (2010), *O. leucophaea* is a monotypic species, distributed in a geographically limited range, without signs of geographical variability. All examined specimens represent an identical morphotype, in all analyses they created a single and homogeneous cluster (see Benda & Gvoždík 2010: 90, 92).

Barbastella darjelingensis (Hodgson, 1855)

Records. **Published data** [all as *B. leucomelas*]: K h o s t: Wazir Bagh (ca. 2.5 km E of Khost) [1], 7 August 1965: 1 fa (Meyer-Oehme 1965, 1968). – L a g h m a n: Kalat-us-Seraj [= Mihtar Lam, Qalat us Sirai] [2], 900 m, 12 September 1965: 1 f (Meyer-Oehme 1968). – N u r i s t a n: Kamu [3], King's Garden, 8 km W of Kamdesh, a room in the King of Afghanistan's retreat, 17 October 1965: coll. 1 f (Neuhauser 1969); Kamu, 16 October 1965: 1 f, FMNH (Neuhauser & DeBlase 1974, DeBlase 1980); Kamdesh, FMNH (Bates & Harrison 1997).

Distribution. *Barbastella darjelingensis* is a rather rare bat in Afghanistan, only three localities are available from the eastern part of the country (Fig. 54). These sites are situated in the submontane to montane areas at the altitude range of 900–1350 m a. s. l. (mean altitude 1133 m), in the Khost, Konar and Laghman provinces.

B. darjelingensis is the only species of the genus living in the Indian subcontinent, it occurs in the belt of southern slopes of the high mountains in southern Asia, from Afghanistan to north-eastern India (Bates & Harrison 1997, Kruskop 2015). The distribution of *B. darjelingensis* in Afghanistan constitutes the westernmost extension of the species range, it continues eastwards in a more common presence of this bat in north-eastern Pakistan, Kashmir and north-western India (Bates & Harrison 1997); one record is known from eastern Khyber Pakhtunkhwa (Dunga Gali; Roberts 1977) and from southern Himachal Pradesh (Shimla; Blanford 1891), two records were reported from Uttarakhand (Kapkot, Masuri; Blanford 1891, Bhat 1974), and numerous records are available from Kashmir (Akhnoor, Bhaderwah, Gilgit, Naltar, Punch, Yangi Dawar; Scully 1881a, Roberts 1977, Sinha 1980, Chakraborty 1983). The record of *B. darjelingensis* from Naltar (Roberts 1977) represents the northernmost occurrence spot of the distribution range of this bat (36° 09' N) situated only slightly northwards of the northernmost Afghanistani record from Kamu (35° 24' N; Neuhauser 1969).

B. darjelingensis was considered to be present also in Central Asia (see e.g. Benda et al. 2008, 2011a, 2012), i.e. in eastern Transcaucasia, West Turkestan, central and northern Iran, and marginally also in East Turkestan. However, the results of taxonomic revision of the Asian *Barbastella* bats by Kruskop (2015) have demonstrated a separate species position of the Central Asian populations under the name *B. caspica* Satunin, 1908 (described from eastern Azerbaijan; Satunin 1908). The latter species, however, is rather commonly found in West Turkestan (Strelkov

Table 21. Basic biometric data on the examined Afghanistani samples of *Barbastella darjelingensis* (Hodgson, 1855), *Plecotus strelkovi* Spitzenberger, 2006, and *Scotophilus heathii* (Horsfield, 1831). Data on the FMNH specimen of *B. darjelingensis* are added after Neuhauser & DeBlase (1974) [N&DB]. For abbreviations see p. 272

	Barbastella darjelingensis			*Plecotus strelkovi*					*Scotophilus heathii*				
	SMF 38779	SMF 38780	[N&DB]	n	**M**	min	max	SD	n	M	min	max	SD
LAt	40.7	43.7	43	21	**42.97**	40.7	44.8	1.421	14	**61.76**	59.2	65.9	1.971
LPol	–	–	–	21	**7.27**	6.8	7.8	0.294	–	–	–	–	–
LCr	–	–	15.6	11	**17.14**	16.55	17.69	0.313	7	**21.45**	20.38	22.61	0.796
LCb	–	–	14.8	11	**15.96**	15.37	16.39	0.299	9	**20.06**	19.42	20.88	0.532
LaZ	–	–	7.5	10	**8.99**	8.73	9.28	0.174	8	**15.37**	14.98	15.83	0.258
LaI	–	–	4.1	11	**3.37**	3.24	3.65	0.111	9	**5.12**	4.92	5.26	0.111
LaInf	–	–	–	11	**4.31**	4.16	4.43	0.086	10	**7.75**	7.42	8.18	0.228
LaN	–	–	7.3	11	**8.42**	8.05	8.67	0.177	8	**10.30**	10.11	10.54	0.149
LaM	–	–	–	11	**9.33**	9.14	9.63	0.161	8	**13.23**	12.67	13.81	0.453
ANc	–	–	–	11	**5.36**	5.11	5.58	0.157	5	**8.86**	8.14	9.51	0.578
LBT	–	–	–	11	**4.61**	4.48	4.84	0.135	7	**4.39**	4.16	4.77	0.211
CC	–	–	–	11	**3.72**	3.58	3.84	0.085	10	**7.41**	6.82	7.88	0.272
M^3M^3	–	–	–	11	**6.33**	6.13	6.47	0.122	9	**9.53**	9.24	9.98	0.263
CM^3	–	–	5.0	11	**5.69**	5.52	5.84	0.096	11	**7.66**	7.48	8.01	0.158
LMd	–	–	–	11	**10.85**	10.53	11.28	0.237	11	**16.00**	15.68	16.54	0.263
ACo	–	–	–	11	**3.06**	2.89	3.23	0.091	11	**6.42**	6.24	6.61	0.099
CM_3	–	–	5.9	11	**6.20**	6.09	6.37	0.094	11	**8.76**	8.46	9.09	0.184

et al. 1978, Rybin et al. 1989, Habilov 1992), including the areas close to the northern border of Afghanistan. In south-eastern Turkmenistan, there are two localities of this bat situated near the Afghanistani border, viz. Tagtabazar [Tahta-Bazar], 20 km from the border (Radde & Walter 1889) and Kapkatan cave at Garlyk [Karlûk], 26 km from the border (Strelkov et al. 1978); Bogdanov (1953) mentioned two findings of this bat from south-eastern Uzbekistan, from near Lalmikar (ca. 55 km north of the border) and from Salavat near Termiz, just on the border with Afghanistan; finally Habilov (1992) reported a record from near Horugh in the Upper Badakhshan province in south-eastern Tajikistan, next to the Afghanistani border. All these records suggest possible occurrence of *B. caspica* in the whole northern part of Afghanistan, north and west of the Hindu Kush range; this mountain chain perhaps constitutes a border between the distribution ranges of the two above mentioned Asian *Barbastella* species.

Material examined. 1 ♀ (SMF 38780 [A]), Kalat-us-Seraj, Laghman, 900 m, 12 September 1965, leg. D. Meyer-Oehme; – 1 ♀ (SMF 38779 [A]), Wazir Bagh, Khost, Paktia, 1240 m, 7 August 1965, leg. D. Meyer-Oehme.

Morphology and variation. Forearm dimensions of two examined Afghanistani specimens of *Barbastella darjelingensis* as well as the forearm and cranial data on the FMNH specimen published by Neuhauser (1969) and Neuhauser & DeBlase (1974) are shown in Table 21. The dorsal colouration of two examined SMF bats (despite their submersion in alcohol, see above) was found very dark, almost completely black in SMF 38780, while blackish brown with "pale frosty" hair tips in SMF 38779.

A series of recent taxonomic revisions of the Asian populations of the genus *Barbastella* (Zhang et al. 2007, Benda et al. 2008, Kruskop et al. 1912, Kruskop 1915) revealed an unexpected diversity in the formerly broadly considered species *B. leucomelas* (Cretzschmar, 1830). Most of the compendium authors (Ellerman & Morrison-Scott 1951, Wallin 1969, Corbet 1978, Corbet & Hill 1980, 1992, Sinha 1980, Nader 1990, Harrison & Bates 1991, Koopman 1994, Bates

& Harrison 1997, Horáček et al. 2000, Simmons 2005, etc.) regarded this species to be distributed from Transcaucasia and the Middle East via West Turkestan and Himalayas to China, Indochina and Japan. All three specimens of *Barbastella* from Afghanistan were also originally assigned to *B. leucomelas* s.l. (Meyer-Oehme 1965, 1968, Neuhauser 1969, Neuhauser & DeBlase 1974, DeBlase 1980, Bates & Harrison 1997) and this identification was accepted by subsequent authors (Gaisler 1970b, 1971, Corbet 1978, Nader 1990, Corbet & Hill 1992, Horáček et al. 2000, Alfred et al. 2002, Ghosh 2008, Srinivasulu & Srinivasulu 2012, etc.). Since the east-Afghanistani populations belong to the north-Indian range of *Barbastella*, all these authors consistently regarded the Afghanistani bats to belong to the subspecies *B. leucomelas darjelingensis* described from Darjeeling, West Bengal (Benda & Mlíkovský 2008: 37).

However, Zhang et al. (2007) and Benda et al. (2008) demonstrated the populations from the western and eastern margins of the range of *B. leucomelas* s.l. (southern Levant and north-eastern China) to represent two species separated from the populations inhabiting Central and southern Asia, viz. *B. leucomelas* s.str. in the Levant and the newly described *B. beijingensis* Zhang, Han, Jones, Lin, Zhang, Zhu, Huang et Zhang, 2007 in China. For the remaining populations, considered a single species living in the belt from Transcaucasia and Iran to Indochina and Japan, the name *B. darjelingensis* was used (Benda et al. 2008, 2011a, 2012, Kruskop et al. 2012). Kruskop et al. (2012), based on a simple molecular genetic comparison, indicated a further possible split of the latter taxon into the population from Nepal, i.e. *B. darjelingensis* s.str., and another (not closely defined) species from the Far East, technically named as "*Barbastella* sp. TMP1". Finally, Kruskop (2015) published a profound analysis of morphological and molecular genetic data on the Asian populations of *Barbastella* and further revised their taxonomy; according to these results, at least seven species occur in southern Asia (in the west-east arrangement): (1) *B. barbastellus* (Schreber, 1774) (Caucasus, Transcaucasia, Turkey, northern Iran [plus Europe, Morocco, Canary islands]), (2) *B. leucomelas* (Sinai, southern parts of Israel and Jordan, Eritrea), (3) *B. caspica* Satunin, 1908 (eastern Transcaucasia, Iran, West and East Turkestan), (4) *B. darjelingensis* s.str. (eastern Afghanistan, northern Pakistan, Kashmir, north-western and north-eastern India, Nepal), (5) *Barbastella* sp. 1 (Indochina, southern China, ? Taiwan), (6) *B. beijingensis* (north-eastern China), and (7) *Barbastella* sp. 2 (Kuril islands, ? Japan). The east-Afghanistani populations thus belong to *B. darjelingensis* s.str., which lives in a limited range along the high mountains in the north of the Indian subcontinent and most probably represents a monotypic species, as in this whole area the metric and colouration characters are described very similarly (Blanford 1891, Neuhauser & DeBlase 1974, Chakraborty 1983, Bates & Harrison 1997, Csorba et al. 1999, Sinha 1999, etc.).

The molecular genetic evaluation by Kruskop (2015) elucidated the taxonomic confusions concerning the Central Asian populations of *Barbastella*, caused by inconsistent examinations of various data sets. The final situation thus could be reviewed here.

Some authors (e.g. Neuhauser & DeBlase 1974, Strelkov et al. 1978, DeBlase 1980, Habilov 1992) evaluated mainly the pelage colouration traits and found two basic forms in Central Asia, dark and pale. The dark form was reported by Neuhauser & DeBlase (1974: 92) as follows (based on the FMNH specimen from Kamu, Afghanistan): "The dorsal aspect is almost totally black, with only a slight hint of silver color at the tips of the fur. The ventral region is only slightly paler than the dorsum; the throat and chest are blackish-brown, and the mid-abdomen has slight indications of white tips. Only with the post-inguinal region is the color more white than black." The pale form was described by these authors as follows (based on the hand-coloured illustration on the plate 28 by Cretzschmar 1830, see also its facsimile in Benda et al. 2008: 51): "[it is] with a dark blackish-brown throat and breast region fading to a lighter black-brown washed with cream in the mid-abdominal region, which in turn fades to a cream washed with straw brown in the inguinal

region." Neuhauser & DeBlase (1974) and DeBlase (1980) found the pale coloured individuals in the Levant and central Iran (and Strelkov et al. 1978 and Habilov 1992 also in West Turkestan), and assigned them to *B. leucomelas leucomelas* (described from southern Sinai; Benda et al. 2008: 53), while the dark forms in northern Iran, eastern Afghanistan and northern India, and assigned them to *B. l. darjelingensis*. However, they did not properly examined the morphometric characters of the bats, and in fact, they mixed the contemporary (cf. Kruskop 2015) species *B. leucomelas* and *B. caspica* under their *B. l. leucomelas*, and the species *B. barbastellus* and *B. darjelingensis* under their *B. l. darjelingensis*.

On the other hand, several other authors (Kock 1969, Qumsiyeh 1985, Benda et al. 2008, 2012) concentrated mainly on the morphometric traits and found a group of larger bats (LCr 14.5–15.5 mm) from broader Central Asia and smaller bats (LCr 13.7–14.6 mm) from Europe and the Levant; Kock (1969) and Qumsiyeh (1985) interpreted the smaller bats as *B. barbastellus* and the larger bats as *B. darjelingensis* (if the sympatric occurrence with *B. barbastellus* is really proven in Transcaucasia, otherwise a subspecies of the latter form). By this approach, they mixed the contemporary (cf. Kruskop 2015) species *B. barbastellus* and *B. leucomelas* under their *B. barbastellus*, and the contemporary species *B. caspica* and *B. darjelingensis* under their *B. darjelingensis*. Later on, Benda et al. (2008), with the help of a molecular genetic analysis and a slightly finer morphometric comparison, separated *B. leucomelas* of the Levant from *B. barbastellus* of Europe, Transcaucasia and northern Iran. Thus they identified the DeBlase's (1980) dark specimen of *B. l. darjelingensis* from Iran as *B. barbastellus*, but did not separate the contemporary species

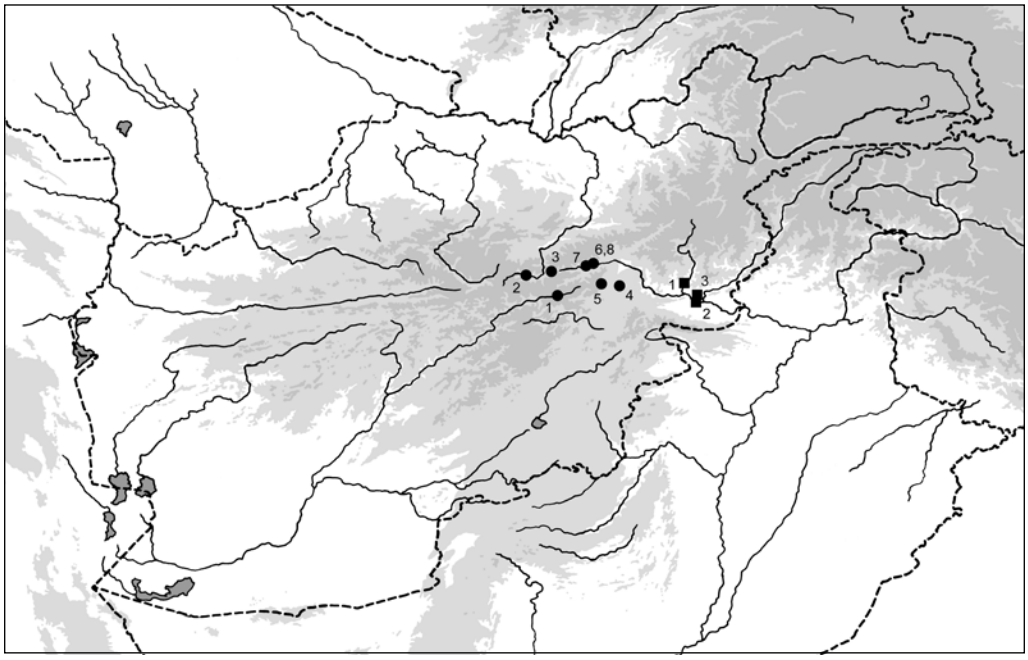

Fig. 55. Records of *Plecotus strelkovi* Spitzenberger, 2006 (circles) and *Scotophilus heathii* (Horsfield, 1831) (squares) in Afghanistan.

B. caspica and *B. darjelingensis*, which they both assigned to *B. darjelingensis* (see also Benda et al. 2011a, 2012), mainly because of the lack of comparative material for examination.

The above review, based on the data presented by various authors (mainly by Neuhauser & DeBlase 1974, DeBlase 1980, Benda et al. 2008, and Kruskop 2015), could be concluded as follows: four species of *Barbastella* occur in western Eurasia (i.e. to the west of Burma), (1) small and dark *B. barbastellus* (Morocco, Canary islands, Europe and forests of western Asia), (2) small and pale *B. leucomelas* (deserts of the southern Levant and north-eastern Africa), (3) large and pale *B. caspica* (arid areas of Iran, Transcaucasia, West and East Turkestan), and (4) large and dark *B. darjelingensis* (northern mountains of the Indian subcontinent, from Afghanistan to north-eastern India). While two species live in sympatry in Transcaucasia and northern Iran (*B. barbastellus*, *B. caspica*), two other live in well separated allopatric ranges (*B. leucomelas*, *B. darjelingensis*).

Plecotus strelkovi Spitzenberger, 2006

Records. **New data**: V a r d a k: Qala-e Safed [1], Kuh-e Qul Kharidah, cave, 19 March 1965: 1 m, SMF (leg. D. Meyer-Oehme). – **Published data**: B a m y a n: Bamyan [2], cave near the Small/Lesser Budha statue, 25 June 1965: coll. 1 m, NMP (Hůrka & Povolný 1968, Gaisler 1970a [as *P. austriacus*], cf. Smit & Rosický 1973; Fig. 56); – Shombul [3], 12 km W of Shibar Pass, village house, 27 July 1965: 2 f, 28 July 1965: 1 m (Neuhauser 1969 [as *P. austriacus*]). – K a b o l: Kabul [4], auf einem Dachboden und unter Hausdächern, 1750 m, June 1953: 1 m, 2 f, [SMF] (Zimmermann 1956 [as *P. auritus*]), 1 ind., ZMB (Spitzenberger et al. 2006); Kabul, 1750 m, 15 & 24 June 1953: 1 m, 1 f, SMF (Kock 1996 [as *P. austriacus*]); Kabul, 1800 m, 26 April & 23 May 1962: 1 fG, 1 ind., SMF (Kock 1996 [as *P. austriacus*]); – Paghman [5], 23 km NW of Kabul, abandoned stables, 15 July 1965: shot 1 f, 17 July 1965: shot 1 f (Neuhauser 1969 [as *P. austriacus*]). – P a r v a n: Firindjal [6], 2 April 1965: 1 m, SMF (Kock 1996 [as *P. austriacus*]); – Khvadjah ghar [7], 13 May 1959 [1 f, MZLU] (Lindberg 1961 [as *P. wardi*]); Khvadjah gar, près de Mazanah, Vallée du Shourbaud, 13 May 1959: 1 ind. (Vercammen-Grandjean 1963 [as *P. wardi*]); – Samotch-e-Nayak [8], 2150 m, 2 April 1965: 1 f, SMF (Kock 1996 [as *P. austriacus*]). – V a r d a k: Grotte du Mont Qoul Kharideh [1], W de Kaboul, 4 April 1958: 1 m, 1 f, [MHNG, MZLU] (Aellen 1959a, Cooreman 1960, Vercammen-Grandjean 1963 [as *P. wardi*]); Grotte Qal'éh Safid Ouanaï, à 75 km à l'ouest de Kaboul, 4 April 1958 (Lindberg 1961 [as *P. wardi*]); Kala-e-Safed, [Kuh-Qoul Kharidah, cave], 11 December 1962: 1 m, SMF (Kock 1996 [as *P. austriacus*]). – Afghanistan, 1 ind., SMF (Uchikawa et al. 1994 [as *P. austriacus*]).

Distribution. *Plecotus strelkovi* is a medium-frequent bat in Afghanistan, eight localities are available from the central part of the country (Fig. 55), in the provinces of Bamyan, Kabol, Parvan, and Vardak (Fig. 56). The sites are concentrated to a limited area (ca. 125×45 km) of the high mountain habitats, at the altitude range of 1800–2750 m a. s. l. (mean altitude 2358 m). Hence, *P. strelkovi* represents the most montane bat species of the country, exceeding the second such species (*Hypsugo savii*) by more than 400 m of the mean altitude.

Srinivasulu & Srinivasulu (2012) reported the occurrence of *Plecotus* (under *P. wardi*) also in the provinces of Balkh, Konar, Nangarhar, and Paktia; however, no records of this genus are available from these parts of Afghanistan as well. *P. wardi* is, according to the revision by Spitzenberger et al. (2006: 210), known from the areas east of Afghanistan, from north-eastern Pakistan to Nepal: "Hindu Kush (Hazara/Northwest frontier [= Khyber Pakhtunkhwa], Pakistan), Karakoram (Leh […]) and the southern slopes of the Himalayas from Rattu in Northern Areas/Pakistan [= Kashmir] in the west over Milam, 3740 m and Martoli, 3575 m in Uttaranchal/India [= Uttrakhand] to Mustang in Nepal in the east." Thus, some of its localities in Kashmir lie only slightly over 100 km away from the Afghanistani border, in north-eastern Pakistan around 170 km. So, although the occurrence of *P. wardi* in Afghanistan is well possible, *P. strelkovi* remains the only *Plecotus* species confirmed to occur in this country. Thus, considering the results by Spitzenberger et al. (2006) and the very limited range of *Plecotus* in Afghanistan (Fig. 55), all records of this genus from the country are here tentatively referred to *P. strelkovi*,

According to Spitzenberger et al. (2006) and Dolch et al. (2007), *P. strelkovi* is distributed in the mountainous eastern part of West Turkestan including eastern Kazakhstan, and further in East

Turkestan, western Mongolia, Afghanistan and Iran. It is the only *Plecotus* species reported from Tajikistan and Kirghizstan, where it belongs to rather infrequent bat species (Rybin et al. 1989, Habilov 1992). Since the collection sites of three available specimens of this bat from Iran have not been localised, the occurrence area in central Afghanistan represents the south-westernmost extension of the confirmed distribution range of *P. strelkovi*.

Habilov (1992) summarised the records of *Plecotus austriacus* s.l. [= *P. strelkovi* sensu Spitzenberger et al. (2006)] in Tajikistan; the species was found mainly in the north-western part of the country, with only exceptional findings originating from the central and southern regions of Tajikistan. Two records were reported from areas situated just next to the border of Afghanistan; Satunin (1910; as *P. auritus*) reported four and Spitzenberger et al. (2006) two ZIN specimens, respectively, from the Darvaz region and Kornev (1941) a record from near Horugh, both lying in the Pamir Massif within the Upper Badakhshan province in south-eastern Tajikistan, at the altitudes of above 1250 m and 2050 m a. s. l., respectively. Additionally, Spitzenberger et al. (2006) mentioned a ZIN specimen of *P. strelkovi* originating from near Teharv in the same province, situated some 30 km from the Afghanistani border at the altitude of ca. 1950 m. The *Plecotus* bats are extremely rare in Uzbekistan, where only four records are available (Gricina et al. 2013); however, one finding is available from Boldyr, 5 km north of the Afghanistani border (Kaškarov & Mitropol'skaâ 2004). These records indicate possible occurrence of *P. strelkovi* also in the north-eastern part of Afghanistan that interconnect the known record sites in the southern parts of Uzbekistan and Tajikistan with central Afghanistan, namely in the provinces of Badakhshan, Baghlan, Balkh, Kondoz, and/or Takhar.

Based solely on biogeographical grounds, Benda et al. (2012) suggested the record of *Plecotus* from Nikshahr in southern Baluchistan, Iran (published by DeBlase 1980) to be assigned to *P. strelkovi*. Anyway, despite the real species identification of that bat, this occurrence spot indicates

Fig. 56. Bamyan valley, central part of the Afghanistani Hindu Kush, ca. 2550 m a. s. l. (Bamyan). Two bat species were documented there; *Hypsugo savii* was recorded in Saydabad, south-east of Bamyan (Neuhauser & DeBlase 1974), and *Plecotus strelkovi* was found roosting in one of small caves next to the Lesser Buddha semi-statue in Bamyan (in the middle).

that the presence of *Plecotus* bats could be awaited also further south in mountainous areas of Afghanistan and south-western Pakistan.

Material examined. 1 ♂ (NMP 95338 [S+B]), Bamyan, 25 June 1965, leg. M. Daniel; – 1 ♂, 1 ♀ (SMF 38861 [S+A], 38854 [A]), Firindjal, Parwan, 2070 m, 2 April 1965, leg. D. Meyer-Oehme; – 1 ♂, 1 ♀ (MHNG 953.003, MZLU L58/3274, L58/3320 [S+A]), Grotte du Mt Qoul Kharideh, W. de Kaboul, 4 April 1958, leg. K. Lindberg; – 1 ♀ (SMF 49234 [S+B]), Kabul, 1750 m, 15 June 1953, leg. J. Klapperich; – 1 ♂ (SMF 49235 [S+B]), Kabul, 1750 m, 24 June 1953, leg. J. Klapperich; – 2 ♂♂, 10 ♀♀ (SMF 38847 [S+A], 38843–38846, 38848–38852, 38856, 38857 [A]), Kabul, 1800 m, 23 May 1962, leg. D. Meyer-Oehme; – 1 ind. (SMF 39923 [S]), Kabul-Dar-ul-Aman, 1800 m, 26 April 1962, leg. D. Meyer-Oehme; – 2 ♂♂, 1 ♀ (SMF 38858 [S+B], 38853, 38859 [A]), Kala-e-Safed, Wardak, Höhle im Kuh-Qoul Kharidah, 2700 m, 11 December 1962, leg. D. Meyer-Oehme; – 1 ♂ (SMF 38860 [A]), Kala-e-Safed, Wardak, Höhle im Kuh-Qoul Kharidah, 2700 m, 19 March 1965, leg. D. Meyer-Oehme; – 1 ♀ (MZLU L59/3165, L59/3184 [S+A]), Khvadjah ghar, pres de Mazanah, vallée du Ghourband, alt. 2390 m, 13 May 1959, leg. K. Lindberg; – 1 ♀ (SMF 38855 [S+A]), Samotch-e-Nayak, Parwan, Gruft, 2150 m, 2 April 1965, leg. D. Meyer-Oehme.

Morphology and variation. External and cranial dimensions of the Afghanistani specimens of *Plecotus strelkovi* are shown in Table 21. For the material examined see above.

The *Plecotus* populations collected from Afghanistan were assigned to various species names by various authors, viz. *P. auritus* (Linnaeus, 1758) (Zimmermann 1956), *P. wardi* Thomas, 1911 (Aellen 1959a, Cooreman 1960, Lindberg 1961, Vercammen-Grandjean 1963, Srinivasulu & Srinivasulu 2012), *P. austriacus* (Fischer, 1829) (Strelkov 1963, 1988, Hůrka & Povolný 1968, Neuhauser 1969, Gaisler 1970a, b, Niethammer 1983, Koopman 1994, Kock 1996, Uchikawa et al. 1994, Bates & Harrison 1997, Horáček et al. 2000), and/or *P. strelkovi* Spitzenberger, 2006 (Spitzenberger et al. 2006, Srinivasulu & Srinivasulu 2012). However, when the subspecies is mentioned, solely the name *wardi* is used (Zimmermann 1956, Aellen 1959a, Strelkov 1963, Gaisler 1970a, Strelkov 1988, Koopman 1994, Bates & Harrison 1997, Horáček et al. 2000).

Nevertheless, only *P. strelkovi* has been confirmed to occur in Afghanistan according to the broad scale taxonomic revision by Spitzenberger et al. (2006), based on the combined results of morphometric and molecular genetic analyses. The only Afghanistani specimen identified was originally published by Zimmermann (1956) as *P. auritus wardi*, the genetic analysis by Spitzenberger et al. (2006) showed it to belong to *P. strelkovi*. Srinivasulu & Srinivasulu (2012) accepted the identification of the respective specimen by Spitzenberger et al. (2006) and mentioned occurrence of *P. strelkovi* from the Kabul province; however, from this province as well as from four other provinces (see Distribution), Srinivasulu & Srinivasulu (2012) also mentioned occurrence of another species, *P. wardi*. Although the occurrence of this species in Afghanistan is well possible (see above), *P. strelkovi* remains the only species of the genus confirmed to occur in the country for sure.

Spitzenberger et al. (2006) examined in total 46 specimens of *P. strelkovi* from its whole distribution range from Iran to East Turkestan and did not report any geographical variability to be present among populations across this area. The dimensions of the Afghanistani samples of *P. strelkovi* (Table 21) conform well to the dimensions of this species presented by Spitzenberger et al. (2006: S27–28, Tables 8, 9) from the whole range (n=18–46), viz. LAt 39.6–44.8 mm, LPol 5.1–8.1 mm, LCr 16.34–17.89 mm, CM^3 5.25–6.12 mm, LMd 10.22–11.45 mm, or by Benda et al. (2011a: 201, Table 15) from southern Kirghizstan (n=7), viz. LAt 41.3–44.9 mm, LPol 6.8–8.2 mm, LCr 16.17–17.19 mm, CM^3 5.42–5.71 mm, LMd 10.47–11.82 mm (see also Table 22). Thus, considering the metric data, *P. strelkovi* could be regarded a monotypic species represented by a homogeneous morphotype over its whole range. Without any close details or illustrations, Neuhauser (1969: 89) reported the following note concerning the Afghanistani samples of *Plecotus*: "The bacula of the males were examined, and found to be similar to those illustrated by Lanza (1957) [= Lanza 1960] for this species [= *P. austriacus* s.l.]."

Table 22. Comparison of biometric data on six sample sets of the genus *Plecotus* Geoffroy, 1818 from central and southern Asia; *P. strelkovi* Spitzenberger, 2006 from West Turkestan, *P. homochrous* Hodgson, 1847 from Pakistan, China and Nepal, *P. wardi* Thomas, 1911 from Kashmir, *P. kozlovi* Bobrinskoj, 1926 from China and Mongolia, *P. turkmenicus* Strelkov, 1988 from Turkmenistan, and *P. macrobullaris* Kuzâkin, 1965 from the Middle East and Caucasus. For abbreviations see p. 272

	strelkovi Turkestan					*homochrous* Pakistan, China, Nepal					*wardi* Kashmir	
	n	**M**	min	max	SD	n	**M**	min	max	SD	BMNH 6.10.3.1.	BMNH 6.10.3.2.
LAt	18	**43.23**	41.2	45.7	1.321	1	38.3				–	45.4
LPol	18	**7.47**	6.8	8.3	0.395	1	5.3				–	6.6
LCr	19	**16.88**	16.17	18.10	0.489	3	**15.67**	15.60	15.78	0.099	17.07	17.19
LCb	19	**15.73**	15.28	17.10	0.489	3	**14.48**	14.37	14.65	0.151	16.04	16.12
LaZ	12	**8.88**	8.60	9.95	0.353	1	8.08				8.77	8.68
LaI	22	**3.28**	3.07	3.45	0.124	3	**3.27**	3.23	3.30	0.036	3.34	3.26
LaInf	23	**4.25**	4.00	4.70	0.172	3	**3.84**	3.72	4.06	0.191	4.56	4.30
LaN	20	**8.38**	7.77	8.93	0.261	3	**7.72**	7.51	7.89	0.192	8.42	8.05
ANc	19	**5.27**	5.02	5.75	0.209	3	**5.17**	5.12	5.26	0.076	5.23	5.32
LBT	22	**4.50**	3.85	4.80	0.212	3	**4.18**	3.92	4.35	0.231	4.52	4.42
CC	22	**3.79**	3.53	4.22	0.138	2	**3.57**	3.42	3.72	0.212	3.84	3.80
M^3M^3	23	**6.34**	6.12	6.87	0.167	3	**5.56**	5.27	5.83	0.281	6.17	6.28
CM^3	23	**5.61**	5.42	6.10	0.153	3	**5.21**	5.12	5.29	0.086	5.83	5.74
LMd	21	**10.86**	10.47	11.45	0.259	3	**9.97**	9.68	10.16	0.253	11.13	11.07
ACo	20	**3.04**	2.83	3.23	0.124	3	**2.75**	2.68	2.82	0.070	2.92	2.82
CM_3	22	**6.14**	5.87	6.42	0.164	3	**5.55**	5.49	5.64	0.079	6.33	6.25

	kozlovi China, Mongolia					*turkmenicus* Turkmenistan					*macrobullaris* Middle East, Caucasus				
	n	M	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	9	**45.11**	43.2	46.0	0.978	10	**44.51**	43.3	46.3	1.017	43	**42.59**	39.6	45.7	1.550
LPol	9	**7.70**	7.3	8.2	0.320	10	**7.78**	7.5	8.0	0.187	42	**7.21**	6.5	8.0	0.397
LCr	9	**17.95**	17.32	18.47	0.359	10	**17.87**	17.32	18.25	0.282	44	**17.24**	16.59	18.02	0.333
LCb	9	**16.83**	16.27	17.53	0.442	10	**17.02**	16.18	17.35	0.347	44	**15.98**	15.38	16.85	0.323
LaZ	7	**9.54**	9.28	10.08	0.280	8	**9.96**	9.77	10.17	0.137	38	**9.00**	8.65	9.93	0.261
LaI	9	**3.49**	3.34	3.68	0.137	11	**3.48**	3.37	3.65	0.092	44	**3.42**	3.12	3.67	0.134
LaInf	9	**4.56**	4.15	4.77	0.176	11	**4.42**	4.22	4.68	0.143	44	**4.21**	3.88	4.57	0.168
LaN	9	**8.69**	8.27	8.97	0.216	11	**8.70**	8.43	8.88	0.134	44	**8.49**	7.71	8.83	0.224
ANc	8	**5.41**	5.20	5.49	0.091	11	**5.42**	5.25	5.58	0.117	44	**5.47**	5.12	5.78	0.143
LBT	9	**4.73**	4.57	4.91	0.118	11	**4.74**	4.58	4.87	0.102	44	**4.65**	4.43	4.89	0.123
CC	9	**4.20**	3.90	4.38	0.147	11	**4.23**	3.89	4.43	0.155	44	**3.82**	3.58	4.07	0.108
M^3M^3	9	**6.93**	6.47	7.17	0.225	11	**6.92**	6.25	7.28	0.281	44	**6.24**	5.96	6.61	0.141
CM^3	9	**6.18**	5.91	6.47	0.211	11	**6.18**	5.80	6.31	0.137	44	**5.64**	5.35	5.92	0.131
LMd	8	**11.79**	11.41	12.22	0.262	11	**12.13**	11.78	12.62	0.240	44	**10.93**	10.30	11.46	0.253
ACo	8	**3.41**	3.08	3.80	0.226	11	**3.63**	3.23	3.87	0.158	44	**3.03**	2.67	3.28	0.161
CM_3	8	**6.69**	6.37	7.05	0.222	11	**6.71**	6.55	6.93	0.119	43	**6.18**	5.93	6.75	0.168

P. wardi is another bat of the genus *Plecotus* which may occur in Afghanistan (cf. Spitzenberger et al. 2006, Srinivasulu & Srinivasulu 2012), being reported from Kashmir and Pakistan close to the borders of Afghanistan (see Distribution). This bat is described to be very similar to *P. strelkovi* in body and skull size (see Fig. 57) and in pelage colouration, see Spitzenberger et al. (2006: 208–209, S29–30, Tables 10, 11), viz. LAt 41.8–45.4 mm, LPol 6.5–6.8 mm, LCr 16.91–17.61 mm, CM^3 5.40–5.78 mm, LMd 10.58–11.24 mm (n=7–10). Spitzenberger et al. (2006: 208) mentioned very fine characters to distinguish between these two species in the description

of *P. strelkovi*: "Resembles in colour *P. wardi* and *P. macrobullaris* [Kuzâkin, 1965], but dorsal fur of *P. strelkovi* less dense, its colour cold greyish-drab instead of buff or brown and colour of membranes brown without reddish touch. Collar of whitish hairs on neck and basal parts of pinnae. Ventral fur longer and less dense than in the other two species. […] Shape of skull distinctly different from *P. wardi* […] and *P. macrobullaris* […]. Rostrum of *P. strelkovi* bulky, very high behind the rhinion; dorsal profile in the interorbital region elevated, attains its highest point approximately in the middle of the braincase. The high rostrum becomes specially apparent in frontal view. Upper canines evidently stronger than in the other two species." Unfortunately, such characters could be useful rather when large series of specimens of both species are available for identification. In other words, until clear and unchangeable morphological characteristics are specified for both species, *P. wardi* can be distinguished from *P. strelkovi* for sure only with the help of a molecular genetic analysis (Spitzenberger et al. 2006). One such additional character could be useful for separation of *P. strelkovi* from *P. wardi*, the thumb length; unfortunately, only one specimen of *P. wardi* (a holotype) was available for comparison (Fig. 58). In the latter specimen, the thumb length is absolutely and relatively small (LPol 6.6 mm; LPol/LAt 0.145), while in *P. strelkovi* from West Turkestan the thumb is larger in both dimensions (LPol 6.8–8.3 mm; LPol/LAt 0.162–0.190; n=18) similarly as in Afghanistani bats (LPol 6.8–7.8 mm; LPol/LAt 0.155–185; n=21). However, these relations and their utility for identification should be tested in larger sets of specimens, namely of *P. wardi*.

