3.2.1.4. Lacertidae (True Lizards)

The Lacertidae comprise about 280 different species (UETZ & HALLERMANN 2007), native to Europe, Africa and Asia. They are small to medium in size (snout-vent length 40 to 260 mm, ZUG *et al.* 2001), typically not growing to more than 200 mm total length. Lizards are elongated animals with a conical head, a robust trunk, strong legs, particularly the hind limbs, and they have very long, moderately thick tails. The tongue is notched. Most lacertids are terrestrial and diurnal. Nearly all Lacertidae are oviparous, with a typical clutch unlikely to contain more than ten eggs. There are three species of the Lacertidae found in Cyprus.

Acanthodactylus schreiberi BOULENGER, 1878
Schreiber's Spiny-footed Lizard

Grk. – Ακανθοδάκτυλος (Akanthodáktylos), Αμμόσαυρα (Ammósavra)
Trk. – Tarak Parmakli Kertenkele

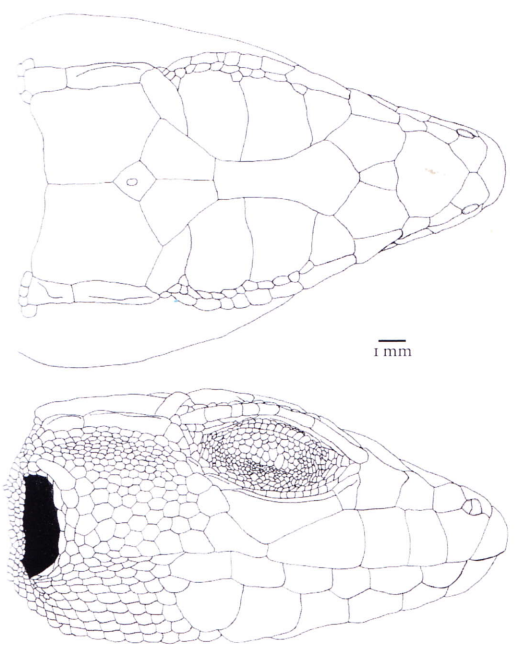
Taxonomy. The first record of the genus *Acanthodactylus* in Cyprus was by GÜNTHER (1879) who assigned the Cyprus form to *Acanthodactylus boskianus*. In the same year BÖTTGER (1879) described a new variety of *A. boskianus* on the basis of two juvenile specimens (type locality "Haiffa, Syria"), which he named *A. b. syriacus*. However, only a year later he obtained a larger set of specimens from Syria and Cyprus which he renamed as *A. savignyi* (BÖTTGER 1880), although he was aware that they did not fit perfectly well with the description of typical *A. savignyi* specimens. Previously, BOULENGER (1878) had described *Acanthodactylus savignyi schreiberii* (holotype RBINS 521602), but unfortunately did not mention its distribution in comparison to other varieties of *A. savignyi* (interestingly, the type specimen is labelled as having been collected in the Ukraine). BOULENGER (1881) then revised his view and elevated both forms to full species level (*A. syriacus* and *A. schreiberii*), i.e. they were not yet considered to be conspecific. *Acanthodactylus schreiberi* (and thus the type locality) was ultimately restricted to Cyprus by LATASTE (1885) and BOULENGER (1887). Several years later, BOULENGER (1918) then defined *syriacus* as a distinct subspecies of *A. schreiberi* (*A. s. syriacus*).

Since then, *Acanthodactylus schreiberi schreiberi* has been the taxon generally accepted to be endemic to Cyprus. However, recent examination of material from *A. schreiberi schreiberi* and *A. schreiberi syriacus* by FRANZEN (1998: 30) gave the impression of specific distinctiveness of these two taxa ["entstand bei der Untersuchung des Materials von ... *A. schreiberi schreiberi* sowie ... *A. schreiberi syriacus* der Eindruck der artlichen Verschiedenheit beider Taxa."]. Similarly, W. MAYER (in litt.) stated that, when comparing

the *Acanthodactylus*-taxa *boskianus, syriacus* and *schreiberi,* specimens of *syriacus* matched the geographic variability in the dorsal scalation of *boskianus* (which generally has anteriorly small and almost granular scales that become bigger towards the tail), while *schreiberi* (having dorsally small scales throughout) could be well separated from the two other taxa. Recently, YALÇINKAYA & GÖÇMEN (2012) described the Turkish population of *Acanthodactylus schreiberi*, which was previously believed to originate from a recent introduction of *A. s. schreiberi* to Turkey, as a new subspecies, *A. s. ataturi*. However, they did not use DNA sequence analysis to support their findings. In view of these uncertainties, a phylogeographic analysis of all eastern Mediterranean *Acanthodactylus* taxa based on both ncDNA and mtDNA sequences is strongly needed.

