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A new subspecies from Anatolia, *Acanthodactylus schreiberi* Boulenger, 1879 *ataturi* n. ssp. (Squamata: Lacertidae)

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Abstract. A new subspecies the *Acanthodactylus schreiberi, A. s. ataturi* n. ssp., is being described from Anatolia which differs from the nominate subspecies *A. s. schreiberi* Boulenger, 1879 of Cyprus island and *A. s. syriacus* Böttger, 1878 from Lebanon and Israel. Compared to the later two populations, *A. s. ataturi* n. spp. is different in having 'half-domes' (protuberant) above the eyes (71.4%), one or two additional small plates between the prefrontals in the majority of examined specimens (73.6%). It is also differs in having no distinctly keeled dorsal and temporal scales, and also the presence of small-sized dorsal maculations (based on the average numbers of scales within dorsal maculations) from *A. s. syriacus* and *A. s. schreiberi*, respectively. The obtained electropherograms of the examined blood-serum protein samples showed important qualitative differences between the Cypriot and Anatolian populations; in the Cypriot samples the total protein fraction number was 13-14, while in Anatolian samples the number between 14 and 16, indicating the difference. It is also stressed that the only known biotope of the subspecies in Anatolia is now under grave habitat destruction, which should cease immediately to safeguard the future of the subspecies.

Key words: Turkey, Cyprus, taxonomy, new lizard subspecies, *Acanthodactylus schreiberi*, serology.

Introduction

Acanthodactylus schreiberi has a wide range in Cyprus island with a vertical distribution to 1000 m (Troodos Mountain, Southern Cyprus) (Salvador 1982, Osenegg 1989, Göçmen et al. 1996). However, two relict populations are also found in the Eastern Mediterranean region of Turkey (Botaş, Adana) and in a small area including the southern Lebanon and northernmost of Israel (Franzen 1998, Atatür & Göçmen 2001).

Its subspecies from Israel-Lebanon is *A. s. syriacus* Boettger, 1878 (Hraoui Bloquet 1981, Werner 1988, Martens 1997, Franzen 1998). In contrary to the subspecific name, this taxon does not found in Syria –this name was given when 'Syria' included also parts of the modern states of Israel and Lebanon (Martens 1997). *Acanthodactylus schreiberi schreiberi*, until recently thought to be endemic to Cyprus, was reported for the first time from Anatolia – Turkey by Franzen (1998). Franzen (1998) found four specimens from a small area located between the two vilayets, Antakya and Adana (Yukarı Burnaz/Botaş) in morphological accordance with those collected museum samples from Cyprus in ZSM (Zoologische Staatssammlung München, Germany), but quite distinct from *A. s. syriacus* based on the museum specimens collected from Tel Aviv (Israel) in ZFMK (Zoologisches Museum Alexander Koenig, Germany).

Up to the present, the race inhabiting Cyprus and Turkey was given as *A. s. schreiberi* Boulenger, 1879 (Franzen 1998, Atatür & Göçmen 2001). The present study reports morphological and ecological comparisons between Anatolian and Cypriot populations of *A. schreiberi*, conducted on material in the ZDEU (Zoology Department of Ege University) museum and later material gathered in Cyprus and Anatolia. Because we have got only two adult museum specimens (one male and one female) belonging to the other known subspecies *A. s. syriacus* and also this taxon shows clear qualitative differences, such as the presence of strongly keeled dorsal and temporal scales as a diagnostic features (Boulenger 1921, Salvador 1982, Franzen 1998), from its close related populations in Cyprus and Anatolia, statistical testing is avoided. The obtained data led to the description of a new subspecies from Anatolia.

Materials and Methods

The *Acanthodactylus schreiberi* material for the morphological comparisons consist of 91 (23 ♂♂, 9 subadult ♂♂, 38 ♀♀, 14 subadult ♀♀, 7 juveniles) specimens from Anatolia, both ZDEU specimens and new material gathered in April 2007-2008, and 89 (25 ♂♂, 3 subadult ♂♂, 36 ♀♀, 10 subadult ♀♀, 15 juveniles) specimens from Cyprus. For ecological comparisons, notes were taken during the field studies. For seeing and scaling the states of the comparing characteristics with closely related but also distinctly different taxa, 2 *A. s. syriacus* (1 ♂, 1 ♀) specimens were also utilized.