Another *Plecotus* species, which can potentially occur in the mountains of eastern Afghanistan (being known from Pakistan, Kashmir, Nepal, and northern India; westernmost locality Murree in northernmost Punjab), is *P. homochrous* Hodgson, 1847. However, it differs significantly from *P. strelkovi* and *P. wardi* by its darker uniformly brown dorsal and ventral pelage colou-

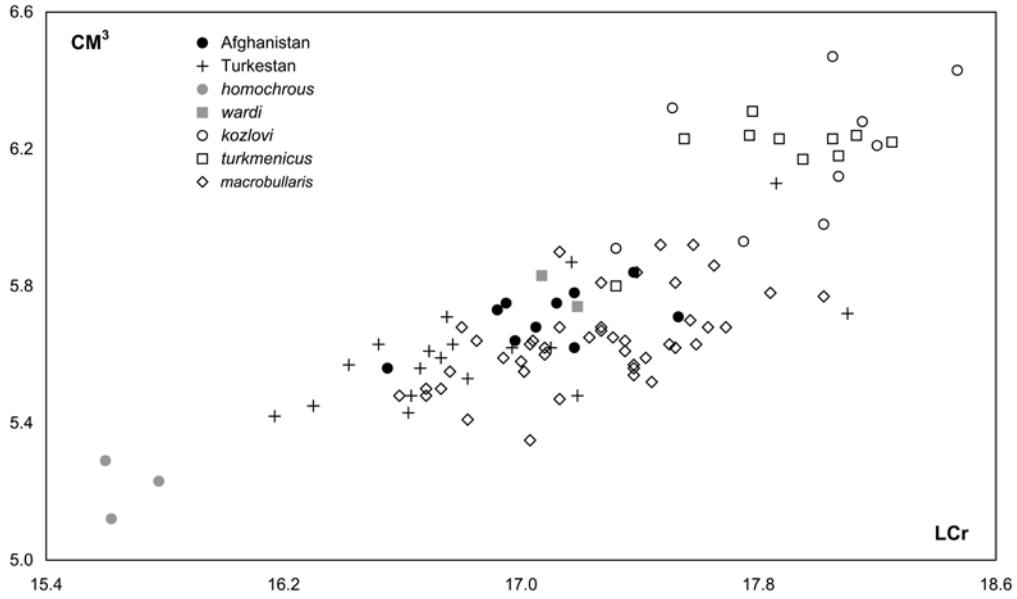

Fig. 57. Bivariate plot of the examined Afghanistani and comparative samples of the genus *Plecotus* Geoffroy, 1818: greatest length of skull (LCr) against the length of upper tooth-row (CM^3). For details see text and Table 22.

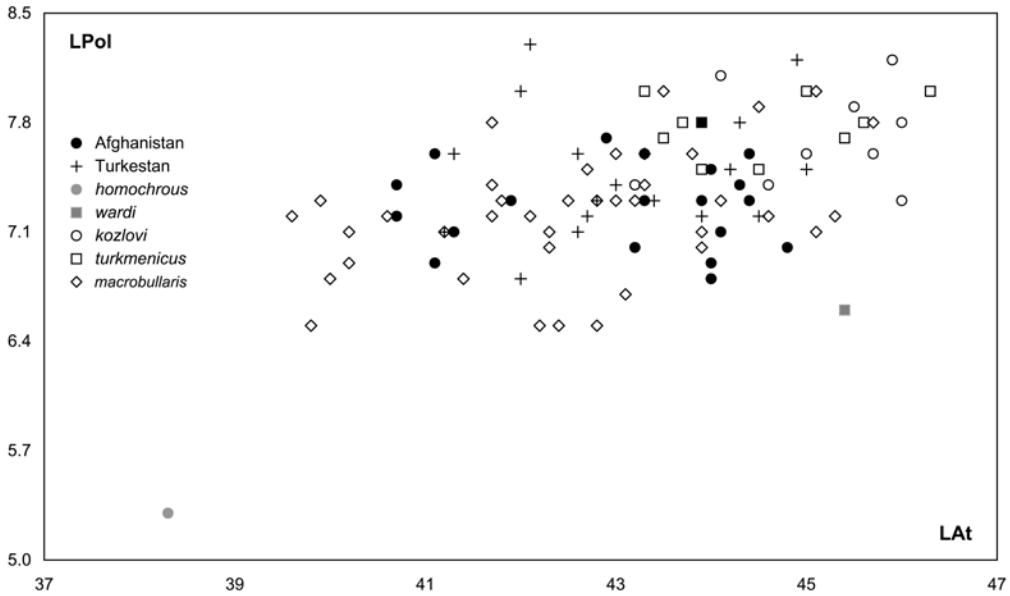

Fig. 58. Bivariate plot of the examined Afghanistani and comparative samples of the genus *Plecotus* Geoffroy, 1818: forearm length (LAt) against the thumb length (LPol). For details see text and Table 22.

ration and smaller body and skull size, see Spitzenberger et al. (2006: S37–38, Tables 18, 19), viz. LAt 37.8–40.8 mm, LPol 5.0–6.8 mm, LCr 16.01–16.40 mm, CM^3 4.99–5.47 mm, LMd 9.76–10.02 mm (n=3).

In conclusion, according to Spitzenberger et al. (2006), three species of *Plecotus* occur in the Hindu Kush. Two of them, *P. strelkovi* and *P. wardi*, are large in size and very similar to each other, while third one, *P. homochrous*, is small-sized and thus, differs significantly from the former two species (also in colouration). Within the Hindu Kush range, *P. strelkovi* finds its easternmost occurrence in Afghanistan, while *P. wardi* and *P. homochrous* the westernmost occurrence in Pakistan. Until now, the pair of large-sized species was not found to live in sympatry. While *P. homochrous* can be excluded to occur among the Afghanistani specimens examined, based on an analysis of their dimensions, *P. wardi* cannot be excluded as its dimensions are almost identical to those of *P. strelkovi*, the only *Plecotus* species that was confirmed by genetic methods to occur in Afghanistan.

Scotophilus heathii (Horsfield, 1831)

Records. **Published data**: L a g h m a n: Laghman [1], on a low hill adjacent to the town, 21 October 1965: shot 1 f, FMNH (Neuhauser 1969, Bates & Harrison 1997). – N a n g a r h a r: Jalalabad [2], 17 & 18 September 1964, 2 July 1965: 2 ma, 2 fa, 2 mj, [SMF] (Meyer-Oehme 1965, 1968); Jalal-Abad, 1967: 4 m, 9 f; bottom part of the crown of a date palm in the orchard of the Royal Palace, obs. a colony of some 50 inds. (Fig. 59); fissure behind a column of the former Habibula Palace, coll. 2 f (Gaisler et al. 1968, Groschaft & Tenora 1971b, cf. Groschaft & Tenora 1973, 1974; Fig. 34); Jalalabad, 30 March, 8, 9, 10, 11 & 25 April 1967: 4 m, 9 f (Hůrka & Povolný 1968, Baruš & Tenora 1970, Dusbábek 1970, Gaisler 1970a), 22 April 1967 (Dusbábek 1970); – 7 km north of Jalalabad [3], at the edge of cultivated fields,

11 October 1965: shot 1 m, 1 f, 19 October 1965: shot 2 m, 24 October 1965: shot 1 f (Neuhauser 1969). – Affghanistan, 1 ms (Dobson 1878 [as *S. temminckii*]).

Distribution. *Scotophilus heathii* is a rare bat in Afghanistan, only three specified localities situated in the eastern part of the country were reported (Laghman and Nangarhar provinces; Fig. 55). These sites are situated in semi-arid low areas of the broader Jalalabad valley at the altitudes of ca. 570 and 850 m a. s. l.

The limited occurrence of *S. heathii* in Afghanistan continues eastwards in the distribution of this bat in Pakistan and north-western India (Bates & Harrison 1997). It is one of the most common bats in the whole Punjab and Sindh provinces, as well as in the Islamabad area (Roberts 1977, Mahmood-ul-Hassan et al. 2009, Javid 2011). Rather few records of *S. heathii* are available from Khyber Pakhtunkhwa (Kohat, Mardan; Bates & Harrison 1997, Perveen & Rahman 2015) and Himachal Pradesh (Koolloo Valley, Solan; Allen 1908, Saikia et al. 2011); this bat is missing in Kashmir (Chakraborty 1983, Bates & Harrison 1997, Ghosh 2008).

Fig. 59. A palm tree in the garden of the Royal Palace in Jalalabad (Nangarhar). In the hanging dead leaves below the crown, a colony of some 50 individuals of *Scotophilus heathii* roosted.

S. heathii is distributed continuously throughout the continental part of the Oriental region (including Ceylon), except the northern mountainous areas and the Malayan peninsula (Corbet & Hill 1992, Bates & Harrison 1997). Its occurrence in Afghanistan represents the northernmost extension of the whole species distribution range.

Material examined. 1 ♂ (SMF 38772 [A]), Jalalabad, Nangarhar, 650 m, 17 September 1964, leg. D. Meyer-Oehme; – 1 ♂ (SMF 38773 [A]), Jalalabad, Nangarhar, 650 m, 18 September 1964, leg. D. Meyer-Oehme; – 2 ♂♂, 2 ♀♀ (SMF 38774–38777 [A]), Jalalabad, Nangarhar, 650 m, 2 July 1965, leg. D. Meyer-Oehme; – 1 ♂, 1 ♀ (IVB af533, af534 [S+B]), Jalal Abad, university campus, 30 March 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♀ (IVB af651 [S+B]), Jalal Abad, university campus, 8 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂, 1 ♀ (IVB af658, af659 [S+B]), Jalal Abad, university campus, 9 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 2 ♀♀ (IVB af660, af661 [S+B]), Jalal Abad, university campus, 10 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂, 1 ♀ 1 ♂, 1 ♀ (NMP 95426, 95427 [B]), Jalal Abad, university campus, 10 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 1 ♂, 1 ♀ (IVB af672, af673 [S+B]), Jalal Abad, Royal Palace, 11 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 2 ♀♀ (IVB af982, af983 [S+B]), Jalal Abad, Habibula Palace, 25 April 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Scotophilus heathii* are shown in Table 21. For the material examined see above.

S. heathii is considered a polytypic species, several subspecies are recognised within its extensive distribution range (Tate 1942, Ellerman & Morrison-Scott 1951, Sinha 1980, Koopman 1994, Simmons 2005). On the other hand, some authors regarded this bat as generally very variable and the delimitation of the subspecies as rather problematic (Brosset 1962c, Corbet & Hill 1992, Bates & Harrison 1997). Anyway, the populations of *S. heathii* occurring in the whole Indian subcontinent are consistently affiliated to the nominotypical subspecies (Tate 1942, Ellerman & Morrison-Scott 1951, Sinha 1976, 1980, 1986, 1999, Khajuria 1980, Koopman 1994, Bates & Harrison 1997, Alfred et al. 2002, Srinivasulu & Srinivasulu 2012, etc.), described from Madras, south-eastern India (Horsfield 1831: 113). The Afghanistani specimens were assigned to *S. h. heathii* explicitly by Gaisler (1970a: 48), who compared these bats with the samples fom Pakistan and a syntype specimen from India, and this conclusion was accepted by e.g. Koopman (1994), Bates & Harrison (1997), and Srinivasulu & Srinivasulu (2012).

A bat of the genus *Scotophilus* was for the first time reported from Afghanistan by Dobson (1876) without species identification and then by Dobson (1878: 259) under the species affiliation *S. temminckii* (Horsfield, 1824) (= *S. kuhlii* Leach, 1821); an immature male collected by T. Horsfield and originally labelled *S. fulvus* [(Blyth, 1851) = a junior synonym of *S. heathii*, see e.g. Ellerman & Morrison-Scott (1951) and Simmons (2005)]. Aellen (1959a) accepted the identification of the bat by Dobson (1876), i.e. as *S. temminckii*. However, Meyer-Oehme (1965, 1968), who was the first to correctly identify the Afghanistani samples of *Scotophilus* (collected by him in 1964 and 1965) as *S. heathii*, affiliated also the uncertain old Dobson's reports to this species. This view conforms to those by Neuhauser (1969) and Gaisler (1970a, b) as well as other subsequent authors, who mentioned only *S. heathii* from Afghanistan (see e.g. Roberts 1977, 1997, Corbet & Hill 1980, Robbins 1982, Koopman 1993, 1994, Bates & Harrison 1997, Simmons 2005, Srinivasulu & Srinivasulu 2012, etc.).

Miniopterus fuliginosus (Hodgson, 1835)

Records. **New data**: N a n g a r h a r: Jalalabad [1], 14 May 1965: 11 m, 2 f, ZFMK (coll. J. Niethammer; cf. Šrámek et al. 2013), 4 March 1966: 1 m, 2 f, ZFMK (coll. J. Niethammer; cf. Šrámek et al. 2013). – **Published data**: N a n g a r h a r: Jalalabad [1], May 1965: colony obs. (ca. 100–200 inds.), 2 July 1965: 2 m, 3 f [SMF] (Meyer-Oehme 1965 [as *M. schreibersi*]); Jalalabad, 2 July 1965: 5 inds., SMF (Kock 1987); Afghanistan, SMF [= Jalalabad, 2 July 1965] (Uchikawa 1985, Uchikawa et al. 1994 [as *M. schreibersi*]); Jalal-Abad, gallery in the vicinity of the Royal Palace, 3 March 1966: 75 inds.

(Baruš & Tenora 1967 [as *M. schreibersi*]); Jalal-Abad, a low gallery or canal, 1966/1967: a colony of ca. 100–500 inds. obs., coll. 37 m, 35 f (Gaisler et al. 1968 [as *M. schreibersi*]); Jalalabad, 3 March 1966: coll. 12 m, 25 f, 15 March 1967: coll. 3 m, 4 f, 3 May 1967: coll. 22 m, 6 f, [IVB, NMP] (Baruš & Tenora 1970, Dusbábek 1970, Gaisler 1970a, Smit & Rosický 1974 [as *M. schreibersi*]), 1 March 1966 & 3 May 1967 (Hůrka & Povolný 1968 [as *M. schreibersi*]); Jalalabad, 3 May 1967: 1 m, 1 f, BMNH (Maeda 1982).

Distribution. *Miniopterus fuliginosus* is a rare bat in Afghanistan, only one locality is known from the country, situated in the old town of Jalalabad, Nangarhar province, at 570 m a. s. l. (Fig. 60). However, a large colony was documented there several times, roosting in a short underground passage (ca. 20 m long) beneath a square near the Royal Palace (Figs. 30, 31); the largest counted number of *M. fuliginosus* in this roost was 500 individuals in March/May 1967 (Gaisler et al. 1968) and more than a hundred specimens were collected from this colony in total (see Material examined). The roost was occupied also by a large colony of *Myotis longipes*, ca. 2000 individuals in total (Gaisler et al. 1968).

Srinivasulu & Srinivasulu (2012) reported the occurrence of *M. fuliginosus* from the Bamyan, Helmand, Kandahar, Nangarhar, Nimruz, and Zabol provinces of Afghanistan. However, these authors did not distinguish between *M. fuliginosus* and *M. pallidus*, and assigned all records from Afghanistan to the former species. Anyway, no records of *Miniopterus* are available from the central mountainous parts of the country, and the occurrence of these bats in the Bamyan province has not yet been documented (see also below under *M. pallidus*). Similarly as in some other species (see e.g. under *Rhinopoma microphyllum*), Srinivasulu & Srinivasulu (2012) perhaps misidentified the position of the Kuh-e Duzdan cave and affiliated it to the Nimruz instead to Farah province.

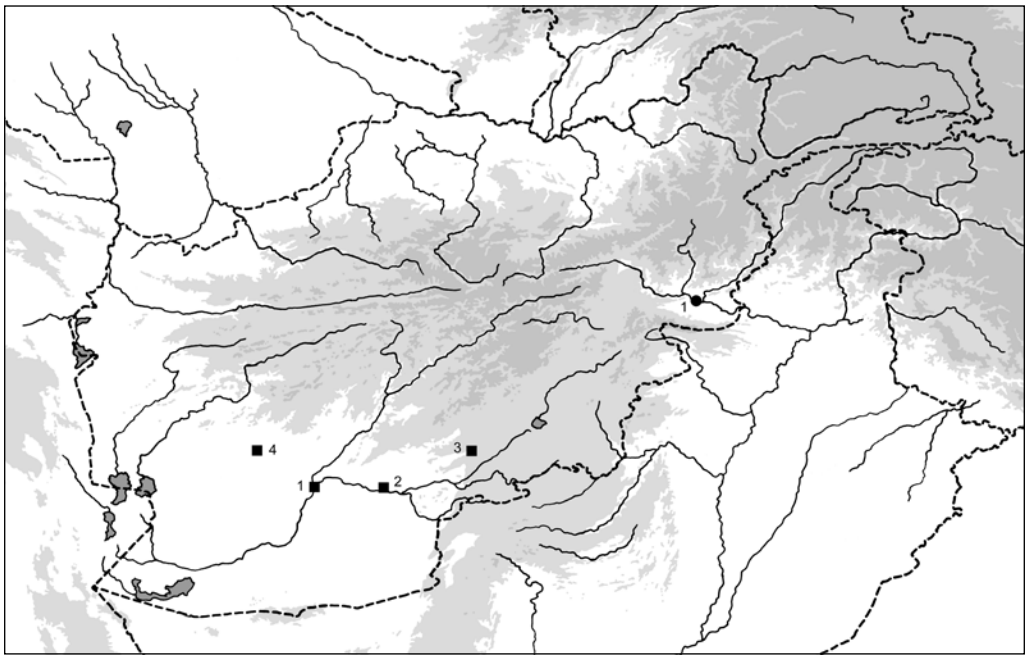

Fig. 60. Records of *Miniopterus fuliginosus* (Hodgson, 1835) (circle) and *M. pallidus* Thomas, 1907 (squares) in Afghanistan.

Table 23. Basic biometric data on the examined Afghanistani samples of *Miniopterus fuliginosus* (Hodgson, 1835), *M. pallidus* Thomas, 1907, and *Nyctinomus aegyptiacus* Geoffroy, 1818. For abbreviations see p. 272

	Miniopterus fuliginosus					*Miniopterus pallidus*					*Nyctinomus aegyptiacus*				
	n	**M**	min	max	SD	n	**M**	min	max	SD	n	**M**	min	max	SD
LAt	75	**48.40**	46.1	51.5	1.250	9	**46.66**	45.7	47.5	0.532	9	**51.20**	49.7	53.2	1.213
LCr	97	**15.57**	14.96	16.38	0.264	29	**15.44**	15.08	15.83	0.190	5	**20.02**	19.82	20.29	0.182
LCb	95	**15.23**	14.51	15.77	0.262	29	**15.01**	14.68	15.32	0.169	5	**19.51**	19.18	20.04	0.321
LaZ	84	**8.86**	7.98	9.24	0.198	28	**8.78**	8.54	9.12	0.138	5	**12.76**	12.56	13.18	0.245
LaI	97	**3.83**	3.65	4.09	0.093	31	**3.57**	3.37	3.76	0.093	5	**4.64**	4.52	4.74	0.101
LaInf	98	**4.09**	3.74	4.43	0.143	31	**4.06**	3.83	4.32	0.120	5	**5.34**	5.13	5.86	0.296
LaN	98	**8.11**	7.68	8.42	0.157	29	**8.04**	7.83	8.28	0.104	5	**10.40**	10.23	10.54	0.122
LaM	98	**8.81**	8.36	9.24	0.173	29	**8.87**	8.46	9.11	0.141	5	**11.63**	11.34	11.93	0.212
ANc	96	**6.49**	6.16	6.85	0.146	29	**6.36**	6.14	6.48	0.100	5	**6.66**	6.48	6.84	0.146
LBT	87	**3.20**	2.66	3.67	0.153	29	**3.16**	2.94	3.94	0.184	5	**4.51**	4.38	4.67	0.124
CC	98	**4.68**	4.33	5.06	0.142	30	**4.59**	4.39	4.74	0.079	5	**5.40**	5.27	5.61	0.142
M^3M^3	99	**6.66**	6.24	6.98	0.145	30	**6.44**	6.23	6.58	0.077	5	**8.92**	8.82	9.14	0.138
CM^3	98	**6.13**	5.76	6.80	0.132	31	**5.97**	5.73	6.16	0.095	5	**7.91**	7.67	8.13	0.168
LMd	99	**11.23**	10.64	11.92	0.203	31	**11.09**	10.67	11.37	0.160	5	**14.19**	13.89	14.63	0.320
ACo	98	**2.62**	2.36	3.13	0.125	31	**2.60**	2.44	2.73	0.082	5	**4.01**	3.87	4.08	0.089
CM_3	98	**6.57**	6.31	6.84	0.107	31	**6.36**	6.19	6.49	0.075	5	**8.43**	8.18	8.61	0.169

The single Afghanistani locality of *M. fuliginosus* represents the westernmost site within its known distribution range. This species is considered to inhabit the whole continental part of the Oriental region from Afghanistan to China and Japan (Corbet & Hill 1992), in the Indian subcontinent, *M. fuliginosus* was rather rarely found throughout India as well as in Ceylon and Nepal (Bates & Harrison 1997). Just recently this bat has been also documented in Pakistan (Mahmood-ul-Hassan & Salim 2015); a female was captured at Barcharai Diram in the Malakand district, Khyber Pakhtunkhwa, situated some 50 km from the Afghanistani border, and ca. 120 km east of Jalalabad. Hence, this individual recorded in Pakistan could originate even from the Jalalabad colony.

Material examined. 11 ♂♂, 2 ♀♀ (ZFMK 97.215–97.218, 97.220–97.223, 97.238–97.241 [S+B], 97.219 [B]), Jalalabad, 14 May 1965, coll. J. Niethammer; – 2 ♂♂, 2 ♀♀ (SMF 38828, 38829, 38840, 38841 [S]), Jalalabad, Nangarhar, 650 m, 2 July 1965, leg. D. Meyer-Oehme; – 14 ♂♂, 29 ♀♀, 5 inds. (IVB af1556–1571, ZFMK 97.224–97.226, 97.228–97.234 [S+B], IVB af1572–1592, ZFMK 97.227 [S]), Jalal Abad, 1 March 1966, leg. D. Povolný & F. Tenora, coll. J. Niethammer; – 1 ♂, 2 ♀♀ (ZFMK 97.242–97.244 [S+A]), Jalalabad, 4 March 1966, coll. J. Niethammer; – 3 ♂♂, 4 ♀♀ (IVB af417, af478–483 [S+B]), Jalal Abad, gallery under the Royal Palace, 15 March 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora; – 21 ♂♂, 5 ♀♀ (IVB af1029, af1030, af1032, af1033, af1035–1037, af1039–1054, NMP 95432, 95433 [S+B], IVB af1031 [B]), Jalal Abad, gallery under the Royal Palace, 3 May 1967, leg. J. Gaisler, D. Povolný, Z. Šebek & F. Tenora.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Miniopterus fuliginosus* are shown in Table 23. For the material examined see above.

Although *M. fuliginosus* was described as a separate species by Hodgson (1835), for a long time it was considered an Oriental subspecies of the European congener, *M. schreibersii* (Kuhl, 1817) (Tate 1941c, Ellerman & Morrison-Scott 1951, Wallin 1969, Gaisler 1970a, Corbet 1978, Strelkov 1981, Hill 1983, Yoshiyuki 1989, Corbet & Hill 1992, Koopman 1994, Kock 1996, Bates & Harrison 1997, Sinha 1999, Horáček et al. 2000, Alfred et al. 2002, Simmons 2005, etc.). The east-Afghanistani *Miniopterus* populations (i.e. the bats of the Jalalabad colony) were mentioned under *M. schreibersii* by Meyer-Oehme (1965), Baruš & Tenora (1967, 1970), Gaisler et al. (1968), Hůrka & Povolný (1968), Dusbábek (1970), Gaisler (1970a, b), Smit & Rosický (1974),

Niethammer (1983), Uchikawa (1985), Corbet & Hill (1992), Koopman (1994), Uchikawa et al. (1994), Kock (1996), Bates & Harrison (1997), and perhaps others. However, Gaisler (1970a), Corbet & Hill (1992), Koopman (1994), Kock (1996), and Bates & Harrison (1997) assigned these populations to the subspecies *M. s. fuliginosus*.

Based on the results of a profound morphometric analysis of samples of the whole genus, including also the east-Afghanistani ones, Maeda (1982) suggested to split *M. schreibersii* s.l. into a number of species, including *M. fuliginosus* in the range from Afghanistan to Japan. However, this taxonomic view was generally refused by subsequent authors (see Hill 1983, Corbet & Hill 1992, etc.); concerning the respective Afghanistani populations, it was accepted only by Kock (1987). The species position of *M. fuliginosus* was raised up again as a consequence of the results of molecular genetic analyses (Appleton et al. 2004, Tian et al. 2004, Furman et al. 2010a, Kruskop et al. 2012, Šrámek et al. 2013). With a reference to the former two of these analyses, Srinivasulu & Srinivasulu (2012) reported only *M. fuliginosus* from Afghanistan.

The results of the morphologic revision by Maeda (1982) and the molecular genetic analysis by Kruskop et al. (2012) suggested a monotypic status of *M. fuliginosus* in its whole range. Similarly, the dimensions of the Afghanistani samples of *M. fuliginosus* (Table 23; see also Šrámek et al. 2013) conform to the metric data on this bat from various parts of its Oriental range, including Taiwan and Japan (Maeda 1982).

Gaisler (1970a: 53) characterised the specimens from the Jalalabad colony as follows: "[they] are markedly darker than those from Europe and correspond fully to the ssp. *Miniopterus schreibersii fuliginosus* […]. […] I had the opportunity of examining the material of this subspecies from India and had ascertained that its colouration is in full agreement with that of the specimens from eastern Afghanistan. […] for the size, there is no difference between the members of the ssp.

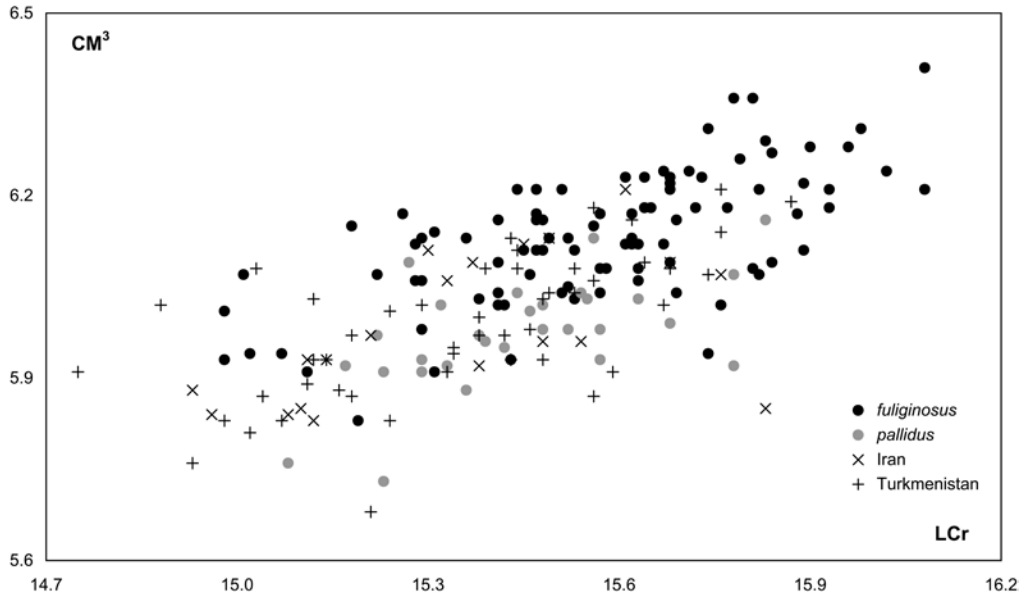

Fig. 61. Bivariate plot of the examined Afghanistani and comparative samples of the genus *Miniopterus* Bonaparte, 1837: greatest length of skull (LCr) against the length of upper tooth-row (CM^3); see text for details.

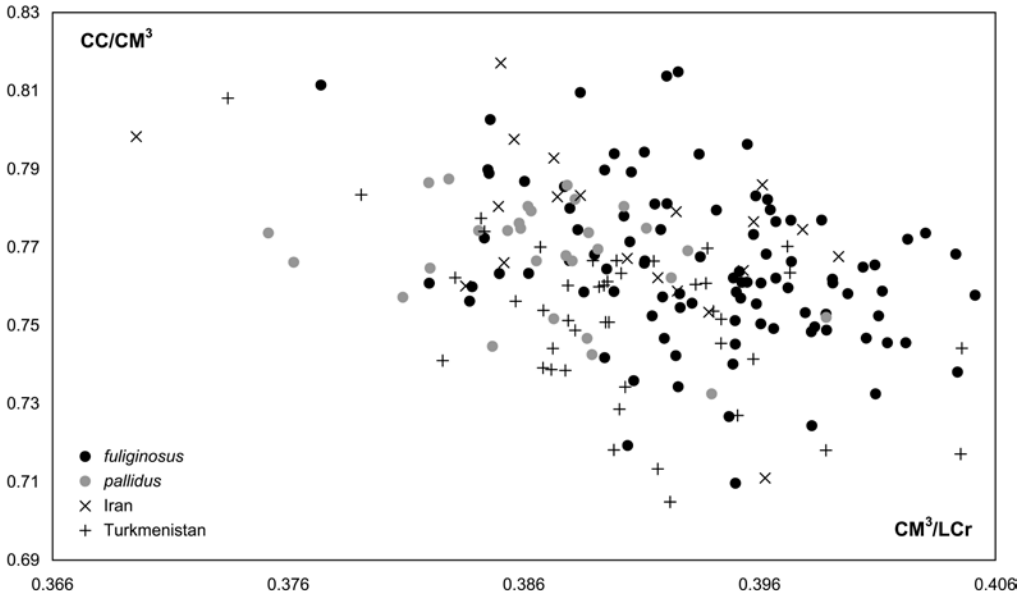

Fig. 62. Bivariate plot of the examined Afghanistani and comparative samples of the genus *Miniopterus* Bonaparte, 1837: relative length of rostrum (CM^3/LCr) against the relative width of rostrum (CC/CM^3); see text for details.

pallidus from Central Asia [= Turkmenistan] and those of ssp. *fuliginosus* from India but that the specimens from Jalalabad are somewhat bigger. […] The greater size of the Afghan individuals can be explained (as in some other species of bats) in agreement with Bergmann's rule." Here it should be noted that for a metric comparison of 71 specimens from Jalalabad, Gaisler (1970a) used a series of only nine bats from India (one from Ramnagar, Kumaon; eight from Mahableshwar). Kock (1996) mentioned the Jalalabad specimens of *M. schreibersii* s.l. (i.e. *M. fuliginosus*) to be larger in size than the specimens from southern Afghanistan (i.e. *M. pallidus*).

The metric comparison of specimens of both *Miniopterus* species from Afghanistan showed differences in body and skull size and in skull shape between them, observable mainly in mean values, although extensive overlaps of value ranges were present (Table 23). The most obvious differences are found in the forearm and skull length dimensions (including tooth-rows), while the skull widths are very similar in both species in absolute values (this indicates relatively narrower skulls in *M. fuliginosus*). In conclusion, *M. fuliginosus* is on average larger than *M. pallidus*, with a relatively narrower skull and longer rostrum (Figs. 61, 62). Surprisingly, the size differences between the Afghanistani populations of the two *Miniopterus* species are sufficiently significant so that the sets of specimens are clearly divided into two clusters by the results of the principal component analysis of the skull dimensions without any remarkable overlap (Fig. 63).

