Notes on some bats from the Near East (Mammalia: Chiroptera)

By I. A. Nader and D. Kock

Forschungsinstitut Senckenberg, Frankfurt a. M.

Receipt of Ms. 6. 10. 1982

Abstract

Studied or listed are additional records of *Rhinolophus ferrumequinum* from Iraq and Turkey, *Asellia tridens* and *Pipistrellus kuhli* from Syria, *Eptesicus bottae innesi* and *P. rueppelli* from Egypt, *E. bottae anatolicus* from Turkey, *Otonycteris hemprichi* from Arabia, Iraq, Palestine, Libya and Tunisia. The occurrence of *Plecotus austriacus* is definitely established in Turkey.

Introduction

Our knowledge of the bat fauna in the Near East was summarized for Arabia by Harrison (1964, 1972: App. IV). Nader (1975, 1982) presented additional information on Saudi Arabian species. Recent accounts of the bats of Turkey are Kumerloeve (1975) and Felten (1977), for Egyptian bats the paper of Gaisler et al. (1972) and finally Atallah (1977) for the East-Mediterranean.

During the past years a number of bat specimens have been studied in several scientific collections. They include noteworthy records for eight taxa from the Near East, which help for a better understanding of their distribution and the poorly known taxonomic relationships.

Abbreviations

Measurements: Head and body = HB; tail = T; hind foot = HF; ear = E; length of forearm = FA; tibia = Tb; Greatest length of skull = Crn; condylobasal length = Cbl; zygomatic breadth = Zyg; breadth of braincase = Br; interorbital breadth = Ior; breadth across canines = C^1–C^1; breadth across molars = M^3–M^3; maxillary toothrow = C^1–M^3; mandibular toothrow = C_1–M_3; condylar length of mandible = Mand; alcohol preserved specimen = alc.

Rhinolophus ferrumequinum irani (Cheesman, 1921)

1921 *Rhinolophus ferrumequinum irani* Cheesman, J. Bombay nat. Hist. Soc. 27, 35; Shiraz, 5200 ft., S-Iran.

Material: Iraq: Shalahedin (Hotel Pirman), 36° 21′ N – 44° 10′ E, Erbil Liwa, 10. X. 1954; ♀ (skull, skeleton) FMNH 84499, leg. C. A. Reed.

Comparative material: Israel: Haifa, 1880; ♀ (skull, alc) SMF 17506, leg. H. Simon (cf. Felten 1977). Jordan: Zerka River, 1886; ♂ (skull, alc) SMF 17508, leg. G. Schumacher (cf. Felten 1977). Turkey: Sultanhani, Vil. Niğde, 28. VIII. 1975, 1 ♂ad 1 ♂subad 9 ♀ad 2 ♀subad (13 skulls, 13 skins) Coll. Issel, leg. B. & W. Issel.

Measurements (FMNH 84499, rostrum damaged): Zyg 12.0; Br 10.4; Ior 3.0; C^1–M^3 8.5; C_1–M_3 8.8; Mand 15.5.

U.S. Copyright Clearance Center Code Statement: 0044-3468/83/4801-0001 $ 02.50/0
Z. Säugetierkunde 48 (1983) 1–9

ISSN 0044-3468 / InterCode: ZSAEA 7

we regard to be *ikhwanius*. In two of the Syrian specimens with I^1 present, this tooth is unicuspid and none of three had lost PM^1 (cf. Kock 1972).

The two ♀♀ from al Hamza which were collected on 4. May had two embryos each. Harrison (1964: 158) reported two pregnant ♀♀ collected on 25. March from Shaiba in S-Iraq with one embryo each. Al-Robaae (1966: 197) also found pregnant ♀♀ in full term in the middle of March in Iraq, no exact locality was given. Thus, reproduction of this species in the Near East seems to take place in spring.

The specimens examined give additional locality records, however all are within the distributional range as outlined by Kock (1972: fig. 5). The specimens from Shush in the SMF reported by Kock (1972: 211) from Iraq are actually from S-Iran; the mistake was due to mislabeling of the specimens.