Diagnosis. BOULENGER (1878: 188) characterised *Acanthodactylus Savignyi* var. *Schreiberii* against other specimens of *Acanthodactylus Savignyi* ("forme type") using the following characteristics (translated from French): four 'plaques palpébrales' (cf. supraocularia); cranial edge of ear denticulated; eight to ten longitudinal rows of ventralia, which are much broader than long; median preanal scales larger than the other; those prior to the cloaca much more broad than wide.

SALVADOR (1982) and FRANZEN (1998) demonstrated that *A. s. schreiberi* can be distinguished from *A. s. syriacus* by the following characteristics (contrasting features of



Figs. 110–111:
Head scalation of a spiny-footed lizard (*Acanthodactylus s. schreiberi*). Specimen collected in Pafos (BM 1972.1963). Modified after SALVADOR (1982).

Fig. 112: Spiny-footed lizard (*Acanthodactylus s. schreiberi*), Pyrgos, May. E. Razzetti

Fig. 113: Male spiny-footed lizard (*Acanthodactylus s. schreiberi*), near Kannaviou, July. D. J. Sparrow

Fig. 114: Spiny-footed lizard (*Acanthodactylus s. schreiberi*), Chlorakas, June. D.J. Sparrow

Fig. 115: Underside of tail of a subadult spiny-footed lizard (*Acanthodactylus s. schreiberi*), near Agia Marina, June. F. Baier

A. s. syriacus in parentheses): small, granular, rarely indistinctly keeled dorsalia (flat and strongly keeled dorsalia); temporalia small, granular and smooth, the more ventrad scales somewhat roundishly enlarged (temporalia large, distinctly keeled, the more ventrad scales longishly enlarged); upper caudalia poorly keeled and of medium size (considerably keeled and large).

Description. This lizard can grow up to 73–93 mm snout-vent length in males and 55–76 mm in females, with the slender tail of twice this length. It has a somewhat upright stance, with a pointed snout and largish head being distinctly separated from the rest of the body.

There are four supraoculars which are separated from five to eight superciliars by a row of 10 to 25 granules. Two supratemporals, both presenting a distinct longitudinal keel. The subocular is lodged between the fourth and fifth supralabial and not in contact with the mouth. Four supralabials lie anterior to the subocular. 31 to 36 gulars down the centre line. The collar is formed by eight to ten collars. 43 to 75 very small dorsals. Ten longitudinal rows of ventrals. 19 to 29 femoral pores on each femur. The toes are slightly denticulated by 20 to 27 rows of subdigital lamellae (Salvador 1982, Osenegg 1989, pers. obs.).

The young and some females have red tails (Figs. 114–115). Our hypothesis is that the red colouration of the juvenile and some (still subadult?) females offers protection from the male (which can become very aggressive, especially during mating season), by demonstrating conspecifity. The body colouration varies from sandy grey to copper-brown with several rows of dark spots along the back and flanks (Figs. 112–113). The dark legs are spotted with light dots. Young specimens have six to eight pale stripes on their back (cp. Figs. 116–117).

Distribution. *Acanthodactylus schreiberi schreiberi* is endemic to Cyprus. Franzen (1998) recorded this subspecies from two locations (Botas and Yukari Burnaz, province Antakya [Hatay]) in southeastern Turkey, and assumed that these populations were recently introduced from Cyprus via the harbour of Botas. Sindaco *et al.* (2000), however, noted that the Turkish population might be a relict population "because a similar distribution is typical of several insects and vertebrates (see also *Archaeolacerta laevis* Gray, 1838 and *Ablepharus budaki* Göçmen, Kumlutas & Tosunoglu, 1996)". Recently, Yalçinkaya & Göçmen (2012) described the Turkish population of *A. schreiberi* as a new subspecies, *A. s. ataturi*, and formally restricted the distribution of *A. s. schreiberi* to Cyprus again. Molecular evidence, however, is strongly needed to confirm the taxonomic status and determine the geographic distribution of *A. s. schreiberi* and *A. s. ataturi*.