Miniopterus pallidus Thomas, 1907

Records. **New data**: H e l m a n d: Qala-e Bust [1], 2 March 1965: 1 m, 2 f, SMF (leg. D. Meyer-Oehme), 29 March 1972: 2 m, 1 f, ZFMK (leg. D. Meyer-Oehme; cf. Šrámek et al. 2013). – K a n d a h a r: Shamshir cave [2], 28 February 1965: 1 f, ZFMK (coll. J. Niethammer; cf. Šrámek et al. 2013). – Z a b o l: Bulan cave [3], 11 June 1964: 4 m, 12 f,

24 August 1965: 1 m, 1 ind., SMF (leg. D. Meyer-Oehme). – **Published data**: F a r a h: Koh-i-Duzdan Cave [4], 12 km NE of Dilaram, 15 November 1965: coll. 1 ind. (Neuhauser 1969 [as *M. schreibersi*]); Dilaram, FMNH (Bates & Harrison 1997 [as *M. schreibersii*]). – H e l m a n d: Qala Bist [1], fortress, fissures between bricks, 13 November 1965: few inds., FMNH (Neuhauser 1969 [as *M. schreibersi*], Bates & Harrison 1997 [as *M. schreibersii*]). – K a n d a h a r: Shamshir Ghar [2], subfossil bone material, 1 inds. (Dupree 1958 [as *M. schreibersii*]); Grotte Chamchir, Kandahar, 14 April 1958: 1 m, 5 f, [MHNG, MZLU] (Aellen 1959a, b [as *M. schreibersi*]), 4 inds. (Vercammen-Grandjean 1963 [as *M. schreibersi*]); Chamchir ghar, 14 April 1958 (Smit 1960 [as *M. schreibersi*]); Chamchir ghar, près Pandjvaï, 4 December 1957 & 14 April 1958 (Lindberg 1961 [as *M. schreibersi*]); Shamshir Ghar, 19 km SW of Kandahar, 26 September 1965: obs. ca. 500 inds., coll. 3 inds. (Neuhauser 1969 [as *M. schreibersi*]); Shamshir Cave, 19 km. SW Kandahar, 29 October 1965 (Lewis 1973 [as *M. schreibersi*], cf. Uchikawa 1985); Shamshir Ghar, [23 May 1961 & 28 February 1965:] 7 inds. [= 1 m, 3 f], SMF (Kock 1987 [as *M. schreibersi*], cf. Uchikawa 1985); Kandahar, 14 April 1958: 1 m, 1 f, MHNG (Maeda 1982 [as *M. schreibersi*]). – Z a b o l: Bolan Cave [3], 13.6 km S of Kalat-i-Ghilzai, 5 November 1965: net. numerous inds. (Neuhauser 1969 [as *M. schreibersi*]); Qalat, FMNH (Bates & Harrison 1997 [as *M. schreibersii*]). – Afghanistan, four localities, 49 inds., FMNH (DeBlase 1980 [as *M. schreibersi*]); Afghanistan, 10 September 1968, FMNH (Uchikawa et al. 1994 [as *M. schreibersi*]).

Distribution. *Miniopterus pallidus* is a rather rare bat in Afghanistan, four localities are available from the southern part of the country (Fig. 60), from the central belt of the Farah, Helmand, Kandahar, and Zabol provinces. Its occurrence sites are situated on the transition of the desert and steppe areas at the altitudes between 760 and 1750 m a. s. l. (mean altitude 1167 m).

The species status of *M. pallidus* has been defined recently (Furman et al. 2010b, Bilgin et al. 2012, Šrámek et al. 2013), formerly it was considered a form of *M. schreibersii* (Kuhl, 1817) (see the review by Benda et al. 2012). The distribution range of *M. pallidus* is still known only approximately; however, its distribution is centred to Iranian mountains (it is the only species of the genus currently recognised in Iran, see Benda et al. 2012, Akmali et al. 2015), with certain extensions to the surrounding regions – eastern and central Anatolia, eastern Levant, Azerbaijan,

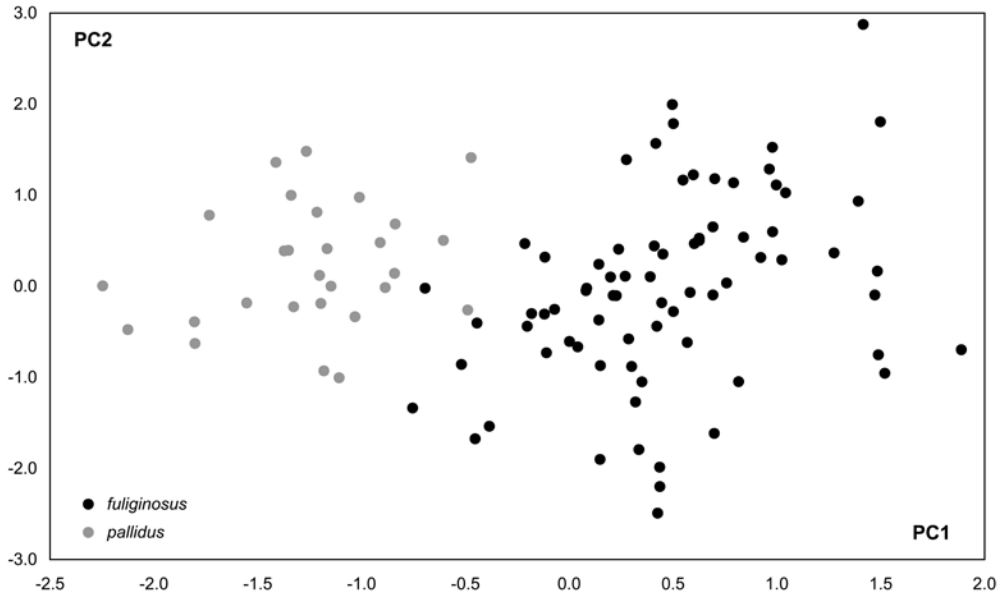

Fig. 63. Bivariate plot of the examined Afghanistani samples of the genus *Miniopterus* Bonaparte, 1837: results of the principal component analysis of the skull dimensions (PC1=70.31% of variance; 22.39%).

southern Turkmenistan and Afghanistan (Šrámek et al. 2013). The Afghanistani localities thus constitute the south-eastern margin of the species distribution range as well.

M. pallidus is a rather common species of the Kopetdagh Mts. and adjacent areas on the Iranian-Turkmenistani transition, at least twenty records are known from this region (Strelkov et al. 1978, Benda et al. 2012); the Iranian sites situated closest to the Afghanistani border lie only some 80 km away (Mozduran, SE Messhed; DeBlase 1980, Benda et al. 2012). *M. pallidus* could thus be found also in the north-western and western parts of Afghanistan, in mountain areas connecting the known distribution in north-eastern Iran and southern Afghanistan.

Habilov (1983) reported a record of *Miniopterus* from Istaravšan [Ura-Tûbe] in north-western Tajikistan (based on three ZIN male specimens which he assigned to *M. schreibersii* s.l.). The locality is completely separated from the rest of the genus range in Asia – it is situated 855 km WNW of the closest site in Turkmenistan (Kelat cave, 18 km SW of Duşak; Strelkov et al. 1978), 850 km WNW of the closest site in Iran (Bazangan cave; Benda et al. 2012), and 895 km north of the closest site of *M. pallidus* (Bolan cave) and 620 km north of the closest site of *M. fuliginosus* (Jalalabad) in Afghanistan (in both cases across the highest ranges of the Pamirs and Hindu Kush). Unfortunately, neither Habilov (1983) nor Habilov (1992) presented any metric data to be able to identify the real species affiliation of the respective *Miniopterus* specimens and thus, it is not clear whether these bats belong to *M. pallidus* or *M. fuliginosus* (but most probably not to *M. schreibersii* s.str.). Anyway, if the respective bats are labelled correctly and they really originated from Tajikistan, the range of the genus *Miniopterus* in the southern Palaearctic is considerably larger than it was assumed previously (Corbet 1978, Horáček et al. 2000, Boye 2004, etc.) and these bats could be found also in the northern or north-eastern parts of Afghanistan as well as in various parts of West Turkestan, in areas interconnecting the hitherto known occurrence spots in western Asia.

Material examined. 4 ♂♂, 12 ♀♀ (SMF 38809–38820, 38835–38838 [S]), Bolan Ghar, Zabul, Höhle, 1850 m, 11 June 1964, leg. D. Meyer-Oehme; – 1 ♂, 1 ind. (SMF 38842, 39922 [S]), Bolan Ghar, Zabul, Höhle, 1850 m, 24 August 1965, leg. D. Meyer-Oehme; – 1 ♂, 5 ♀♀ (MHNG 953.004, 953.005 [S+A], MZLU L58/3314 [A]), Grotte Chamchir, Kandahar, 14 April 1958, leg. K. Lindberg; – 2 ♂♂ (ZFMK 97.235–97.237 [S+B]), Kala-Bust, 29 March 1972, coll. J. Niethammer; – 1 ♂, 2 ♀♀ (SMF 38826, 38827, 38839 [S]), Kala-e-Bust, Helmand, 870 m, 2 March 1965, leg. D. Meyer-Oehme; – 1 ♂ (SMF 38832 [S]), Shamshir Ghar, Kandahar, Höhle, 1080 m, 23 May 1961, leg. D. Meyer-Oehme; – 3 ♀♀ (SMF 38823–38825 [S]), Shamshir Ghar, Kandahar, Höhle, 1080 m, 28 February 1965, leg. D. Meyer-Oehme; – 1 ♀ (ZFMK 97.245 [S]), Shamshir Gor bei Kandahar, 28 February 1965, coll. J. Niethammer.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Miniopterus pallidus* are shown in Table 23. For the material examined see above.

As mentioned above and similarly to *M. fuliginosus*, the species status of *M. pallidus* has been defined only recently, thanks to a series of subsequent studies (Bilgin et al. 2006, 2012, Furman et al. 2009, 2010b, Šrámek et al. 2013). This species was for a long time considered the Middle Eastern subspecies or just a population of the European species, *M. schreibersii* (Kuhl, 1817) (Bobrinskoj 1925, Ognev 1927, 1928, Tate 1941c, Ellerman & Morrison-Scott 1951, Harrison 1964, Kuzâkin 1965, Gaisler 1970a, Corbet 1978, Strelkov et al. 1978, DeBlase 1980, Strelkov 1981, Maeda 1982, Niethammer 1983, Nader & Kock 1987, Harrison & Bates 1991, Koopman 1994, Borisenko & Pavlinov 1995, Pavlinov & Rossolimo 1998, Horáček et al. 2000, Simmons 2005, etc.). However, unlike *M. fuliginosus*, *M. pallidus* was originally described by Thomas (1907) as a subspecies of *M. schreibersii* and moreover, even this status was doubted by some authors, who considered the colouration traits that were declared as the differences from the nominotypical form too weak for a delimitation of a separate taxon (Kuzâkin 1944, 1950, Lay 1967).

The *Miniopterus* populations from southern Afghanistan were assigned to *M. schreibersii* by Dupree (1958), Aellen (1959a, b), Smit (1960), Lindberg (1961), Vercammen-Grandjean (1963),

Neuhauser (1969), Gaisler (1970a, b), Lewis (1973), DeBlase (1980), Maeda (1982), Niethammer (1983), Kock (1987, 1996), Koopman (1994), Uchikawa et al. (1994), Bates & Harrison (1997), and perhaps others. Aellen (1959a), Gaisler (1970a), Koopman (1994), and Kock (1996) assigned these populations to the subspecies *M. s. pallidus*. As noted above, Srinivasulu & Srinivasulu (2012) erroneously reported *M. fuliginosus* from southern Afghanistan.

However, based on the results of molecular genetic as well field data analyses, Furman et al. (2010b) and Bilgin et al. (2012) suggested two Middle Eastern subspecies of *M. schreibersii* s.l., *M. s. schreibersii* and *M. s. pallidus*, to represent in fact a pair of independent species. The genetic data by Furman et al. (2009), Çoraman et al. (2013), Šrámek et al. (2013), and Akmali et al. (2015) confirmed the occurrence of *M. pallidus* from a number of localities spread over central and eastern Turkey, Levant, Azerbaijan, and Iran. From the latter two countries, it is the only *Miniopterus* species (see also Benda et al. 2012, Akmali et al. 2015). Besides these areas, *M. pallidus* was reported to occur only in south-western Turkmenistan (Bobrinskoj 1925, Ognev 1927, 1928, Kuzâkin 1965, Strelkov et al. 1978, Strelkov 1981) and southern Afghanistan (see above), where the genetic evidence is not available.

Due to the geographically limited distribution range and also according to the available morphometric and genetic data (Šrámek et al. 2013), no geographical variation has been evidenced in *M. pallidus*. The Afghanistani samples agree in dimensions with the specimens from Iran (identified also by genetic methods) and from Turkmenistan (Figs. 61, 62), in the mean values almost absolutely (comp. Table 23; Benda et al. 2011a: 205, Table 16; and Benda et al. 2012: 502, Table 36). Hence, *M. pallidus* represents a single homogeneous morphotype, at least in the eastern and central parts of its distribution range.

Tadarida teniotis (Rafinesque, 1814)

Records. **Published data**: K a b o l: Kabul, Hausgasse im Stadteil Schar-i-Nau, 1 m (coll. on 30 June 1962), SMF (Meyer-Oehme 1965, 1968, Nader & Kock 1980, Kock 1999).

Distribution. *Tadarida teniotis* is a very rare bat in Afghanistan, only one individual was reported from the country; a mummy of an adult bat was discovered in Shahr-e Naow, a part of the Kabul downtown. This area lies at the altitude of ca. 1800 m a. s. l. (Fig. 1).

T. teniotis is a Mediterranean bat species distributed in the south-western part of the Palaearctic (Kock & Nader 1984, Horáček et al. 2000, Simmons 2005), its single occurrence site in Afghanistan represents a part of the eastern margin of the species distribution range. To the south-west, this margin continues in southern and south-eastern Iran (DeBlase 1971a, de Roguin 1988, Benda et al. 2012), and to the north, it continues in western Tajikistan and south-western Kirghizstan (Rybin et al. 1989, Habilov 1992), where this species has the easternmost area of distribution as well.

T. teniotis remains an unknown bat in Pakistan, Kashmir and India (Corbet & Hill 1992, Bates & Harrison 1997, Mahmood-ul-Hassan et al. 2009, Saikia et al. 2011, etc.); on the other hand, this bat belongs to rather frequent faunal elements in areas west and north of Afghanistan. In Iran, it is broadly distributed throughout the country with the exception of deserts (Benda et al. 2012), the closest records are known from the Kuh-e Taftan mountains of eastern Baluchistan (Kusheh, de Rougin 1988; 130 km SW of the Afghanistani border) and the Karakum desert of north-eastern Khorasan (Shurlaq, Benda et al. 2012; 97 km of the border). Very closely situated records of *T. teniotis* are known from the southern parts of West Turkestan (Bogdanov 1953, Strelkov et al. 1978, Habilov 1992). From south-eastern Turkmenistan, Gorelov (1977) reported a finding of this bat from Rabatkaşan, less than 10 km from the north-western border of Afghanistan. Bogdanov (1953) reported two records of *T. teniotis* from the Babatag Mts. in south-eastern

Uzbekistan (between the Kaška-bulak and Gul'baj springs and between the Bol'šaâ turanga and Patally springs), between 50 and 100 km from the border of Afghanistan. From south-western Tajikistan, Habilov (1992) summarised a series of findings of this bat situated also closely to the border of Afghanistan; Ŝerbin (1968) reported *T. teniotis* records from Agaravak and Ok-Bulak in the Aktau Mts. and from near Âhči-Sar near Daštičum and Staraâ pristan' [old port] at Čilikul; the latter two sites lie 5 km and 23 km north of the Panj river valley, respectively, i.e. almost at the border of Afghanistan.

The distribution of *T. teniotis* in the countries neighbouring Afghanistan in the west and north indicates a possibility of a broad occurrence of this bat also in this country. Considering the distribution pattern of *T. teniotis* in western Asia, this bat could occur mainly in the montane and sub-montane areas of Afghanistan, namely in those situated north-west of the central Hindu Kush range, and perhaps it miss only in the southern desert plateaus.

Material examined. 1 ♂ (SMF 38739 [S]), Kabul, 1800 m, 30 June 1962, coll. D. Meyer-Oehme.

Morphology and variation. Some cranial dimensions of the Afghanistani specimen of *Tadarida teniotis* are shown in Table 24. For the material examined see above.

Two subspecies of *T. teniotis* were traditionally recognised in the western Palaearctic (Ellerman & Morrison-Scott 1951, Lewis & Harrison 1962, Harrison 1964, Aellen 1966, Kock 1969, DeBlase 1980, Kock & Nader 1984, Harrison & Bates 1991, Simmons 2005, etc.), *T. t. teniotis* (Rafinesque, 1814) in Europe and the Maghreb and *T. t. rueppellii* (Temminck, 1826) in north-eastern Africa and south-western Asia. On the other hand, *T. teniotis* is considered a monotypic species by several other authors (Corbet 1978, Koopman 1994, Benda et al. 2008, 2012, 2014) and the name *rueppellii* a mere synonym of the nominotypical form.

Since no differences in morphology were originally documented between the two subspecies of *T. teniotis*, their distinctness was defined only in pelage colouration – in *T. t. rueppellii* it is referred to be pale and greyish, while dark and brownish in the nominotypical form (see Lewis & Harrison 1962, Kock & Nader 1984). However, the colouration traits were shown to be very variable throughout the range of *T. teniotis* and not useful for separation of geographical forms (see the review by Benda et al. 2008). Benda et al. (2012) evaluated also the morphometric variation throughout the distribution range of *T. teniotis* and revealed slight differences in body and skull size among the populations from all main parts of the species range. The geographical sets clustered into groups of rather large-sized bats from Iran, West Turkestan and the Maghreb and of rather small-sized bats from Cyrenaica, while the samples from the Levant, Egypt and Europe were found medium-sized (see also Table 24). Benda et al. (2012) suggested that this morphological

Table 24. Basic biometric data on the examined Afghanistani specimen of *Tadarida teniotis* (Rafinesque, 1814) from Afghanistan and the mean values from the comparative sets of specimens of this species from the south-western Palaearctic (after Benda et al. 2012). For abbreviations see p. 272

	Afghanistan	Iran	West Turkestan	Levant	Egypt	Libya	Europe	Maghreb
n	1	12	16	32	18	19	27	13
LAt	*62.0	61.07	62.53	60.78	60.68	59.99	60.27	61.86
CM^3	9.12	9.07	9.18	8.95	9.00	8.80	8.89	9.11
LMd	17.04	16.96	17.17	16.83	16.85	16.67	16.87	17.10
ACo	4.13	4.04	4.14	4.04	4.03	4.15	4.15	4.25
CM_3	9.93	9.76	9.84	9.55	9.63	9.44	9.59	9.74

* after Meyer-Oehme (1965)

plasticity of *T. teniotis* is a response to climatic conditions: larger bats seem to occur in higher mountains or continental steppes, while smaller bats in coastal areas of the Mediterranean basin. However, Benda et al. (2014), examining the Cyrenaican population of *T. teniotis*, showed this metric plasticity not to be in line with the colour variation (i.e., dark larger bats vs. pale smaller bats), as the Cyrenaican samples are small-sized and uniformly dark brownish grey. This suggests that the variability in body size and pelage colouration represents rather local and individual variations than any clear geographical and phylogenetic trends. In other words, the morphometric and colouration characters do not help in taxonomic evaluation of the intraspecific variation in *T. teniotis*, while the real description of its geographical variation has to be based on a molecular genetic analysis of the samples representing its whole range. Hence, until a new evidence suggesting a subspecific division is available, it is appropriate to consider *T. teniotis* a monotypic species (in accordance with the view by Corbet 1978, Koopman 1994, and Benda et al. 2008).

Considering the traditional taxonomic division of *T. teniotis* as well as the subspecific assignation of the Iranian populations by DeBlase (1980) and de Roguin (1988), both colour morphs (or the "subspecies") could be found in Afghanistan. The only Afghanistani specimen of *T. teniotis* was first examined by Meyer-Oehme (1965), who suggested it to belong to the nominotypical form because of the dark colouration; he added the following details on this bat (p. 45): "Die Hautfaerbung der Dorsal- wie Ventralseite ist bleich mattbraun; Haarspitzen dorsal und ventral isabellfarben getoent, Haarbasen weisslich; die derbledrigen Flughaeute und Ohren sind dunkelbraun; […]. Ob die Kabuler Exemplare zur Rasse *T. t. teniotis* oder *T. t. rueppelli* gestelt werden muessen, laesst sich an Hand eines Tieres nicht sicher entscheiden, zumal beide Rassen nach Harrison [1964] nur in dem – variablen – Charakter der Haarfaerbung differieren. Die fuer *teniotis* bezeichnende fahlbraune Faerbung trifft zu." This taxonomic conclusion was accepted by Gaisler (1971) and Srinivasulu & Srinivasulu (2012). Interestingly, neither Corbet & Hill (1992) nor Bates & Harrison (1997) suggested any taxonomic position of the Afghanistani populations of *T. teniotis*, although these authors mentioned occurrence of this species in the country.

Another type of evidence was evaluated by Kock (1999), who compared the structure of lower molars in several Asian populations/taxa of *Tadarida*. He found the Afghanistani specimen larger in size than the European samples, but in the molar structure positioned closely to the European bats (their molars did not show the reduced hypoconulids), while similarly large-sized specimen from Kirghizstan he found situated close to the east-Asian species, *T. insignis* (Blyth, 1862) according to the tooth structure (reduced hypoconulids present). Kock (1999) regarded the latter taxon a subspecies of *T. teniotis*, a taxonomic view currently abandoned, see Yoshiyuki (1989), Funakoshi & Kunisaki (2000), and Simmons (2005).

Considering the body and skull size of the Afghanistani specimen, they conform to those of the large-sized populations of Iran and West Turkestan (Table 24; see also Benda et al. 2012: 502, 514).

Nyctinomus aegyptiacus Geoffroy, 1818

Records. **Published data**: K a b o l: Kabul, Lehmhaus der Altstadt im Stadteil Ashk an Arfan, 11 July 1962: great colony obs. (639 inds. emerged), coll. 9 fa, 29 September 1965: 1 mj, SMF (Meyer-Oehme 1965, 1968, Nader & Kock 1980, Kock 1999).

Distribution. *Nyctinomus aegyptiacus* is a rare bat in Afghanistan, only one locality was reported from the country, situated at the southern periphery of Kabul. However, there a large colony composed of more than 600 adult and juvenile individuals was found in an old earthen house. This site lies at the altitude around 1815 m a. s. l. (Fig. 1).

The Afghanistani locality represents the northernmost known spot of the whole distribution range of *N. aegyptiacus* (Bates & Harrison 1997, Horáček et al. 2000); moreover, it is significantly separated from the closest segment of the continuous area of occurrence, in the southern part of Pakistan (Bates & Harrison 1997, Mahmood-ul-Hassan et al. 2009). The closest record of *N. aegyptiacus* is known from Rajanpur in southern Punjab (Blanford 1891, Ghosh 2008; as *N. tragatus*), more than 600 km south of Kabul. Other occurrence in southern Asia covers a more or less continuous belt of areas including southern Arabia, south-eastern Iran, Sindh valley of southern Pakistan, Ceylon, and a large part of central and southern India (Harrison & Bates 1991, Bates & Harrison 1997, Benda et al. 2011c, 2012).

N. aegyptiacus is distributed over a broad range comprising the southern and eastern parts of Africa, almost the whole North Africa, southern Arabia and a large part of the Indian subcontinent (Bates & Harrison 1997, Horáček et al. 2000, Simmons 2005); it shows one of the most extensive distribution areas among the molossid bats. In most of this range, *N. aegyptiacus* is an inhabitant of rather low situated steppe and desert regions. The high-situated Afghanistani spot of occurrence represents, not only geographically, but also climatically, a rather extreme offshoot from the regular occurrence pattern of this bat.

Material examined. 9 ♀♀ (SMF 38740, 38741, 38744, 38745, 38747 [S+A], 38742, 38743, 38746, 38748 [A]), Kabul, 1800 m, 11 July 1962, leg. D. Meyer-Oehme; – 1 ♂ (SMF 38749 [S+A]), Kabul, 1800 m, 29 September 1965, leg. D. Meyer-Oehme.

Morphology and variation. Forearm and cranial dimensions of the Afghanistani specimens of *Nyctinomus aegyptiacus* are shown in Table 23. For the material examined see above.

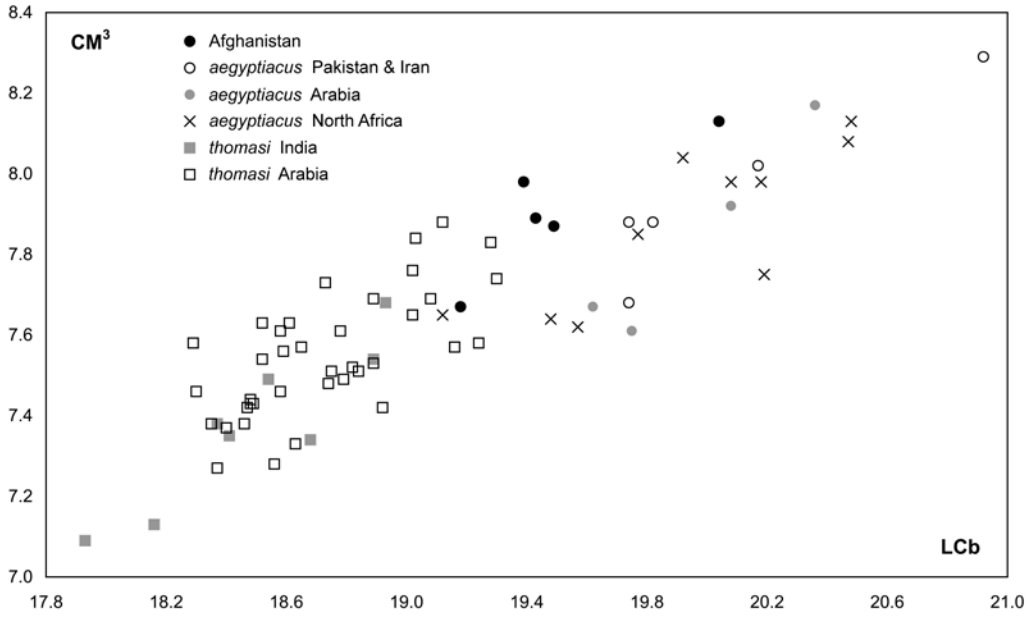

Fig. 64. Bivariate plot of the examined Afghanistani and comparative samples of the genus *Nyctinomus* Geoffroy, 1818: condylobasal length of skull (LCb) against the length of upper tooth-row (CM^3). For details see text.

In its Asian range (see above for the description of the whole distribution), *N. aegyptiacus* used to be divided up to four subspecies (cf. Koopman 1994, Horáček et al. 2000, Simmons 2005), viz. *N. a. tragatus* Dobson, 1874 (north-eastern India), *N. a. thomasi* (Wroughton, 1919) (remainder of India, and Ceylon), *N. a. sindicus* (Wroughton, 1919) (Pakistan and Iran), and *N. a. aegyptiacus* Geoffroy, 1818 (Arabia and most of the African range); the delimitation of the subspecies ranges here follows Koopman (1994). However, this unusually high geographical diversity is (1) in variation with the situation in the African range of this bat, in which – despite its more extensive area of distribution with more diversified environments – only two subspecies are recognised; and (2) based on various identification characters, whose validity was questioned by several authors (comp. Wroughton 1919, Hill 1961, Brosset 1962c, Bates & Harrison 1997).

Ellerman & Morrison-Scott (1951) and Hill (1961) accepted the arrangement by Wroughton (1919) and recognised three Indian subspecies of *aegyptiacus* s.str. (*thomasi*, *sindicus*, *gossei*; originally, under the original Wroughthon's view three species) plus a separate species *tragatus*. While *tragatus* was declared by Dobson (1874) to differ from *aegyptiacus* s.str. in possessing six lower incisors against four, Wroughton (1919) separated his three forms within *aegyptiacus* s.str. on the basis of a combination of differing body size and pelage colouration. However, Brosset (1962c) and Sinha (1970) found the colouration traits reported by Wroughton (1919) to differ the subspecies from western India (*thomasi* and *gossei*) as an effect of individual variation and suggested to synonymise these names under *thomasi*. Chaturvedi (1964) examined morphological traits (ear and tooth characters and body size) of the type series (three specimens) of *N. tragatus* Dobson, 1874 and found no differences from *N. aegyptiacus* Geoffroy, 1818; the name *tragatus* thus belongs into the synonymy of *aegyptiacus*. After these revisions, four subspecies were available from southern Asia, one small-sized (LAt 48 mm or less, Wroughton 1919), *thomasi*, and three large-sized (LAt about 52 mm; Wroughton 1919, Chaturvedi 1964), *aegyptiacus*, *tragatus*, and *sindicus*; the large-sized forms differing only in geographical distribution (see above).

Considering this taxonomic arrangement, Meyer-Oehme (1965: 45–46) assigned the series of Afghanistani specimens, based on body measurements, to the subspecies *N. a. sindicus*. He added the following description: "Die Faerbung ist dorsal mattbraun (nicht grau!), ventral median bleicher, an der ventralen Flue gelbasis z. T. eininge weisse Haare. Die in der Literatur fuer die Rasse *T. ae. sindica* [= *N. a. sindicus*] angegebene helle Y-Zeichnung ist nicht erkennbar. Der Hinterrand der Armflughaut ist weisslich. Nach die Massen gehoeren die afghanischen Vertreter eindeutig zur Rasse *T. ae. sindica* – sofern man die Unterscheidung von *sindica* und *thomasi* ueberhaupt aufrecht erhalten will; ihre Gueltigkeit wird von Brosset [1962c] angezweifelt." This conclusion was accepted by Gaisler (1971) and Srinivasulu & Srinivasulu (2012), and conforms to the views by Roberts (1977, 1997), Sinha (1980), Koopman (1994), and Horáček et al. (2000)

Benda et al. (2012) found the two size categories of *N. aegyptiacus* to represent two different morphotypes, differing besides their body and skull size also in skull shape. Moreover, they demonstrated these morphotypes to live in sympatry in southern Arabia, and according to literature data (Brosset 1962c) also in western India, and therefore, suggested to consider the two morphotypes as a pair of separate species, large-sized *N. aegyptiacus* and small-sized *N. thomasi*.

Considering this new taxonomic arrangement, the Afghanistani populations – based on specimens collected and discussed by Meyer-Oehme (1965) – represent clearly the large-sized morphotype, i.e. the species *N. aegyptiacus* (see Fig. 64). However, there remains an uncertainty concerning the subspecies of *N. aegyptiacus* in southern Asia. The comparison by Benda et al. (2012) did not find any morphological difference between the North African samples (i.e., those covering also the nominotypical populations from Egypt; type locality Giza; Koopman 1975: 422) and the samples from Arabia, Iran and Pakistan. Corbet & Hill (1992) also noted the uncertain validity of the recognised subspecies in India. Thus, Benda et al. (2012) suggested to consider all

northern populations of *N. aegyptiacus* (i.e. those of North Africa and southern Asia) as monotypic, representing a single taxon, the nominotypical subspecies. In case an additional research finds the Asian populations to represent a separate subspecies, the name *tragatus* has a priority (type locality Calcutta [Kolkata, India]; Dobson 1876: 202–203).

DISCUSSION AND CONCLUSIONS

Fauna

The present revision summarises 224 records of 40 bat species from the territory of Afghanistan (Table 1). Such species number is well comparable with the faunas of the neighbouring Pakistan and Iran, both comprising around 50 species (Mahmood-ul-Hassan et al. 2009, Benda et al. 2012, Mahmood-ul-Hassan & Salim 2015). The last published list of bats from Afghanistan, included in the review of bats of the Indian subcontinent by Bates & Harrison (1997), brought 121 records of 36 species (Table 1); together with the records of *Rhinolophus bocharicus* and *Myotis emarginatus* (not mentioned by the latter authors) there are at least 123 records of 38 species. In comparison with the latter review, the number of records summarised here has increased almost twice (182%) and the number of species has increased by three species newly reported from Afghanistan, while one species has been deleted from the list.

The increase in the number of fauna members is a result of documentation of a new species for the fauna of Afghanistan, but also of taxonomical splitting. One bat species, *Nyctalus noctula*, is here listed from Afghanistan for the first time, two specimens of this bat were found in the ZFMK collection. Two species reported from Afghanistan already by previous authors (*Eptesicus serotinus*, *Miniopterus schreibersii*) were found to represent complexes of several species, of which two occur in the country in both cases (*Eptesicus serotinus* and *E. pachyomus*, *Miniopterus fuliginosus* and *M. pallidus*). Taxonomical revisions have also brought new naming of some Afghanistani bat populations that were assigned to different species by the previous authors (*Myotis davidii*, *Submyotodon caliginosus*, *Eptesicus ognevi*, *Otonycteris leucophaea*, *Barbastella darjelingensis*, *Plecotus strelkovi*); however, these changes did not affect the number of bat species in the Afghanistani fauna. One bat species was deleted from the list of Afghanistani bats sensu the faunal review by Bates & Harrison (1997) due to the revision of the respective collection specimens (*Pipistrellus javanicus*), and two others, mentioned from Afghanistan by several authors (but not by Bates & Harrison 1997) just by mistake, were deleted too (*Rhinolophus mehelyi*, *Myotis bucharensis*). The Afghanistani occurrence of one bat species was doubted, based on a revision of published data (*Eptesicus ognevi*); however, the respective specimen was not available for examination to confirm these doubts and this species tentatively remains in the fauna of the country (moreover, its occurrence in northern Afghanistan is very probable considering its distribution in West Turkestan, see above).

Although the number of bat records in Afghanistan has increased rather significantly (Table 1), only in a minor part of the species (one eighth), their Afghanistani distribution range has been significantly modified in comparison with that summarised by Bates & Harrison (1997), viz. *Rhinolophus hipposideros*, *Asellia tridens*, *Pipistrellus pipistrellus*, *P. kuhlii*, and *Nyctalus leisleri* (see under Distribution of these species). Considering the enormous area of Afghanistan and the known number of bat records (Table 1), distribution of no bat species can be considered as well studied and no bat as abundant. However, the number of *Pipistrellus pipistrellus* localities (35) is extremely high in comparison with those of the remaining species, and this bat could be regarded as common at least in relation to the frequency of other collected bats (however, this ratio is a rather artificial value due to synanthropic habits of this species which is found more often

Table 25. Review of bat records in particular provinces of Afghanistan

province	no. species	no. records	no. localities	average record per species
Badakhshan	0	0	0	–
Badghis	1	1	1	1.0
Baghlan	2	4	3	2.0
Balkh	7	16	11	2.1
Bamyan	2	4	3	2.0
Farah	4	9	4	2.3
Faryab	10	13	4	1.3
Ghazni	1	1	1	1.0
Ghowr	0	0	0	–
Helmand	7	12	5	1.7
Herat	3	3	3	1.0
Jowzjan	0	0	0	–
Kabol	12	25	9	2.1
Kandahar	9	13	5	1.4
Kapisa	0	0	0	–
Khost	5	8	6	1.6
Konar	9	13	7	1.4
Kondoz	3	4	2	1.2
Laghman	12	12	4	1.0
Lowgar	1	1	1	1.0
Nangarhar	19	44	16	2.3
Nimroz	4	4	2	1.0
Nuristan	7	8	3	1.1
Oruzgan	0	0	0	–
Paktika	0	0	0	–
Paktia	1	2	2	2.0
Parvan	6	10	3	1.7
Samangan	3	3	1	1.0
Sar-e Pol	0	0	0	–
Takhar	3	3	1	1.0
Vardak	3	3	2	1.0
Zabol	6	6	1	1.0

than exoanthropic bats). Only three other bat species (*Rhinopoma microphyllum*, *Rhinolophus ferrumequinum*, *Myotis blythii*) were recorded in more than ten localities. On the other hand, the prevailing majority, more than two thirds of bat species (67.5%), are known only from five or less localities and at least nine bat species (22.5%) are still known from a single site from Afghanistan (Table 1). The area of Afghanistan is covered by the bat records very irregularly, from seven provinces (of 32 in total) no bat finding was reported, while from some others numerous records of several species are available (range 0–19 species, 0–44 records, 0–16 localities per province; see Table 25).

