

Tadarida teniotis (Rafinesque, 1814) in the W-Palaeartic and a lectotype for *Dysopes rupelii* Temminck, 1826 (Chiroptera: Molossidae)

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Abstract

Presented are additional records of *Tadarida teniotis* within the W-Palaeartic Region from Algeria, Tunisia, Spain, Corsica, Italy, Greece and Lebanon, and the known species range is updated. Based on available information the status of *Dysopes rupelii* Temminck, 1826 (= *T. teniotis rueppelli*) from Egypt is discussed and a lectotype is selected.

Introduction

The geographical distribution of *Tadarida teniotis* (Rafinesque, 1814) was reviewed by AELLEN (1966). In connection with studies of molossids and other bats from the Middle East (NADER and KOCK 1980, 1983), a number of specimens of *T. teniotis* were found to be of distributional interest within the W-Palaeartic Region and stimulated a review of the taxonomy and nomenclature of this species in the E-Mediterranean. Our conclusions are represented hereunder.

Abbreviations

Measurements: Head and body = HB; tail = T; hindfoot = HF; ear = E; length of forearm = FA; Greatest length of skull = Crn; condylobasal length = Cbl; zygomatic breadth = Zyg; breadth of braincase = Br; interorbital breadth = Ior; maxillary toothrow = C¹-M³; mandibular toothrow = C₁-M₃; condylar length of mandible = Mand; alcohol preserved specimen = alc.

Results and discussion

Tadarida teniotis teniotis (Rafinesque, 1814)

1814 *Cephalotes teniotis* Rafinesque, Précis Découv. som. zool. bot., Palermo: 12; Sicily, Italy.
(Detailed lists of synonyms are given by ELLERMAN and MORRISON-SCOTT 1951 and CORBET 1978).

Material: Spain: nr. Verdiago, Picos de Europa, 3. VIII. 1981; ♀ (skull, skin) Coll. ISSEL - Albarracin, Teruel, 2. VII. 1965; ♂ (skull, skin) Coll. ISSEL. - France: Pont d'Arc, nr. Vallon, Ardèche River, 2. IX. 1960 (pellets of *Strix aluco*); 3 sex? (3 skull fragments) Coll. ISSEL. - Pont du Gard, nr. Rémoulin, 22 km w. of Avignon, 24. VIII. 1960, 27. VIII. 1966; 2 ♂♂ 1 ♀ (2 skulls, 3 skins) Coll. ISSEL. - Corniche de l'Estérel, 3 km w. of La Trayas, Riviera, 19. X. 1956, 28. IX. 1958; 2 ♂♂ 2 ♀♀ (4 skulls, 4 skins) Coll. ISSEL. - Patrimonio, NE-Corsica, 25. V. 1976; ♀ (skull, skin) Coll. ISSEL. - Italy: 3 km nw. of Naples, 14. IV. 1963; ♂ (skull, skin) FMNH 96280, leg. D.M. LAY. - 3 km n. of Aquafredda, W-coast of Basilicata, 12. VIII. 1969; ♀ (skull, skin) Coll. ISSEL. - Tindari, N-coast of Sicily, 21. VIII. 1968, 18. and 19. VIII. 1969; 2 ♂♂ 1 ♀ (3 skulls, 3 skins) Coll. ISSEL. - Greece: Meteora, Trikala, 3. VIII. 1964, 24. VIII. 1971; 5 ♀♀ (5 skulls, 5 skins) Coll. ISSEL. - Algeria: Lakhdaria, 50 km se. of Alger, 24. VIII. 1972; ♂ (skull, skin) Coll. ISSEL. - Tighanimine Gorge, n. of

