

# MAMMALS OF AFRICA

VOLUME IV

HEDGEHOGS, SHREWS AND BATS

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*Tadarida spurrelli*

**Distribution** Endemic to Africa. Recorded disjunctly from Rainforest BZ and Rainforest–Savanna Mosaics, from Sierra Leone, Liberia, Guinea, Côte d'Ivoire, Ghana, Togo, Cameroon, perhaps Central African Republic, Equatorial Guinea including Bioko I. and NE DR Congo (De Vree 1969, Kock 1969b, Jones 1971, El-Rayah 1981, Schlitter *et al.* 1982, Smith *et al.* 1986, Koopman 1989, Juste & Ibáñez 1994, Koopman *et al.* 1995, Grubb *et al.* 1998, RMCA). The lack of records from most of the Congolian rainforest in DR Congo might reflect insufficient collecting.

**Habitat** Found in wetter and drier types of lowland rainforest, secondary forest and areas of invasive Guinea woodland savanna

close to the rainforest. Has been recorded along streams and rivers (e.g. Schlitter *et al.* 1982, Juste & Ibáñez 1994).

**Abundance** Uncertain; considered rare but possibly more common and widespread than records indicate. Seems to be the most common molossid on Bioko I. (Juste & Ibáñez 1994).

**Remarks** Nothing else appears to be known about this species.

**Conservation** IUCN Category: Least Concern.

#### Measurements

*Tadarida spurrelli*

FA: 28.3 (27–30) mm, n = 49

WS: n. d.

TL: 83.8 (78–91) mm, n = 10

T: 23.3 (20–25) mm, n = 12

E: 12.6 (11–14) mm, n = 8

Tr: n. d.

Tib: 10 mm, n = 1

HF: 8.0 (7–10) mm, n = 6

WT: 10.6, 11 g, n = 2

GLS (♂♂): 16.7 (14.8–17.6) mm, n = 12

GLS (♀♀): 15.4 (14.6–16.3) mm, n = 25

GWS (♂♂): 10.2 (10.0–10.5) mm, n = 12

GWS (♀♀): 9.6 (9.3–10.0) mm, n = 25

C–M<sup>3</sup> (♂♂): 6.2 (5.7–6.8) mm, n = 12

C–M<sup>3</sup> (♀♀): 5.9 (5.6–6.3) mm, n = 12

Throughout geographic range (BMNH, RMCA and literature including Juste & Ibáñez 1994)

**Key References** De Vree 1969; Freeman 1981; Kock 1969b; Rosevear 1965.

Meredith Happold

### *Tadarida teniotis* EUROPEAN FREE-TAILED BAT

Fr. Tadaride de Cestoni; Ger. Europäische Bulldoggfledermaus

*Tadarida teniotis* (Rafinesque, 1814). Précis. Som., p. 12. Sicily, Italy.

**Taxonomy** Originally *Cephalotes teniotis*. Subgenus *Tadarida*. Synonyms: *cestoni*, *nigrogriseus*, *savii*, *rueppelli* (see Simmons 2005), but only *rueppelli* and *teniotis* occur in Africa. Subspecies: two, both in Africa. Chromosome number (Croatia): 2n = 48; aFN = 76 (Dulić & Mrakovčić 1980).

**Description** Medium-sized microbat without noseleaf and with terminal portion of tail projecting freely from posterior margin of interfemoral membrane; large for an African molossid; ears relatively large, meeting to form a V-shaped valley; wings blackish; no ventral flank-stripe in contrasting colour; three lower incisors on each side (cf. two in other *Tadarida*); M<sup>3</sup> with third ridge = second ridge. Sexes similar in colour; ♀♀ on average with larger body dimensions. Pelage fine, soft, dense; mid-dorsal hairs ca. 7 mm. Dorsal pelage ashy-grey or brownish-grey; no spots, flecking or frosting; hairs grey

with whitish base. Ventral pelage paler; no mid-ventral markings; no ventral flank-stripe in contrasting colour. No orange-phase. Head not extremely flattened. Upper lip with four well-defined wrinkles on each side and comparatively few spoon-hairs. Ears blackish, relatively large (extending well beyond snout when laid forward); inner margins only just meeting on forehead to form V-shaped valley. Tragus short, concealed by antitragus. Antitragus large, subrectangular. No interaural crest. No gular gland. Wings and interfemoral membrane blackish. Ventral sides of forearms and legs naked and blackish. Foot with raised pad on sole (plantar pad).