Eptesicus bottae innesi (Lataste, 1887)

1887 *Vesperugo (Vesperugo) innesi* Lataste, Ann. Mus. civ. Stor. nat. Genova (2) 4, 625; Cairo, Egypt.
1902 *Vespertilio innesi*, Anderson and DeWinton, Mammals Egypt, 121.
1919 *Eptesicus innesi*, Thomas, Ann. Mag. nat. Hist. (9) 4, 350.
1951 *Eptesicus isabellinus innesi*, Ellerman and Morrison-Scott, Checklist Palaearctic Indian Mamm. 1758 to 1946, 156.
1964 *Eptesicus bottae innesi*, Harrison, Mamm. Arabia 1, 140.

Material: Egypt: Cairo, III. 1891; ♂ (skull, alc) ZMH 22078, leg. Dr. Franz Stuhlmann (cf. Noack 1891: 67, without exact locality).

Comparative material: *E. bottae ognevi* Bobrinskii, 1918: USSR, W-Kazakhstan: nw. Ak Tau (White Mts.) e. Lake Kaspi, Kara Tau, 21. V. 1941; ♂ (skin) Zool. Inst. Alma Ata Univ. 1/4926. Polnostrov, Mangyshlak, e. Lake Kaspi, 21. V. 1947; ♀ (skull, skin) Zool. Inst. Alma Ata Univ. 25/4992. Turkmenia: Ashkhabad region, IV. 1971; ♂ (skull, skin) Zool. Mus. Moscow 90955.

E. b. hingstoni Thomas, 1919: see Felten (1971) for SMF-specimens from Iraq.

E. bobrinskoi Kuzyakin, 1935: USSR, Kazakhstan: Sazik-Bulak, Betpagdala desert, 12. VIII. 1938; sex? (skin) Zool. Inst. Alma Ata Univ. 3/4943. Betpagdala desert, 1928; 2 sex? (2 skins) Zool. Inst. Alma Ata Univ. 2/4942, K 941. Western Betpagdala, 15. V. 1950; ♂ (skin) Zool. Inst. Alma Ata Univ. 27/16317. 30 km n. Irgis, 9. VI. 1956; sex? (skull) Zool. Mus. Moscow 60608. 10 km from mouth of Emba River, n. Lake Kaspi, 1. VII. 1952? ♂juv ♀juv (1 skull, 2 skins) Zool. Inst. Alma Ata Univ. 4/6809, 6/6811.

Measurements: *E. b. innesi:* HF 7.3; E 13.4; FA 40.3. Cbl 15.2; Zyg 10.35; Br 7.6; Ior 3.9; C^1–C^1 4.85; M^3–M^3 7.0; C^1–M^3 5.7; C_1–M_3 6.3; Mand 11.7.

E. b. ognevi (selected): FA 40.7–44.6; n2: 42.7; Tb 16.6–16.7. Crn 16.1–17.2, n2: 16.7; Cbl 15.6–17.1, n2 16.4; Zyg 10.65; Ior 3.7–3.8; Mand 11.8–12.7, n2: 12.25.

E. bobrinskoi (selected): FA 32.7–36.0, n5: 34.4. Crn 14.65; Cbl 14.55; Ior 4.1; Mand 10.5.

Remarks

There exists a surprising confusion about the actual number of *E. b. innesi* specimens available in collections. The following summary gives a total of eight specimens known of this rare subspecies:

1–2: Lataste (1887), Anderson and DeWinton (1902), Thomas (1919), Flower (1932), Setzer (1952), Harrison (1963): ♂ ♀, Cairo, leg. W. Innes 1885.

3: Noack (1891), Anderson and DeWinton (1902): ♂, Egypt (= Cairo, see above), leg. F. Stuhlmann, III. 1891.

4: Wassif (1962): ♂, Abu Rawash w. Cairo, VIII. 1948.