Table
Individual measurements of *Tadarida t. teniotis*
For details of localities and collection see material listed

| | sex and age | HB | T | HF | E | FA | Crn | Cbl | Zyg | Br | Ior | C ¹ -M ³ | C ₁ -M ₃ | Mand |
|------------|-------------|----|----|------|----|------|------|------|------|------|-----|--------------------------------|--------------------------------|------|
| Algeria | ♂ ad | 87 | 52 | 13 | 33 | 60 | 24.7 | 23.8 | 14.4 | 11.7 | 5.0 | 8.7 | 9.7 | 17.5 |
| | ♀ ad | 86 | 53 | 12 | 32 | 59 | 24.7 | 24.0 | 14.4 | 11.9 | 4.7 | 8.7 | 9.7 | 17.5 |
| | ♀ ad | 87 | 53 | 12 | 28 | 58.5 | 24.9 | 23.9 | — | 12.3 | 4.8 | 8.9 | 9.8 | 17.5 |
| Tunisia | | | | | | | | | | | | | | |
| Seldja | ♀ ad | 90 | 52 | 11 | 31 | 60.5 | 24.3 | 23.8 | 14.6 | 12.1 | 4.9 | 8.5 | 9.4 | 17.4 |
| Spain | | | | | | | | | | | | | | |
| | ♂ ad | 85 | 52 | 11.5 | 32 | 60 | 24.7 | 24.0 | 14.5 | 12.2 | 4.9 | 8.9 | 9.7 | 17.7 |
| Verdiago | ♀ ad | 93 | 54 | 14 | 31 | 64 | 24.8 | 24.2 | 14.5 | 12.3 | 5.0 | 8.7 | 9.4 | 18.0 |
| France | | | | | | | | | | | | | | |
| | ♂ ad | 90 | 45 | 10 | 30 | 60 | 24.4 | 23.8 | 14.7 | 12.7 | 4.8 | 8.7 | 9.7 | 17.6 |
| | ♂ ad | 87 | 53 | 10 | 32 | 60 | 23.5 | 22.8 | 13.8 | 11.8 | 4.6 | 8.4 | 9.2 | 16.7 |
| Rémoulin | ♀ ad | 83 | 46 | 11 | 31 | 59 | 23.5 | 22.8 | 13.1 | 11.2 | 4.5 | 8.2 | 9.3 | 16.7 |
| La Trayas | ♂ subad | 81 | 51 | 11 | 31 | 61 | 23.5 | 22.6 | 13.3 | 12.0 | 4.6 | 8.2 | 9.1 | 16.8 |
| | ♂ subad | 76 | 51 | 11 | 31 | 60 | 23.7 | 23.0 | 12.9 | 11.5 | 4.9 | 8.7 | 9.5 | 17.0 |
| | ♀ subad | 77 | 51 | 11 | 29 | 60 | 22.9 | 22.1 | 12.8 | 11.5 | 4.8 | 8.2 | 9.0 | 16.4 |
| | ♀ subad | 78 | 51 | 11 | 30 | 59 | 23.3 | 22.5 | 13.2 | 11.8 | 4.7 | 8.3 | 9.4 | 16.9 |
| | ♀ subad | 79 | 51 | 11 | 28 | 60 | — | — | — | — | — | — | — | — |
| | ♀ ad | 86 | 53 | 12 | 32 | 60 | 24.1 | 23.3 | 14.1 | 12.4 | 5.0 | 8.5 | 9.4 | 17.0 |
| Corsica | | | | | | | | | | | | | | |
| Patrimonio | ♀ ad | 87 | 52 | 11.5 | 32 | 62 | 24.3 | 23.6 | 14.2 | 11.8 | 4.8 | 8.7 | 9.6 | 17.5 |
| Italy | | | | | | | | | | | | | | |
| | ♂ ad | 83 | 51 | 12 | 32 | 62 | 24.2 | 23.5 | 13.9 | 11.8 | 5.0 | 8.9 | 9.6 | 17.2 |
| Aquafredda | ♀ ad | 82 | 55 | 12 | 31 | 60 | — | — | — | — | — | 8.6 | 9.0 | 16.7 |
| Sicily | | | | | | | | | | | | | | |
| | ♂ ad | 84 | 54 | 12 | 32 | 59 | 23.9 | 22.9 | 14.0 | 11.9 | 4.6 | 8.5 | 9.4 | 17.1 |
| | ♂ ad | 87 | 52 | 12 | 32 | 58 | 23.9 | 23.1 | 14.0 | 11.8 | 5.5 | 8.6 | 9.7 | 17.0 |
| Tindari | ♀ ad | 82 | 52 | 12 | 32 | 61 | 23.9 | 22.9 | 13.5 | 11.7 | 4.5 | 8.7 | 9.8 | 16.9 |
| Greece | | | | | | | | | | | | | | |
| | ♀ ad | 90 | 55 | 13 | 35 | 63 | 24.9 | 23.9 | 14.6 | 12.4 | 4.8 | 8.7 | 9.9 | 17.7 |
| | ♀ ad | 90 | 53 | 11 | 33 | 61 | 24.4 | 23.6 | 14.1 | 12.2 | 5.0 | 8.8 | 9.6 | 17.2 |
| | ♀ ad | 86 | 55 | 12.5 | 34 | 61 | 24.2 | 23.3 | 14.1 | 11.9 | 4.6 | 8.5 | 9.6 | 17.1 |
| | ♀ ad | 80 | 48 | 11 | 34 | 61 | 24.2 | 23.6 | 13.9 | 11.8 | 4.4 | 8.7 | 9.7 | 17.3 |
| | ♀ ad | 86 | 55 | 11.5 | 32 | 61 | 24.0 | 23.2 | 14.0 | 11.6 | 4.5 | 8.5 | 9.4 | 16.3 |
| Stavros | ♂ ad | 84 | 56 | — | 32 | 60 | 23.7 | 23.1 | 14.2 | — | 4.8 | 8.9 | 9.5 | — |
| | ♀ ad | 90 | 58 | — | 32 | 60 | — | 23.3 | 14.2 | — | 5.0 | 8.8 | 9.4 | — |