Skull not extremely dorsoventrally flattened. Anterior of braincase not elevated above plane of rostrum. Sagittal crest absent or weakly developed; lambdoid crest poorly to moderately developed. Anterior palatal emargination wide. Interdental palate broad, narrowing only very slightly towards canines, not constricted at level of posterior

premolar. Basisphenoid pits moderate in depth, large, their width greater than their distance apart. Anterior upper premolar rising distinctly above level of cingulum of posterior premolar, within toothrow; canine and posterior premolar well separated.  $M^3$  with third ridge equal in length to second. Three lower incisors on each side (cf. two in all other African species in subgenus *Tadarida*), bicuspid, crowded. Lower canines with cingula not greatly enlarged and not in contact. Dental formula:  $^{1123}/_{3123} = 32$ .

**Geographic Variation** Two subspecies are currently recognized (Simmons 2005):

*T. t. teniotis*: Morocco to Libya (and extraliminally Canary Is., W Mediterranean Europe to Central Asia). Dorsal pelage brownish-grey.

*T. t. rueppelli*: Egypt (and extraliminally Arabia *sensu* Harrison & Bates 1991). Dorsal pelage paler, ashy-grey.

**Similar Species** Four other *Tadarida* in Africa have ears with inner margins meeting, or almost meeting, to form a V-shaped valley:

*Tadarida aegyptiaca*. Two lower incisors on each side. Smaller (FA: 42–55 mm; GLS: 17.1–21.9 mm).

*T. fulminans*. Two lower incisors on each side. Wings brown dorsally, whitish ventrally. Not known north of 5° N.

*T. lobata*. Two lower incisors on each side. Inner margins of ears meeting close to snout; ears extending well beyond snout when laid forward. White spot between shoulder-blades. Interdental palate markedly constricted at level of posterior premolar. Kenya and Zimbabwe.

*T. ventralis*. Two lower incisors on each side. Upper lip without well-defined wrinkles. Anterior upper premolar minute; canine and posterior premolar nearly in contact. Not known north of 18° N.



*Tadarida teniotis*

**Distribution** In Africa, this Palearctic species is found in the Mediterranean Coastal and Afromontane–Afroalpine BZs, in Morocco, Algeria, Tunisia, the Cyrenaica region of Libya, and the Cairo and Giza areas of N Egypt. One doubtful record, based on a mummified specimen with small FA (55 mm), from the Sahara Arid BZ in Algeria (Dorst & Petter 1959), is in very unusual habitat and needs confirmation; it could represent *T. aegyptiaca* (Kowalski & Rzebik-Kowalska 1991). Extraliminally: the Canary Is. and Mediterranean Europe to Central Asia.

**Habitat** Mainly found in areas with Mediterranean-like vegetation; absent in drier areas. Its presence is locally linked to suitable day-roosts, which include narrow crevices in rocky cliffs or human constructions. In the Aures Mts, Algeria, specimens were mist-netted over a stream (Kowalski & Rzebik-Kowalska 1991). The locality in Cyrenaica is Wadi el Kuff, a limestone mountain area with numerous caves and cracks. The vegetation is shrubland (a type of Maquis) with trees in protected areas; rainfall 300–600 mm per year, mostly in Nov–Feb (Qumsiyeh & Schlitter 1982). In Kyrgyzstan, recorded from sea level to 3100 m (Rybin *et al.* 1989).

**Abundance** Throughout its distribution, never abundant but, based on hearings of the very low-frequency echolocation calls of this species, which are audible to humans, it is more common than originally estimated from captures.