Although the bat fauna of Afghanistan cannot be considered as sufficiently studied, three available (and at least two valid) bat names were created based on the specimens originating from the territory of the country, viz. *Pipistrellus lepidus* Blyth, 1845, *Eptesicus serotinus pashtonus* Gaisler, 1970, and *Rhinolophus blasii meyeroehmi* Felten, 1977.

Niethammer (1968) expressed an idea of relative diversity of the bat fauna of Afghanistan; since the territory of Afghanistan lies at the same latitude as e.g. Maghreb, southern Europe, Levant, and/or Iran, the Afghanistani bat fauna should be theoretically similarly rich as in these

countries. Since the territory of Afghanistan is a part of several biogeographical regions and the effort done in bat research in Afghanistan is rather limited, several bat species that reach their occurrence margins in the surrounding countries close to the Afghanistani border could be also found in Afghanistan and could enrich the country's list of bat fauna. In Iran, four bat species were documented in the areas situated relatively close to the western border of Afghanistan (Benda et al. 2012). *Rhinolophus euryale* Blasius, 1853 was recorded at two sites in north-eastern Khorasan including the Mozduran cave (some 90 km west of the Afghanistani border) that represent the easternmost known occurrence point of this Mediterranean species (Felten et al. 1977, DeBlase 1980). *Otonycteris hemprichii* Peters, 1859 occurs closest to the Afghanistani territory in Baluchistan, its nearest locality, Masjed Hazrat Abolfazl, some 214 km south-west of the border of Afghanistan, it is one of the easternmost sites of the species distribution (Benda et al. 2012). *Eptesicus bottae taftanimontis* de Roguin, 1988 is known only from two sites in south-eastern Iran (Kerman and Baluchistan provinces), the locality closest to the Afghanistani territory (130 km south-west of the border) is Kusheh, situated on the western slope of Kuh-e Taftan (de Rougin 1988). *Rousettus aegyptiacus* was found in Bam (Kerman province), ca. 250 km south-west of Afghanistan; however, it was recorded also in Pakistani Baluchistan, where the closest site is Panjgur (ca. 270 km south of Afghanistan). The latter species could theoretically inhabit the oases of southernmost Afghanistan when sufficient date plantations are established there (Benda et al. 2012).

Two bat species known to occur in the southern parts of West Turkestan could be found also in northern Afghanistan. *Myotis bucharensis* Kuzâkin, 1950, now considered an endemic of the eastern part of West Turkestan, was described from Ajvadž, south-western Tajikistan, some 3 km north of the border with Afghanistan. *Barbastella caspica* Satunin, 1908 was reported from several sites situated closely (20–60 km) to the north-Afghanistani border (see under *Barbastella darjelingensis* above). *Eptesicus ognevi*, whose occurrence in Afghanistan has not been confirmed for sure, also belongs to this group.

Numerous bat species reach their western range margins in the Indus valley and adjacent areas of northern Pakistan and Kashmir (see Bates & Harrison 1997, Roberts 1997); some of them were found in Khyber Pakhtunkhwa and/or in Kashmir, both neighbouring the Afghanistani eastern border. Bates & Harrison (1997) reported the following species from these areas: *Pteropus medius* Temminck, 1825 (formerly *P. giganteus* Brünnich, 1782, but see Mlíkovský 2012), *Rousettus leschenaulti* (Desmarest, 1820), *Rhinolophus macrotis* Blyth, 1844, *Pipistrellus javanicus* (Gray, 1838), *Plecotus homochrous* Hodgson, 1847 and *P. wardi* Thomas, 1911 (see also under *P. strelkovi*), *Scotozous dormeri* Dobson, 1875, *Murina tubinaris* (Scully, 1881), *M. huttonii* (Peters, 1872), and *Kerivoula hardwickii* (Horsfield, 1824). Some of these bats could be found in eastern Afghanistan, namely in the provinces of Khost, Konar and Nangarhar (in the case of the lowland faunal elements of the broader Indus valley), or in the mountains of north-eastern Afghanistan, in the eastern Hindu Kush. In both these regions other Oriental elements are already known to occur (see Zoogeography below). However, since the Pakistani bat fauna is not yet sufficiently studied (see Mahmood-ul-Hassan et al. 2009), the list of potential new members of the Afghanistani bat fauna with affinity to the Oriental region could be even larger.

In conclusion, the number of 40 species in the Afghanistani bat fauna is probably not yet final. The margins of distribution ranges of several other bat species are positioned relatively close or even very close to the Afghanistani borders. In the northern and north-western parts of Afghanistan, *Rhinolophus euryale*, *Myotis bucharensis* and *Barbastella caspica* could be recorded, in south-western Afghanistan *Rousettus aegyptiacus*, *Eptesicus bottae*, and *Otonycteris hemprichii*, and in eastern and north-eastern Afghanistan *Pteropus medius*, *Rousettus leschenaulti*, *Rhinolophus macrotis*, *Pipistrellus javanicus*, *Plecotus homochrous*, *P. wardi*, *Scotozous dormeri*, *Murina tubinaris*, *M. huttonii*, *Kerivoula hardwickii* and/or possibly others.

Zoogeography

Although the bat fauna of Afghanistan, including its composition and abundance, certainly cannot be regarded as sufficiently known (see above), it was several times a subject of a zoogeographical analysis or at least comments on zoogeographical relations (see below). The most apparent division can be observed between the fauna of the Oriental region, i.e. the species living in the Indian subcontinent that reach the western margins of their distribution ranges in eastern Afghanistan as well as in north-western India, Kashmir and northern Pakistan (i.e. living in the south-east of the Hindu Kush in Afghanistan), and the fauna of the Palaearctic, i.e. the species living in the northern and western parts of Afghanistan (i.e. in the north-west of the Hindu Kush) and having their southern and/or eastern distribution margins in Afghanistan. However, this simple division does not cover all species of bats; moreover, the contemporary fauna consists of numerous species, whose taxonomic status as well as distribution range have recently been revised and their zoogeographical affiliation in Afghanistan has not yet been evaluated.

Niethammer (1968) simply divided 30 bat species then known from Afghanistan into three groups, according to their zoogeographical affinities; (1) Oriental fauna (8 species known from the Konar valley, Jalalabad lowland, and the provinces of Laghman, Paktia and Khost): *Megaderma lyra*, *Rhinolophus lepidus*, *Hipposideros fulvus*, *Myotis longipes*, *M. formosus*, *Pipistrellus mimus* [= *P. tenuis*], *P. babu* [= *P. javanicus*], and *Scotophilus heathii*; (2) fauna of the south-Palaearctic steppes and deserts (8 species): *Rhinopoma microphyllum*, *R. hardwickii*, *Taphozous nudiventris*, *Asellia tridens*, *Rhinolophus clivosus* [= *R. bocharicus*], *Tadarida aegyptiaca*, *Barbastella leucomelas* [= *B. darjelingensis*], and *Otonycteris hemprichii* [= *O. leucophaea*]; (3) the remaining 14 species belong to the west-Palaearctic fauna, in their distribution range reaching Europe.

Similarly, Neuhauser (1969) divided the fauna of Afghanistan into two groups, the Palaearctic faunal elements (25 species, i.e. 73.5% of the fauna; *Rhinopoma microphyllum*, *R. hardwickii*, *Taphozous nudiventris*, *Rhinolophus ferrumequinum*, *R. clivosus*, *R. hipposideros*, *R. blasii*, *Asellia tridens*, *Myotis mystacinus* [= *M. davidii*], *M. emarginatus*, *M. blythii*, *Nyctalus leisleri*, *Pipistrellus pipistrellus*, *P. kuhlii*, *Eptesicus nasutus*, *E. bobrinskoi* [= *Hypsugo savii*], *E. bottae* [= *E. ognevi*], *E. serotinus* [s.l., incl. *E. pachyomus*], *Vespertilio murinus*, *Otonycteris hemprichii* [= *O. leucophaea*], *Barbastella leucomelas* [= *B. darjelingensis*], *Plecotus austriacus* [= *P. strelkovi*], *Miniopterus schreibersii* [= *M. fuliginosus* and *M. pallidus*], *Tadarida teniotis*, *T. aegyptiaca*) and the Oriental faunal elements (9 species, i.e. 26.5% of the fauna; *Megaderma lyra*, *Rhinolophus lepidus*, *Hipposideros fulvus*, *Myotis formosus*, *M. longipes*, *Pipistrellus coromandra*, *P. mimus* [= *P. tenuis*], *P. babu* [= *P. javanicus*], *Scotophilus heathii*). However, such division is too simplified; for example, the three species of the genera *Rhinopoma* and *Taphozous* cannot be regarded as mere Palaearctic elements, since all of them occur in a large part of the Oriental region, similarly also *Miniopterus schreibersii* s.l., at that time considered to be a widespread species, living from southern Africa and Spain to Australia, Japan and many Pacific islands.

Gaisler (1970b) analysed the zoogeographic affiliation of the bat fauna of Afghanistan (then composed of 32 species); he found the fauna to be almost equally connected with three neighbouring regions; 55.9% of the fauna being common with the Middle East, 53.4% with West Turkestan, and 50.5% with the Indian subcontinent. He divided the particular species of the Afghanistani fauna into eleven categories, nine of them grouped into three main groups; however, some of these categories overlap in their zoogeographical coverage (e.g. the "nearly endemic" species with the Oriental species, or the Mediterranean species with the South Palaearctic arboreal species, etc.); (I) South Palaearctic eremic species (9): (I; 1) Afro-eremic elements (5 species; *Rhinopoma microphyllum*, *R. hardwickii*, *Taphozous nudiventris*, *Asellia tridens*, *Otonycteris hemprichii* [= *O. leucophaea*]), (I; 2) Syro-eremic elements (1 species; *Eptesicus nasutus*), (I; 3) Irano-eremic elements (1 species; *Eptesicus bottae* [= *E. ognevi*]), and (I; 4) Turano-eremic elements (2 species;

Rhinolophus bocharicus, *Barbastella leucomelas* [= *B. darjelingensis*]); (II) Palaearctic arboreal species (11): (II; 5) Mediterranean elements (4 species; *Rhinolophus hipposideros*, *R. blasii*, *Myotis emarginatus*, *Pipistrellus kuhlii*), (II; 6) Eupalaearctic arboreal elements (3 species; *Myotis mystacinus* [= *M. davidii*], *Eptesicus serotinus* [s.l., incl. *E. pachyomus*], *Pipistrellus pipistrellus*), and (II; 7) South Palaearctic elements (4 species; *Rhinolophus ferrumequinum*, *Tadarida teniotis*, *Myotis blythii*, *Plecotus austriacus* [= *P. strelkovi*]); (III) Oriental species (10): (III; 8) Oriental elements (8 species; *Megaderma lyra*, *Rhinolophus lepidus*, *Hipposideros fulvus*, *Myotis formosus*, *Pipistrellus coromandra*, *P. mimus* [= *P. tenuis*], *P. babu* [= *P. javanicus*], *Scotophilus heathii*) and (III; 9) nearly endemic elements (2 species; *Myotis longipes*, *Nyctalus montanus*); and (IV) remaining categories, out of the groups (2): (IV; 10) Ethiopian elements (1 species; *Tadarida aegyptiaca*) and (IV; 11) nearly cosmopolitan elements (1 species; *Miniopterus schreibersii* [= *M. fuliginosus* and *M. pallidus*]).

The first attempt to analyse the zoogeography of Afghanistan including its geographical regionalisation, based on the distribution of the bat fauna, was made by Neronov & Arsen'eva (1982). These authors compared bat distribution and diversity in eleven bioregions of Afghanistan and evaluated their mutual relations. However, although Neronov & Arsen'eva (1982) declared to analyse only the published distribution data, they mentioned 39 species from the country in total (although only 37 species were reported until then, see Niethammer 1983), among them several species which do not occur in Afghanistan (some of them not even in western Asia at all); e.g. *Rhinolophus cornutus*, *Myotis hosonoi*, *M. capaccinii* (along with *M. longipes*), *Eptesicus isabellinus*, or *Plecotus auritus* (along with *P. austriacus*), see also under *Nyctalus noctula*. Moreover, within the respective bioregions the distribution of particular species is really mysterious; for

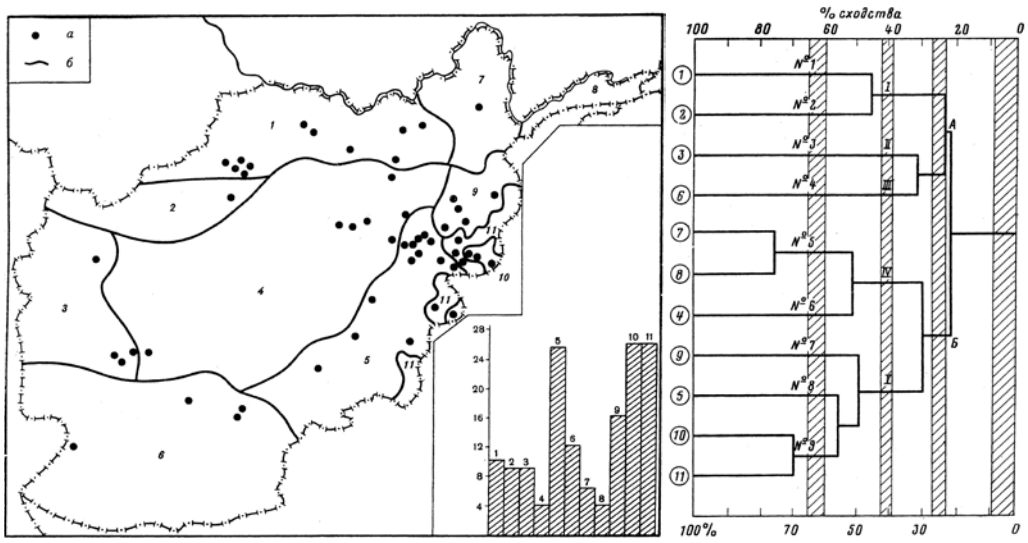

Fig. 65. Facsimile of results of the zoogeographical analysis of bat distribution in Afghanistan by Neronov & Arsen'eva (1982). Left – regional division of the territory of Afghanistan and geographical distribution of bat records according to these authors (legend: а – record localities, б – borders of natural regions), diagram of record numbers in the particular regions in the inset. Right – results of the cluster analysis of similarities among the particular regions (see the map on the left side for the region numbering).

example, from the Badakhshan province, where no record of bats is available (see Table 25), Neronov & Arsen'eva (1982) reported at least six bat species (they divided the territory of the province into two bioregions, from the western part they mentioned six species, from the eastern part four species, but did not specify which ones; Fig. 65). Anyway, the results of this analysis, although based on (at least partly) incorrect data, divided the territory of Afghanistan into two main zoogeographical regions, (A) Saharo-Gobian desert region, covering the lowland deserts of north-western, western and southern Afghanistan, and (Б) Central Asian mountain region, covering the mountainous areas of central and north-eastern Afghanistan (the Hindu Kush and adjacent ranges) and also the lowlands in the eastern parts of the country (the Nangarhar, Konar, Laghman, Paktia, and Khost provinces). The former region (A) was again divided into three parts, (I) Bactrian province (north-western, adjacent to West Turkestan), (II) Herat province (western, adjacent to eastern Iranian deserts), and South Afghanistani province (southern and south-western, adjacent to the deserts of Seistan and Baluchistan in south-eastern Iran and western Pakistan). The latter region (Б) was divided by Neronov & Arsen'eva (1982) into two parts, (IV) Hindu Kush-Pamir province (high mountainous areas of central and north-eastern Afghanistan) and (V) East Afghanistani province (desert lowlands and forest hills of eastern and south-eastern Afghanistan). The authors listed some example species typical for the groups of the particular provinces, e.g. *Rhinolophus ferrumequinum*, *R. blasii*, *Myotis blythii*, *Hypsugo savii*, *Eptesicus serotinus*, and *Otonycteris hemprichii* [= *O. leucophaea*] for the Bactrian and Herat provinces; *Rhinopoma muscatellum*, *Asellia tridens*, and *Myotis capaccinii* [sic!] for the South Afghanistani province; *Rhinopoma microphyllum*, *R. hardwickii*, *Rhinolophus hipposideros*, *R. cornutus* [= ? *R. lepidus*], *Nyctalus leisleri*, *Barbastella leucomelas* [= *B. darjelingensis*], *Plecotus austriacus* [= *P. strelkovi*] for the South Afghanistani and East Afghanistani provinces; and *Hipposideros bicolor* [= *H. fulvus*], *Megaderma lyra*, *Myotis longipes*, *Pipistrellus mimus* [= *P. tenuis*], *P. babu* [= *P. javanicus*], *P. coromandra*, *Eptesicus nasutus*, *Eptesicus isabellinus* [sic!], and *Scotophilus heathii* for the East Afghanistani province. In fact, Neronov & Arsen'eva (1982) did not characterise the particular zoogeographical units by typical species, they only interpreted results of a cluster analysis into their zoogeographical division of Afghanistan without any proper discussion.

Niethammer (1983) divided the mammal fauna of Afghanistan into four main ecological types, in which he included only some examples from among bats; into the group of mammals of arid areas he included nine bat species (*Rhinopoma microphyllum*, *R. muscatellum*, *R. hardwickii*, *Taphozous nudiventris*, *Asellia tridens*, *Lyroderma lyra*, *Myotis formosus*, *M. longipes*, *Otonycteris leucophaea*), into the group of forest mammals of eastern Afghanistan three bats (*Scotophilus heathii*, *Nyctalus montanus*, *Pipistrellus coromandra*), and into the remaining two groups, mammals of the high mountain areas and the synathropic mammal fauna, no bat species were enumerated.

As stressed above and as mentioned by several previous authors (most precisely by Niethammer 1968 and Gaisler 1970b), the currently known composition of the Afghanistani bat fauna (Table 1) could be divided, according to the geographical distribution of the particular species in Afghanistan and also in their whole distribution ranges, into three main zoogeographical groups, (1) Palaearctic fauna (comprising 23 species, i.e. 57.5% of the Afghanistani bat fauna), (II) Oriental fauna (12 species, 30%), and (III) fauna with combined zoogeographical affiliations (5 species, 12.5%).

The group of the Palaearctic fauna (I) is composed of species which reach the eastern, south-eastern, north-eastern, and/or southern margin/s of their distribution range in Afghanistan; the most numerous in this group is the subgroup of (Ia) the Mediterranean fauna (9 species, 39% of the Palaearctic fauna: *Rhinolophus ferrumequinum*, *Rhinolophus hipposideros*, *R. blasii*, *Myotis emarginatus*, *Hypsugo savii*, *Pipistrellus kuhlii*, *Nyctalus leisleri*, *Miniopterus pallidus*, *Tadarida teniotis*); these bats are widely distributed in the Caucasus region and in most of the Middle

East (some of them also in West Turkestan) and their south-eastern distribution margin lies in Afghanistan (four of these species are distributed also more to the east, however, this represents only a minute part of their range; *R. ferrumequinum*, *R. blasii*, *P. kuhlii*, *N. leisleri*). The peculiar type is the subgroup of (Ib) the West Turkestani (Central Asian) endemic fauna (5 species, 22%: *Rhinolophus bocharicus*, *Eptesicus ognevi*, *E. gobiensis*, *Otonycteris leucophaea*, *Plecotus strelkovi*) which is centered by its distribution to lowland or to mountainous areas of West Turkestan (although e.g. *E. gobiensis* occurs also in mountain plateaus of East Turkestan and Mongolia or *E. ognevi* marginally in Transcaucasia); in Afghanistan these species occur in the northern part of the country or even only in the northern lowland steppes. Another subgroup is (Ic) the South-Palaearctic eremic fauna (3 species, 13%: *Rhinopoma muscatellum*, *Asellia tridens*, *Rhyneptesicus nasutus*), which reaches the centre of its distribution in deserts of the Middle East, but marginally extends to the Thar desert in Pakistan and western India (*A. tridens* also to North Africa) and the northern margin of its distribution range lies in Afghanistan (in the areas south of the Hindu Kush). The remaining two groups include bats which are widely distributed in the southern parts of the Palaearctic arboreal and adjacent arid zones, and which reach the southern margin of their distribution in the northern parts of the Middle East, in Afghanistan, and in the case of the last subgroup also in the Asian Palaearctic; they represent the subgroup (Id), the South-Palaearctic arboreal fauna (3 species, 13%: *Myotis blythii*, *M. davidii*, *Vespertilio murinus*), and (Ie) the West-Palaearctic arboreal fauna (3 species, 13%: *Eptesicus serotinus*, *Pipistrellus pipistrellus*, *Nyctalus noctula*).

The group of the Oriental fauna (II) is composed of species which reach the western or northwestern margins of their distribution range in Afghanistan (*Lyroderma lyra*, *Hipposideros fulvus*, *Myotis formosus*, *M. longipes*, *Submyotodon caliginosus*, *Eptesicus pachyomus*, *Pipistrellus coromandra*, *P. tenuis*, *Nyctalus montanus*, *Barbastella darjelingensis*, *Scotophilus heathii*, *Miniopterus fuliginosus*); the bats of this group are distributed exclusively in the easternmost part of Afghanistan, in the monsoonal region of the Jalalabad lowland (Nangarhar province) and adjacent valleys of the Laghman, Konar and Nuristan provinces, as well as of the Khost lowland (Khost province). A subgroup of five species can be observed within this group, which are distributed in the Indian subcontinent mainly in the northern mountains and reach the western margins of their ranges in eastern Afghanistan (*M. formosus*, *M. longipes*, *S. caliginosus*, *N. montanus*, *B. darjelingensis*).

The third group of bats with combined zoogeographical affiliations (III) is represented marginally in the Afghanistani fauna, it comprises only five species distributed representatively both in the Palaearctic and Oriental regions. With the exception of one species, *Rhinolophus lepidus*, which rather curiously combines the occurrence in the Oriental region with that in West Turkestan, all these bats reach a part of the northern margin of their distribution range in Afghanistan. They represent a group of faunal elements combining occurrence in the eremic zones of the Oriental and South-Palaearctic regions (*Rhinopoma microphyllum*, *R. hardwickii*, *Taphozous nudiventris*, *Nyctinomus aegyptiacus*) and in Afghanistan they occur in the southern and/or eastern arid areas.

Considering the particular bat species distribution and their mutual occurrence within the Afghanistani territory, a multivariate analysis (cluster analysis, complete linkage) of the distribution data reviewed in the present revision (represented by 30 localities with known occurrence of at least three bat species; Table 26) showed three main faunal groups, including five subgroups (Fig. 66); (1) the group of species of southern Afghanistan, (2) the group of species of eastern and south-eastern Afghanistan, and (3) the group of species of eastern and northern Afghanistan. Within the group (1), two subgroups can be observed; (1a) predominantly southern Afghanistani species (*Rhinopoma microphyllum*, *R. muscatellum*, *Asellia tridens*, *Miniopterus pallidus*) and (1b) widespread species with an affinity to southern Afghanistan (*Rhinolophus ferrumequinum*,

R. blasii). The group (2) is composed of species distributed in south-eastern and eastern Afghanistan (*Rhinopoma hardwickii*, *Rhinolophus hipposideros*, *Taphozous nudiventris*, *Myotis longipes*, *Eptesicus pachyomus*, *Rhyneptesicus nasutus*, *Pipistrellus kuhlii*, *Nyctalus montanus*, *Scotophilus heathii*, *Miniopterus fuliginosus*). Within the group (3) two subgroups can be found; (3a) the most numerous series of species living in eastern, north-eastern and northern Afghanistan (*Rhinolophus bocharicus*, *Lyroderma lyra*, *Hipposideros fulvus*, *Myotis formosus*, *M. emarginatus*, *M. davidii*, *Submyotodon caliginosus*, *Vespertilio murinus*, *Eptesicus serotinus*, *Eptesicus ognevi*, *Eptesicus gobiensis*, *Hypsugo savii*, *Pipistrellus coromandra*, *Nyctalus leisleri*, *Otonycteris leucophaea*, *Barbastella darjelingensis*, *Tadarida teniotis*, *Nyctinomus aegyptiacus*) and (3b) species with an affinity to northern Afghanistan (*Rhinolophus lepidus*, *Myotis blythii*, *Plecotus strelkovi*). *Pipistrellus pipistrellus* was positioned outside this grouping, as the most widespread species with almost universal geographical affinities (except that to south-Afghanistani deserts). *Pipistrellus tenuis* and *Nyctalus noctula* were not covered by this analysis, as they were found in each of their localities as a single species (only the localities with occurrence of three or more bat species were included into the analysis). With a certain level of simplification, the results of this analysis could be generalised into division of the Afghanistani territory into three zoogeographical zones of bat faunas, but with large territorial overlaps in the eastern part of the country; (1) southern Afghanistan, (2) south-eastern Afghanistan, and (3) northern, north-eastern and eastern Afghanistan.

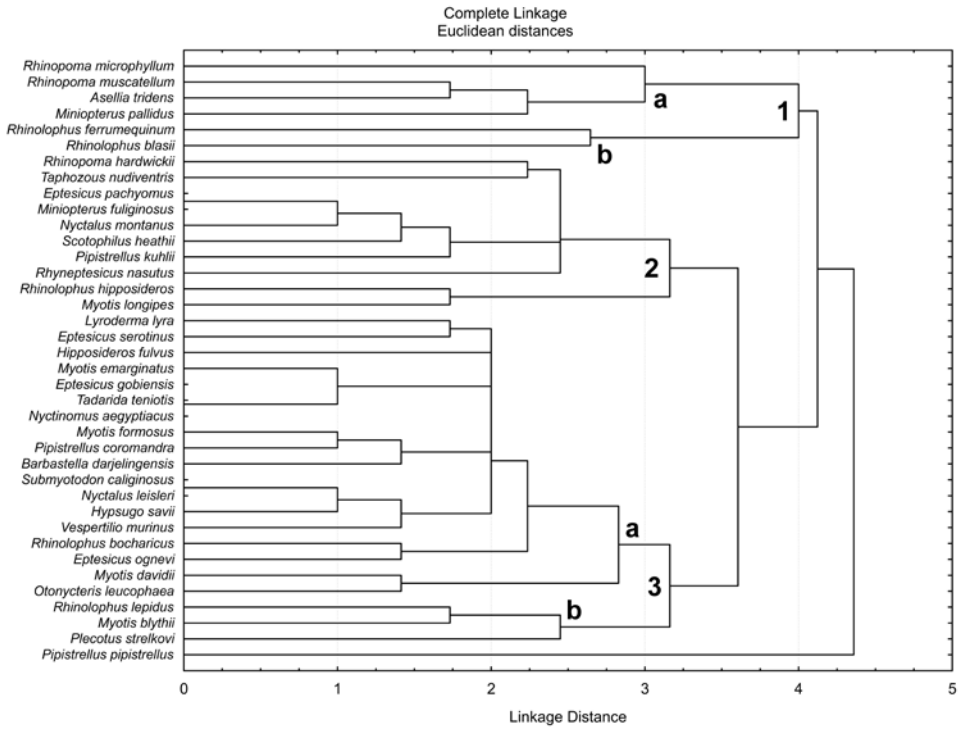

Fig. 66. Results of the cluster analysis (complete linkage) of bat communities recorded in Afghanistan: similarities among particular species (for the data see Table 26). See text for details.

Table 26. List of localities in Afghanistan with known occurrence of at least three bat species. Explanations: 1 = occurrence confirmed, 0 = occurrence unconfirmed; species acronyms: *Rmi = Rhinopoma microphyllum*, *Rmu = Rhinopoma muscatellum*, *Rha = Rhinopoma hardwickii*, *Lly = Lyroderma lyra*, *Rfe = Rhinolophus ferrumequinum*, *Rbo = Rhinolophus bocharicus*, *Rhi = Rhinolophus hipposideros*, *Rle = Rhinolophus lepidus*, *Rbl = Rhinolophus blasii*, *Hfu = Hipposideros fulvus*, *Atr = Asellia tridens*, *Tnu = Taphozous nudiventris*, *Mbl = Myotis blythii*, *Mem = Myotis emarginatus*, *Mfo = Myotis formosus*, *Mda = Myotis davidii*, *Mlo = Myotis longipes*, *Sca = Submyotodon caliginosus*, *Vmu = Vespertilio murinus*,

site	province	*Rmi*	*Rmu*	*Rha*	*Lly*	*Rfe*	*Rbo*	*Rhi*	*Rle*	*Rbl*	*Hfu*	*Atr*	*Tnu*	*Mbl*	*Mem*	*Mfo*	*Mda*
Mazar-e Sharif	Balkh	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Mumlai cave	Farah	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Kuh-e Duzdan cave	Farah	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Belchiragh	Faryab	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maimana	Faryab	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Zarmast cave	Faryab	0	0	0	0	1	1	0	1	1	0	0	0	1	0	0	0
Lashkar-e Bazar	Helmand	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0
Qala-e Bust	Helmand	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
Kabul	Kabol	0	0	0	0	1	0	0	1	0	0	0	0	1	1	0	1
Paghman	Kabol	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Tang-e Lalandar	Kabol	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0
Kandahar	Kandahar	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Shamshir cave	Kandahar	1	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0
Nurgul	Konar	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0
Kunduz	Kondoz	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Qalat us Sirai	Laghman	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Laghman	Laghman	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Pialeh Cave	Laghman	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0
Chak Naur	Nangarhar	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
Darunta Hills	Nangarhar	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
Darunta/Behsud	Nangarhar	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Jalalabad	Nangarhar	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
N of Jalalabad	Nangarhar	1	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0
Seistan	Nimroz	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Kamu	Nuristan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Firindjal	Parvan	0	0	0	0	1	0	0	1	1	0	1	0	1	0	0	0
Nayak cave	Parvan	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0
Kaftar Khaneh cave	Samangan	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0
Taliqan	Takhar	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Bulan cave	Zabol	0	0	0	0	1	0	1	1	1	0	0	0	1	0	0	0
no. localities per species		10	3	6	2	14	3	3	5	7	2	6	3	6	2	1	5

The cluster analysis (WPGMA) of the same data set as the above comparison of species distribution (Table 26) grouped the bat communities of Afghanistan into two main clusters (Fig. 67), (I) the sites with montane fauna, and (II) the sites with the fauna of rather arid lowlands. The cluster (I) is composed of nine sites situated in the Faryab, Helmand, Kabol, Laghman, Parvan, Samangan, and Zabol provinces (Fig. 68), it is typical by the presence of the Palaearctic (Mediterranean and West Turkestani) fauna; the respective region covers 100% of the Afghanistani sites (entering the analysis, cf. Table 26) of *Rhinolophus hipposideros*, *R. lepidus*, *Myotis blythii*, 86% of *Rhinolophus blasii*, 80% of *Plecotus strelkovi*, 66% of *Rhinolophus bocharicus*, and 64% of *R. ferrumequinum*. The cluster (II) is composed of two subclusters, (IIa) the sites of the steppe fauna of northern and eastern Afghanistan, and (IIb) the sites of the desert fauna of southern and eastern Afghanistan. The subcluster (IIa) is composed of nine sites in the Balkh, Faryab, Kabol, Kondoz, Laghman, Nuristan, and Takhar provinces, it is characterised by the presence of the

Ese = Eptesicus serotinus, *Epa = Eptesicus pachyomus*, *Eog = Eptesicus ognevi*, *Ego = Eptesicus gobiensis*, *Rna = Rhyneptesicus nasutus*, *Hsa = Hypsugo savii*, *Ppi = Pipistrellus pipistrellus*, *Pku = Pipistrellus kuhlii*, *Pco = Pipistrellus coromandra*, *Nmo = Nyctalus montanus*, *Nle = Nyctalus leisleri*, *Ole = Otonycteris leucophaea*, *Bda = Barbastella darjelingensis*, *Pst = Plecotus strelkovi*, *She = Scotophilus heathii*, *Mfu = Miniopterus fuliginosus*, *Mpa = Miniopterus pallidus*, *Tte = Tadarida teniotis*, *Nae = Nyctinomus aegyptiacus*

Mlo	*Sca*	*Vmu*	*Ese*	*Epa*	*Eog*	*Ego*	*Rna*	*Hsa*	*Ppi*	*Pku*	*Pco*	*Nmo*	*Nle*	*Ole*	*Bda*	*Pst*	*She*	*Mfu*	*Mpa*	*Tte*	*Nae*	total
0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	4
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3
0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	3
0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	5
0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	1	0	0	0	1	1	11
0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	3
1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5
0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	6
0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	6
0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3
0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	3
0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	4
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
1	0	0	0	1	0	0	0	0	1	1	1	1	0	0	0	0	1	1	0	0	0	10
0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	0	1	0	0	0	0	9
0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
0	1	0	0	0	0	0	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	5
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	6
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	6
3	1	1	1	1	1	1	4	2	13	4	2	2	1	3	2	4	3	1	4	1	1	134

Palaearctic (West Turkestani, Mediterranean, South- and West-Palaearctic) fauna; the respective areas cover 100% of the sites of *Vespertilio murinus*, *Eptesicus serotinus*, *E. ognevi*, *Hypsugo savii*, and *Nyctalus leisleri*, 80% of *Myotis davidii*, 67% of *Otonycteris leucophaea*, and 62% of *Pipistrellus pipistrellus*. The subclaster (IIb) is again composed of two groups of sites, (IIb1) the desert fauna of southern Afghanistan, and (IIb2) the desert fauna of eastern Afghanistan. The group (IIb1) is composed of five sites in the Farah, Helmand, Kandahar, and Nimroz provinces, it is typical by the presence of the South-Palaearctic eremic fauna; the region covers 100% of the sites of *Rhinopoma muscatellum*, 83% of *Asellia tridens*, 75% of *Miniopterus pallidus*, and 44% of *Rhinopoma microphyllum*. The remaining group (IIb2) is composed of five sites in the Kandahar, Konar, and Nangarhar provinces (Fig. 68), it is typical by the combination of the Oriental and South-Palaearctic eremic faunas; there are 100% of the sites of *Lyroderma lyra*, 67% of *Rhinopoma hardwickii*, 50% of *Rhinopoma microphyllum*, *Hipposideros fulvus* and also *Myotis*

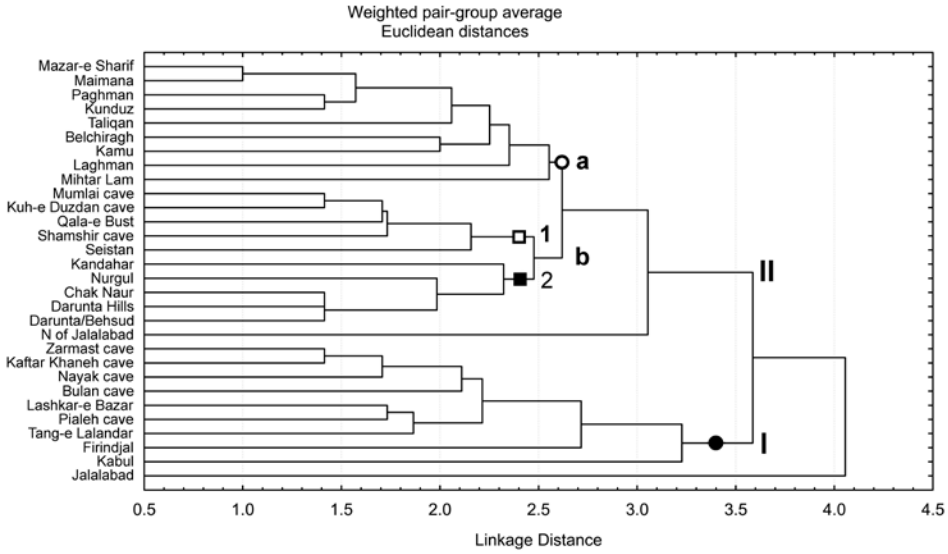

Fig. 67. Results of the cluster analysis (WPGMA) of bat communities recorded in Afghanistan: similarities among particular occurrence sites (for the data see Table 26). Symbols at branches correspond with the symbols in Fig. 68.