5–7: Harrison (1963): additional ♂ ♀, Cairo (catalogued in BM in 1903); ♀, Wadi Araba, Yotvata, 22. IV. 1962.

8: Makin (1976, 1977): Ein Geddi.

The forearm and skull measurements taken by us agree well with those published for *innesi* (partim Wassif 1962; Harrison 1963).

This subspecies apparently forms an isolated population, mainly in the Cairo area with records from Yotvata and Ein Geddi in Israel (Makin 1977). Being smaller than *E. b. hingstoni* (see below) and recorded in this region in March, April and August it may be

excluded that this summer population belongs to a migratory group of *E. bottae* from the north.

Eptesicus bottae anatolicus Felten, 1971

v. 1971 *Eptesicus anatolicus* Felten, Senckenbergiana biol. **52** (6), 371; Alanya, coast of S-Anatolia, Vil. Antalya, Turkey.
1976 *Eptesicus bottae anatolicus,* Harrison, Mammalia **39** (3), 417.
1980 *Eptesicus bottae anatolicus,* DeBlase, Fieldiana Zool. (NS) **4**, 192.

Material: Turkey: Old Fort of Kalesi, nr. Anamur, Vil. Mersin, 3. IX. 1975; ♀ ad (skull, skin) Coll. W. Issel, leg. B. & W. Issel.

Measurements: HB 63; T 54; HF 9; E 18; FA 47. Crn 18.8; Cbl 17.8; Zyg 12.5; Br 9.1; Ior 4.2; C^1–M^3 6.6; C_1–M_3 7.9; Mand 14.1.

Remarks

Harrison (1976) and DeBlase (1980) regarded *E. anatolicus* as a subspecies of *E. bottae* Peters, 1863. This conclusion is based on similarities of colour and dimensions of the type to specimens examined from several localities within the region of Iraqi Kurdistan (Harrison 1964, 1976) southwest to Fars/Iran (DeBlase 1980). The present specimen is slightly larger than the type, however it falls within the range of measurements given by DeBlase (1980: 195). The new locality is close to (about 90 km se.) the type locality. Kumerloeve (1982) mentions two specimens from near Ceyhan, Vil. Adana, collected in 1976.

From the available measurements there seems to be a cline in size from the small *b. innesi* (see above) to the larger *hingstoni* Thomas, 1919 (see Felten 1971) and the even larger *anatolicus*. The additional size data now available for *anatolicus* brings it close to *sodalis* Barrett-Hamilton, 1910 (cf. Hanák and Gaisler 1971; DeBlase 1980).

Plecotus austriacus (Fischer, 1829)

1829 *Vespertilio auritus austriacus* Fischer, Synops. Mamm., 117; Vienna, Austria.

Material: Turkey: Karain Cave, about 30 km n. Antalya, 5. IX. 1975; ♂ (skull, skin) Coll. Issel, leg. and det. B. & W. Issel.

Measurements: HB 46; T 49; HF 8; E 38; FA 38. Crn 16.6; Cbl 15.4; Zyg 8.7; Br 8.1; Ior 3.5; C^1–M^3 5.4; C_1–M_3 5.8; Mand 10.8.

Remarks

P. austriacus (Fischer, 1829) has been differentiated from its sibling species *P. auritus* (Linnaeus, 1758) on the bases of skull size, bullar length and baculum shape (Lanza 1960; Hanák 1966).

The specific identity of *Plecotus* in Turkey is still uncertain. DeBlase and Martin (1974) regarded all *Plecotus* specimens known from Turkey (Kars region; Antakya; nr. Istanbul) to belong to *auritus*. However, Kumerloeve (1975) was not sure whether both *auritus* and *austriacus* or only one of them occur in the country. Although Harrison (1964) indicated in his distribution map (fig. 89) that the specimen from "Antakya" is referable to *austriacus*, he did not state whether he has examined any specimen from Turkey. To our knowledge, the specimen examined is the first confirmed record of *P. austriacus* from Turkey. With the one specimen available to us, no attempt was made to assign a subspecific identity to it at the present time.