As a research strategy, we applied Student t test analyses to compare firstly similarities and differences between male and female in each population, and then the same test were used whether to compare inter-population separately for the sexes or for the pooled material. Statistical significance in this test was set at 0.05. Also, for mensural ("metric") characters we used only the adults, fearing effects of allometry. The evaluations of all statistical analyses were based on the statistical significance level of $P \leq 0.05$.

The material is listed by region and collecting localities are shown in Figure 1.

<u>Anatolia (N=91):</u> ZDEU 6/1999, 13 ♂♂, 21 ♀♀. Botaş-Adana, 11.07.1999, leg M. Tosunoğlu, K. Akman; ZDEU 217/2005, 6 ♀♀. Botaş-Adana, 01.09.2005, leg D Yalçınkaya; ZDEU 218/2005, 5 ♂♂, 5 ♀♀. Botaş-Adana, 03.08.2005, leg D. Yalçınkaya; ZDEU 120/2007, 1 sa. ♂, 3 sa. ♀♀. Botaş-Adana, 30.04.2007, leg B. Göçmen, M. Z. Yıldız, D. Yalçınkaya, B. Akman; ZDEU 155/2007, 5 ♂♂, 8 sa. ♂♂, 6 ♀♀, 9 sa. ♀♀. Botaş-Adana, 27.05.2007, leg B. Göçmen, M. Z. Yıldız, D. Yalçınkaya, B. Akman; ZDEU 220/2007, 2 sa. ♀♀, 7 juveniles. Botaş-Adana 02.11.2007, leg B. Göçmen, M. Z. Yıldız, D. Yalçınkaya, B. Akman. These specimens were all collected from the locality No. [1] (Figure 1).

<u>Cyprus (N=89):</u> ZDEU 79/1993, 8 ♂♂, 5 ♀♀, 1 juvenile. Gönyeli-Nicosia [2], 30.07.1993, leg B. Göçmen; ZDEU 48/1994, 1 ♂, 2 ♀♀, 1 juvenile. Geçitköy-Kyrenia [3], 21.08.1994, leg B. Göçmen; ZDEU 47/1994, 2 ♂♂, 11 ♀♀, 1 sa. ♀, 1 juvenile. Kumköy-Güzelyurt (Morphou) [4], 24.08.1994, leg B. Göçmen; ZDEU 46/1994, 2 ♂♂, 3 ♀♀. Y. Erenköy-Karpas [5], 26.08.1994, leg B Göçmen; ZDEU 45/1994, 3 ♂♂, 1♀, 2 juveniles. Salamis-Famagusta [6], 27.08.1994, leg B Göçmen; ZDEU 30/1995, 2 ♂♂, 3 sa. ♂♂, 4 ♀♀, 1 juvenile. Gönyeli-Nicosia [2], 08.05.1995, leg B. Göçmen;

ZDEU 17/2007, 7 ♂♂, 9 ♀♀, 9 sa. ♀♀, 8 juveniles. Altınkumsal-Karpas [7], 04.04.2007, leg B. Göçmen, M. Z. Yıldız, D. Yalçınkaya, B. Akman; ZDEU 213/2007 1♀. Derinya-Larnaca [8], 19.09.2007, leg B Göçmen, N. Kaşot; ZDEU 215/2007, 1 juvenile. Nicosia-S. Cyprus [9], 20.09.2007, leg B. Göçmen, N. Kaşot.

Israel (N=2): ZDEU 21/1974, 1♂, 1♀. Tel Aviv-Israel [10], 26.03.1974, leg Mendelssohn.