Rhoufi, 28. VIII. 1972; 2 ♀♀ (2 skulls, 2 skins) Coll. ISSEL. – Tunisia: Gorge of Seldja, 34° 21'N–08°19'E, ne. of El Hamma el Djerid, 14. V. 1963; ♀ (skull, skin) Coll. ISSEL.

Measurements: As detailed measurements for the nominate form are hardly available, we give individual dimensions of specimens examined (see Tab.).

The presence of *T. teniotis* in Algeria was confirmed for the first time by DORST and PETTER (1959) from Marhouma, 30 km s. of Béni Abbès. Our specimens from Lakhdaria and Tighanimine Gorge represent second and third records of occurrence of this species for Algeria. – In Tunisia the species was collected recently at Ksar Haddada nw. of Tatahouine (BEAUCOURNU et al. 1983a); our present specimen, the second record from Tunisia, was taken 20 years ago in that region where BEAUCOURNU et al. (1983a: Tamerza) made a probable flight observation. – The specimen from nr. Verdiago represents the most northwestern record of the species in Spain.

KAHMANN and GÖRNER (1956) mentioned the presence of this bat in NW-Corsica based on their field observations. BEAUCOURNU et al. (1983b) reported the collection of *T. teniotis* from an island between Porto and Galeria off the west coast of Corsica. Our specimen from Patrimonia is the second collecting locality of *teniotis* for the island.

Tadarida teniotis rueppelli (Temminck, 1826)

1826 *Dysopes rupellii* Temminck, Monogr. Mammal., 1: 224, pl. 18, pl. 23 figs. 6–8; Egypt [Fig. 9 cited is a misprint for fig. 7 on plate 23].

1842 *D[ysopes]. rueppelli*, – RÜPPELL, Mus. Senckenberg., 3: 154 [emendation].

1866 *Nyctinomus rueppelli*, – GRAY, Mag. Zool. Bot. Geol., 5: 501.