Werner (1936) postulated a vertical distribution up to 4000 ft. (i.e. circa 1,220 m asl.). *Acanthodactylus schreiberi* enters the mountains along the streams, e.g. at Potamos Dhiarizos up to heights of 800 m asl. (Schätti & Sigg 1989b). We found *A.*

Fig. 116: Head portrait of a subadult spiny-footed lizard (*Acanthodactylus s. schreiberi*), same specimen as in Fig. 115. F. Baier

Fig. 117: Head portrait of an adult spiny-footed lizard (*Acanthodactylus s. schreiberi*), same specimen as in Fig. 112. E. Razzetti

schreiberi at the crosspoint of the roads Chandria-Polystypos and Chandria-Agros (34.9404°N, 33.0053°E) at 1,348 m asl., and at the Agros dam (34.9237°N, 33.0136°E) at 1,120 m asl., and thus consider WERNER's (1936) observations as realistic, though of course this species is mainly distributed at lower heights, especially along the coastlines. Fig. 118 shows the distribution of *Acanthodactylus schreiberi* in Cyprus.

Biogeographic classification. Palaearctic: East Mediterranean.

Ecology. *Acanthodactylus schreiberi* prefers coastal areas with sandy dunes and sparse vegetation or light soils close to the dunes (CLARK 1973, SCHÄTTI & SIGG 1989b, OSENEGG 1989, pers. obs.). These areas are often dry and well drained (CLARK 1973). OSENEGG (1989) mentioned records at salt lakes, in dry river beds, at road edges covered with drifting sand, in banana plantations and by stone walls. In the vicinity of Yeni Erenköy (= Gialousa), the lizards inhabit sandy, lightly vegetated places with *Capparis spinosa* (caper) and other halophytes (GÖÇMEN *et al.* 1996b). They can be found in newly cultivated areas with sandy soil, and also can be found along recently dug tracks and fire-breaks (pers. obs.). GÖÇMEN *et al.* (1996b) even found *A. schreiberi* in places with cobblestone pavement (ruins of Salamis). Forests are generally avoided (WERNER 1936) but this lizard may enter forests at least along the edges of sandy tracks. Schreiber's spiny-footed lizard also lives on dunes with many shrubs which provide rich coverage (SCHÄTTI & SIGG 1989b, pers. obs.). A small population in the southeast of Cyprus (Cape Gkreko) inhabits an area lightly covered with small trees (30 × 15 m) adjacent to the beach of a hotel (pers. obs.).

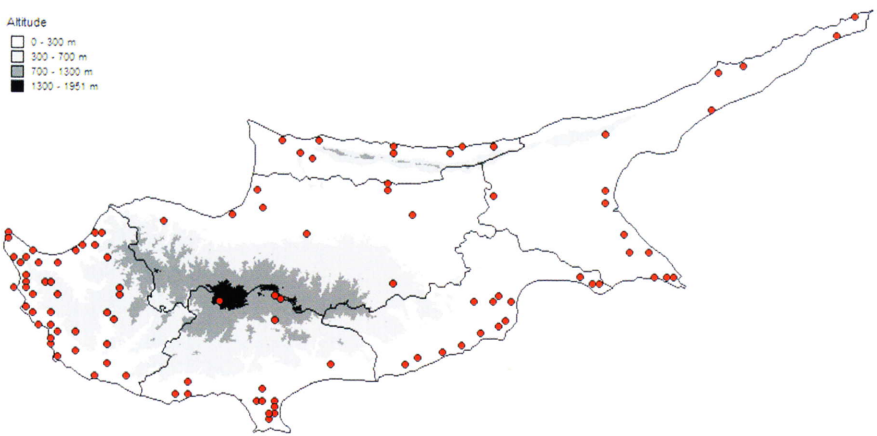


Fig. 118: Distribution of the spiny-footed lizard (*Acanthodactylus s. schreiberi*) in Cyprus.