Otonycteris hemprichi Peters, 1859

1859 *Otonycteris hemprichii* Peters, Mber. k. preuss. Akad. Wiss. Berlin 1859, 223; type locality not given; restricted by Kock (1969: 215) to the Nile valley between north of Aswan, Egypt and Chondek, N-Sudan.

Material: Iraq: Uruq (Warka), holocene; right mandible, SMF 82/309. Chemchemal-Jarmo Valley, Kirkuk Liwa, 8. IV. 1955; ♂ (skull, alc) FMNH 84515, leg. C. A. Reed. Arabia: no loc., 1938; 1 ♂ 5 ♀ (4 skulls, 6 alc) FMNH 48834–9, leg. H. St. J. Philby. Palestine: nr. Jerusalem, 1882–1884; sex? (skull, skin) FMNH 44777, leg. S. Merrill. Turkey: Birecik, Vil. Gaziantep, 11. V. 1972; ♂ (skull, skin) ZFMK 72.140, leg. U. Hirsch (Kumerloeve 1975). Egypt: Giza nr. Cairo, IV. 1971; ♂ (alc) SMF 40649, ded. Namru-3. Sakkara, Giza, 29. V. 1951; ♀ (alc) FMNH 79212, leg. H. Hoogstraal. Imbaba, Abu Rawash, 10. VI. 1953; 1 ♂ 4 ♀ (alc) FMNH 74480-4, leg. H. Hoogstraal. Abu Rawash, 19. VII. 1977; ♀ (skull, skin) Coll. Issel, leg. Groschaft. Fayum, 25. VII. 1971; ♂ (skull, skin) Coll. Issel, leg. Groschaft. Libya: Bahr el Tubat, 29° 36′ N – 24° 53′ E, 21 km ese. Giarabub, 29. V. 1962; ♂ ♀ (2 skulls, 2 skins) USNM 325011-2, leg. G. L. Ranck. Tunisia: Gorge of Seldja, 34° 21′ N – 08° 19′ E, ne. El Hamma el Djerid, 1. IX. 1972; ♂ (skull, skin) Coll. Issel, leg. B. & W. Issel.

Measurements: Since this bat is rare in the Middle East, and not many measurements available in literature, those of the specimen from Iraq (FMNH 84515) and the one from Turkey (ZFMK 72.140) are given, respectively: T –, 50; HF 11.8, 11.5; E 30.3, –; FA 58.6, 57.5. Crn 22.0, 23.2; Cbl 20.8, 21.7; Zyg 13.6, 14.2; Br 10.7, 10.9; Ior 4.4, 4.6; C^1-M^3 7.5, 7.7; C_1-M_3 8.1, 8.6; Mand 15.5, 16.4.

Remarks

Kock (1969: 184) did not find any indication that subspecies can be defined within *hemprichi* by differences in size of ears, third fingers or skull measurements. Colouration seems equally inadequate for a subspecies definition. The Tunisian specimen examined is of an extremely light colour without any brownish tinge of the hair tips and with transparent wing membranes. Our preliminary impression that this might represent the Saharan subspecies, described as *Plecotus auritus saharae* Laurent, 1936 (loc. typ.: El Goléa), had to be discarded as this taxon has at least a brownish tinge on its fur. Other Saharan specimens are of a sand colour (Heim de Balsac 1936).