**Adaptations** Aspect ratio very high; wing-loading very high. Flight fast and agile with poor manoeuvrability; median speed 50 km/h (Marques *et al.* 2004) (= 13.9 m/sec). Roosts by day in crevices, 2–4 cm wide and variable in depth (15 cm up to several metres), in cliffs or similar human-made structures; sometimes with several entrances (Arlettaz 1990, 1993, Ibáñez & Pérez-Jordá 1998). In Egypt, roosts by day in small caves (Qumsiyeh 1985). The free part of the tail is used as a tactile sensor when moving backwards within crevices (Arlettaz 1993). Although summer-roosts are usually in superficial crevices parallel to the main rocky mass, winter-roosts are deeper and typically located within cracks perpendicular to the cliff face; this allows a deeper positioning in thermally more stable environments. This species is able to live at higher latitudes than any other molossid. In Switzerland, it can stay in torpor as long as eight consecutive days (mean in Jan 3.4 days) (Arlettaz *et al.* 2000). When in torpor, it is able to adjust its body temperature to the environment as long as the ambient roost-temperature does not drop below a threshold situated around 6.5–10°C. Colder roost temperatures induce costly thermogenesis.

**Foraging and Food** Forages by fast-hawking in open areas, from 10 m to at least 100 m above ground. In Europe, activity starts later than in other species (39–65 min after sunset) and lasts for 10 h without periods of rest (Arlettaz 1990, Marques *et al.* 2004). Foraging areas extend up to 30 km or even farther from the day-roost, although most of the foraging activity takes place between 5 and 15 km from the day-roost (Marques *et al.* 2004). In the European Alps, seems to ascend to passes in the mountains to feed on migratory insects (Arlettaz 1990). In France, Kyrgyzstan and Israel, the diet is mainly moths (65% and 88% by volume), beetles (up to 27%), neuropterans (up to 24%) and hemipterans (up to 12%) according to the locality (Rydell & Arlettaz 1994, Whitaker *et al.* 1994). A diet

comprised largely of tympanate insects (moths and neuropterans) is only possible because the low-frequency echolocation calls emitted by this bat are largely inaudible to these insects and therefore they do not take evasive action to avoid capture (Rydell & Arlettaz 1994).

**Echolocation** Search-phase call-shape (Switzerland): shallow linear FM. Start-frequency 13 kHz; end-frequency 10.7 kHz; peak-frequency 11.6 kHz; call-duration ca. 15 ms; call repetition rate 1.3–4 per second ( $n > 100$  calls; Zbinden & Zingg 1986). These calls, which are audible to humans, are described as a characteristic 'Tsick'.

**Social and Reproductive Behaviour** Forages singly or in groups (Arlettaz 1990). In Europe, generally roosts by day in groups of a few dozens, although varying from solitary individuals (normally ♂♂) to maternity colonies of up to 160 bats. Inside the day-roost, usually avoids physical contact with other roost-mates, and rarely forms clusters. Huddling to conserve body-heat occurs only when roost temperature drops below ca. 6.5 °C (Arlettaz *et al.* 2000). In communal roosts, each individual usually defends a small territory against intruders by making loud vocalizations (Arlettaz 1990). These vocalizations are particularly intense when the bats return to the day-roost at sunrise (Arlettaz 1990). Typical social calls are an undulating trill, which alternates up and down in frequency (Ahlén 1990). The mating system, and the mating season, of this species are not well documented. One of six ♂♂ captured in Mar–Apr had scrotal testes in Libya (Qumsiyeh & Schlitter 1982), although ♂♂ display courtship behaviour in mid-Aug and Sep in Kyrgyzstan (Rybin *et al.* 1989) and in the European Alps.

**Reproduction and Population Structure** Litter-size (Europe): one. In southern Europe and Lebanon, the reproductive chronology is restricted seasonal monoestry, with births in Jun. At ca. 35°N (Aures Mts, Algeria), 3 of 4 ♀♀ were lactating in early Aug (Kowalski & Rzebik-Kowalska 1991). Despite being a Palaearctic species, it is not known whether this species follows a typically temperate zone chronology (with sperm storage or delayed implantation during hibernation). The maximum known longevity record is 13 years (at least) from a ♂ in S Iberia (Ibáñez & Pérez-Jordá 1998).