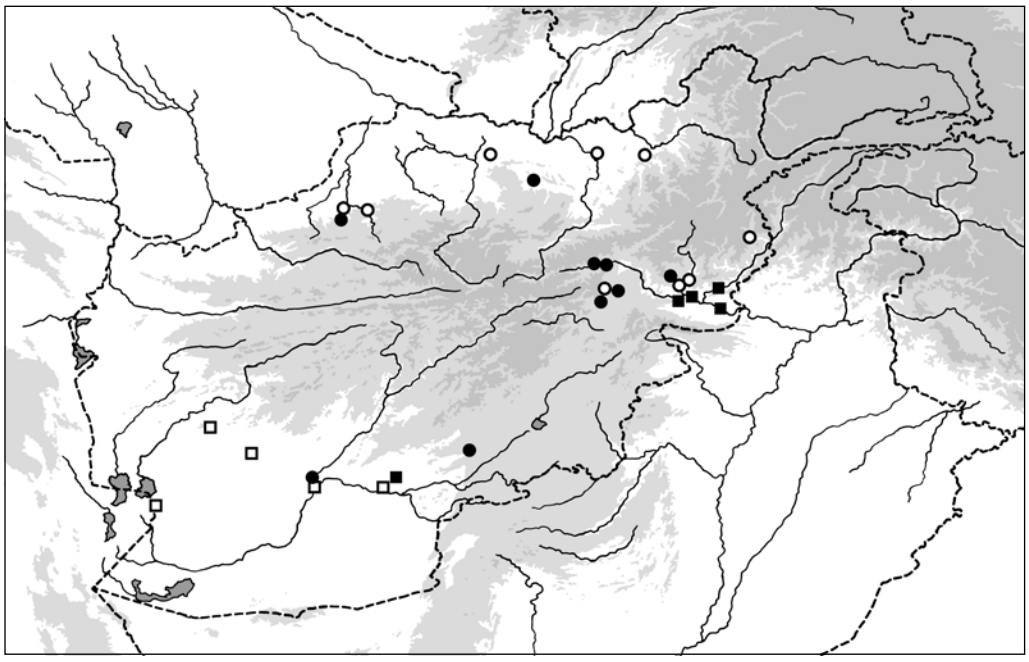

Fig. 68. Distribution of particular types of bat communities in Afghanistan. For symbol definition see the results of the WPGMA cluster analysis (Fig. 67).

emarginatus. Two localities, Jalalabad and north of Jalalabad (Nangarhar province), did not group into the above described clusters and were positioned somewhat separately (Fig. 67). These sites are typical by an extreme diversity of bats, composed of ten and nine species, respectively; these sites are typical by the unique occurrence of *Eptesicus pachyomus*, *Nyctalus montanus*, *Scotophilus heathii*, and *Miniopterus fuliginosus*, and a number of other species belonging to various categories of the above described clustering.

The results of this multivariate analysis (both the zoogeographical and faunal divisions) well correspond with and/or complements the empirical division of bat fauna as delineated by Niethammer (1968, 1983) as well as with the results of the analysis by Gaisler (1970b).

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APPENDIX I

Gazetteer

The sites were identified and the coordinates and altitudes determined with the help of the Google Earth web application; different data on the respective sites originally reported by Neuhauser (1969) are typed in *italics*; alt. = altitude [m a. s. l.]

site	province	coordinates	alt.
3 km W of Mazar-i-Sharif … see Mazar-e Sharif, 3 km west			
3 km west of Mazar-i-Sharif … see Mazar-e Sharif, 3 km west			
4.4 miles E Taliq-an … see Taliqan, 7 km east			
5 km E of Kabul, Pagman to Kabul road … see Paghman to Kabul road, 5 km west of Kabul			
5 km north of Jalalabad … see Jalalabad			
6 km nördlich Jalalabad … see Jalalabad			
6 km north of Doshi … see Doshi, 6 km north			
6 km W of the Afghanistan-West Pakistan border … see Khyber Pass, 6 km west			
7 km E of Taliq-an … see Taliqan, 7 km east			
7 km north of Jalalabad … see Jalalabad			
7 km NW of Kandahar … see Baba Wali			
7–8 km north of Jalalabad … see Jalalabad			
8 km. northwest of Belchiragh … see Belchiragh, 8 km north-west			
8 km N of Jalalabad … see Jalalabad			
8 km north of Jalalabad … see Jalalabad			
8 km NW of Belchiragh … see Belchiragh, 8 km north-west			
8 km NW of Belchiragh on the Maimana-Belchiragh road … see Belchiragh, 8 km north-west			
8 km S of Kunduz … Kunduz, 8 km south			
8 km W of Kamdesh … see Kamu, 8 km east of Kamdesh			
ca. 8 km N of Jalalabad … see Jalalabad			
10 km N of Jalalabad … see Jalalabad			
15 km east of Jalalabad … see Jalalabad, 15 km east			
16 km S of Mazar-i-Sharif … see Tang-e Shadian			
19.2 km (12 miles) south-west of Kandahar … see Shamshir cave			
22.5 km W of Bakva … see Kuh-e Siah Ab cave			
24 km NW of Kandahar … see Qanat System, 24 km NW of Kandahar			
25 miles east of Maimana … see Belchiragh, 8 km north-west			
30 km S Herat … see Herat, 30 km south			
32 km E of Jalalabad … see Basawal			
48 km (30 miles) west of Dilaram … see Kuh-e Siah Ab cave			
69 km. W Dilaram … see Kuh-e Siah Ab cave			
Abdukil near Shigi	Nangarhar	34° 35’ N, 70° 38’ E	620
Aïbak … see Kaftar Khaneh cave			
Ak Kopruk … see Aq Kopruq			
Alingar … see Badiabad			
Alishing, Grotte Pialeh … see Pialeh cave			
Alishing, Kuh-Pialeh … see Pialeh cave			
Aq Kopruq	Balkh	36° 05’ N, 66° 50’ E	725
Aq Kupruk, Darra Band-i-Haba … see Aq Kopruq			
Ashk an Arfan	Kabol	34° 30’ N, 69° 11’ E	1815
Baba Wali	Kandahar	31° 39’ N, 65° 40’ E	1000
Bachlan, Province de Qutaghan … Baghlan			
Badiabad	Laghman	34° 49’ N, 70° 21’ E	900
Bagh-e Malaria	Khost	33° 20’ N, 70° 01’ E	1100
Baghlan	Baghlan	36° 10’ N, 68° 46’ E	530
Balk … see Balkh			
Balkh	Balkh	36° 45’ N, 66° 54’ E	345
		36° 46’ N, 66° 50’ E	*450*
Bamyan	Bamyan	34° 50’ N, 67° 50’ E	2550
Bamiyan … see Saydabad			
Band-e Barq	Khost	33° 19’ N, 69° 57’ E	1150

site	province	coordinates	alt.
Baschgaltal … see Bashgal valley			
Baschgar-Tal … see Bashgal valley			
Bashgal valley	Nuristan	35° 32’ N, 71° 19’ E	1100 –2800
Bashgul-Tal … see Bashgal valley			
Barg-e Matal	Nuristan	35° 40’ N, 71° 21’ E	2110
Barg-i-Matal … see Barg-e Matal			
Barikot	Konar	35° 18’ N, 71° 32’ E	1105
Basawal	Nangarhar	35° 51’ N, 64° 54’ E	470
Behsud	Nangarhar	35° 51’ N, 64° 54’ E	550
Belchiragh, 8 km north-west	Faryab	35° 53’ N, 65° 11’ E	1090
		35° 50’ N, 65° 11’ E	*1225*
between Darunta and Bisut, cave near the Kabul river … see Darunta and Behsud, between			
Bist … see Qala-e Bust			
Bisut … see Behsud			
Bolan Cave, 13.6 km S of Kalat-i-Ghilzai … see Bulan cave			
Bolan Ghar … see Bulan cave			
Boulan Ghar … see Bulan cave			
Boulon Cave … see Bulan cave			
Bulan cave	Zabol	32° 01’ N, 66° 47’ E	1530
		35° 55’ N, 66° 58’ E	*1750*
Candahar … see Kandahar			
Cha Wki Sarkani, Qachgar cave … see Nurgul			
Cha Wki Sarkani, Tangi Mazar … see Tangi Mazar			
Chaghasarai	Konar	34° 53’ N, 71° 09’ E	830
Chahar Asiab	Kabol	34° 20’ N, 69° 11’ E	1830
Chak Naur	Nangarhar	34° 15’ N, 71° 00’ E	450
Chak-Naur, about 12 km W from the Pakistan boundary … see Chak Naur			
Chambel	Konar	34° 46’ N, 70° 59’ E	940
Chamchir cave … see Shamshir cave			
Chamchir ghar, près Pandjvaï … see Shamshir cave			
Chamchir Ghar (perto de Qandahar) … see Shamshir cave			
Changa Sarai … see Chaghasarai			
Chashma-e Shafa	Balkh	36° 32’ N, 66° 58’ E	480
Dacca … see Loe Dakka			
Dahan Ghar … see Tang-e Lalandar			
Dahan-ghar … see Tang-e Lalandar			
Dahnan-ghar cave … see Tang-e Lalandar			
Dar ul Aman	Kabol	34° 27’ N, 69° 08’ E	1835
Dar-i-Nur … see Dara-e Nur			
Där-i-Nur, Shewa … Qala-e Shahi			
Dara-e Nur	Nangarhar	34° 44’ N, 70° 36’ E	1650
Darra Ajer, SW Mazar-i-Sharif	Balkh	36° 30’ N, 66° 55’ E	470
Darra Band-i-Haba … see Aq Kopruq			
Darreh-Chakh … see Kham Zindan cave			
Darunta & Bisut, between … see Darunta and Behsud, between			
Darunta and Behsud, between	Nangarhar	34° 27’ N, 70° 24’ E	580
Darunta Hills	Nangarhar	34° 29’ N, 70° 21’ E	980
Darweshan	Helmand	31° 08’ N, 64° 11’ E	715
Delaram, Kuh-Dozd … see Kuh-e Duzdan cave			
Dilaram … see Kuh-e Duzdan cave			
Dilaram, Farah	Nimruz	32° 09’ N, 63° 26’ E	820
Dilaram, Grotte du Kouh-Dozd … see Kuh-e Duzdan cave			
Doshi, 6 km north	Baghlan	35° 39’ N, 68° 43’ E	805
		35° 38’ N, 68° 43’ E	*750*
Doshi and Pol-e Khomri, between	Baghlan	35° 44’ N, 68° 45’ E	~750

site	province	coordinates	alt.
Ebn-e Yamin … see Farah, Ebn-e Yamin			
eight kilometers south of Kunduz … see Kunduz, 8 km south			
Farah, Ebn-e Yamin	Farah	32° 22’ N, 62° 07’ E	670
Farah-e-Dun, Kuh Dir … see Mumlai cave			
Finidjal … see Firindjal			
Firindjal	Parvan	34° 59’ N, 68° 41’ E	2070
		35° 00’ N, 68° 37’ E	*2150*
Ghar-e-Tschechmesch-e-Schaffar … see Chashma-e Shafa			
Ghazni	Ghazni	33° 33’ N, 68° 25’ E	2190
Ghorband … see Firindjal			
Girishk, 5 km north-east	Helmand	31° 51’ N, 64° 37’ E	840
		31° 51’ N, 64° 38’ E	*950*
Gorat … see Kaougan			
Gr. Dahan-Char … see Tang-e Lalandar			
Gr. Knaffor, Khaneh … see Kaftar Khaneh cave			
Grande Grotte Moumlai … see Mumlai cave			
Grande Grotte Moumlai du Kouh-Pir … see Mumlai cave			
Grande grotte Moumlaï … see Mumlai cave			
Grotte Boulan, Qalat … see Bulan cave			
Grotte Chamchir, près de Kandahar … see Shamshir cave			
Grotte Dahan-Ghon … see Tang-e Lalandar			
Grotte de Boulan, à l’est de Qalat … see Bulan cave			
Grotte de Khvadjah Largar, Guerechk … see Khvajah Largar cave			
Grotte de Siaon … see Kuh-e Siah Ab cave			
Grotte de Zarmast … see Zarmast cave			
Grotte du Kouh-Dozd … see Kuh-e Duzdan cave			
Grotte du Kouh-Siah Ab, entre Dilaram et Farah … see Kuh-e Siah Ab cave			
Grotte du Kouh-Siaou Baba (Siah Ab) … see Kuh-e Siah Ab cave			
Grotte du Mont Qoul Kharideh … see Qala-e Safed, Kuh-e Qul Kharidah			
Grotte Kaftar Khaneh … see Kaftar Khaneh cave			
Grotte Kham Zindan, Darreh-Chakh, Beltchiragh … see Kham Zindan cave			
Grotte Moumlai … see Mumlai cave			
Grotte Nayak … see Nayak cave			
Grotte Pialeh … see Pialeh cave			
Grotte Qachqar, valée du Konar … see Nurgul			
Grotte Qal’éh Safid Ouanaï … see Qala-e Safed, Kuh-e Qul Kharidah			
Grotte Tagheh Tchineh … see Ibrahim Khel			
Grotte Zarmast, Maimaneh … see Zarmast cave			
Grotte Zarmast, Maïmaneh … see Zarmast cave			
gruta de Kham Zindan (a sudoeste de Beltchiragh) … see Kham Zindan cave			
gruta de Khvadjah Largar (ao norte de Guerechk) … see Khvajah Largar cave			
gruta de Zarmast (perto de Maïmaneh) … see Zarmast cave			
Hadda	Nangarhar	34° 22’ N, 70° 28’ E	640
		34° 20’ N, 70° 28’ E	*625*
Haibak … see Kaftar Khaneh cave			
Herat … see Herat, Hari Rud river			
Herat, 11 km. S … see Herat, Hari Rud river			
Herat, 30 km south	Herat	34° 05’ N, 62° 13’ E	1210
Herat, Hari Rud river	Herat	34° 17’ N, 62° 13’ E	925
		34° 20’ N, 62° 10’ E	*925*
Ibrahim Khel	Nangarhar	34° 11’ N, 70° 06’ E	1720
Ismael Khel	Khost	33° 16’ N, 69° 47’ E	1335
Jalal-Abad … see Jalalabad			
Jalal-abad … see Jalalabad			
Jalalabad	Nangarhar	35° 51’ N, 64° 54’ E	570
		34° 26’ N, 70° 25’ E	*725*

site	province	coordinates	alt.
Jalalabad, 3 mi N … see Jalalabad			
Jalalabad, 7 km north of town … see Jalalabad			
Jalalabad, 8 km north of town … see Jalalabad			
Jalalabad, 15 km east	Nangarhar	35° 51’ N, 64° 54’ E	700
Jalalabad, Pol-e Bisut … see Behsud			
Jalalabad, Pul-e-Bisut … see Behsud			
Kabol, Darulaman … see Dar ul Aman			
Kabul	Kabol	34° 32’ N, 69° 10’ E	1800
Kabul, Ashk an Arfan … see Ashk an Arfan			
Kabul, Dar ul Aman … see Dar ul Aman			
Kabul, Schar-i-Nau … see Shahr-e Naow			
Kabul River between Darunta and Bisut … see Darunta and Behsud, between			
Kaftar Khaneh cave	Samangan	36° 15’ N, 67° 57’ E	1210
Kala Bnot … see Qala-e Bust			
Kala near Tschell Ghar … see Shulgareh			
Kala-e-Bust … see Qala-e Bust			
Kala-e-Safed … see Qala-e Safed, Kuh-e Qul Kharidah			
Kala-i-Shahi (NNE Jalalabad) … see Qala-e Shahi			
Kalat-us-Seraj … see Mihtar Lam, Qalat us Sirai			
Kamdesh	Nuristan	35° 25’ N, 71° 20’ E	1950
Kamdesh … see Kamu, 8 km east of Kamdesh			
Kamu, 8 km east of Kamdesh	Nuristan	35° 24’ N, 71° 26’ E	1350
		35° 24’ E, 71° 23’ E	*1350*
Kandahar	Kandahar	31° 37’ N, 65° 43’ E	1020
Kandahar … see Qanat System, 24 km NW of Kandahar			
Kandahar … see Shamshir cave			
Kandahar, 7 km NW … see Baba Wali			
Kaougan	Paktia	33° 48’ N, 69° 17’ E	2750
Katar	Konar	34° 57’ N, 71° 05’ E	940
Kham Zindan cave	Faryab	35° 49’ N, 65° 15’ E	1760
Khost	Khost	33° 20’ N, 69° 55’ E	1180
Khost, Band-e-Barq … see Band-e Barq			
Khvadjah gar … Khvajah cave			
Khvadjah ghar … Khvajah cave			
Khvadjah Largar … see Khvajah Largar cave			
Khvajah cave	Parvan	35° 00’ N, 68° 38’ E	2390
Khvajah Largar cave	Helmand	32° 19’ N, 64° 27’ E	1230
Khyber Pass … see Khyber Pass, 6 km west			
Khyber Pass, 6 km west	Nangarhar	34° 08’ N, 71° 03’ E	730
		34° 08’ N, 71° 00’E	*600*
Koh-i-Duzdan Cave, 12 km NE of Dilaram … see Kuh-e Duzdan cave			
Kouh-Dozd cave … see Kuh-e Duzdan cave			
Kouh-Siaou Baba (Siah Ab) … see Kuh-e Siah Ab cave			
Kuh Dir, Moumlai cave … see Mumlai cave			
Kuh-Dozd … see Kuh-e Duzdan cave			
Kuh-e Dir, Mumlai cave … see Mumlai cave			
Kuh-e Duzdan cave	Farah	32° 12’ N, 63° 32’ E	1010
		32° 13’ N, 63° 29’ E	*1075*
Kuh-e Siah Ab cave	Farah	32° 13’ N, 62° 42’ E	760
		32° 12’ N, 62° 19’ E	*775*
Kuh-Pialeh … see Pialeh cave			
Kuh-Qoul Kharidah … see Qala-e Safed, Kuh-e Qul Kharidah			
Kuh-Siah Ab … see Kuh-e Siah Ab cave			
Kuh-Siah Ab Berg … see Kuh-e Siah Ab cave			
Kunduz	Kondoz	36° 44’ N, 68° 52’ E	405
		36° 42’ N, 68° 52’ E	*550*

site	province	coordinates	alt.
Kunduz, 8 km south	Kondoz	36° 39’ N, 68° 53’ E	410
Kvadjar Largar … see Khvajah Largar cave			
Laghman	Laghman	34° 40’ N, 70° 18’ E	850
Lalanda … see Tang-e Lalandar			
Lalandar … see Tang-e Lalandar			
Lashkar-e Bazar	Helmand	31° 34’ N, 64° 21’ E	785
Lashkari Bazar … see Lashkar-e Bazar			
Loe Dakka	Nangarhar	34° 13’ N, 71° 03’ E	430
Logartal, 35 km S Kabul	Lowgar	34° 13’ N, 69° 06’ E	1850
Madan-Sorb à Firindjal … see Firindjal			
Maidan	Vardak	34° 23’ N, 68° 51’ E	2400
Maidar valley, 20 km east of the Unai Pass	Vardak	34° 27’ N, 68° 35’ E	2700
Maimana	Faryab	35° 55’ N, 64° 47’ E	865
		35° 54’ N, 64° 43’ E	*875*
Maimana … see Belchiragh, 8 km north-west			
Maimana … see Zarmast cave			
Maimana, 40 km. E … see Belchiragh, 8 km north-west			
Maimaneh, Grotte Zarmast … see Zarmast cave			
Mardkhel	Khost	33° 19’ N, 69° 54’ E	1180
Mazanah … Khvajah cave			
Mazar-e Sharif	Balkh	36° 43’ N, 67° 07’ E	365
		36° 43’ N, 67° 05’ E	*450*
Mazar-e Sharif, 3 km west	Balkh	36° 42’ N, 67° 03’ E	360
Mazar-i-Sharif … see Mazar-e Sharif			
Meta Khan	Khost	33° 16’ N, 69° 47’ E	1330
Mihtar Lam, Qalat us Sirai	Laghman	34° 40’ N, 70° 12’ E	900
Mohmandan	Balkh	36° 51’ N, 66° 51’ E	330
Moumlai cave … see Mumlai cave			
Moumlai Höhle … see Mumlai cave			
Muang Loei … see Loe Dakka			
Mumlai cave	Farah	32° 28’ N, 62° 18’ E	840
Nahr-i-Seraj … see Lashkar-e Bazar			
Nangarhar, 6 km W of the Afghanistan-West Pakistan border … see Khyber Pass, 6 km west			
Nauabad-Bagrami, 13 km ESE Kabul	Kabol	34° 30’ N, 69° 16’ E	1790
Nayak cave	Parvan	35° 00’ N, 68° 48’ E	2145
Nimla	Nangarhar	34° 18’ N, 70° 06’ E	1115
Nurgul	Konar	34° 37’ N, 70° 45’ E	705
		34° 35’ N, 70° 48’ E	*800*
Nurgul, 8 km W of Kunar, Qachqar cave … see Nurgul			
Paghman	Kabol	34° 35’ N, 68° 58’ E	2300
		34° 36’ N, 68° 56’ E	*2450*
Paghman to Kabul road, 5 km west of Kabul	Kabol	34° 32’ N, 69° 04’ E	1800
		34° 30’ N, 69° 10’ E	*1800*
Parapamis	Herat	–	–
Pashtunkot (Grotte Zarmast, 1295 m NN) … see Zarmast cave			
Pashtunkot, Zarmast cave … see Zarmast cave			
Pech valley	Konar	34° 58’ N, 70° 50’ E	1100
Peiwar Kotal	Paktia	33° 58’ N, 69° 52’ E	2620
Petsh-Tal … see Pech valley			
Pialeh cave	Laghman	34° 47’ N, 70° 06’ E	1615
Pol-e Bisut … see Behsud			
Pul-e-Bisut … see Behsud			
Pul-i-Khumri … see Doshi and Pol-e Khomri, between			
Qachgar cave … see Nurgul			
Qades, SE. de Qal’eh Naon … see Qades			
Qades	Badghis	34° 53’ N, 63° 20’ E	1150

site	province	coordinates	alt.
Qal'eh Bojr … see Qala-e Bust			
Qal'eh Bost … see Qala-e Bust			
Qal'eh Naon … see Qades			
Qala Bist … see Qala-e Bust			
Qala-e Bust	Helmand	31° 30' N, 64° 21' E	765
Qala-e Safed, Kuh-e Qul Kharidah	Vardak	34° 26' N, 68° 28' E	2670
Qala-e Shahi	Nangarhar	34° 39' N, 70° 36' E	850
Qalat … see Bulan cave			
Qalat us Sirai … see Mihtar Lam, Qalat us Sirai			
Qalat, Grotte Boulan … see Bulan cave			
Qanat System, 24 km NW of Kandahar	Kandahar	31° 42' N, 65° 24' E	1100
Saijad, Samangan … see Sayyed			
Samotch-e-Nayak … see Nayak cave			
Samotch Nayak, vallée du Ghourband … see Nayak cave			
Samshir Ghor … see Shamshir cave			
Sarai-Siah Ab, 22.5 km W of Bakva … see Kuh-e Siah Ab cave			
Sarai-Siah Ab Cave, 22.5 km W of Bakva … see Kuh-e Siah Ab cave			
Sarai-Siah Ab Cave, 69 km. W Dilaram … see Kuh-e Siah Ab cave			
Sarai-Siah cave … see Kuh-e Siah Ab cave			
Sarban-Qala, Khvadjah Largar cave … see Khvajah Largar cave			
Sarobi	Kabol	34° 35' N, 69° 46' E	980
Saydabad	Bamyan	34° 49' N, 67° 51' E	2560
Sayedabad, 4 km. southeast of Bamiyan … see Saydabad			
Sayyed	Baghlan	35° 52' N, 68° 26' E	1010
Scham-Schir-Rohr … see Shamshir cave			
Schar-i-Nau … see Shahr-e Naow			
Seistan	Nimruz	31° 02' N, 61° 52' E	480
Shahr-e Naow	Kabol	34° 32' N, 69° 10' E	1800
Shamshir cave	Kandahar	31° 34' N, 65° 29' E	1083
		31° 33' N, 65° 28' E	*1075*
Shamshir Ghar, 19 km SW of Kandahar … see Shamshir cave			
Shamshir Ghor … see Shamshir cave			
Shamshir Gor bei Kandahar … see Shamshir cave			
Shewaki	Kabol	34° 24' N, 69° 13' E	1810
Sholghara, Darra Band-i-Haba … … see Aq Kopruq			
Sholghara, Takhtar Pul … see Takhta Pul			
Shombul … see Shonbul			
Shombul, 12 km W of Shibar Pass … see Shonbul			
Shonbul	Bamyan	34° 53' N, 68° 10' E	2700
		34° 55' N, 68° 18' E	*2750*
Shulgareh	Balkh	36° 22' N, 66° 53' E	550
Siah Ab … see Kuh-e Siah Ab cave			
Siaou cave … see Kuh-e Siah Ab cave			
Spin Boldak	Kandahar	35° 51' N, 64° 54' E	1220
Tagheh Tchineh … see Ibrahim Khel			
Takhta Pul	Balkh	36° 44' N, 67° 01' E	350
Takhtar Pul … see Takhta Pul			
Taliqan … see Taliqan, 7 km east			
Taliqan, 7 km east	Takhar	35° 51' N, 64° 54' E	895
		36° 46' N, 69° 39' E	*875*
Tang-Lalonda … see Tang-e Lalandar			
Tang-e Lalandar	Kabol	35° 51' N, 64° 54' E	1250
		34° 24' N, 69° 02' E	*2090*
Tang-la-Landar … see Tang-e Lalandar			
Tangi Mazar	Konar	34° 44' N, 71° 00' E	760
Tang-e Shadian	Balkh	36° 34' N, 67° 09' E	865

site	province	coordinates	alt.
Tangi-Shadian ravine, about 16 km. S of Mazar-i-Sharif … see Tang-e Shadian			
Tschaga Serail … see Chaghasarai			
Tscharasiaw … see Chahar Asiab			
Tschechmesch-e-Schaffar … see Chashma-e Shafa			
Tschell Ghar … see Shulgareh			
Tshambel/Dewagall … see Chambel			
Tut-Tangei	Konar	34° 35’ N, 70° 53’ E	820
Unai Pass … see Maidar valley			
Wazir Bagh	Khost	33° 20’ N, 69° 58’ E	1150
Wazirabad … see Balkh			
Zarmast cave	Faryab	35° 51’ N, 64° 54’ E	1250
Zarmast Cave, 16 km SE of Maimana … see Zarmast cave			
Zindan cave … see Kham Zindan cave			
zwischen Doshi und Pul-i-Khumri … see Doshi and Pol-e Khomri, between			

APPENDIX II

List of the comparative material examined

Rhinopoma microphyllum (Brünnich, 1782)

Iran: 1 ♀ (NMP 93877 [S+A]), Bishapur, 6 October 2011, leg. M. Andreas, S. Ashrafi, P. Benda, K. Faizolahi, A. Reiter & M. Uhrin; – 2 ♂♂ (NMP 93907, 93908 [S+A]), Dehloran cave, 17 October 2011, leg. M. Andreas, P. Benda, K. Faizolahi, A. Reiter & M. Uhrin; – 1 ♂ (NMP 93886 [S+A]), Manian, 8 October 2011, leg. M. Andreas, S. Ashrafi, P. Benda, K. Faizolahi, A. Reiter & M. Uhrin; – 1 ♂, 1 ♀ (NMP 93904, 93905 [S+A]), Mormori, 17 October 2011, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 2 ♀♀ (NMP 93878, 93879 [S+A]), Tadovan cave, 7 October 2011, leg. M. Andreas, S. Ashrafi, P. Benda, K. Faizolahi, A. Reiter & M. Uhrin; – 1 ♀ (BMNH 2.10.1.6 [S+B]), Telespid, Persia, date unlisted, leg. H. F. Ketherby. – **Pakistan**: 4 ♀♀ (MNHN 1983-1630, 1631, 1997, 1999 [S]), Karachi, 21 June 1965, leg. M. A. El Hussein.

Rhinopoma muscatellum Thomas, 1903

Iran: 2 ♀♀ (NMP 93898, 93899 [S+A]), Bandar Siraf, 13 October 2011, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 1 ♂, 1 ♀ (NMP 93875, 93876 [S+A]), Bishapur, 6 October 2011, leg. M. Andreas, S. Ashrafi, P. Benda, K. Faizolahi, A. Reiter & M. Uhrin; – 3 ♂♂, 1 ♀ (NMP 48443–48446 [S+A]), Hormoz island, 17 April 2000, leg. P. Benda & A. Reiter; – 1 ♂, 1 ♀ (NMP 93888, 93889 [S+A]), Jahrom, 8 October 2011, leg. M. Andreas, S. Ashrafi, P. Benda, K. Faizolahi, A. Reiter & M. Uhrin; – 8 ♂♂, 2 ♀♀ (NMP 48387–48395 [S+A], JOC unnumbered [S+Sk]), Mach Gur, 11 April 2000, P. Benda, J. Obuch & A. Reiter; – 1 ♀ (NMP 93887 [S+A]), Manian, 8 October 2011, leg. M. Andreas, S. Ashrafi, P. Benda, K. Faizolahi, A. Reiter & M. Uhrin; – 1 ♂, 1 ♀ (NMP 48421, 48422 [S+A]), Pir Sohrab, 12 April 2000, leg. P. Benda & A. Reiter; – 1 ♂, 1 ♀ (NMP 48463, 48464 [S+A]), Pol-e Tang, 11 April 1977, leg. B. Pražan; – 9 ♂♂, 1 ♀ (NMP 48164–48172 [S+A], JOC unnumbered [S+Sk]), Sarkan near Izeh, 12 October 1998, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 1 ♀ (BMNH 20.1.19.3 [S], holotype of *Rhinopoma pusillum* Thomas, 1920), Sib, Pers. Baluchestan, date unlisted, leg. J. E. B. Hotson; – 1 ♂ (NMP 93880 [S+A]), Tadovan cave, 7 October 2011, leg. M. Andreas, S. Ashrafi, P. Benda, K. Faizolahi, A. Reiter & M. Uhrin; – 1 ♀, 1 ind. (NMP 48423 [S+A], JOC unnumbered [S+Sk]), Tis, 13 April 2000, leg. J. Obuch. – **Oman**: 1 ♀ (NMP 92625 [A]), Al Aqar, 18 October 2009, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♀ (NMP 92626 [S+A]), Al Ghubrah, 18 October 2009, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♂, 1 ♀ (NMP 92652 [S+A], 92653 [A]), Al Qarbi Ash Sharqiyah, 21 October 2009, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♂ (NMP 93747 [S+A]), Al Ghayyan, 6 April 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♂ (NMP 93756 [S+A]), Al Hawqain, 7 April 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 2 ♂♂, 1 ♀ (NMP 93770, 93771 [S+A], 93769 [A]), Al Hotta cave, 8 April 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♂, 1 ♀ (NMP 93808, 93809 [A]), Al Iraqi, 11 April 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♂, 1 ♀ (NMP 93820, 93824 [S+A]), Al Zihaymi, 14 & 15 April 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 4 ♀♀ (NMP 92641–92643 [S+A], 92644 [A]), Ar Rustaq, 19 October 2009, leg. P. Benda, A. Reiter & M. Uhrin; – 3 ♀♀ (NMP 92635–92637 [S+A]), At Tabaqah, 19 October 2009, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♀ (NMP 92630 [A]), Awabi, 18 October 2009, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♀ (NMP 93768 [S+A]), Bahla, 8 April 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♀ (NMP 93810 [S+A]), Belt, 11 April 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 2 ♂♂ (NMP 93715, 93716 [A]), Birkat Al Mawz, 27 March 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♂ (NMP 92780 [S+A]), Dibab, 3 November 2009, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♂, 2 ♀♀ (NMP 92660–92662 [S+A]), Jabrin, 22 October 2009, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♂ (NMP 93757 [S+A]), Jamma, 7 April 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 2 ♂♂ (NMP 93744, 93745 [S+A]), Khabbah, 5 April 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♂ (NMP 92785 [S+A]), Mansaft, 4 November 2009, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♀ (NMP 93789 [A]), Misfat Al Khawater, 10 April 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♀ (NMP 92769 [S+A]), Muqal, 1 November 2009, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♂ (NMP 93998 [S+A]), Rawdah, 16 March 2012, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♂ (NMP 94000 [S+A]), Wadi Banah, 16 March 2012, leg. P. Benda, A. Reiter & M. Uhrin; – 2 ♀♀ (NMP 93758, 93759 [S+A]), Wadi Bani Hani, 7 April 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♂ (BMNH 94.3.9.17 [S]; holotype specimen of *Rhinopoma muscatellum* Thomas, 1903), Wadi Bani Ruba, date unlisted, leg. Jayaker; – 1 ♂ (NMP 93792 [A]), Wadi Misfah, 10 April 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 3 ♀♀ (NMP 92657, 92658 [S+A], 92659 [A]), Yanqul, 22 October 2009, leg. P. Benda, A. Reiter & M. Uhrin.