Distribution

The known range of the species is mapped (Fig.) from the following sources, including the specimens examined: Kock (1969: 186), Fain (1959) for Tunisia, Fairon (1980) for Niger,

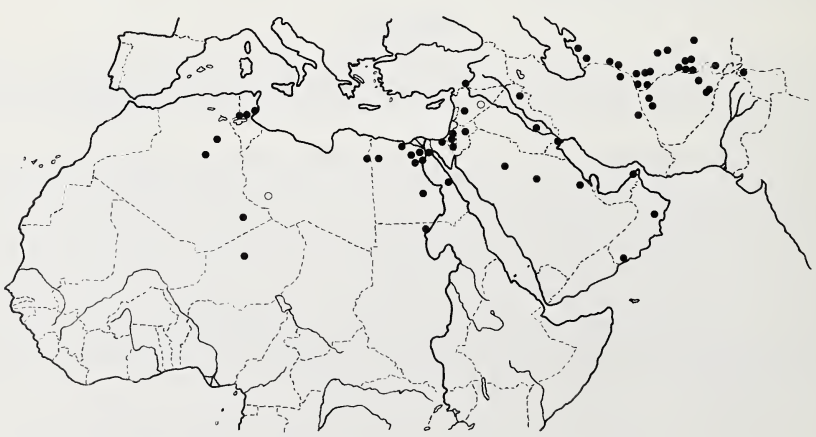

Fig. Known distribution of *Otonycteris hemprichi*. Open circles indicate localities not exactly known

Kumerloeve (1975) for Turkey, Harrison (1964, 1977: 627) for Arabia, Atallah (1977) for Palestine and Jordan, Makin (1977) for Israel, Harrison (1980) for Oman, DeBlase (1980) for Iran, Bobrinskii et al. (1965) for South Russia, Meyer-Oehme (1965) and Niethammer (1982) for Afghanistan and Roberts (1977) for Pakistan.

As can be seen now the holocene record from Uruq/Iraq and the recent occurrence at Kirkuk demonstrate a very probably closed distributional area in the Saharo-Sindian arid zone (Fig.).

The new material from Libya and Iraq represent second records of occurrences of this species for both countries (Hufnagel 1972; Harrison 1964).

Acknowledgements

Our warmest thanks are due to Mrs. Dr. B. Issel and Mr. Dr. W. Issel (Augsburg = Coll. Issel) for an invitation to examine bats in their collection in relation to the area under study and species covered by this paper; especially their hospitality to the senior author (IAN) is cordially remembered. For the loan of specimens we thank Prof. H. Schliemann (Hamburg = ZMH). For provision of research facilities to study bat collections under their care, we thank Dr. H. Felten (Frankfurt a. M. = SMF), Dr. R. Hutterer (Bonn = ZFMK), Dr. B. C. Robbins and Dr. H. W. Setzer (Washington = USNM), Dr. B. Patterson (Chicago = FMNH), Dr. O. Rossolimo (Moscow) and the late Prof. A. Sludsky (Alma Ata). Last but not least, we thank Prof. R. Kinzelbach (Darmstadt) for the deposit of specimens in the Forschungsinstitut Senckenberg originating from his research in the Near East. The junior author (DK) is indebted to the Deutsche Forschungsgemeinschaft for travel grants which enabled him to study collections in the USSR (477/9/74) and USA (477/297/77).

Zusammenfassung

Notizen über einige Fledermäuse des Nahen Ostens (Mammalia: Chiroptera)

Untersucht oder aufgelistet werden weitere Nachweise von *Rhinolophus ferrumequinum* aus Irak und Türkei, *Asellia tridens* und *Pipistrellus kuhli* aus Syrien, *Eptesicus bottae innesi* und *P. rueppelli* aus Ägypten, *E. bottae anatolicus* aus der Türkei, *Otonycteris hemprichi* aus Arabien, Irak, Palästina, Libyen und Tunesien. Das Vorkommen von *Plecotus austriacus* in der Türkei ist gesichert.

Literature

Al-Robaae, K. (1966): Untersuchungen der Lebensweise irakischer Fledermäuse. Säugetierkdl. Mitt. **14**, 177–211.

— (1976): On a collection of mammals from Mosul, North Iraq. Bull. Basrah nat. Hist. Mus. **3**, 67–76.

Anderson, J.; DeWinton, W. E. (1902): Zoology of Egypt. Mammalia. London: Hugh Rees.

Atallah, S. I. (1977): Mammals of the eastern Mediterranean region; their ecology, systematics and zoogeographical relationships. Säugetierkdl. Mitt. **25**, 241–320.