1870 *Dysopes (Molossus) rueppellii*, – SWINHOE, Proc. Zool. Soc. Lond., 1870: 619 [partim emendation].

1939 *Mops rueppellii*, – G. M. ALLEN, Bull. Mus. comp. Zool. Harvard College, 83: 108.

1951 *Tadarida teniotis rueppelli*, ELLERMAN and MORRISON-SCOTT, Checklist Palaeart. Indian Mamm., 134.

Material: Egypt: 2 sex? (2 skulls, 2 skins) SMF 12379–80 (= RÜPPELL 1842: no. II. K. 1. a, b), leg. E. RÜPPELL & ded. 1822 [cotypes]. – Abu Rawash, Giza Prov., 12. XI. 1951; 2 ♂♂ 1 ♀ (3 skulls, 3 alc.) FMNH 79284, 79286, 79288, leg. H. HOOGSTRAAL. – Giza Pyramids, Giza Prov., 14. II. 1952; ♀ (skull, skin) FMNH 79757, leg. H. HOOGSTRAAL. – Lebanon: Natural Bridge, 7 km e. of Faraya, 25. IX. 1960; ♀ (skull, skin) FMNH 99569, leg. R.E. LEWIS (cf. LEWIS & HARRISON 1962). – Ba'albek, Bekaa (= El Beqá), VIII. 1961; 2 ♀♀ (2 skulls, 2 alc.) FMNH 99291–92, leg. H. HOOGSTRAAL. – Turkey: Birecik, Vil. Gaziantep, 26. V. 1964, 11. III. 1972; 5 ♀♀ (5 skulls, 5 skins) ZFMK 64.699–702, 72.141, leg. U. HIRSCH (cf. VON LEHMANN 1966).

Measurements: Lectotype SMF 12380: FA 58.7; E 21.7. – Ior 4.6; C¹–M³ 9.0; C₁–M₃ 9.2; Mand 17.0.

Lectoparatype SMF 12379: FA 60; E 20.7 – Cbl 22.5; Zyg 13.7; Br 11.7; Ior 4.4; C¹–M³ 8.7; C₁–M₃ 9.2; Mand 16.9.



Recorded localities for *Tadarida teniotis* in the western Palearctic. Black square: subfossil records; open circles: exact locality not known. (Zeichnung G. VOLKENING)

Egyptian *T. t. rueppelli* (n6): HB n1: 77; T n1: 52; E 28.6–33, n4: 31; FA 56.8–62.3, n6: 60. – Crn 23.2–24.1, n4: 23.8; Cbl 22.2–23.2, n5: 22.8; Br 11.7–12.5, n5: 12.0; Zyg 13.5–14.3, n5: 13.8; Ior 4.4–4.9, n6: 4.7; C¹–M³ 8.2–9.0, n6: 8.7; C₁–M₃ 9.1–9.6, n6: Mand 16.5–17.1, n6: 16.9.

Near East *T. teniotis* (n14 from Israel, Lebanon, Turkey; from specimens listed above and HARRISON 1964: tab. 54): HB 74–90, n7: 82; T 46.6–52, n7: 49.5; HF 9–12.5, n11: 11.6; E 25–32, n10: 28.3; FA 58.4–63.9, n12: 61.8 – Crn 23.2–24.9, n11: 24.1; Cbl 22.3–24, n10: 23.2; Br 11.1–12.5, n10: 11.8; Zyg 13.1–14.5, n10: 14.0; Ior 4.2–4.8, n12: 4.6; C¹–M³ 8.2–9.0, n11: 8.7; C₁–M₃ 9.1–10.0, n10: 9.6; Mand 16.6–18.0, n12: 17.1

TEMMINCK (1826) described *Dysopes rupelii* (= *T. teniotis rueppelli*) from five specimens (three with skulls in the Museum Leiden, two in the Museum Frankfurt) collected by RUPPEL (= E. RÜPPELL) and sent to him by PH. CRETZSCHMAR; he compared this taxon only with *T. aegyptiaca* (Geoffroy, 1818) which he renamed as *T. geoffroyi* as to avoid confusion of the two molossid bats from Egypt by their etymology ('Nyctinome d'Égypte'). Becoming aware of the description of *Dinops cestoni* Savi, 1825, TEMMINCK (1827) considered both *rueppelli* and *cestoni* (= *teniotis* Rafinesque, 1814) to be conspecific.