Fig. 119: Habitat of the spiny-footed lizard (*Acanthodactylus s. schreiberi*), coastal dunes near Argaka. D.J. Sparrow

Fig. 120: Burrow of a spiny-footed lizard (*Acanthodactylus s. schreiberi*), coastal dunes near Argaka. D.J. Sparrow

Shrubs are seemingly often used as a shelter. We frequently found this lizard in areas with many thyme bushes which possibly provide a rich food source. This lizard generally prefers dry habitats, but often with occasional humid spots. Franzen (1998) described similar habitats for a Turkish population (see above). The denticulated scale fringes on the fingers and toes, which are characteristic for the genus *Acanthodactylus* and are interpreted as an adaptation to sandy soils, are only moderately developed in *A. schreiberi* (Salvador 1982) – apparently as a morphological adaptation to a less close dependence on sandy habitats than in other *Acanthodactylus* species.

Nutritional analyses of *A. schreiberi* in Cyprus are still lacking. Ewald (1984a) mentioned that relatively hard shelled beetles are often eaten, and occasionally also fruits. From our own observations, the diet consists typically of beetles, grasshoppers and ants.

Franzen (1998) reported an adult female from the Turkish population (ZFMK 65034) that contained four eggs measuring app. 19 × 9 mm. A female will lay a clutch of three to five eggs (Atatür & Göçmen 2001). Zotos *et al.* (2012) demonstrated sperm storage of up to 3 months in *A. s. schreiberi.* In their study, all four females studied laid a second fertile clutch on average 33.75 days after the first clutch without any mating in between. The first clutch contained on average 3 eggs (min.-max. 2–4); the second clutch on average 2.25 eggs (min.-max. 2–3). One female even laid a third fertile clutch and a fourth unfertile clutch. The ability for sperm storage may be essential for sustaining more isolated small populations in the Troodos Mountains.

Böhme & Wiedl (1994) mentioned *Hierophis cypriensis* as a predator of young spiny-footed lizards. We once observed an attack of *Chalcides ocellatus* upon a juvenile *A. schreiberi* (see below).

Schreiber's spiny-footed lizard is rather rare in Cyprus when compared to the other lacertid lizards, but where populations occur they are locally abundant (Osenegg 1989). For example, we observed a very large population in May on Cape Kormakitis, and found individuals approximately every three to four metres along approximately five kilometres of dirt track around Letymvou. Schätti & Sigg (1989b) also reported large populations in certain places; Clark (1973) was even able to collect 88 specimens of this species during a three-week visit. From our own observations, females outnumber males (two to three females per one male).

Across its broad geographic range, *A. schreiberi* is declining seriously in population number, size and area of occupancy and is thus listed as "Endangered" in the IUCN Red List of Threatened Species (IUCN 2007). At least for the present, the species appears to be doing fairly well in Cyprus, although in the long term it maybe threatened from the loss of coastal habitats due to tourist development and the concreting of the dirt tracks.

Behaviour. This species, in common with other members of the genus *Acanthodactylus,* is very aggressive and frequently gets in intraspecific skirmishes. Males aggressively defend their territorial boundaries, and, if they are willing to mate, treat their partners very roughly. For example, we observed an attempt at mating on 3rd June at Cape Gkreko in southeastern Cyprus. The male bit the female in the lateral haunch region to prevent her flight. The couple struggled together like this for several minutes. After a particularly hard move by the male, the female autotomised a part of her tail and was finally able to flee under a stone.

Birkenmeier (1953) believed Schreiber's spiny-footed lizard uses sand holes dug by crabs. These holes (Fig. 120) are however dug by the lizards themselves (Osenegg 1989, pers. obs.), probably as a shelter during the night (Osenegg 1989) and in the midday heat in the summer (cp. Franzen 1998). Göçmen *et al.* (1996b) wrote that the lizards dig their holes in areas of woody scrubs, close to bushes, typically those belonging to the Mimosaceae, Fabaceae and Rutaceae. It is possible that the animals also hibernate in these holes. According to Schätti & Sigg (1989b), hibernation in Cyprus lasts from November to February, on Karpasia to early March, and is only interrupted after several warm days have heated the ground. This behaviour highlights the thermophilicity of this species.

Acanthodactylus schreiberi is a very lively, vigilant and fast lizard (pers. obs., Schätti & Sigg 1989b), that is difficult to catch (Werner 1936, Birkenmeier 1953, Atatür & Göçmen 2001). For example, we once observed a predation attack by an adult *Chalcides ocellatus* on a newborn *A. schreiberi* within the fort of Keryneia (Girne). The young reacted to this attack extremely fast, autotomised its tail and fled. Whether the skink was actually able to grab the lizard, could not be observed due to the high speed of the event; the broken tail, however, was not eaten by the skink during the observation.