Atallah, S. I.; Harrison, D. L. (1967): New records of rodents, bats and insectivores from the Arabian peninsula. J. Zool. **153**, 311–319.

Bobrinskii, N. A.; Kuznetzov, B. A.; Kuzyakin, A. P. (1965): [Key to the mammals of the USSR]. 2nd ed., Moscow, 382 pp.

Bonhote, J. L. (1909): On a small collection of mammals from Egypt. Proc. zool. Soc. Lond. **1909**, 788–798.

DeBlase, A. F. (1980): The bats of Iran: systematics, distribution, ecology. Fieldiana Zool., (NS) **4**, I–XVII, 1–424.

DeBlase, A. F.; Martin, R. L. (1974): Distributional notes on bats (Chiroptera: Rhinolophidae, Vespertilionidae) from Turkey. Mammalia **37**, 598–602 [for 1973].

Fain, A. (1959): La famille Gastronyssidae Fain, 1956. Description de deux nouvelles espèces chez des chauves-souris asiatiques (Acarina: Sarcoptiformes). Bull. Inst. roy. Sci. nat. Belgique **35** (12), 1–22.

Fairon, J. (1980): Deux nouvelles espèces de chiroptères pour la faune du massif de l'Aïr (Niger): *Otonycteris hemprichi* Peters, 1859 et *Pipistrellus nanus* (Peters 1852). Bull. Inst. roy. Sci. nat. Belgique **52** (17), 1–7.

Felten, H. (1971): Eine neue Art der Fledermaus-Gattung *Eptesicus* aus Kleinasien (Chiroptera: Vespertilionidae). Senckenbergiana biol. **52**, 371–376.

— (1977): Teil IIIa. In: Felten, H.; Spitzenberger, F.; Storch, G.: Zur Kleinsäugerfauna West-Anatoliens. Senckenbergiana biol. **58**, 1–44.