FITZINGER (1870) classified *rüppellii* as closely resembling *cestonii* and apparently differing mainly in colouration: besides being slightly larger, *rueppelli* is brownish to mousegrey with lighter underparts, *cestonii* dark greyish-brown with underparts grey-brown.

DOBSON (1876: 719) listed *rueppelli* [together with *T. (Mops) midas* (Sundevall, 1842)] as a synonym of *cestonii* Savi, 1825 without any remarks on colour or size differences, but also not mentioning neither types nor 'co-types' for the taxa included under *cestonii* (as he did for several monotypic species), although in the introduction this author emphasized (:702), that he had seen most of the types.

JENTINK (1887: 289) lists one skull (sex unknown) and (1888: 201) three mounted (sex unknown) specimens and one ♂ spirit specimen ('b' in JENTINK 1887: 289) as [co-]types of *Dysopes rupelii* from 'Egypt' under *Nyctinomus cestonii* Savi. Thus these syntypes outnumber the material mentioned by TEMMINCK (1826). In SMF two mounted specimens still exist, faded in colouration, which were included in TEMMINCK's description (:225), of which the skulls have been extracted recently. Of these SMF 12380 (a.K. [= RÜPPELL 1842] II. K. 1. b, sex unknown, occipit missing) is fixed here as lectotype, SMF 12379 (a.K. II. K.1.a, sex unknown, skull distorted) and the specimens of the Leiden Museum (except the alcohol specimen which may have reached that collection later) are to be considered as lectoparatypes.

RÜPPELL's autobiography shows (MERTENS 1949: 245) that he sent his natural history collections to the Frankfurt Museum under the condition that all new species contained in it, should be retained by the Senckenberg Natural History Society and should not be published or exchanged before he studied and described them. This conditioning taken in regard, we fixed the lectotype from the SMF-collection.

The name introduced by TEMMINCK (1826) for this taxon is clearly an incorrect original spelling and should be corrected (Intern. Code of Zool. Nomencl., article 32c) accordingly to *rueppelli*.

The listing of *rueppelli* as a subspecies of *teniotis* by ELLERMAN and MORRISON-SCOTT (1951) – ALLEN (1939) had this taxon synonymized with *midas*, following DOBSON (1876) and later authors – has led to a re-examination of its status by LEWIS and HARRISON (1962), who found only a colour difference between the two taxa (paler grey-brown in *rueppelli*, more brownish in *teniotis*) and ascribed to *rueppelli* a distribution in Egypt and Near East. This has been followed by subsequent authors (e.g. ATALLAH 1977; DEBLASE 1980), although ALLEN (1966) found the colour difference less convincing and considered the character used as not too important. PIEPER (1966: 28) mentioned that the East-Mediterranean population is going to be considered (by other authors than himself) as a separate species; however, this is not supported by morphological evidence, nor could we find size

or colour differences between W- and E-Mediterranean specimens at species level. Until further evidence is produced, we maintain two subspecies of *teniotis*, the nominate form in Europe (no discussion of subspecific differences between NW-African and Libyan specimens can be presented) and a lighter coloured subspecies in the Near and Middle East (see Fig.).

T. teniotis was first recorded from Lebanon by LEWIS and HARRISON (1962) from nr. Faraya. Although they stated that specimens from Ba'albek were collected but data were not available, the specimens listed above from this locality represent a second record of occurrence of this species for Lebanon.

The distribution map presented here (see Fig.) is based on AELLEN (1966) and the specimens listed above with additions for:

Canary Islands: HUTTERER 1979: Hierro.