Rhinolophus bocharicus Kašenko et Akimov, 1918

Kirghizstan: 1 ♂ (NMP 58445 [S+A]), Oš district, 1987, leg. J. Obuch; – 4 ♂♂ (MHNG 1806.062, NMP 58336/2–58336/4 [S+A]), Samarkandyk, Kanigut, 2 July 1988 & 30 September 1992, leg. R. Arlettaz, J. Červený, A. Červená & J. Obuch. – **Uzbekistan**: 1 ♂, 11 ♀♀ (NMP 91458–91461, 91489–91496 [S+B]), Samarqand, 28 September & 14 October 1963, leg. V. Hanák & A. Sagitov.

***Rhinolophus hipposideros* (Borkhausen, 1797)**

Algeria: 1 ♂ (ISEA 9586 [S+B]), 20 km NW of Sebdou, 6 November 1981, leg. K. Kowalski & B. Rzebik-Kowalska; – 2 ♂♂ (ISEA 9584, 9585 [S+B]), Brezina, 31 October 1981, leg. K. Kowalski & B. Rzebik-Kowalska; – 1 ♂ (IVB a204 [S+B]), Gorges de Kherrata, 15 January 1982, leg. J. Gaisler; – 1 ♂ (ISEA 9587 [S+B]), Misserghin, 14 December 1982, leg. K. Kowalski & B. Rzebik-Kowalska; – 1 ♂, 1 ♀ (ISEA 9588, 9664 [S+B]), Sig, 4 & 25 January 1983, leg. K. Kowalski & B. Rzebik-Kowalska; – 1 ♂ (IVB a237 [S+B]), Sebdou, 1 May 1982, leg. J. Gaisler. – **Azerbaijan**: 1 ♀ (NMP 91697 [S+B]), Suçma, 25 April 1976, leg. I. K. Rahmatulina. – **Bulgaria**: 2 ♂♂ (NMP 49788, 49789 [S+A]), Âgodina, Gorna Karanska dupka cave, 16 August 1978, leg. P. Donát, J. Flegr, J. Janda & V. Vohralík; – 5 ♂♂, 1 ♀ (NMP 49780–49786 [S+A]), Âgodina, Imamova dupka cave, 15 August 1978, leg. P. Donát, J. Flegr, J. Janda & V. Vohralík; – 1 ♀ (NMP 49807 [S+A]), Bačkovo, 30 July 1979, leg. D. Holečková, P. Donát, I. Horáček, J. Jirouš & V. Vohralík; – 2 ♂♂ (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 ♀ (NMNHS unnumbered [S]), Borovo, 19 March 1968, leg. P. Beron; – 2 ♂♂, 3 ♀♀ (NMP 50091–50095 [S+B]), Brestnica, Saeva dupka cave, 8 February 1965, leg. J. Figala, J. Gaisler, V. Hanák & K. Hůrka; – 1 ♂ (NMP 49433 [S+A]), Čepelare, 13 July 1976, leg. M. Braniš, V. Hanák, I. Horáček, K. Hůrka, J. Jirouš, V. Švihla & V. Vohralík; – 1 ♂ (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 ♀♀ (NMP 50027–50031 [S+A]), Gorna Breznica, 21 & 24 July 1981, leg. J. Flousek, R. Fuchs & V. Vohralík; – 2 ♂♂, 1 ♀ (NMP 49354, 49758, 49777 [S+A]), Karlukovo, 5 July 1976, 8 & 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 ♂ (NMP 50080 [S+B]), Karlukovo, Bankova cave, 7 February 1965, leg. J. Figala, J. Gaisler, V. Hanák & K. Hůrka; – 1 ♂ (NMP 49753 [S+A]), Karlukovo, Temnata dupka cave, 7 August 1978, leg. P. Donát, J. Flegr, J. Janda & V. Vohralík; – 5 ♂♂ (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, date unlisted, leg. I. Bureš; – 2 ♂♂ (NMP 50136, 50137 [S+B]), Lakatnik, Svinskata cave, 19 March 1956, collector unlisted; – 1 ind. (NMP 49813 [S+B]), Lakatnik, Temnata dupka cave, 3 January 1962, leg. J. Sklenář; – 1 ♂, 4 ♀♀ (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 ♂♂, 2 ♀♀ (NMP 49997–50003 [S+A]), Orehovo, 30 August 1980, leg. D. Holečková, J. Jirouš, H. Prágnerová & V. Vohralík; – 1 ♀ (RMR 739 [S]), Pepelina, Orlova čuka cave, February 1961, leg. I. Ivanov; – 1 ♀ (IVB 398 [S+B]), Pešera, Lilova skala cave, 3 February 1965, leg. J. Figala, J. Gaisler, V. Hanák & K. Hůrka; – 1 ♂ (NMP 50072 [S+B]), Pešera, Nova pešera cave, 4 February 1965, leg. J. Figala, J. Gaisler, V. Hanák & K. Hůrka; – 1 ♂ (NMP 50076 [S+B]), Pešera, Snežânka cave, 5 February 1965, leg. J. Figala, J. Gaisler, V. Hanák & K. Hůrka; – 1 ♀ (NMP 49347 [S+B]), Ropotamo, 6 June 1957, leg. V. Hanák; – 2 ♂♂ (NMNHS N63, unnumbered [S]), Studen Kladenec, 3 May 1996, leg. T. Ivanova; – 1 ♂ (NMNHS unnumbered [S]), Treklâno, date & collector unlisted; – 3 ♂♂, 1 ♀ (NMNHS unnumbered [S]), Urvič, 8 April 1971, leg. V. Beškov. – **Cyprus**: 2 ♀♀ (MSNG 44488 [A]), Akantu, 12 January 1899, leg. Cecconi; – 2 ♂♂ (NMP 90424, 91269 [S+A]), Cinarli, Inçirli cave, 6 & 17 April 2005, leg. P. Benda, V. Hanák, I. Horáček, P. Hulva & R. Lučan; – 4 ♂♂, 2 ♀♀ (NMP 90924–90928 [S+A], 90923 [A]), Kakopetria, Troodos forest, 27 July 2006, leg. P. Benda. – **Czech Republic**: 1 ♀ (NMP 343/64 [S+B]), Jílové u Prahy, 30 October 1964, leg. V. Hanák; – 1 ♂ (NMP e7 [S]), Karlštejn, 15 February 1957, leg. V. Hanák; – 1 ♀ (NMP 155/62 [B]), Lednice, 9 June 1962, leg. V. Hanák; – 2 ♂♂, 1 ♀ (NMP 341/58, 347/58, 348/58 [S]), Mníšek pod Brdy, 8 March 1958, leg. J. Sklenář; – 1 ♂ (NMP zn17 [S]), Vranov nad Dyjí, 31 July 1957, leg. V. Hanák; – 1 ♂, 1 ind. (NMP zb11, zb12 [S]), Zbraslav, 1 December 1956, leg. V. Hanák; – 2 ♀♀ (NMP zn26, zn27 [S]), Znojmo, 3 August 1957, leg. V. Hanák. – **Greece**: 1 ♂, 6 ♀♀ (NMP 48710–48715, 49028 [S+A]), Kombotades, 9 & 10 September 1996, 31 August 2001, leg. M. Andreas, P. Benda & M. Uhrin; – 1 ♀ (NMP 48643 [S+B]), Maronia, Cyclops Polyphemos cave, 19 June 1989, leg. R. Chaloupka, V. Hanák & V. Vohralík. – **Iran**: 3 ♂♂ (NMP 48096, 48097, 48439 [S+A]), Emamzadeh, 1 May 1997, 6 April 2000, leg. P. Benda & A. Reiter; – 1 ♀ (BMNH 94.11.16.1 [S], holotype of *Rhinolophus midas* Andersen, 1905), Jask, Persian Gulf, date & collector unlisted; – 1 ind. (NMP 93858 [S+Sk]), Moghan cave, October 1999, leg. K. Faizolahi; – 1 ♀ (NMP 48117 [S+A]), Nosrat Abad, 7 May 1997, leg. P. Benda; – 1 ♂ (NMW 21008 [S+A]), Shiraz, 1894, leg. B. Wagschal. – **Jordan**: 1 ind. (NMP 92842 [S+Sk]), Bait Idis, Jesus' cave, 15 July 2010, leg. P. Benda & A. Reiter; – 2 ♀♀ (NMP 92409, 92410 [S+A]), Dibbin, Dibbin forest, 27 October 2008, leg. P. Benda & J. Obuch; – 1 ♂, 2 ♀ (NMP 92508–92510 [S+A]), Zubiya, Zubiya cave, 24 May 2009, leg. P. Benda & A. Reiter. – **Kirghizstan**: 1 ♀ (NMP 58323 [S+A]), Kyzyl-Kiâk, 30 June 1988, leg. J. Červený, A. Červená & J. Obuch; – 1 ♀ (NMP 58324/2 [S+A]), Toâ-Moûn, Kolodec Fersmana mine, 12 July 1988, leg. J. Červený, A. Červená & J. Obuch. – **Lebanon**: 3 ♂♂ (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 ♂, 1 ♀ (NMP 93552 [S+A], 93553 [A]), Aanjar, Cellis cave, 5 June 2010, leg. P. Benda & M. Uhrin; – 1 ♂ (NMP 91782 [S+A]), Afqa, Afqa cave, 22 January 2009, leg. T. Bartonička, P. Benda, I. Horáček & R. Lučan; – 1 ♂ (NMP 91798 [S+A]), Antelias, Kenaan cave, 25 January 2007, leg. P. Benda, R. Černý, I. Horáček & R. Lučan; – 1 ♂, 1 ♀ (NMP 91789, 91790 [S+A]), Bcharre, Qadicha cave, 23 January 2007, P. Benda, R. Černý, I. Horáček & R. Lučan; – 1 ♂ (AUB M-170 [V-6059] [B]), Beit el Dine, 7 September 1960, leg. J. M. Stencel; – 1 ♀ (NMP 93711 [A]), Dahr el Mghara, Aaonamie cave, 28 March 2009, leg. T. Bartonička, P. Benda, I. Ho-

ráček & R. Lučan; – 1 ♂ (NMP 91775 [S+A]), El Aaqoura, Er Rouais cave, 22 January 2007, leg. P. Benda, R. Černý, I. Horáček & R. Lučan; – 2 ♂♂ (NMP 93537, 93538 [S+A]), Faraya El Mzar, Raymond cave, 2 July 2010, leg. P. Benda & M. Uhrin; – 1 ♂ (NMP 91801 [A]), Faraya, El Qana cave, 27 January 2007, leg. P. Benda, R. Černý, I. Horáček & R. Lučan; – 2 ♂♂ (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 ♂, 1 ♀ (NMP 91770 [S+A], 91769 [A]), Haqel El Aazime, Achou cave, 21 January 2007, leg. P. Benda, R. Černý, I. Horáček & R. Lučan; – 1 ♀ (NMP le36 [S+A]), Jezzine, Pont El Khalass, 23 June 2006, leg. I. Horáček, P. Hulva, R. Lučan & P. Němec; – 3 ♂♂, 1 ♀ (NMP 91753–91755 [S+A], 91756 [A]), Marjaba, 19 January 2007, leg. P. Benda, R. Černý, I. Horáček & R. Lučan; – 1 ♂ (NMP 91809 [S+A]), Nabaa Es Safa, 29 January 2007, leg. P. Benda, R. Černý, I. Horáček & R. Lučan; – 1 ♀ (NMP 93706 [S+A]), Ouadi Jilo, 22 March 2009, leg. T. Bartonička, P. Benda, I. Horáček & R. Lučan; – 1 ♀ (NMP 93577 [S+A]), Seraal, Qadicha valley, 10 June 2010, leg. P. Benda & M. Uhrin; – 1 ♂ (NMP 91786 [S+A]), Tourzaiya, Maba'aj cave, 23 January 2007, leg. P. Benda, R. Černý, I. Horáček & R. Lučan. – **Morocco**: 1 ♀ (NMP 93602 [S+A]), Gorges du Dadès, 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 ♀♀ (NMP 94519, 94520 [S+A]), Takoumit, 26 April 2008, leg. P. Benda, J. Červený, A. Konečný & P. Vallo. – **Slovakia**: 6 ♂♂ (NMP 118/58, 121/58–123/58, 125/58, 130/58 [S]), Ardovo, Ardovská cave, 5 February 1958, leg. V. Hanák; – 1 ♂ (NMP 084/63 [B]), Červený Kláštor, Aksamitka cave, 2 March 1963, leg. V. Hanák; – 1 ♀ (NMP 7712/1957 [S+B], Domica, 24 August 1957, leg. J. Hanzák; – 1 ♂, 1 ♀ (NMP 101/58, 102/58 [S]), Domica, Čertova diera cave, 5 February 1958, leg. V. Hanák; – 1 ♂, 2 ♀♀ (NMP j185–j187 [S]), Kečovo, 10 December 1956, leg. V. Hanák; – 5 ♂♂, 1 ♀ (NMP 109/58–114/58 [S]), Domica, Liščia diera cave, 5 February 1958, leg. V. Hanák; – 5 ♂♂, 1 ♀ (NMP J209–J213, J215 [S]), Gombasek, Ludmila cave, 11 December 1956, leg. V. Hanák. – **Syria**: 1 ♀ (NMP 48054 [S+A]), Qala'at Al Hosn, 28 June 1998, leg. M. Andreas, P. Benda & M. Uhrin; – 1 ♀ (NMP 48979 [S+A]), Qanawat, 27 April 2001, leg. P. Munclinger & P. Nová. – **Turkey**: 1 ♂ (NMW 24585 [S+B]), Ahmetbeyli, Apollo cave, 16 February 1969, leg. F. Spitzenberger; – 1 ♂ (NMW 24587 [S+B]), Arak, Icme Pinari cave, 1 March 1969, leg. F. Spitzenberger; – 2 ♂♂ (NMW 24586, 24588 [S+B]), Bornova, 20 February & 6 April 1969, leg. F. Spitzenberger; – 1 ♂, 3 ♀♀ (NMW 22236, 22237, 34330, 34331 [S+B]), Efes, 12 August 1976, 2 August 1984, leg. A. Mayer, F. Spitzenberger, E. Weiß & P. Wolff; – 3 ♀♀ (NMW 19313–19315 [S+A]), Hakkari, Nestorian church, 16 August 1973, leg. F. Spitzenberger; – 1 ♀ (NMW 11731 [S+B]), Iğneada, 15 May 1967, leg. F. Spitzenberger; – 1 ♂ (NMW 13299 [S+A]), Maden köy, 1 August 1970, leg. F. Spitzenberger; – 1 ♀ (CUP t93/63 [S+A]), Narlikuyu, 29 October 1993, leg. P. Benda & I. Horáček; – 2 ♀♀ (NMP 90488, 90489 [S+A]), Posyağbasan, 15 June 2003, leg. J. Hájek & J. Hotový; – 1 ♀ (NMW 20510 [B]), Rize, 14 July 1961, leg. M. Çağlar; – 4 ♂♂ (MHNG 967.48–967.51 [S+A]), Sile, Satzmal cave, 29 April 1955, leg. H. Coiffat & P. Strinati; – 1 ♂ (MSNG 44534 [A]), Izmir, 1870, leg. G. Gonzenbach; – 1 ♂, 2 ♀♀ (CUP t93/65, t93/67, t93/68 [S+A]), Yalan Dünya cave, 30 October 1993, leg. P. Benda & I. Horáček. – **Ukraine**: 1 ♀ (NMP pb4360 [S+A]), General'skoe, 18 September 2009, leg. P. Benda, S. Gazarân & M. Uhrin; – 2 ♀♀ (NMP pb4287, pb4289 [S+A]), Kujbyševo, 12 September 2009, leg. P. Benda, S. Gazarân & M. Uhrin; – 1 ♀ (NMP pb4342 [S+A]), Partizanskoe, 16 September 2009, leg. P. Benda, S. Gazarân & M. Uhrin.

Rhinolophus blasii Peters, 1866

Albania: 3 ♂♂, 5 ♀♀ (NMP b151, b162, b163, b171 [S+B], b176 [S], b150, b152 [A], b162 [B]), Mezhgoran, Mezhgorani cave, 11 October 1960, leg. V. Hanák; – 1 ♀ (NMP b008 [B]), Pishkash, Igors cave, 5 October 1960, leg. V. Hanák. – **Algeria**: 1 ♂ (MUB A487 [S+B]), Ain Ouarka, 17 July 1983, leg. J. Gaisler; – 9 ♂♂, 2 ♀♀ (MUB a29, a167, a171, a188, a189, a216, a253, a255, a263, a264, a371 [S+B]), Bejaïa, Aokas, 30 April, 10 & 18 December 1981, 24 March, 14 May, 20 June & 26 November 1982, leg. J. Gaisler; – 1 ♂ (MUB a391 [S+B]), Gorges de Kherrata, 14 January 1983, leg. J. Gaisler; – 1 ♂, 1 ♀ (ISEA 10071 [S], MUB a198 [S+B]), Sig, 8 December 1980, 23 November 1981, leg. J. Gaisler, K. Kowalski & B. Rzebik-Kowalska; – 1 ♂ (MUB a221 [S+B]), Souk el Tenine, 23 April 1982, leg. J. Gaisler. – **Bosnia**: 1 ♂ (NMW 10808 [S+A]), Sarajevo, ~1891, leg. O. Reisler. – **Bulgaria**: 1 ♀ (NMNHS N54 [S]), Bežanovo, Parnicite cave, 21 January 1995, leg. T. Ivanova, B. Petrov & P. Stoev; – 1 ♀ (NMP 50101 [S+B]), Lakatnik, Temnata dupka cave, 10 February 1965, leg. J. Figala, J. Gaisler, V. Hanák & K. Hůrka; – 2 ♀♀ (NHNMS N90, unnumbered [S]), Ribino, Aina Ini cave, 10 November 1995 & 3 January 1997, leg. T. Ivanova, A. Georgieva, B. Petrov & P. Stoev; – 1 ♀ (NMNHS N40 [S]), Ribino, Samara cave, 7 July 1995, leg. T. Ivanova; – 2 ♂♂, 1 ♀, 3 inds. (NMNHS unnumbered [S]), Tarnovci, Karaguk cave, 1960, leg. P. Beron; – 1 ♂ (NMNHS unnumbered [S]), Treklâno, Âmkata cave, 29 October 1966, leg. P. Beron. – **Croatia**: 1 ♀ (NMW 10806 [S+A]), Monte Promina or Biokovo, before 1884, leg. G. Kolombatović; – 1 ♂ (NMW 28847 [S]), Baska, Krk, 2 June 1960, E. Christian, M. Christian & A. Mayer. – **Cyprus**: 2 ♂♂ (NMW 23381, 23382 [S+B]), between Pyla and Troulli, June–July 1977, leg. K. Kollnberger. – **Iran**: 11 ♂♂, 2 ♀♀ (NMP 48098–48110 [S+A]), Emamzadeh, 1 May 1997, leg. P. Benda; – 1 ♂ (HNHM 2009.46.2. [S+A]), Golgik cave, 11 May 2009, collector unlisted; – 2 ♂♂, 2 ♀♀ (MHNG 1703.88–1703.91 [S+A]), Kusheh, Kuh-e Taftan Mt., 16 June 1975, leg. M. Desfayes & J.-C. Praz; – 1 ♀ (NMP 93864 [S+A]), Meymand, 4 October 2011, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 1 ♀ (SMF 46686 [S+B]), Mozduran, 4 October 1974, leg. H. Felten, K. Walch & Wirth; – 1 ♀ (SMF 47842 [S+B]),

Tabriz, March 1975, leg. Assadi; – 3 ♀♀ (MHNG 1703.85–1703.87 [S+A]), Varaj [= Kusheh], Kuh-e Taftan Mt., 13 June 1975, leg. M. Desfayes & J.-C. Praz; – 1 ♀ (MHNG 1703.84 [S+B]), Zahrud-e Bala, Kuh-e Hazar, 21 May 1975, leg. M. Desfayes & J.-C. Praz. – **Israel**: 1 ♂, 1 ♀ (MHNG 1709.062, 1709.063 [S+A]), Palestine, date unlisted, leg. Dor. – **Jordan**: 1 ind. (NMP 92429 [S+Sk]), Al Qurayqira, Khirbet Feynan, 14 May 2009, leg. P. Benda, J Obuch & A. Reiter; – 2 ♂♂, 3 ♀♀ (NMP 92387–92390 [S+A], 92391 [A]), Ash Shawbak, 20 October 2008, leg. P. Benda & J. Obuch; – 2 ♀♀ (NMP 92526, 92527 [S+A]), Khashibah, Al Wardeh cave, 26 May 2009, leg. P. Benda & A. Reiter; – 3 ♂♂ (NMP 92541–92543 [S+A]), Kufranja, Iraq Al Wahaj cave, 26 May 2009, leg. P. Benda & A. Reiter; – 1 ♂ (NMP 92412 [S+A]), Wadi As Sir, Iraq Al Amir, 10 May 2009, leg. P. Benda & A. Reiter; – 3 ♂♂ (NMP 92516–92518 [S+A]), Zubiya, Zubiya cave, 24 May 2009, leg. P. Benda & A. Reiter. – **Greece**: 1 ♀ (NMP 48590 [S+B]), Aidonohori, Aoos river, 28 August 1988, leg. V. Hanák, Z. Roček & V. Vohralík; – 1 ♂, 1 ♀ (NMW 29717, 29718 [S+B]), Archaea Korinth, 6 August 1979, leg. A. Baar & W. Baar; – 1 ♂ (NMP 91190 [S+A]), Crete, Amnisos, Eileithyias cave, 4 October 2006, leg. P. Benda, V. Hanák & P. Hulva; – 4 ♂♂ (NMP 92325, 92326, NMW 36149 [S+A], NMP 92327 [A]), Crete, Katholiko monastery, Agiou Ioanni cave, 11 September 1986 & 27 May 2008, leg. A. Baar, P. Benda, V. Hanák & W. Pölz; – 1 ♀ (NMP 91179 [S+A]), Crete, Omalos plateau, Tzani cave, 1 October 2006, leg. P. Benda, V. Hanák & P. Hulva; – 1 ♀ (NMP 92312 [S+A]), Crete, Pefki, Vreiko cave, 12 October 2007, leg. P. Benda; – 2 ♂♂ (NMP 92347 [A], 92348 [S+A]), Crete, Rouva forest, 4 June 2008, leg. P. Benda & V. Hanák; – 1 ♀ (NMP 92301 [S+A]), Crete, Theriso, Sarakinas cave, 8 October 2007, leg. P. Benda; – 3 ♀♀ (NMP 48634–48636 [B]), Cyclops Polyphemos cave, 18 June 1989, leg. R. Chaloupka, V. Hanák & V. Vohralík; – 1 ♀ (NMW 10805 [S+A]), Morea [= Peloponnese], 12 June 1885, leg. E. Reitter; – 4 ♂♂, 3 ♀♀ (NMP 48593, 48594, 48599, 48601, 48603, 48606, 48607 [B]), Petralona, cave, 28 September 1988, leg. V. Hanák, I. Horáček, Z. Roček & V. Vohralík; – 2 ♂♂, 2 ♀♀ (NMP 51479–51482 [S+A]), Stoupa near Kardamili, 8 July 1991, leg. M. Anděra & P. Zbytovský. – **Lebanon**: 1 ♀ (NMP 91908 [S+A]), Aamchite, Mogharet Saleh cave, 22 January 2008, leg. P. Benda, I. Horáček, R. Lučan & M. Uhrin; – 1 ♀ (NMP 91897 [S+A]), Batroun, Mussaylah, 18 January 2008, leg. P. Benda, I. Horáček, R. Lučan & M. Uhrin; – 1 ♀ (NMP 91900 [S+A]), Haqel al Azime, Achou cave, 18 January 2008, leg. P. Benda, I. Horáček, R. Lučan & M. Uhrin; – 2 ♂♂, 2 ♀♀ (NMP 91793–91795 [S+A], 91792 [A]), Kfar Zabad, 24 January 2007, leg. P. Benda, R. Černý, I. Horáček & R. Lučan; – 1 ♂ (NMP 91898 [S+A]), Tarabulus, Mtal al Azraq cave, 18 January 2008, leg. P. Benda, I. Horáček, R. Lučan & M. Uhrin. – **Morocco**: 15 ♂♂, 30 ♀♀ (NMP 94494–94496, 94500, 94501, 94533, NMW 28037–28047, 28049–28058 [S+A], NMW 28022–28036 [S+B], NMP 94497–94499 [A]), Kef Azigza cave, 16 August 1979 & 26 April 2008, leg. P. Benda, J. Červený, E. Hubert, A. Konečný, A. Mayer, F. Spitzenberger, P. Vallo & J. Wirth; – 1 ♀ (NMP 94521 [S+A]), Takoumit, 27 April 2008, leg. P. Benda, J. Červený, A. Konečný & P. Vallo. – **Syria**: 11 ♂♂, 3 ♀♀ (NMW 21962–21975 [S+A]), Halab, 13–23 March 1910, leg. V. Pietschmann; – 2 ♀♀ (MNHN 1876-339, 1985-894 [S+A]), Al Lataqieh, date unlisted, leg. M. Deyrolles & H. Gadeau de Kerville; – 6 inds. (MNHN 1860-487A–1860-487C, 1860-487E–1860-487G [B]), Syrie, 1860, leg. Blanche; – 1 ind. (MNHN 1921-86 [S+A]), Syrie, leg. D. Siépi; – 1 ♂ (ZFMK 79.627 [S+A]), Syrien, 1894, ded. Schlüter. – **Turkey**: 1 ♂ (NMW 24589 [S+B]), Ahmetbeyli, Apollo cave, 16 February 1969, leg. F. Spitzenberger; – 1 ind. (NMW 62695 [S]), Antalya province, 21 November 2000, leg. U. Passauer & H. Mixanig; – 1 ♂ (NMW 13361 [S+B]), Belgrad forest, 24 May 1968, leg. K. Bauer & F. Spitzenberger; – 9 ♂♂ (NMP 47917–47922 [S+A], 90297–90299 [S+B]), Cehennem cave, 2 May 1991 & 3 August 1992, leg. P. Benda, J. Flegr, V. Hanzal, P. Horák & J. Sádlová; – 2 ♂♂, 3 ♀♀ (NMW 24591–24595 [S+A]), Dutalan near Bucak, 25 February 1969, leg. F. Spitzenberger; – 1 ♂ (NMW 24597 [S+B]), Farilya köyü, 24 February 1969, leg. F. Spitzenberger; – 1 ♀ (NMW 24596 [S+A]), Havran, 17 March 1969, leg. F. Spitzenberger; – 5 inds. (SMF 92193–92197 [S]), Karain and Oküzini caves, 1990–1994, leg. P. Lacroix; – 5 ♂♂ (NMW 13436–13439 [S+A], 13424 [S+B]), Kiyiköy, 2 & 3 June 1968, leg. K. Bauer & F. Spitzenberger; – 2 ♂♂, 11 ♀♀ (CUP T93/83–T93/94 [S+A], NMW 24590 [S+B]), Insuyu cave, 24 February 1969 & 1 November 1993, leg. P. Benda, I. Horáček & F. Spitzenberger; – 3 ♂♂, 4 ♀♀ (NMP 47952, 47954–47958, 47960 [S+A]), Sergen, Safe Suyu cave, 1 September 1996, leg. M. Andreas, P. Benda & M. Uhrin.

Taphozous nudiventris Cretzschmar, 1830

Egypt: 4 ♂♂, 3 ♀♀, 10 inds. (IVB 1–13, 15–18 [S+B]), Abu Rawash, 15 & 17 June, 10 July, 15 September & 18 October 1971, leg. B. Ryšavý; – 2 ♂♂, 1 ♀ (NMP 94971–94973 [S+A]), Al Bahariya, 17 October 2011, leg. R. Lučan; – 3 ♂♂, 2 ♀♀ (IVB 29–33 [S+B]), Cairo, Sultan Mahmud Mosque, 21 April 1969, leg. J. Gaisler; – 2 ♂♂, 2 ♀♀ (NMP 94974–94977 [S+A]), Dakhla, Al Rashda, 13 October 2011, leg. R. Lučan; – 3 ♀♀ (ZFMK 96.546–96.548 [S]), Gebel el Lahun, Fayum, Beni Suef, 8 August 1988, leg. J. Handwerk; – 1 ♂, 2 ♀♀, 3 inds. (IVB 28, MUB 1.1.108, 1.1.109 [S+B], NMP e20, e21, SMF 4310 [S]; incl. lectotype of *Taphozous nudiventris* Cretschmar, 1830), Gizeh, pyramids, before 1824, 20 April 1969, 22 May & 15 September 1971, leg. J. Gaisler, J. Groschaft & E. Rüppell; – 4 ♂♂, 3 ♀♀ (IVB 21–27 [S+B]), Karnak, Great Temple, 26 April & 1 May 1969, leg. J. Gaisler; – 1 ind. (ZFMK 97.260 [S]), Maidum pyramids, 3 December 1986, leg. J. Handwerk; – 3 inds. (SMF 12080, 12082, 12083 [S]), Egypt, before 1824, before 1831, leg. E. Rüppell. – **India**: 3 ♀♀ (ZFMK 96.542–96.544 [S]), Fatehpur Sikri, 12 January 1965, leg. J. Niethammer; – 1 ♀ (SMF 19855 [S]), Jodhpur, 12 November 1961, collector unlisted; – 1 ♂ (SMF 86456 [S]), Madurai-Kamaraj, ca. 1985, leg. J. Habersetzer. – **Iran**: 3 ♂♂, 1 ♀ (NMP 48188, 48189 [S+A], JOC unnumbered [S]), Choqa Zanbil, 15 October 1998 & 17 October 2002, leg.

M. Andreas, P. Benda, J. Obuch, A. Reiter & M. Uhrin. – **Iraq**: 3 ♀♀, 1 ind. (SMF 34203–34205, 34440 [S]), Amara, 25 October 1961, leg. K. Al-Robbae; – 1 ♂ (NMW 8377 [S+A]; holotype of *Taphozous magnus* von Wettstein, 1913), Basra, September 1910, leg. V. Pietschmann; – 1 ind. (ISEA 5101 [S]), Hatra island, 29 May 1905, collector unlisted; – 1 ind. (SMF 34441 [S]), Khan al Nuss, 20 April 1962, leg. K. Al-Robbae; – 1 ind. (SMF 34207 [S]), Iraq, 1961–1962, leg. K. Al-Robbae. – **Oman**: 4 ♀♀ (NMP 94087–94089 [S+A], 94086 [A]), Al Khaburah, 5 April 2012, leg. P. Benda, A. Reiter & M. Uhrin; – 5 ♂♂ (NMP 92645–92648 [S+A], 92650 [A]), As Suwayq, 19 October 2009, leg. P. Benda, A. Reiter & M. Uhrin; – 5 ♀♀ (NMP 93723–93726 [S+A], 93727 [A]), Jaalan Bani Bu Ali, 2 April 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♂ (NMP 92681 [S+A]), Shisr, 24 October 2009, leg. P. Benda, A. Reiter & M. Uhrin. – **Sudan**: 2 ♂♂ (NMP 93668, 93669 [S+A]), Dongola Alajuz, 7 December 2010, leg. P. Benda & J. Šmíd; – 1 ♀ (IVB 1 [S+B]), Khartum, 2 October 1970, collector unlisted. – **Syria**: 1 ♀ (NMP 48826 [S+A]), Ayyash, 19 May 2001, leg. M. Andreas, P. Benda, A. Reiter & D. Weinfurtová; – 1 ♂, 12 ♀♀ (NMP 48015–48018, 48793, 48795, 48796, 48798, SMF 74084–74086 [S+A], NMP 48794 [S+B], NMP 48797 [A]), Halabiyyeh, 31 May 1989, 17 June 1998 & 14 May 2001, leg. M. Andreas, P. Benda, D. Kock, A. Reiter, M. Uhrin & D. Weinfurtová; – 2 ♀♀ (NMP 48822, 48823 [S+A]), Khazneh, Jebel ‘Abd al ‘Aziz, 17 May 2001, leg. M. Andreas, P. Benda, A. Reiter & D. Weinfurtová.