Flower, S. S. (1932): Notes on the recent mammals of Egypt with a list of the species recorded from that Kingdom. Proc. zool. Soc. Lond. **1932**, 369–450.
Gaisler, J.; Madkour, G.; Pelikán, J. (1972): On the bats (Chiroptera) of Egypt. Acta Sci. nat. Acad. Sci. bohemoslov. Brno **6**, 1–40.
Hanák, V. (1966): Zur Systematik und Verbreitung der Gattung *Plecotus*, Geoffroy, 1818 (Mammalia, Chiroptera). Lynx (NS) **6**, 57–66.
Hanák, V.; Gaisler, J. (1971): The status of *Eptesicus ognevi* Bobrinskii, 1918, and remarks on some other species of this genus (Mammalia, Chiroptera). Věst. Čs. spol. zool. **35**, 11–24.
Harrison, D. L. (1963): A new bat for Israel, *Eptesicus innesi* Lataste, 1887, with some remarks on the affinities of this species. Z. Säugetierkunde **28**, 107–110.
— (1964): The mammals of Arabia, **I.** Insectivora, Chiroptera, Primates. London: E. Benn.
— (1972): The mammals of Arabia, **III.** Lagomorpha, Rodentia. London: E. Benn.
— (1976): Scientific results of the Oman flora and fauna survey, 1975. Description of an new subspecies of Botta's serotine (*Eptesicus bottae* Peters, 1869, Chiroptera: Verspertilionidae) from Oman. Mammalia **39**, 414–418 [for 1975].
— (1977): Mammals obtained by the expedition with a checklist of the mammals of the Sultanate of Oman. In: The scientific results of the Oman Flora and Fauna Survey, 1975. J. Oman Stud., spec. Rep. **1**, 13–26.
— (1980): The mammals obtained in Dhofar by the 1977 Oman Flora and Fauna Survey. In: The scientific results of the Oman Flora and Fauna Survey 1977 (Dhofar). J. Oman Stud., spec. Rep. **2**, 387–397.
Hatt, R. T. (1959): The mammals of Iraq. Misc. Publ. Mus. Zool. Univ. Michigan **106**, 1–113.
Heim de Balsac, H. (1936): Biogéographie des mammifères et des oiseaux de l'Afrique du Nord. Bull. Biol. France Belgique **21** (Suppl.), 1–446.
Heyneman, D; Macy, R. W. (1962): Helminths reported from bats (Chiroptera) in Egypt with an illustrated key to the common flukes. J. Egypt. Publ. Hlth. Ass. **37**, 109–139.
Hoogstraal, H. (1962): A brief review of the contemporary land mammals of Egypt (including Sinai). I. Insectivora and Chiroptera. J. Egypt. Publ. Hlth. Ass. **37**, 143–162.
Hufnagel, E. (1972): Libyan mammals. Harrow: Oleander Press.
Kock, D. (1969): Die Fledermaus-Fauna des Sudan. Abh. senckenberg. naturforsch. Ges. **521**, 1–238.
— (1972): In: Kock, D.; Malec, F.; Storch, G.: Rezente und subfossile Kleinsäuger aus dem Vilayet Elaziğ, Ostanatolien. Z. Säugetierkunde **37**, 204–229.
Kumerloeve, H. (1975): Die Säugetiere (Mammalia) Syriens und des Libanon. Veröff. zool. Staatssamml. München **18**, 159–225.
— (1982): Zur Erforschungsgeschichte der Säugetiere Kleinasiens (III). Säugetierkdl. Mitt. **30**, 26–30.
Lanza, B. (1960): Su due specie criptiche di Orecchione: "*Plecotus auritus*" (L.) e "*P. wardi*" Thomas ("Mamm.; Chiroptera"). Monit. zool. ital. **68**, 7–23.
Lataste, F. (1887): Description d'une nouvelle espèce de chiroptère d'Égypte. Ann. Mus. civ. Stor. nat. Genova (2) **4**, 625–630.
Lewis, R. E.; Harrison, D. L. (1962): Notes on bats from the Republic of Lebanon. Proc. zool. Soc. Lond. **138**, 473–486.
Makin, D. (1976): Preliminary report of a survey of Microchiroptera in Israel. Israel J. Zool. **25**, 211.
— (1977): [Bats of Israel]. Teva va aretz **18**, 74–80 [in Hebrew].
Metaxas, C. (1891): Mémoise sur les animaux de la Mesopotamie. Bull. Soc. natn. Acclim. France **9**, 321–328.
Meyer-Oehme, D. (1965): Die Säugetiere Afghanistans (Teil III), Chiroptera. Science, Quart. J. Fac. Sci. Kabul Univ., (Special ed.), 42–59.
Nader, I. A. (1971): Noteworthy records of bats from Iraq. Mammalia **35**, 644–647.
— (1975): On the bats (Chiroptera) of the Kingdom of Saudi Arabia. J. Zool. **176**, 331–340.
— (1982): New distributional records of bats from the Kingdom of Saudi Arabia (Mammalia: Chiroptera). J. Zool. **198**, 69–82.
Niazi, A. D. (1976): On the Mediterranean horseshoe bat from Iraq. Bull. nat. Hist. Res. Center 7, 167–176.
Niethammer, J. (1982): Mausschläfer (*Myomimus* Ognev, 1924) in Afghanistan. Z. Säugetierkunde **47**, 187–189.
Noack, Th. (1891): Beiträge zur Kenntnis der Säugetier-Fauna von Ostafrika. Jb. hamburg. wiss. Anst. **9**, 1–88.
Roberts, T. J. (1977): Mammals of Pakistan. London: E. Benn.
Sanborn, C. C.; Hoogstraal, H. (1955): The identification of Egyptian bats. J. Egypt. Publ. Hlth. Ass. **30**, 105–119.
Setzer, H. W. (1952): Notes on mammals from the Nile delta region of Egypt. Proc. U. S. natn. Mus. **102**, 343–369.
Thomas, O. (1919): The types of the mammals described by M. Fernand Lataste. Ann. Mag. nat. Hist. **4**, 350–354.
Trouessart, E. L.; Kollmann, M. (1923): Étude sur les mammifères rapportés par M. Henri