Spain: LAY 1967: Granada.

France: SAINT GIRONS 1973: fig. 24; DESMET and NOBLET 1976: Vercors, Isère.

Corsica: BEAUCOURNU et al. 1983b: island off w-coast betw. Porto and Galeria.

Italy: LAY 1967: Naples.

Yugoslavia: DULIČ and TVRKOVIČ 1979: Šolta; Brač; Korčula.

Greece: WINGE 1882: Dekelia, Attica. – PIEPER 1965: Stavros, Chalkidike (measurements in Tab. 1); Karpathos Isld. – PIEPER 1966: Rhodos Isld.; Kos Isld.; Athens. – MARTENS 1967: Macedonia; Athens; E-Peloponnes; Crete; Karpathos Isld. – NIETHAMMER 1971:

Kythira Isld. – KOCK 1974: Chios Isld. – PIEPER 1977: Crete.

Turkey: CORBET and MORRIS 1967: Finike.

Tunisia: BEAUCOURNU et al. 1983a: Ksar Haddada nr. Fom Tatahouine.

Libya: QUMSIYEH 1981; QUMSIYEH and SCHLITZER 1982: Wadi al Kuf, Jebel al Akhdar.

Israel: MAKIN 1977, 1979: Jaffa; Luzit Cave; Sidi Boqer.

Jordan: BOYD 1966; ATALLAH 1967, 1977: Faidhat edh Dhakikiya. – QUMSIYEH 1980: Ibeika.

Iran: DEBLASE 1971, 1980: Busher; foot of Elburz Mts.; Chelmir; Minab.

Armenian SSR: JAVRUJAN and SAFARJAN 1975: Enokavan, Idzevan; Agarein; Dilizan.

Azerbaijan SSR: VON LEHMANN 1966: Susino = ? Šušije.

Turkmenian SSR: BABAYEV and DMITRIYEVA 1966: upper Sumbar R.; Geok-Tepe Station, Kopet Dağ.

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Zusammenfassung

Tadarida teniotis (Rafinesque, 1814) in der W-Paläarktis und ein Lectotypus zu
Dysopes rupellii Temminck, 1826

Weitere Belege von *Tadarida teniotis* aus Algerien, Tunesien, Spanien, Korsika, Italien, Griechenland und Libanon werden dargestellt und die Gesamtverbreitung in der W-Paläarktis kartiert. Der Status von *Dysopes rupellii* (= *T. teniotis rueppelli*) wird diskutiert und ein Lectotypus festgelegt.

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The biology of the Levant vole, *Microtus guentheri* in Israel

I. Population dynamics in the field

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Abstract

Investigated the population dynamics of *Microtus guentheri* in two places in the Southern Coastal Plain of Israel during November 1977 to September 1979. The field work was carried out once a month, during four consecutive nights placing 120 night-traps. The method of capture - marking - recapture was used with about 155 marked individuals (83 males and 72 females). Age, reproductive condition and body weight were recorded. There were two trapping peaks: December and June to September. Voles were heavier in winter than in summer but most animals lost weight in the traps. Voles were recaptured mostly within a range of 10-20 m; males showing higher attachibility to their home range than females. The overall sex ratio did not differ significantly from equity. The estimated age structure of the population showed that most voles lived less than a year. The breeding season lasted from October until April. The existence of a post-partum oestrus was ascertained. The mean number of embryos was 8.8 and the largest litters were produced in February. Juvenile breeding began at an age of about 30 days. Results indicate that control measures should take place in summer such as deep ploughing of the field and field edges.

Introduction

Relatively little information has been published on Levant voles in the Mediterranean region and the Middle East (ATALLAH 1969; AHARONI 1930; BODENHEIMER 1949; BODENHEIMER and DVORETZKY 1952; HARRISON 1972; ONDRIAS 1965). The Levant vole (*Microtus guentheri*) as well as other voles are important agricultural pests (BODENHEIMER

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