Myotis blythii (Tomes, 1857)

India: 1 ♂ (BMNH 20.4.24.1. [S]), Balna, date unlisted, leg. H. L. Tyter; – 1 ind. (BMNH 49.8.16.22. [S+B], holotype of *Vespertilio blythii* Tomes, 1857), Nurshabad, date unlisted, leg. Warwick; – 1 ind. (BMNH 13.10.16.1. [S+A]), Simla, date unlisted, leg. P. Dodsworth. – **Iran**: 5 ♂♂, 2 ♀♀ (NMP 90848, 90851–90854 [S+A], NMP 90849, 90850 [A]), Ali Abad, 28 May 2006, leg. P. Benda & A. Reiter; – 2 ♂♂, 12 ♀♀ (ZIN 11227, 11234, 11257, 11275, 11276, 11292, 11294, 11307–11310, 11316, 11325, 11326 [S]), Gorgan, 20–30 April 1914, leg. A. Kiričenko; – 2 ♀♀ (NMP 90777 [S+A], 90778 [A]), Bazangan, 17 May 2006, leg. P. Benda & A. Reiter; – 1 ♂ (NMP 90775 [S+A]), Chenarbu, 17 May 2006, leg. P. Benda & A. Reiter; – 2 ♂♂ (NMW 23474, 23475 [S+A]), Dagbageh near Khoy, 1905, leg. E. Zugmayer; – 1 ♀ (NMP 94108 [S+A]), Dashkasan, Dashkahul cave, 29 September 2011, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 9 inds. (JOC unnumbered [S+Sk]), Dashtak, 3 May 1996, leg. J. Obuch; – 10 ♂♂ (NMP 48355–48362 [S+A], 48353, 48354 [A]), Deh Bakri, 8 April 2000, leg. P. Benda, J. Obuch & A. Reiter; – 1 ♂ (BMNH 5.10.4.14 [S+B], holotype of *Myotis myotis omari* Thomas, 1905), Derbend, 60 miles W of Isfahan, 14 May 1905, leg. R. Woosnam; – 1 ind. (ZFMK 85.162 [S]), Elburs, Kulak cave, 24 June 1978, collector unlisted; – 1 ♂ (HNHM 2009.46.1. [A]), Golgik cave, 7 May 2008, don. F. Hemmati; – 1 ♂ (NMP 93868 [S+A]), Hesar, 5 October 2011, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 1 ♂, 11 ♀♀ (NMP 90815–90823 [S+A], 90812–90814 [A]), Mina, 22 May 2006, leg. P. Benda & A. Reiter; – 4 inds. (HMSC moz1, moz3, moz5, moz6 [S]), Mozdooran, 17 August 1968, leg. H. M. Steiner; – 1 ♂ (HNHM 2007.30.4. [S]), Qaranukh Kahul cave, 17 May 2006, leg. E. Sheikh-Jabbari & H. Sheikh-Jabbari; – 4 ♀♀ (NMP 48459–48462 [S+A]), Serizjan, 21 April 2000, leg. P. Benda & A. Reiter; – 12 ♂♂, 3 ♀♀ (HNHM 2000.6.1., 2008.37.3.–2008.37.6. [A], HNHM 2007.3.16.–2007.3.23., MHNG 1869.10A, 1869.10B [S]), Shirabad cave, October 1997, 1998, June 1999, 2008, leg. S. Ashrafi, S. Farrokhi, M. Peymani & H. Zohoori; – 1 ♂ (BMNH 20.2.9.18 [S+B], holotype of *Myotis myotis risorius* Cheesman, 1821), Shiraz, date unlisted, leg. J. Hotson; – 1 ♂ (NMP 93881 [S+A]), Tadovan cave, 7 October 2011, leg. M. Andreas, S. Ashrafi, P. Benda, K. Faizolahi, A. Reiter & M. Uhrin; – 1 ♂ (NMP 90799 [S+A]), Tahir Abad, 21 May 2006, leg. P. Benda & A. Reiter; – 8 ♂♂, 2 ♀♀ (NMP 48131–48137, 48142–48144 [S+A]), Takht-e Soleyman, 3 October 1998, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin. – **Kashmir**: 1 ♂ (BMNH 71.14 [S+A]), Achabal, Bahmajo Bat cave, date unlisted, leg. G. LePatourel; – 1 ♀ (ZFMK 97.137 [S]), Srinagar, August 1962, leg. E. Kollmann. – **Kirghizstan**: 1 ♀ (CUP ct84/254 [S+A]), Aravan, Čarvak, 20 August 1984, leg. J. Červený & I. Horáček; – 1 ♂ (CUP ct84/255 [S+A]), Aravan, Duvahan-Ungur cave, 21 August 1984, leg. J. Červený & I. Horáček; – 6 ♂♂, 1 ♀ (CUP ct84/279–84/281, NMP 58320/13, 58436/1, 58436/2, 58453 [S+A]), Aravan, Sasyk Ungur cave, 24 August 1984 & 11 July 1988, leg. J. Červený, A. Červená, I. Horáček & J. Obuch; – 1 ♀ (NMP 58455 [S+A]), Čauvaj, 26 June 1988, leg. J. Červený, A. Červená & J. Obuch; – 17 ♀♀ (NMP 58310/1–6, 58320/1–5, 58320/7, 58320/8, 58446, 58454, 58456 [S+A], 58320/6 [A]), Kadamžaj, 27 June 1988, leg. J. Červený, A. Červená & J. Obuch; – 3 ♂♂ (NMP 58340/1–3 [S+A]), Kara-Kokty, 13 July 1988, leg. J. Červený, A. Červená & J. Obuch; – 2 ♀♀ (NMP 59324 [S+A], 58310/7 [A]), Kyzyl-Kiâk, 30 June 1988, leg. J. Červený, A. Červená & J. Obuch; – 9 ♂♂, 5 ♀♀ (CUP ct84/361–84/374 [S+A]), Nižnaâ Serafimovka, Solânka cave, 29 August 1984, leg. J. Červený & I. Horáček; – 1 ♂ (CUP ct84/324 [S+A]), Oš, Sulejman, 26 August 1984, leg. J. Červený & I. Horáček; – 9 ♂♂ (CUP ct84/67–84/69, ct84/116–84/118, ct84/246–84/248 [S+A]), Oš, Toâ-Moûn, 2, 6 & 19 August 1984, leg. J. Červený & I. Horáček; – 27 ♂♂, 30 ♀♀ (CUP ct84/97–84/112, ct84/129–84/162, ct84/164–84/169 [S+A]), Oš, Toâ-Moûn, Ažidar-Ungur cave, 5 & 8 August 1984, leg. J. Červený & I. Horáček; – 8 ♂♂, 7 ♀♀ (CUP ct84/205–84/219 [S+A]), Oš, Toâ-Moûn, Barytovaâ cave, 9 August 1984, leg. J. Červený & I. Horáček; – 7 ♂♂ (NMP 58310/9, 58310/10, 58320/10–12, 58320/14, 58437 [S+A]), Samarkandyk, Kanigut, 2 July 1988, leg. J. Červený, A. Červená & J. Obuch. – **Tajikistan**: 1 ♂ (NMP 58472 [S+A]), Čarku, 3 July 1988, leg. J. Červený, A. Červená & J. Obuch; – 1 ind. (ZIN 32277 [S]), Kulâb, July 1941–1943, leg. B. Vinogradov & S. Stroganov; – 1 ♂ (ZIN 24389 [S]), Kzyl-Tam, Gissarskij range, 18 July 1933, leg. Vel’gišev. – **Turkmenistan**: 6 ♂♂, 13 ♀♀ (NMP 91587, 91601–91604, 91623–91636 [S+B]), Baharly

cave, 29 July 1964, leg. V. Hanák; – 7 ♀♀ (ZIN 63915–63921 [S]), Duşak, Kelat cave, 20 May 1967, leg. K. Babaev; – 2 inds. (ZIN 48479, 48480 [S]), Tagtabazar [= Tahta-Bazar], 25 June 1930, leg. K. Flerov. – **Uzbekistan**: 4 ♂♂ (NMP 91743–91746 [S+B]), Aman-Kutan, 9 June 1989, leg. M. Vykopalová; – 1 ♂, 1 ♀ (NMP 91456, 91457 [S+B]), Samarqand, 28 September 1963, leg. V. Hanák.

Myotis davidii (Peters, 1869)

Azerbaijan: 1 ♀ (NMP 49237 [S+B]), Acınohur, 27 June 1986, coll. V. Hanák; – 2 ♀♀ (ZIN 9018, 9019 [S+A]), Gănсă province, 1895, leg. K. Satunin; – 2 ♀♀ (ZIN 23506, 23507 [S+A]), Ağdaş, 30 July 1915, leg. K. Satunin; – 1 ind. (ZIN 5346 [S+A]), Kur river, Salyan, 1888, collector unlisted; – 1 ♀ (NMP 48521 [S+B]), Şəki district, 29 April 1976, leg. I. Rahmatulina. – **China, East Turkestan**: 2 inds. (ZIN 13915 [S], 98-1914-1 [S+A]), Ili [= Kul'dža], 6 & 20 June 1913, leg. P. Kozlov. – **Georgia**: 1 ♂ (ZIN 9287 [S+A]), Lagodehi, 25 July 1911, leg. K. Satunin. – **India**: 1 ♀ (BMNH 23.9.1.12. [S]), Chirot, Pattan, Lahul, Punjab, date & collector unlisted; – 3 ♂♂, 2 ♀♀ (BMNH 16.7.29.37–16.7.29.41 [S]), Hasimara, Duars, date & collector unlisted. – **Iran**: 1 ♀ (HNHM 2007.30.3. [S+A]), Ahmad Beiglu, 18 July 2006, leg. E. Sheikh-Jabbari & H. Sheikh-Jabbari; – 2 ♂♂ (NMP 48119, 48120 [S+A]), Bastam, 30 September 1998, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 1 ind. (NMP 93914 [S+Sk]), Qutur Su, 31 August 2010, leg. K. Faizolahi. – **Kashmir**: 1 ♀ (BMNH 26.3.1.1. [S+B]; holotype of *Myotis meinertzhageni* Thomas, 1926), Ladak, Nubra and Shiyok rivers junction, 17 June 1925, leg. R. Meinertzhagen. – **Kazakhstan**: 1 ♀ (ZIN 62510 [S+B]), 224 km by road between Georgievka and Zajsan, 6 August 1975, leg. P. Strelkov; – 4 ♀♀ (ZIN 68339, 68340, 68343, 68345 [S+B]), 75 km N of Saryšagan, 28 June 1979, leg. P. Strelkov; – 2 ♀♀ (ZIN 68334 [S+B], 68335 [S]), 80 km WSW of Mirnyj, 23 June 1979, leg. P. Strelkov; – 1 ind. (ZIN 49737 [S]), Ak-Ička, Kopal' district, 29 July 1916, leg. V. Šnitnikov; – 3 ♀♀ (ZIN 68515–68517 [S+B]), Akžajdas, 75 km E of Balkaš, 9 July 1980, leg. P. Strelkov; – 1 ♀, 1 ind. (ZIN 46040, 46868 [S+B]), Akžon, Dala desert, 17 June 1961, leg. N. Voroncov; – 1 ♀ (ZIN 68338 [S+B]), Balkaš lake, 16 km N of Mynaral, 25 June 1979, leg. P. Strelkov; – 2 ♀♀ (ZIN 69169, 69170 [S+B]), Karakul'tas, 80 km N of Aâgoz, 21 June 1982, leg. P. Strelkov; – 1 ind. (ZIN 5117 [S]), Mangyšlak, date unlisted, leg. K. Ber; – 2 ♀♀ (ZIN 68521, 68522 [S+B]), 25 km & 60 km SSW of Aâgoz, 13 July 1980, leg. P. Strelkov; – 1 ♂ (ZIN 69040 [S+B]), Tokrau river, Bektau-Ata, 10 June 1979, leg. V. Mazin; – 3 ♀♀ (ZIN 68518–68520 [S+B]), tomb 120 km E of Balkaš, 10 July 1980, leg. P. Strelkov; – 6 ♀♀, 1 ind. (ZIN 68322–68326, 68329, 68330 [S+B]), tomb 30 km N of Karabugut on theČu river, 21 June 1979, leg. P. Strelkov; – 2 ♀♀ (ZIN 68524, 68525 [S+B]), tomb 90 km NW of Uštobe, Karatal river, 24 & 25 July 1980, leg. P. Strelkov; – 1 ind. (ZIN 67-1917(34) [S]), south-eastern Kazakhstan [= Semirečenskaâ province], date & collector unlisted. – **Kirghizstan**: 1 ♂ (NMW 17407 [S+A]), Karakol [= Prževal'sk], 15 August 1900, collector unlisted; – 10 ♀♀ (ZIN 62172–62181 [S+B]), Semenovka, Grigorievka, Anan'evo, northern bank of Yssyk-kel lake, 15 July 1975, leg. P. Strelkov. – **Russia**: 1 ♂ (NMP 95308 [S+A]), Apšeronsk, 20 July 2008, leg. S. Gazarân; – 3 ♂♂ (NMP 95318–95320 [S+A]), Egerskaâ Karaulka, 8 August 2005, leg. S. Gazarân; – 1 ♀ (ZIN 69879 [S+B]), Ipatovo, 4 July 1983, collector unlisted; – 1 ♂ (ZIN 83623 [S+B]; holotype of *Myotis mystacinus caucasicus* Tsytsulina, 2000), Kiša forestry, Caucasus reserve, 19 June 1998, leg. B. Tuniev; – 1 ♀ (ZMMU S166219 [S+A]), Krinipovskoe, Tuapse district, 10 August 1998, leg. S. Kruskop & S. Apisimova; – 2 ♀♀ (NMP 95302, 95303 [S+A]), Kumtor-Kala, Dagestan, 22 June 2005, leg. S. Gazarân; – 1 ♂, 2 ♀♀ (ZMMU S9266, S46560, S46562 [S+B]; incl. holotype of *Myotis mystacinus aurascens* Kuzâkin, 1935), Kurkužin near Vladikavkaz, Caucasus, 11 May 1928, leg. A. Radyŝev; – 3 ♀♀ (ZIN 80847, 80848, 80850 [S+B]), road between Levokumskoe and Aleksandrovskoe, 15 June 1994, leg. P. Strelkov; – 1 ♀ (ZIN 78274 [S+B]), Malyj Irtyš, Novorossijsk district, 17 August 1990, leg. P. Strelkov; – 1 ind. (ZIN 4910 [S]), Mius district, date & collector unlisted; – 1 ♂ (ZIN 83771 [S+A], paratype of *Myotis mystacinus caucasicus* Tsytsulina, 2000), Ahmet-skala range E of Psebaj, January 1998, leg. S. Gazarân; – 1 ind. (ZMMU S5022 [S+B]), Tarasov district, 14 September 1926, collector unlisted; – 1 ♂ (ZMMU S29432 [S+B]), Tarasovka, 17 August 1925, leg. V. Raevskij; – 1 ♀ (ZIN 78288 [S+B]), Terek river, Kargaminskaâ, Groznyj–Kizlâr road, 6 June 1990, leg. P. Strelkov; – 1 ♀ (ZMMU S166220 [S+A]), Tuapse district, 12 August 1998, leg. S. Kruskop & S. Apisimova; – 1 ♂ (ZMMU S46564 [S]), northern Caucasus, 2 May 1928, leg. A. Radyŝev. – **Tajikistan**: 1 ♀ (ZMMU S9265 [S]; holotype of *Myotis mystacinus pamirensis* Kuzâkin, 1935), Âšikul lake, Pamirs, 27 August 1934, leg. R. Meklenburcev; – 1 ind. (ZIN 24392 [S+B]), Kzyl-Tam, northern slope of the Gissarskij range, 21 August 1933, leg. Vel'tišev; – 1 ind. (ZIN 23148 [S+B]), Pamirs, 1932, collector unlisted; – 1 ind. (ZIN 23147 [S+B]), Šidharv, Pamirs, 9 September 1932, leg. M. Rozanov. – **Turkey**: 1 ♂ (NMW 20644 [S+B]), Agzikarahan, 18 July 1975, leg. F. Spitzenberger; – 2 ♂♂ (NMW 34377, 34378 [S+B]), Akdamar island, Van lake, 18 July 1984, leg. F. Spitzenberger; – 1 ♀, 2 inds. (ZIN 9002, 9003, 9009, 9011 [S+A]), Aralik [= Aralyh], 6 September 1910, leg. K. Satunin; – 1 ♂, 1 ♀ (ZDNU 1998/101, 103 [S+B]), Beyşehir, 9–10 August 1998, leg. A. Karataş; – 1 ♂ (NMW 34379 [S+B]), Eski Van, 20 July 1984, leg. F. Spitzenberger; – 1 ♂ (OHC unnumbered [S+B]), a valley NW of Ispir, 4 August 1983, leg. O. von Helversen; – 1 ♀ (NMW 34375 [S+B]), Komus deresi, 16 July 1984, leg. F. Spitzenberger; – 2 ♂♂, 2 ♀♀ (NMW 37205–37208 [S+B]), Sardes in Sartmustafa, 21 August 1986, leg. F. Spitzenberger; – 1 ♀ (ZDNU 2003/38 [S+B]), Sarıkamış, 21 July 2003, leg. A. Karataş & F. Toprak; – 1 ♂ (ZDNU 2000/15 [S+B]), Selim, Sarıgün, 15 September 2000, leg. A. Karataş; – 1 ♂ (NMP 48094 [S+A]), Sirbasan, 10 September 1995, leg. P. Benda & I. Horáček; – 1 ♀ (OHC un-

numbered [S+B]), Taurus Mts. near Üçpınar, ca. 20 km E of Bozkir, 27 June 1986, leg. O. von Helversen; – 1 ♀ (NMW 34380 [S+B]), Tercan, 24 July 1984, leg. F. Spitzenberger; – 2 ♂♂ (NMP 47913, 47914 [S+A]), Van castle, 28 July 1992, leg. P. Benda. – **Turkmenistan**: 10 ♀♀ (NMP 48539, ZIN 56674–56682 [S+B]), Esenguli, 30 May 1970 & July 1964, leg. V. Hanák & P. Strelkov; – 2 ♂♂ (NMP 48538, ZMMU S29214 [S+B]; incl. holotype of *Myotis mystacinus transcaspicus* Ogneff et Heptner, 1928), Germab, Kopetdag, 12 June 1925 & 16 July 1964, leg. V. Hanák & S. Ognev. – **Ukraine**: 1 ♂ (ZIN 49555 [S+B]), Bolgrad, 5 August 1913, collector unlisted; – 1 ind. (ZIN 49554 [S]), Crimea, 26 June 1916, collector unlisted; – 3 ♂♂ (NMP pb4406, pb4407 [S+A], ZIN 45249 [S+B]; incl. holotype of *Myotis mystacinus popovi* Strelkov, 1983), Crimea, Kamenskoe, February 1961 & 17 September 2009, leg. P. Benda, S. Gazarân, A. Konstantinov & M. Uhrin; – 2 ♂♂ (ZIN 68508, 68509 [S]), Crimea, Karadag, June & July 1916, collector unlisted; – 3 ♂♂ (ZIN 9249–9251 [S+B], paratypes of *Myotis mystacinus popovi* Strelkov, 1983), Crimea, vicinity of Simferopol', 1889, collector unlisted; – 2 ♂♂, 4 ♂♂ (NMP pb4354–4358 [S+A], pb4359 [A]), Crimea, Čatyr-Dag Âjla, Suuk-Koba cave, 22 September 2009, leg. P. Benda, S. Gazarân & M. Uhrin; – 2 inds. (ZIN 8057, 9189 [S+B], paratypes of *Myotis mystacinus popovi* Strelkov, 1983), Crimea, Fersmanovo [= Tatajkoj], 1890, collector unlisted. – 1 ind. (ZMMU S29157 [S], paratype of *Myotis mystacinus popovi* Strelkov, 1983), Doneck province, 31 August 1926, leg. N. Kalabuhov; – 1 ♂, 2 ♀♀ (ZIN 78275– 78277 [S+B]), Kujuk-Tuk island, Sivaš bay, 12–13 August 1990, leg. P. Strelkov. – **Uzbekistan**: 1 ind. (ZIN 57301 [S+B]), 10 km of Metal, Ak-Dar'â river, 20 September 1959, collector unlisted; – 1 ind. (ZIN 31857 [S+B]), Džûjlângar, Toškent province, 25 June 1944, collector unlisted; – 1 ♀ (ZIN 57302 [S+B]), Far'gona, 23 September 1950, collector unlisted; – 1 ♀ (ZIN 31858 [S+B]), Havast, 15 June 1944, collector unlisted; – 2 inds. (ZIN 41678, 41679 [S+B]), Termiz, 14 June 1930, collector unlisted; – 1 ♀ (ZMMU S6819 [S]; holotype of *Myotis mystacinus sogdianus* Kuzâkin, 1934), Toškent, 14 September 1932, leg. A. Kuzâkin; – 1 ♀, 1 ind. (ZIN 41677 [S+B], NMP 48522 [S]), Toškent, 2 & 21 September 1935, leg. A. Kuzâkin.

Myotis mystacinus (Kuhl, 1817)

Azerbaijan: 1 ind. (NMP 48520 [S+B]), Qəbələ [= Kutakšen], 7 August 1935, leg. N. Vereŝagin; – 1 ♂ (NMP 48540 [S+B]), Xaçmaz district, 24 June 1975, leg. I. Rahmatulina. – **Georgia**: 1 ♂ (NMP 95301 [S+A]), Kvanša Mt., Bzibskij range (Abhaziâ), 8 August 2003, leg. S. Gazarân; – 1 ♂ (ZIN 9286 [S+A]), Lagodehi, 25 July 1911, leg. K. Satunin. – **Iran**: 4 ♂♂ (BMNH 63.1196–1198 [S], NMP 94105 [S+A]), Qutur Su, N of Mt. Sabalan, 21 August 1961 & 29 September 2011, leg. M. Andreas, P. Benda, A. Reiter, M. Uhrin & University of Wales Expedition. – **Russia**: 1 ♀ (ZIN 83008 [S+A], paratype of *Myotis mystacinus caucasicus* Tsytsulina, 2000), Adler, 16 July 1997, leg. K. Cyculina; – 1 ♂ (NMP 95311 [S+A]), Berkubinskaâ forest (Dagestan), 9 May 2008, leg. S. Gazarân; – 1 ♀ (NMP 95304 [S+A]), Èsto-Sadok, Krasnaâ Polâna, 16 September 2008, leg. S. Gazarân; – 3 ♀♀ (NMP 95321–95323 [S+A]), Gebeus Mt., Gešebs, 11 July 2007, leg. S. Gazarân; – 1 ♂ (NMP 95305 [S+A]), Guzeripl', June 2006, leg. S. Gazarân; – 1 ♀ (NMP 95332 [S+A]), Psezuapse river, 30 km, 23 August 2007, leg. S. Gazarân; – 1 ♀ (ZIN 9178 [S+A]), Stavropol', date & collector unlisted. – **Turkey**: 1 ♂ (ZIN 9004 [S+A]), Aralik [= Aralyh], 1901, leg. K. Satunin; – 1 ♂ (ZMB 53250 [S]), Mersin, date unlisted, leg. Siehe; – 1 ♂ (NMP 47915 [S+A]), Van, 28 July 1992, leg. P. Benda.

Myotis brandtii (Eversmann, 1875)

Georgia: 1 ♂ (ZIN 9253 [S+A]), Bakuriani, 9 July 1910, leg. K. Satunin. – **Russia**: 1 ♂ (NMP 95310 [S+A]), Dzyhra Lake, Ahštyr', 13 August 2002, leg. S. Gazarân; – 2 ♀♀ (ZIN 23490, 23491 [S+A]), Caucasus Mts., date unlisted, leg. Gorbunov; – 1 ♂ (ZIN 9260 [S+A]), Psebaj, date & collector unlisted; – 1 ♂, 1 ♀ (ZIN 78286, 78287 [S+B]), Pšiš river, between Oktâbrskij and Kurinskij, 30 May 1990, leg. P. Strelkov; – 1 ♂ (ZIN 80876 [S+B]), Teberda, Teberda river, 8 June 1994, leg. P. Strelkov. – **Turkey**: 3 ♀♀ (ZDNU 2001/124–126 [S+B]), Çamlıhemşin, Çat, 24 August 2001, leg. A. Karataş; – 1 ♀ (ZDNU 2002/23 [S+B]), Hacıbekir, Çeşka ruins, 12 April 2002, leg. H. Öztekin. – **Ukraine**: 1 ♂ (NMP pb4345 [S+A]), Crimea, Partizanskoe, 16 September 2009, leg. S. Gazarân.

Myotis alcathoe von Helversen et Heller, 2001

Russia: 1 ♀ (ZIN 69582 [S+A]), Aše, 20 July 1913, collector unlisted; – 1 ♂, 1 ♀ (NMP 95329, 95330 [S+A]), Aše, 21 August 2007, leg. S. Gazarân; – 6 ♂♂ (NMP 95309, 95324–95328 [S+A]), Fanagorijskoe, Bol'šaâ Fanagorijskaâ cave, 3 October 2007 & 30 September 2008, leg. S. Gazarân; – 5 ♀♀ (NMP 95313–95317 [S+A]), Gebeus Mt., Gešebs, 11 July 2007, leg. S. Gazarân; – 1 ♀ (ZMMU S10447 [S+A]), Gelendžik, 20 August 1927, leg. B. Obrazcov; – 1 ind. (ZMSO 263 [S+A]), Hosta river, Caucasus reserve, 8 July 1967, collector unlisted; – 2 ♀♀ (NMP 95307, 95312 [S+A]), Psekabs river, Thamaha, 24 May 2008, leg. S. Gazarân; – 1 ♂ (NMP 95331 [S+A]), Kalež, Tahira cave, 22 August 2007, leg. S. Gazarân; – 1 ♀ (NMP 95306 [S+A]), Utriš peninsula, 27 June 2007, leg. S. Gazarân; – 1 ♀ (ZIN 6031 [S+A]), Vladikavkaz, 1896, collector unlisted. – **Turkey**: 1 ♀ (NMW 30707 [S+A]), Kaçkar Dağı Mts., Artvin province, 1896, leg. A. Hacker; – 1 ♂ (OHC unnumbered [S]), Şohun Dere, 8 August 1983, leg. O. von Helversen.

Eptesicus serotinus (Schreber, 1774)

Armenia: 1 ind. (NMP 91577 [S+B]), environs of Erevan, 10 July 1947, collector unlisted. – **Azerbaijan**: 1 ♀ (ZIN 78429 [S]), Harmas, 9 July 1983, leg. I. Rahmatulina; – 30 ♂♂, 4 inds. (NMP 91276–91282, 91286, 91287, 91292, 91293, 91295, 91296 [S+A], 91314–91322, 91325, 91331, 91336, 91338, 91359, 91377, 91418, 91432, 91442–91444 [S+B], 91413 [S]), Qobustan, 20 & 21 June 1979, 19 & 20 June 1981, 18 & 19 June 1982, 20 June 1983, 7 June 1985, 20 June 1986, 22 & 23 June 1987, leg. D. Frynta, P. Mácha, J. Moravec, I. Rehák, P. Roth, T. Scholz, P. Škoudlín & M. Švátora; – 1 ♂ (ZIN 78428 [S]), Şabran [= Diviči], 7 May 1983, leg. I. Rahmatulina; – 2 ♀♀ (ZIN 35686, 35688 [S]), Vilâš-çay valley, Talysh Mts., 15 June 1945, leg. N. Vereŝagin. – **Georgia**: 3 ♀♀ (NMP 91557, 91559, 91561 [S+B]), Džali, 14 July 1964, leg. V. Hanák. – **Iran**: 3 ♂♂ (NMP 90864–90866 [S+A]), Ali Abad, 28 May 2006, leg. P. Benda & A. Reiter; – 1 ♂ (NMP 94109 [S+A]), Dashkasan, Dashkahul cave, 29 September 2011, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 1 ♀ (BMNH 77.840 [S+B]), Noushar, Caspian shore, 12 May 1974, leg. E. Etemad; – 1 ind. (BMNH 10.8.12.1 [S]), Foot of Elborz, N. side, Demavend, date unlisted, leg. G. Barrett-Hamilton; – 1 ind. (BMNH 63.1185 [S+A]), Qutur Su, Mount Sabalan, 21 August 1961, leg. Aberystwyth University Expedition; – 10 ♂♂ (NMP 90779–90786 [S+A], 90787, 90788 [A]), Rubat-e Sharaf caravanserai, 18 May 2006, leg. P. Benda & A. Reiter; – 1 ♂ (BMNH 77.841 [S+B]), Shehr Abad, 10 km N of Mashad, 21 August 1962, leg. E. Etemad; – 1 ♀ (BMNH 74.11.21.31 [S], holotype of *Vesperus Shiraziensis* Dobson, 1871), Shiraz, date unlisted, leg. W. I. Blanford; – 9 ♂♂ (NMP 90800–90806 [S+A], 90807, 90808 [A]), Tahir Abad, 21 May 2006, leg. P. Benda & A. Reiter; – 1 ♀ (BMNH 25.10.4.10 [S+B]), Zarghun, 2 July 1920, collector unlisted. – **Kazakhstan**: 4 ♂♂, 7 ♀♀ (NMP 91737–91741 [S+A], MUB 1.4.63–1.4.68, NMP 91736 [S+B]), Grodikovo, 3 June 1980, leg. J. Gaisler & V. Hanák; – 1 ♀ (NMP 91694 [S+B]), Almaty, Voznesenskij church, 5 July 1929, leg. Kolabrykov. – **Kirghizstan**: 2 ♂♂ (MUB 1.4.50, NMP 91722 [S+B]), Bishkek, 28 May 1980, leg. J. Gaisler & V. Hanák. – **Lebanon**: 1 ♀ (BMNH 61.419. [S+B]), American University Beirut, 6 June 1960, leg. R. E. Lewis. – **Russia**: 6 ♀♀ (ZIN 69912, 69913, 69917, 69918, 69920, 69922 [S]), Budennovsk, 5 July 1983, leg. P. Strelkov; – 1 ♂ (ZIN 82428 [S+A]), Caucasus reserve, Laura forestry, 29 July 1996, leg. K. Cyculina; – 1 ♂ (ZIN 48051 [S]), Limančak, Abrau-Dûrso, 19 June 1958, leg. B. Bazahov; – 2 ♀♀ (ZIN 78163, 78165 [S]), Mineralnye Vody, 1 June 1990, leg. P. Strelkov; – 1 ♂ (ZMMU S29296 [S+B], holotype of *Eptesicus serotinus intermedius* Ognev, 1927), near Vladikavkaz, 16 June 1923, leg. S. Ognev; – 1 ♀ (ZIN 48052 [S]), Podkumok, Kislovodsk, 18 June 1961, leg. G. Lukina; – 1 ♀ (ZIN 78166 [S]), Pâtigorsk, 2 June 1990, leg. P. Strelkov; – 3 ♀♀ (ZIN 78167, 78170, 78172 [S]), between Ŝelkovskaâ and Starogladovskaâ, 5 June 1990, leg. P. Strelkov. – **Syria**: 3 ♂♂ (NMP 48924–48926 [S+A]), Hayalien, 1 June 2001, leg. P. Benda; – 4 ♂♂ (NMP 48985, 48986, 48988 [S+A], 48987 [S+B]), Maalula, 30 April 2001, leg. J. Obuch; – 1 ♀ (NMP 48875 [S+A]), Safita, 29 May 2001, leg. M. Andreas, P. Benda, A. Reiter & D. Weinfurtová; – 2 ♂♂ (NMP 48058, 48059 [S+A]), Slinfeh, 29 June 1998, leg. M. Andreas, P. Benda & M. Uhrin. – **Turkey**: 2 ♂♂, 7 ♀♀ (NMW 37242–37246, 37272–37275 [S+B]), Alara Hani, 16 August 1986, leg. F. Spitzenberger; – 1 ♂ (NMP 90012 [S+A]), Tuz Gölü lake, 9 May 2001, leg. A. Reiter. – **Tajikistan**: 1 ♀ (NMP 91734 [S+B]), Dušanbe, 2 June 1980, leg. J. Gaisler & V. Hanák. – **Turkmenistan**: 2 ♂♂, 7 ♀♀ (NMP 91584–91586, 91663–91665, 91666–91668 [S+B]), Ašhabad, 28 & 30 July 1964, leg. V. Hanák; – 6 ♀♀ (ZIN 59995, 59996, 59998, 60001, 60003, 60004 [S]), 10 km E of the Duşak, 11 & 12 May 1973, leg. P. Strelkov; – 1 ♂ (ZIN 57952 [S]), Karabil', 15 May 1971, leg. P. Strelkov; – 2 ♀♀ (ZIN 60007, 60008 [S]), Karabil', Lekker well, 20 May 1973, leg. P. Strelkov; – 2 ♀♀ (ZIN 60011, 60012 [S]), Karabil', Išmet-Pest', 3 June 1973, leg. P. Strelkov; – 1 ♀ (ZIN 23723 [S]), Sehretabad [= Kuška], 13 June 1933, collector unlisted; – 4 ♀♀ (ZIN 56683, 56686, 56688, 56689 [S+B]), Morgunovka, Badhiz reserve, 30 April 1970, leg. P. Strelkov; – 1 ♀ (NMP 91682 [S+B]), Repetek, 2 August 1964, leg. V. Hanák. – **Uzbekistan**: 1 ♀ (ZIN 400-1930 [S+B]), Termez, 14 June 1930, collector unlisted.

Eptesicus pachyomus (Tomes, 1857)

Iran: 1 ♀ (NMP 48436 [S+A]), Dehbarez, 17 April 2000, leg. P. Benda & A. Reiter; – 3 ♂♂, 2 ♀♀ (NMP 48466–48470 [S+A]), Isin, 30 April 1977 & 2 May 1977, leg. B. Pražan. – **Kashmir**: 1 ♂ (BMNH 3.9.29.1. [S+B]), Kashmir, 7000 ft, 27 July 1903, leg. A. Ward; – 2 ♀♀ (BMNH 8.7.6.5., 8.7.6.6. [S+B]), Kashmir, Pahlgam, 7300 ft, 7 & 10 October 1903, leg. A. Ward. – **Pakistan**: 1 ♂ (BMNH 71.1578. [S+B]), Dunga Gali, Muree Hills, 13 April 1971, leg. T. Roberts. – **China**: 1 ♀ (NMP 90554 [S+A]), Daguping, Shaanxi, 17 September 2004, leg. P. Benda & P. Kaňuch; – 1 ♂, 1 ♀, 1 ind. (ZFMK 50.241–50.243 [S+B]), Kuatun, Fukien, 1 & 9 March 1938, leg. J. Klapperich; – 1 ♂, 1 ♀, 1 ind. (ZFMK 50.244–50.246 [S+B]), Shaown, 7 & 8 July 1937, leg. J. Klapperich.

Eptesicus gobiensis Bobrinskoj, 1926

Iran: 1 ♂, 2 ♀♀, 4 inds. (BMNH 63.1184., 63.1186., 63.1189., 63.1190. [S], NMP 90890–90892 [S+A]), Qutur Su, Mt. Sabalan, 21 August 1961 & 5 June 2006, leg. Aberystwyth University Expedition, P. Benda & A. Reiter. – **Kazakhstan**: 1 ♂ (ZIN 61694 [S+B]), Aryskumy desert, 27 km SSE of Mustafa, 25 July 1974, leg. I. Stogov; – 1 ♀ (ZIN 62247 [S+B]),

10 km NW of Čelkar, 18 June 1975, leg. P. Strelkov; – 1 ♂, 1 ♀ (ZIN 65104, 65121 [S+B]), Sarysu river, between Džilandy and Kense, 120 km SSE of Džezkazgan, 13 June 1977, leg. P. Strelkov; – 1 ♂ (ZIN 68618 [S+B]), Karakum meteorologic Station, Bokdok Valley, 180 km N of Džusaly, 21 June 1980, leg. P. Strelkov; – 6 ♀♀ (ZIN 62240–62242, 62244–62246 [S+B]), Žetybaj well, 150 km N of Kzyl-Orda, 5 & 8 June 1975, leg. P. Strelkov. – **Kirghizstan**: 6 ♀♀ (CUP CT84/24–29 [S+A]), Ala-Arča reserve, 30 July 1984, leg. J. Červený & I. Horáček.