Gadeau de Kerville de son voyage zoologique en Syrie (Avril–Juin 1908). In: Voyage zoologique d'Henri Gadeau de Kerville en Syrie. **4**, 59–64.
Wassif, K. (1962): The serotine bat, *Eptesicus isabellinus innesi* Lataste from Egypt. Bull. zool. Soc. Egypt **17**, 108–110.
Wettstein, O. von (1913): Wissenschaftliche Ergebnisse der Expedition nach Mesopotamien 1910. Die Chiropterenausbeute. Ann. nat.-hist. Mus. Wien **27**, 465–471.

Authors' addresses: Dr. Iyad A. Nader, College of Education, King Saud University, Abha branch, P.O.Box 157, Abha, Saudi Arabia; Dr. Dieter Kock, Forschungsinstitut Senckenberg, Senckenberg-Anlage 25, D-6000 Frankfurt a. M. 1

Zur Phylogenie und Ausbreitungsgeschichte mediterraner Hausmäuse (Genus *Mus* L.) mit Hilfe von „Compatibility Analysis"

Von H. Engels

Departamento de Zoologia, Universidade de Coimbra, Portugal

Eingang des Ms. 3. 8. 1982

Abstract

The evolutionary history of Mediterranean mice (Genus Mus L.) with aid of „Compatibility Analysis"

Studied was the evolutionary history of 14 populations of mice (Genus *Mus* L.) from the Mediterranean region, Asia Minor, and Afghanistan with aid of compatibility analysis, „Prim"-networks, and hierarchical cluster analyses.

Morphological and fossil data indicate that immigration of mice into the Mediterranean region took place first in the eastern parts and started from Asia Minor. Separated phylogenetic lines may have led to feral mice of Greece, *Mus spretus* of North Africa and the Iberian Peninsula, and to the commensal stocks of the Mediterranean region. A further phylogenetic line leads (probably from mice of the Ukraine) to *Mus musculus spicilegus* of South eastern Europe.

There are also fossil indications that the spreading of farming cultures into the western Mediterranean regions was accompanied by immigrations of mice into these regions, which may have become possible by climatic changes and beginning formation of culture steppes. Morphological results indicate that parallel evolution and reversals of characters have commonly occured during evolutionary history of mice in the Mediterranean region.

Einleitung

Nach Schwarz und Schwarz (1943) erstreckt sich die ursprüngliche, natürliche Verbreitung der Hausmaus durch palaearktische Trockengebiete zwischen 44° und 36° N.B. von Spanien-Marokko bis Japan, wobei sie in dieser Zone vier wildlebende (ferale) Unterarten unterscheiden: *spretus* Lataste im äußersten Westen, *spicilegus* Pet. in Südosteuropa von Ungarn bis zur Wolga, *wagneri* Ev. in Zentral- und *manchu* Thom. in Ostasien. Daneben haben sich mehrfach halbkommensale und kommensale, an den Menschen angeschlossene Formen herausgebildet, zu denen der mediterrane *brevirostris* Waterhouse, der west- und mitteleuropäische *domesticus* Rutty sowie der osteuropäische *musculus* L. gehören.

Neuere Untersuchungen an mediterranen Hausmäusen haben gezeigt, daß *spretus* wahrscheinlich eine eigene Art darstellt (Britton et al. 1978; Pelz und Niethammer 1978), und daß eine in Griechenland verbreitete Freilandform möglicherweise ebenfalls artlich verschieden ist (Bonhomme et al. 1978; Engels 1980).

U.S. Copyright Clearance Center Code Statement: 0044-3468/83/4801-0009 $ 02.50/0
Z. Säugetierkunde 48 (1983) 9–19

ISSN 0044-3468 / InterCode: ZSAEA 7