**Predators, Parasites and Diseases** Bone remains were found in pellets of Peregrines *Falco peregrinus* and owls *Tyto alba* and *Strix aluco* (Aymerich & García de Castro 1982, Brunet-Lecomte & Delibes 1982, Kock & Nader 1984). Ectoparasites include a flea *Araeopsylla wasiffi* (Siphonaptera: Ischnopsyllidae) (Beaucournu & Kowalski 1985); ticks *Carios vespertilionis*, *C. boueti* (Acari: Argasidae); and a mite *Parasteatonyssus hoogstraali* (Acari: Macronyssidae) (Anciaux de Faveaux 1984).

**Conservation** IUCN Category: Least Concern (assessed from extralimital as well as African data).

Likely to be threatened by decrease in abundance of its main prey, e.g. moths.

#### Measurements

##### *Tadarida teniotis*

FA (♂♂): 61.0 (58–64) mm,  $n = 24$

FA (♀♀): 58.9 (56–61) mm,  $n = 9$

WS (d): mean 410 mm,  $n = 9^*$

TL (♂♂): 127.5 (119–139) mm,  $n = 9$

TL (♀♀): 135 (129–142) mm,  $n = 12$

T (♂♂): 42.8 (37–52) mm,  $n = 9$

T (♀♀): 50.2 (46–57) mm,  $n = 12$

E: 30.0 (25–33) mm,  $n = 20$

Tr: n. d.

Tib: 19 mm,  $n = 1$

HF: 12.1 (10–14) mm,  $n = 21$

WT: 29.5 (20–40) g,  $n = 60$

GLS: 23.8 (22.5–24.8) mm,  $n = 23$

GWS: 14.1 (13.4–15.1) mm,  $n = 27$

C–M<sup>3</sup>: 8.8 (8.5–9.1) mm,  $n = 29$

Morocco, Algeria, Libya, Egypt (BMNH, Qumsiyeh & Schlitter 1982, Kock & Nader 1984, Kowalski & Rzebik-Kowalska 1991)

\*Portugal (Marques *et al.* 2004)

**Key References** Arlettaz 1990; Arlettaz *et al.* 2000.

Carlos Ibáñez & R. Arlettaz

### *Tadarida thersites* RAILER FREE-TAILED BAT (RAILER BAT)

Fr. Tadaride railleuse; Ger. Thersites Bulldogfledermaus

*Tadarida thersites* (Thomas, 1903). Ann. Mag. Nat. Hist., ser. 7, 12: 634. Efulen, Cameroon.

**Taxonomy** Originally *Nyctinomus thersites*. Subgenus *Xiphonycteris*. Synonyms: *occipitalis*. Subspecies: none. Chromosome number (Cameroon):  $2n = 48$ ; aFN = 62; one pair large metacentric, three pairs small metacentric, three pairs medium subtelocentric, one pair small subtelocentric and 15 pairs medium-small acrocentric autosomes (Smith *et al.* 1986).

**Description** Small to very small microbat without noseleaf and with terminal portion of tail projecting freely from posterior margin of interfemoral membrane; small for an African molossid (FA: 35–42 mm); ears joined by interaural band; M<sup>3</sup> with third ridge present

but < half length of second ridge; anterior palatal emargination narrow; wings blackish, ventral pelage dark; ventral flank-stripe black. Not easily distinguished from *T. brachyptera*. Sexes apparently similar. Pelage short (mid-dorsal hairs ca. 2 mm), sleek; dorsally with a conspicuous wide band of naked skin adjacent to the flight-membranes (cf. absent or very narrow in *T. brachyptera*). Dorsal pelage blackish-brown to dark reddish-brown; no grizzling, no spots; hairs with paler, yellowish base. Flanks naked, black. Rump naked, with two tufts of long hairs (as in several other species of *Tadarida* but not often so conspicuous). Ventral pelage medium brown becoming almost black on flanks; mid-ventral markings absent; ventral flank-stripe black and mainly