Eptesicus nilssonii (Keyserling et Blasius, 1839)

Czech Republic: 1 ♂ (NMP 91133 [S]), Dlouhá Ves, Franz-Franz mine, 30 January 1959, leg. V. Hanák; – 1 ♀ (NMP 91144 [S+B]), Malé Karlovice, Tísňavy, 5 June 1973, leg. V. Bejček; – 4 ♂♂, 3 ♀♀ (NMP 91136, 91138, 91139 [S+B], 91123, 91124, 91126, 91127 [S]), Mariánská Hora, Bílá Desná mine, 24 February 1958, 13 February 1962 & 2 December 1964, leg. V. Hanák; – 1 ♂ (NMP 91128 [S]), Mikulov u Teplic, 13 March 1958, leg. V. Hanák; – 1 ♂ (NMP 91146 [S+B]), Orlické Záhoří, 10 February 1977, leg. P. Rybář; – 1 ♀ (NMP 91152 [S]), Pohorská Ves, Žofín forest, 16 June 1973, leg. V. Vohralík; – 1 ♀ (NMP 91140 [S]), Rokytnice v Orlických horách, Hanička fortress, 22 January 1965, leg. J. Sklenář; – 1 ♂ (NMP 91132 [S+B]), Suchá Rudná, 30 January 1959, leg. V. Hanák; – 1 ind. (NMP 91151 [S]), Šumava Mts., leg. J. Červený; – 2 ♀♀ (NMP 91121, 91122 [S+B]), Vrbno near Blatná, 4 & 5 June 1956, leg. V. Hanák; – 2 ♂♂ (NMP 91130, 91131 [S]), Zlaté Hory, Poštovní mine, 29 January 1959, leg. V. Hanák. – **Slovakia**: 2 ♀♀ (NMP 91135 [S+B], 91134 [S]), Demänovská Dolina, Dračia cave, 14 February 1961, leg. V. Hanák; – 2 ♂♂ (NMP 91142, 91143 [S+B]), Dobšiná, Dobšinská cave, 16 February 1968, leg. V. Hanák; – 1 ♂ (NMP 91145 [S+B]), Tatranská Javorina, Muránska cave, 13 December 1973, leg. J. Gaisler & V. Hanák.

Rhyneptesicus nasutus (Dobson, 1877)

Iran: 3 ♂♂ (BMNH 5.10.4.2, 5.10.4.4, 5.10.4.6 [S+B], type series of *Vespertilio matschiei pellucens* Thomas, 1905), Ahwaz, Karun river, 28 March 1905, leg. R. Woosnam; – 1 ♂, 2 ♀♀ (NMP 48437, 48438 [S+A], 48439 [A]), Chahar Dahaneh, 17 April 2000, leg. P. Benda & A. Reiter; – 1 ♂, 4 ♀♀ (NMP 48404–48408 [S+A]), Pir Sohrab, 12 April 2000, leg. P. Benda & A. Reiter. – **Iraq**: 1 ♀ (BMNH 19.3.1.2 [S+A], holotype of *Eptesicus walli* Thomas, 1919), Basra, date unlisted, leg. F. Wall; – 1 ♂ (BMNH 36.4.14.13 [S+B]), Zubier, Mesopotamia, 2 March 1921, leg. R. Cheesman. – **Oman**: 2 ♂♂ (NMP 93828, 94090 [S+A]), Al Ajal, 15 April 2011 & 5 April 2012, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♀ (NMP 93720 [S+A]), Al Rumayliyah, 31 March 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♀ (BMNH 68.1356 [S+B], holotype of *Eptesicus nasutus batinensis* Harrison, 1968), Harmul, 10 mls N of Sohar, 26 March 1967, leg. C. Seton-Browne; – 1 ♂ (NMP 93719 [S+A]), Muntasar, 30 March 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♀ (NMP 94077 [S+A]), Uwayfiyah, 3 April 2012, leg. P. Benda, A. Reiter & M. Uhrin. – **Saudi Arabia**: 1 ♂ (BMNH 48.350 [S+B]), near Jedda, 4 July 1948, leg. G. B. Popov; – 1 ind. (BMNH 34.8.8.1 [S+A]), Shanna, Arabia, date unlisted, leg. J. Philby. – **UAE**: 1 ♀ (NMP pb5737 [S+A]), Wadi Sahm, Fujairah, 31 October 2013, leg. P. Benda & M. Uhrin. – **Yemen**: 1 ♂ (BMNH 99.11.6.19. [S+B], holotype of *Vespertilio matschiei* Thomas, 1905), Jimel, W. Aden, 16 August 1899, leg. W. Dodson; – 1 ♂, 1 ♀ (NMP pb3708, pb3714 [S+A]), Wadi Zabid, 10 km SE of Al Mawkir, 30 October 2007, leg. P. Benda & A. Reiter.

Pipistrellus kuhlii (Kuhl, 1817)

Iran: 4 ♂♂, 3 ♀♀ (NMP 48116, 48369–48374 [S+A]), Arg-e Bam, 4 May 1997 & 8 April 2000, leg. P. Benda & A. Reiter; – 1 ♂ (NMP 48121 [S+A]), Bastam, 30 September 1998, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 5 ♂♂, 6 ♀♀ (NMP 48427–48431, 48433 [S+A], NMP 48425, 48426, 48432, 48434, 48435 [A]), Chah Reza, 16 April 2000, leg. P. Benda & A. Reiter; – 1 ♂, 1 ♀ (NMP 48190, 48191 [S+A]), Choqazanbil, 15 October 1998, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 1 ♂, 5 ♀♀ (HNHM 2007.3.7., 2007.3.8. [S+A], HNHM 2007.3.9.–2007.3.11., 2007.3.24. [A]), Qeshm island, Dafari pool, 11 April 2002, leg. H. Zohoori; – 1 ♂ (NMP 93862 [S+A]), Garmab, 30 September 2011, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 1 ♂ (NMP 93871 [S+A]), Hesar, 5 October 2011, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 2 ♀♀ (CUP i1, i2 [S+B]), Deh Zireh, 26 April 1996, leg. J. Sádlová; – 1 ♂ (HNHM 2007.30.7. [S]), Narkor near Pars Abad, 4 March 2005, leg. E. Sheikh-Jabbari & H. Sheikh-Jabbari; – 1 ♂ (NMP 48403 [S+A]), Pir Sohrab, 12 April 2000, leg. P. Benda & A. Reiter; – 1 ♀ (SMF 46398 [S+B]), Rafsanjan, 21 April 1974, leg. H. Felten & K. Walch; – 2 ♂♂, 1 ♀ (NMP 48455–48457 [S+A]), Sarvestan, 20 April 2000, leg. P. Benda & A. Reiter; – 1 ♀ (NMP 90792 [S+A]), Shurlaq, 18 May 2006, leg. P. Benda & A. Reiter; – 4 ♂♂ (SMF 34355–34357, 34362 [S+B]), Shush, 21 September 1957, collector unlisted; – 2 ♂♂ (NMP 48160, 48161 [S+A]), Si Mili, 11 October 1998, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 3 ♂♂ (NMP 90845–90847 [S+A]), Suzesh, 27 May 2006, leg. P. Benda & A. Reiter; – 1 ♂ (SMF 47843 [S+B]), Tabriz, 1970, leg. Herbst.

Nyctalus noctula (Schreber, 1774)

Albania: 4 ♂♂, 3 ♀♀ (NMP b262, b264, b266–b269 [S+B], b265 [S]), Shkodër, 20 October 1960, leg. V. Hanák; – 6 ♂♂, 1 ♀ (NMP b249, b254, b255, b257, b258, b260 [S+B], b256 [S+A]), Tiranë, 19 October 1960, leg. V. Hanák. – **Armenia**: 1 ♀ (NMP 91566 [S+K]), Ijewan, 24 May 1956, leg. P. Gambarân. – **Bulgaria**: 1 ♂, 1 ♀ (NMP 50148, 50149 [S]), Albena, 14 October 1965, leg. P. Beron; – 1 ind. (NMNHS unnumbered [S]), Dragalevci near Sofiâ, 7 August 1964, leg. P. Beron; – 4 ♂♂, 1 ♀ (NMP 49366, 49739–49741, 49768 [S+A]), Karlukovo, 6 July 1976, 6 & 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 ♂♂ (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 ♂ (NMP 49348 [S+B]), Petrič, 19 June 1957, leg. V. Hanák; – 1 ♀ (NMNHS unnumbered [S]), Bulgaria (undef.), 7 August 1969, collector unlisted. – **Czech Republic**: 1 ♀ (NMP 482/59 [S]), Břve, 1 May 1959, leg. P. Miles; – 1 ♀ (NMP 657/58 [S]), Číměř, Krvavý fishpond, 2 August 1958, leg. V. Hanák; – 1 ♀ (NMP 148/65 [S]), Horusice, Kvíčadlo Fishpond, 1 May 1965, leg. V. Hanák; – 10 ♂♂, 2 ♀♀ (NMP 29/74–35/74, 25/76, 28/76, 29/76, 8/77, 13/77 [S]), Horusice, Ruda forestry, 9 & 12 October 1974, 30 September 1976 & 24 August 1977, leg. V. Hanák; – 1 ♀ (NMP 853/58 [S]), Jindřichův Hradec, Kacležský fishpond, 1 October 1958, leg. B. Král; – 2 ♂♂, 4 ♀♀, 1 ind. (NMP 810/58, 811/58, 813/58, 814/58, 506/59, 740/59, 739/59, E122 [S]), Klec, Potěšil fishpond, 13 May 1957, 15 September 1958, 24 May & 4 July 1959, leg. V. Hanák; – 1 ♀ (NMP 49/75 [S]), Kolešovice u Rakovníka, 3 April 1975, ded. V. Hanák; – 1 ♂, 1 ♀ (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 ♂♂ (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 ♂ (NMP 37/74 [S]), Srbsko, 19 November 1974, leg. V. Bejček; – 1 ♂ (NMP 469/58 [S]), Stará Hlína u Třeboně, 27 October 1958, leg. V. Hanák; – 1 ♂, 1 ♀ (NMP P9, B58 [S]), Tchořovice, Velký Pálenec fishpond, 3 October 1955 & 5 June 1956, leg. V. Hanák. – **Germany**: 1 ♂ (ZFMK 35.240 [S+B]), Augsburg, 6 March 1924, leg. A. Fischer; – 1 ind. (ZFMK 82.239 [S+Sk]), Hambacher Forst near Köln, 6 June 1982, collector unlisted; – 1 ind. (ZFMK 35.241 [S+B]), Lohr am Mein, 21 March 1924, leg. A. Fischer; – 1 ♀ (ZFMK 46.294 [S+B]), Möggingen near Radolfzell, 14 January 1946, leg. Freiherr von Bodmann; – 1 ♂ (ZFMK 54.9 [S+B]), Pleisse/Wald nr. Leipzig, 22 January 1952, collector unlisted; – 1 ♀ (ZFMK 37.130 [S+B]), Reipzig near Frankfurt am Oder, 24 January 1936, leg. G. Stein; – 1 ♂ (ZFMK 2003.862 [S+B]), Villip, October 1999, leg. H. Roer. – **Greece**: 1 ♀ (NMP 49032 [S+A]), Anthiro, 31 August 2001, leg. P. Benda; – 1 ♂ (NMP 48695 [S+B]), Thassos island, Theologos, 25 June 1989, leg. R. Chaloupka, V. Hanák & V. Vohralík. – **Iran**: 5 ♂♂ (MHNG 1905.5A–1905.5E [S+A]), Bouchir, Brazjan, June 1968, leg. A. Arata. – **Kirghizstan**: 15 ♂♂ (MUB 1.4.43–1.4.49, NMP 91715 [S+B], NMP 91716–91721 [S+A]), Biškek, 28 May 1980, leg. J. Gaisler & V. Hanák. – **Lebanon**: 1 ♂ (BMNH 61.406. [S+B], holotype of *Nyctalus noctula lebanoticus* Harrison, 1962), Natural Bridge, Faraya, 29 July 1960, leg. R. Lewis. – **Serbia**: 2 ♂♂, 3 ♀♀ (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 ♂♂ (NMP 90626, 90627 [S+A]), Zlatno, Za Havraník valley, 2 August 2005, leg. P. Benda & M. Uhrin. – **Syria**: 2 ♂♂, 2 ♀♀ (NMP 48876–48877 [S+A], 48879 [S+B]), Safita, 29 May 2001, leg. M. Andreas, P. Benda, A. Reiter & D. Weinfurtová. – **Turkey**: 2 inds. (NMW H1998-14-3 [S]), Altinbeşik, Düdensuyu cave, 5–10 October 1998, leg. U. Passauer & H. Mixanig; – 1 ♂ (NMW 11739 [S+B]), Iğneada, 16 May 1967, leg. F. Spitzenberger; – 2 ♂♂, 1 ♀ (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. – **Ukraine**: 1 ♂ (NMP pb4284 [S+A]), Crimea, Naučnoe, 12 September 2009, leg. P. Benda, S. Gazarân & M. Uhrin. – **Uzbekistan**: 1 ♂ (NMP 91702 [S+B]), Farg'ona, 20 May 1980, leg. J. Gaisler & V. Hanák; – 1 ♀ (NMP 91692 [S+B], paratype of *Nyctalus noctula meklenburzevi* Kuzâkin, 1934), Toškent, 14 September 1932, leg. A. P. Kuzâkin.

Nyctalus plancyi (Gerbe, 1880)

China: 1 ♀ (NMP 90547 [S+A]), Bangfangzi, Shaanxi, 11 September 2004, leg. P. Benda & P. Kaňuch; – 1 ♂ (ZFMK 50.247 [S+B]), Kuatun, Fukien, 7 October 1938, leg. J. Klapperich; – 1 ♂, 1 ind. (ZFMK 50.248, 50.250 [S+B]), Shaown, Fukien, 2 June & 8 July 1937, leg. J. Klapperich; – 7 ♀♀ (NMP cn27–cn33 [S+A]), Zhu Jia Di, Yunnan, 9 April 2007, leg. P. Kaňuch & M. Uhrin.

Nyctalus leisleri (Kuhl, 1817)

Albania: 3 ♂♂ (NMP pb5989–pb5991 [S+A]), Krongj, Vrisit valley, 3 July 2015, leg. P. Benda, F. Spitzenberger, M. Uhrin & E. Weiß; – 1 ♂ (NMP pb5998 [S+A]), Zhulat, Kardhiqit valley, 5 July 2015, leg. P. Benda, F. Spitzenberger, M. Uhrin & E. Weiß; – 1 ♂ (NMP pb6008 [S+A]), Sinicë, Devollit valley, 7 July 2015, leg. P. Benda, F. Spitzenberger, M. Uhrin & E. Weiß. – **Bulgaria**: 1 ♂ (NMP 50034 [S+B]), Gorna Breznica, 19 July 1982, leg. I. Horáček & V. Vohralík. – **Cyprus**: 3 ♂♂, 1 ♀ (NMP 90411, 90412, 90901, 90902 [S+A]), Troodos forest, 2 km S of Troodos, 12 April 2005

& 22 July 2006, leg. P. Benda, V. Hanák & I. Horáček. – **Czech Republic**: 1 ind. (NMP 95110 [S+B]), Brno, 1 January 1973, leg. J. Gaisler; – 1 ♀ (NMP 95102 [B]), Hatě u Svinař, 30 April 1971, leg. V. Hanák; – 1 ♂ (NMP 95105 [S+B]), Klec, Potěšil fishpond, 24 August 1976, leg. V. Hanák; – 1 ♀ (NMP 10350 [S]), Lanžhot, July 1943, leg. J. Staněk; – 1 ind. (NMP 10348 [S]), Šumava Mts., date unlisted, coll. Lokay; – 1 ♀ (NMP 95101 [S+B]), Šumperk, 1 June 1967, leg. V. Hanák; – 2 ♀♀ (NMP 95103, 95104 [S+B]), Vracov u Hodonína, 10 August 1972, leg. V. Hanák; – 2 ♀♀ (NMP 95106, 95107 [B]), Žihobce, 23 August 1979, leg. V. Hanák; – 1 ♂ (NMP 95108 [B]), Žofín, 16 July 1974, leg. V. Hanák. – **Germany**: 1 ♂ (SMF 16181 [S]), Frankfurt am Main, 4 July 1956, collector unlisted; – 1 ♀ (SMF 66779 [S]), Holler, Unterwesterwald, 24 June 1985, leg. Forstdirekt. Volkening; – 1 ♂, 1 ♀ (SMF 23509, 23636 [S]), Kaiserslautern, 1963, leg. G. Preuß. – **Greece**: 3 ♂♂, 2 ♀♀ (NMP 49033–49037 [S+A]), Anthiro, 31 August 2001, leg. P. Benda; – 1 ♂, 1 ♀ (NMP 49038, 49039 [S+A]), Dimitra, 1 September 2001, leg. P. Benda; – 1 ind. (NMP 48739 [S+B]), Drakolimni lake, Tymphi Mts., 25 September 1988, leg. V. Hanák, Z. Roček & V. Vohralík; – 1 ♂ (NMP 48724 [S+A]), Kombotades, 9 September 1996, leg. M. Andreas, P. Benda & M. Uhrin; – 2 ♂♂ (NMP 49042, 49043 [S+A]), Papagianni, 2 September 2001, leg. P. Benda; – 1 ♂ (NMP 48631 [S+B]), Xanthi, 17 June 1989, leg. R. Chaloupka, V. Hanák & V. Vohralík. – **Iran**: 2 ♂♂, 2 ♀♀ (NMP 94099–94102 [S+A]), Kalaleh, 28 September 2011, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 2 ♂♂, 4 ♀♀ (NMP 90867–90871 [S+A], 90872 [A]), Ali Abad, 28 May 2006, leg. P. Benda & A. Reiter. – **Libya**: 1 ♂ (NMP 95063 [S]), Wadi Al Kuf, 5 km SW of Al Bayda, 1 May 1980, leg. V. Hanák & K. Hůrka. – **Morocco**: 1 ♂, 2 ♀♀ (NMP 90034, 94537, 94538 [S+A]), Bekrite, 28 August 2003 & 27 April 2008, leg. P. Benda, J. Červený, A. Konečný & P. Vallo; – 1 ♀ (NMP 93582 [S+A]), Derdara, 6 km SW of Chefchaouen, 2 October 2010, leg. P. Benda, A. Reiter, M. Ševčík & M. Uhrin; – 1 ♂, 2 ♀♀ (NMP 90100–90102 [S+A]), Oued El-Ammar, Sebt-des-AïtSerhrouchen, 9 September 2003, leg. P. Benda; – 1 ♀ (NMP 90026 [S+A]), Souk-Khemis-des-Beni-Arouss, Makhazen river, 25 August 2003, leg. P. Benda. – **Romania**: 1 ♀ (MSNG 27596 [S+B]), Zorleni, Valle del Barlad, Moldavia, December 1909, leg. A. L. Montandon. – **Slovakia**: 1 ♂ (ZMM ZM-448/75 [S+B]), Michalovce, 10 June 1974, leg. Š. Danko. – **Spain**: 1 ♂, 1 ind. (SMF 16188, 16189 [S]), Linares de Riofrio, Salamanca, 29 May & 25 June 1956, leg. H. Grün. – **Switzerland**: 1 ♀ (NMP 95109 [S+B]), Col de Bretolet, 6 September 1969, leg. V. Aellen. – **Turkey**: 2 ♀♀, 1 ind. (NMW 11733, 11734, 11741 [S+B]), Iğneada, 15 & 17 May 1967, leg. F. Spitzenberger; – 1 ♂ (NMP 47979 [S+A]), Abant Gölü, 14 June 1998, leg. M. Andreas, P. Benda & M. Uhrin; – 1 ind. (NMW H 1998-14-4 [S]), Altınbeşik, Düdensuyu cave, 5–10 October 1998, leg. U. Passauer & H. Mixanig; – 2 ♂♂ (NMP 47948, 47949 [S+A]), Velika Köprüsü, 31 August 1996, leg. M. Andreas, P. Benda & M. Uhrin. – **Ukraine**: 2 ♂♂ (NMP pb4367, pb4368 [S+A]), Crimea, General'skoe, 18 September 2009, leg. P. Benda, S. Gazarân & M. Uhrin; – 1 ♂ (NMP pb4318 [S+A]), Crimea, Laspi, 14 September 2009, leg. P. Benda, S. Gazarân & M. Uhrin; – 3 ♂♂, 1 ♀ (NMP pb4278, pb4282, pb4285 [S+A], pb4277 [A]), Crimea, Naučnoe, 11 September 2009, leg. P. Benda, S. Gazarân & M. Uhrin; – 1 ♂ (NMP pb4400 [S+A]), Crimea, Šebetovka, 21 September 2009, leg. P. Benda, S. Gazarân & M. Uhrin; – 1 ♀ (NMP pb4273 [S+A]), Crimea, Trudolûbovka, 10 September 2009, leg. P. Benda, S. Gazarân & M. Uhrin; – 3 ♂♂ (NMP pb4300, pb4301 [S+A], pb4299 [A]), Crimea, Uzundža, 13 September 2009, leg. P. Benda, S. Gazarân & M. Uhrin.

Plecotus strelkovi Spitzenberger, 2006

China, East Turkestan: 1 ♀ (ZIN 4929 [S+A]), Hot-tag (Russian range), May 1885, leg. N. Prževalskij; – 4 inds. (ZIN 13919, 13921–13923 [S+A]), Ûigun'-Bulak spring, northern slope of Russkij range, 13 May 1885, leg. N. Prževalskij. – **Kazakhstan**: 1 ind. (ZMMU S144924 [S]), Kainda, Kalbinskij Altai Mts., date unlisted, leg. K. Prokopov; – 1 ind. (ZMMU S84120 [S]), Zailijskij Alatau Mts., 21 August 1938, leg. S. Ognev. – **Kirghizstan**: 2 ♂♂, 2 ♀♀ (NMP 58858/1, 58858/2, 58897 [S+A], SMF 77804 [S]), Hajdarkan, Gauân cave, 22 May 1990, leg. J. Červený, A. Červená & J. Obuch; – 1 ♀ (NMP 58859 [S+A]), Oš, Bir-Uâ cave, 31 May 1990, leg. J. Červený, A. Červená & J. Obuch; – 1 ♂, 3 ♀♀ (NMP 58857/1–58857/3 [S+A], SMF 77801 [S]), Samarkandyk, Kanigut, 18 May 1990, leg. J. Červený, A. Červená & J. Obuch. – **Tajikistan**: 2 inds. (ZIN 5966, 5967 [S+A]), Darvaz, 1889, leg. B. Grombčevskij; – 1 ♂ (ZIN 22346 [S+B]), Dušanbe, 22 April 1932, collector unlisted; – 1 ♂ (ZIN 59414 [S+B]), Čorkuh, Isfara district, April 1963, collector unlisted; – 1 ind. (ZIN 77321 [S]), Petra Pervogo range, 6 July 1974, leg. S. Isakov; – 1 ♂, 1 ♀ (ZIN 69065, 69066 [S]), northern Tajikistan, 1976, leg. T. Habilov. – **Uzbekistan**: 1 ind. (ZMMU S4186 [S]), Samarqand, date & collector unlisted.

Plecotus wardi Thomas, 1911

Kashmir: 1 ♂, 1 ind. (BMNH 6.10.3.1., 6.10.3.2. [S+B], paratype and holotype of *Plecotus wardi* Thomas, 1911), Ladak, near Leh, 10,500 ft, 10 June 1906, leg. Grump & H. Ward.

Plecotus homochrous Hodgson, 1847

China, Tibet: 1 ♀ (BMNH 15.2.21.6. [S+A]), Palti lake [= Yamdok Tso], date unlisted, leg. E. Gerrard. – **Nepal**: 1 ind. (BMNH 54.9.1.1. [S+A], holotype of *Plecotus homochrous* Hodgson, 1847), Nepal, date unlisted, leg. B. Hodgson.

– **Pakistan**: 1 ♂ (BMNH 5.11.19.1. [S+B]), holotype of *Plecotus puck* Barrett-Hamilton, 1907), Murree, 7,500 ft, 20 August 1905, leg. Capt. Burrell.

Plecotus kozlovi Bobrinskoj, 1926

China, Tibet: 1 ♂ (ZIN 5239 [S+A], paratype of *Plecotus auritus kozlovi* Bobrinskoj, 1926), Bomyn-Gol river, eastern Qaidam, June 1895, leg. P. Kozlov & V. Roborovskij; – 2 ♂♂, 1 ♀ (ZIN 5306, 5309, 5311 [S+A], paratypes of *Plecotus auritus kozlovi* Bobrinskoj, 1926), Hyrma Barun'-Dzasaka, eastern Qaidam, May–August 1900, leg. P. Kozlov & A. Kaznakov; – 2 ♂♂ (ZIN 5879, 5880 [S+A], paratype and holotype of *Plecotus auritus kozlovi* Bobrinskoj, 1926), Hyrma Barun'-Dzasaka, eastern Qaidam, 11 & 25 June 1901, leg. P. Kozlov. – **China, Inner Mongolia**: 1 ♂, 1 ♀ (ZIN 13932, 14186 [S+A], incl. paratype of *Plecotus auritus kozlovi* Bobrinskoj, 1926), Hara-Hoto [= Khar Khot], Central Gobi, May–June 1909 & 6 June 1926, leg. P. Kozlov. – **Mongolia**: 1 ♀ (ZIN 14187 [S+A]), Ieè-borgo, S of Orok-Nor lake, Gobi Altai Mts., 24 May 1926, leg. P. Kozlov.

Plecotus turkmenicus Strelkov, 1988

Turkmenistan (type series of *Plecotus austriacus turkmenicus* Strelkov, 1988): 5 ♀♀ (ZIN 56661–56665 [S+B]), Bikebent, 75 km SSW of Bereket [= Kazandžik], May 1970, leg. P. Strelkov; – 1 ♂ (ZIN 53947 [S+A]), 200 km W of Daşoguz [= Tašauz], 1966, leg. V. Dmitrieva; – 1 ♂, 2 ♀♀ (ZIN 51382, 51383 [S+B], 51384 [S]; incl. holotype of *Plecotus austriacus turkmenicus* Strelkov, 1988), Kurgankyr, Sarygamyş depression, 240 km W of Daşoguz [= Tašauz], 7 June 1964, leg. V. Dmitrieva; – 1 ind. (ZIN 50701 [S+B]), Onhauz, 190 km SW of Daşoguz [= Tašauz], 29 July 1963, leg. V. Dmitrieva; – 1 ind. (ZIN 58495 [S+B]), Polvankyr, 240 km ENE of Türkmenbaşy, 17 April 1960, leg. V. Efrimov.

Plecotus macrobullaris Kuzâkin, 1965

Armenia: 1 ♀ (ZIN 72366 [S+A]), Mormarik river near Ankovan, 8 August 1971, leg. E. Âvruân & L. Saharân; – 1 ♂ (ZIN 21442 [S+B]), Tel', northern bank of Sevan lake, 15 November 1931, leg. A. Argiropulo. – **Azerbaijan**: 1 ♂ (MUB 1.2.103 [S+B]), Kəlvəz [= Kâl'vâz], Lerik district, 9 July 1968, leg. I. Rahmatulina. – **Georgia**: 1 ♂ (ZIN 8699 [S+A]), Ahalkalaki, 1894, leg. Âblokov. – **Iran**: 2 ♂♂, 6 ♀♀ (NMP 90767–90774 [S+A]), Aftar, 14 May 2006, leg. P. Benda & A. Reiter; – 2 ♂♂, 5 ♀♀ (NMP 48123–48127, 48129 [S+A], 48128 [S+B]), Choplu, 2 October 1998, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 1 ♂ (NMP 94110 [S+A]), Dashkasan, 29 September 2011, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 1 ♂ (HNHM 2009.46.3. [S+A]), Golgik cave, 11 May 2009, collector unlisted, don. F. Hemmati; – 1 ♂ (HNHM 2007.52.1. [S]), Qaranuh Kahul cave, 10 December 2005, collector unlisted; – 4 ♂♂ (NMP 48138–48141 [S+A]), Takht-e Suleyman, 3 October 1998, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin. – **Russia**: 1 ind. (ZMMU 96545 [S+A], paratype of *Plecotus auritus macrobullaris* Kuzâkin, 1965), near Vladikavkaz, summer 1914, leg. L. Bëma; – 2 ♂♂, 1 ♀ (ZIN 72326–72328 [S+B]), Zaramag, Alagir district, 25 June 1957, leg. E. Fasler, Lysenko & D. Sokolova. – **Syria**: 1 ♀ (MNHN 1983-1996 [S+A]), Djéroud, 1908, leg. H. Gadeau de Kerville; – 1 ♂, 5 ♀♀ (NMP 48989, 48990, 48992–48994 [S+A], 48991 [S+B]), Maalula, 30 April 2001, leg. J. Obuch; – 2 ♂♂, 3 ♀♀ (NMP 48849–48853 [S+A]), Ras al Ain, 22 May 2001, leg. M. Andreas, P. Benda & A. Reiter; – 2 ♀♀ (NMP 48052, 48053 [S+A]), Yabroud, 26 June 1998, leg. M. Andreas, P. Benda & M. Uhrin. – **Turkey**: 1 ♀ (NMP 47911 [S+A]), Van, 28 July 1992, leg. P. Benda.

Miniopterus pallidus Thomas, 1907

Iran: 1 ♂ (NMP 93874 [S+A]), Bishapur, 6 October 2011, leg. M. Andreas, S. Ashrafi, P. Benda, K. Faizolahi, A. Reiter & M. Uhrin; – 2 ♂♂, 1 ♀ (NMP 48149–48151 [S+A]), Bisotun, 8 October 1998, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 1 ♂ (NMP 93860 [S+A]), Dashkasan, Dashkahul cave, 29 September 2011, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 1 ♂ (NMP 93869 [S+A]), Hesar, 5 October 2011, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 2 ♂♂ (NMP 93912, 93913 [S+A]), Karaftu cave, 18 October 2011, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 1 ♂ (HNHM 2007.30.8. [S]), Kojanagh cave, 31 May 2007, leg. E. Sheikh-Jabbari & H. Sheikh-Jabbari; – 1 ♂ (NMP 48154 [S+A]), Lenje Abad, 8 October 1998, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 1 ♀ (NMP 93865 [S+A]), Meymand, 4 October 2011, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 7 ♂♂ (NMP 90825–90830 [S+A], 90831 [A]), Mina, 22 May 2006, leg. P. Benda & A. Reiter; – 1 ♀ (NMP 93902 [S+A]), Mormori, 16 October 2011, leg. M. Andreas, P. Benda, A. Reiter & M. Uhrin; – 1 ♀ (HNHM 2000.63.7. [A]), Sanandaj, 11 September 1998, leg. M. Szatyor; – 1 ♀ (HNMH 2007.3.15. [S]), Shirabad cave, October 1997, leg. S. Ashrafi, M. Peymani & H. Zohoori; – 1 ♂ (NMP 93882 [S+A]), Tadovan cave, 7 October 2011, leg. M. Andreas, S. Ashrafi, P. Benda, K. Faizolahi, A. Reiter & M. Uhrin. – **Turkmenistan**: 15 ♂♂, 35 ♀♀ (NMP 91588–91597, 91607–91616, 91618–91622, 91637–91643, 91646–91662 [S+B], 91617 [S]), Baharly, Baharly cave, 29 July 1964, leg. V. Hanák.

Nyctinomus aegyptiacus Geoffroy, 1818

Algeria: 1 ♂ (BMNH 66.4081 [S]), Beni Abbes, date unlisted, leg. E. Johnson. – **Egypt**: 2 inds. (BMNH 3.6.3.3., 3.6.3.4. [S+B]), Abu Roach, 31 Mach 1903, leg. Capt. S. Flower; – 5 ♂♂ (NMP 91995–91999 [S+B]), Bir Kohila, Qattar Mts., 30 May 1984, leg. D. Osborn; – 1 ♂ (NMP 92001 [S+B]), Bir Nagat, Qattar Mts., 2 June 1984, leg. D. Osborn; – 1 ind. (MNHN 1986-1084 [S+B], lectotype specimen of *Nyctinomus aegyptiacus* Geoffroy, 1818), Egypte, date & collector unlisted. – **Iran**: 1 ♂, 2 ♀♀ (NMP 48400–48402 [S+A]), Pir Sohrab, 12 April 2000, leg. P. Benda & A. Reiter. – **Morocco**: 1 ♂ (NMP 90065 [S+A]), Anagam, Oued Drâa, 31 August 2003, leg. P. Benda. – **Pakistan**: 1 ♂, 1 ♀ (BMNH 15.11.1.50., 15.11.1.51. [S+B]; type series of *Tadarida sindica* Wroughton, 1919), Kashmor, Sind, 6 March 1915, leg. S. H. Prater. – **South Sudan**: 2 ♂♂ (NMW 8406 [A], 8407 [S+A], type series of *Nyctinomus tongaënsis* von Wettstein, 1916), Tonga am Weißen Nil, 16 April 1916, leg. O. von Wettstein. – **Yemen**: 2 ♂♂ (NMP pb3603, pb3604 [S+A]), Kadamat Al Abali, 24 October 2007, leg. P. Benda & A. Reiter; – 2 ♀♀ (BMNH 54.1018, 54.1019 [S+B]), Thukmein, Hadramaut, 13 May 1953, leg. G. Popov.

Nyctinomus thomasi (Wroughton, 1919)

India: 2 ♂♂, 2 ♀♀ (BMNH 12.10.4.30.–12.10.4.33. [S+B], type series of *Tadarida thomasi* Wroughton, 1919), Bhuj, Cutch, 25 September 1911, purch. Bombay Natural History Society; – 2 ♂♂, 3 ♀♀ (BMNH 19.6.3.20.–19.6.3.25. [S+B], type series of *Tadarida gossei* Wroughton, 1919), Sasson Hospital, Poona, India, 13 March – 1 April 1918, leg. Capt. P. H. Gosse. – **Oman**: 3 ♀♀ (NMP 92737, 92738 [S+A], 92739 [A]), Ain Tabruq, 28 October 2009, leg. P. Benda, A. Reiter & M. Uhrin; – 4 ♂♂, 7 ♀♀ (NMP 92668–92677 [S+A], 92678 [A]), Al Nakhar, 22 October 2009, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♀ (NMP 92656 [S+A]), Dhahir Al Fawaris, 21 October 2009, leg. P. Benda, A. Reiter & M. Uhrin; – 3 ♂♂, 3 ♀♀ (NMP 93762, 93764–93766 [S+A], 93763, 93767 [A]), Ghab, Wadi Al Hawasina, 7 April 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 3 ♀♀ (NMP 92775, 92777 [S+A], 92776 [A]), Muqal, 1 November 2009, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♂ (NMP 93795 [S+A]), Rawdah, 10 April 2011, leg. P. Benda, A. Reiter & M. Uhrin; – 1 ♂, 3 ♀♀ (NMP 92631 [S+A], 92632–92634 [A]), Wadi Bani Awf, 18 October 2009, leg. P. Benda, A. Reiter & M. Uhrin. – **Yemen**: 2 ♂♂, 1 ♀ (NMP pb3106–pb3108 [S+A]), Hammam Ali, 27 October 2005, leg. P. Benda; – 6 ♂♂, 6 ♀♀ (NMP pb2982–pb2984, pb2986–pb2990, pb2992, pb2993 [S+A], pb2985, pb2991 [A]), Hauf, 12 & 13 October 2005, leg. P. Benda; – 1 ♂, 3 ♀♀ (NMP pb3133–pb3136 [S+A]), Jebel Bura, 30 October 2005, leg. P. Benda.