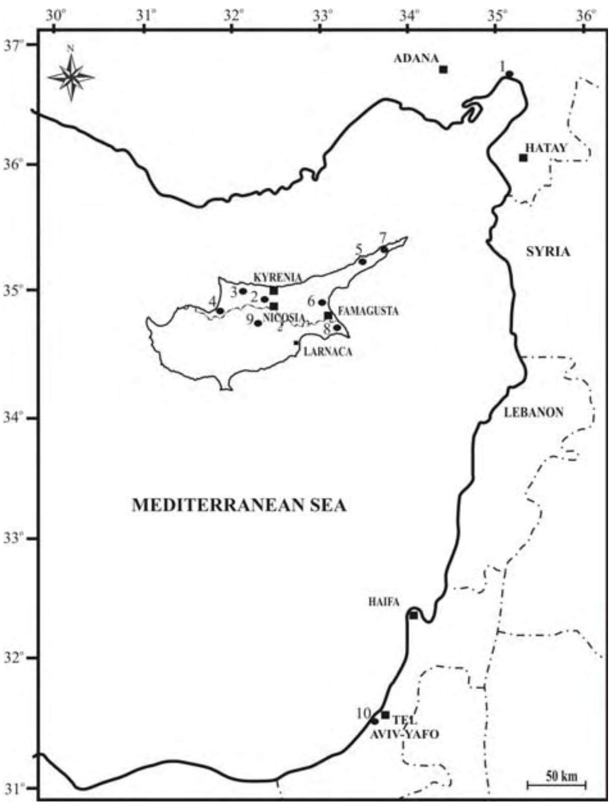


Figure 1. Sample collecting localities (squares: cities; circles: localities of material). 1; Botaş-Adana. 2; Gönyeli-Nicosia. 3; Geçitköy-Kyrenia. 4; Kumköy-Güzelyurt (Morphou). 5; Yeni Erenköy-Karpas. 6; Salamis-Famagusta. 7; Altınkumsal-Karpas. 8; Derinya-Larnaca (Southern Cyprus). 9; Nicosia (Southern Cyprus). 10; Tel Aviv (Israel).

The caught specimens were kept alive for a short time, changing between two weeks and a month in a terrarium for colouration analyses and photography, using Olympus C-5060WZ and Nikon Coolpix 5400 digital cameras.

To facilitate intra- and interpopulation comparisons regarding blood-serum proteins, polyacrilamide gel electrophoresis (PAGE) and densitometric analyses were utilized. Blood samples were obtained from postorbital sinuses of 12 Anatolian (6♂♂, 6♀♀) and 8 Cypriot (4♂♂, 4♀♀) specimens, using heparinized hematocrit tubes. The separations of blood-serum proteins were done according to the polyacrilamid "disk" electrophoresis method of Davis (1964), slightly modified by Özeti & Atatür (1979).

Following the serological procedures, all specimens were initially etherized, then injected with 96 % ethanol and transferred to the ZDEU museum (Zoology Dept., Ege University) in glass jars with 96 % ethanol (Göçmen et al. 2008a) to facilitate future DNA studies.

Several meristic characters were examined bilaterally and right and left sides were compared to verify the possible presence of directional asymmetry (Werner et al. 1991). Further, individual means of the right and left sides were used. These characters are indicated by an asterisk **(*)** in the character list below (Moravec et al. 1999).

Mensural characters

Head length (HL): Distance from tip of snout to posterior edge of ear; Head width (HW): Greatest width of head; Head depth (HD): Greatest depth of head; Horizontal diameter of eye (HDEy): Distance from anterior edge to posterior edge of eye; Distance from anterior edge of eye to tip of snout (DES); Horizontal diameter of ear (HDEa): Distance from anterior edge to posterior edge of ear opening; Distance from posterior edge of eye to anterior edge of ear opening (DEE); Pileus length (PilL): Distance from posterior edge of parietal plates to tip of snout; Pileus width (PilW): Distance between the posterior-outer edges of the posterior supratemporal plates; Parietal length (ParL): Distance from anterior edge to posterior edge of parietal plate; 1st Supratemporal length (1.STL): Distance from anterior edge to posterior edge of 1st supratemporal plate; Rostrum-anus length (RA): Distance from tip of snout to anus; Body width (BW): Greatest width of body; Forelimb length (FLL): From axilla to tip of distal claw; Hindlimb length (HLL): From groin to tip of distal claw; Fourth toe length of hindlimb (FTL): From insertion of 5th toe, claw included; Tail length (TL): From anus to tip of tail, if original.

Measurements on head and plates, also plate nomenclature of *Acanthodactylus schreiberi* are shown in Figures 2 and 3.

Meristic pholidotic characters

Number of prenasal plates (*PreNP); Number of postnasal plates (*PostNS); Number of preocular plates (*PreOP); Number of plates between prefrontal plates (BPFP); Number of supratemporal plates (*STP); Supralabials (*SupL): Number of labials both anterior and posterior to center of eye; Sublabials (*SubL); Number of subocular plates (*SubOP); Number of supraocular plates (*SupOP); Number of supraciliary granules along the 2nd Supraocular plate (*2.SpOG); Number of supraciliary granules corresponding to 3rd Supraocular plate (*3.SpOG); Total number of supraciliary granules (*SpCG); Number of supraciliary plates (*SpCP); Number of scales of lower eyelid (SLEL); Inframaxillars (*IM); Gulars (G): Number of gular scales in a straight median series; Collars (C): Number of scales in a transverse series following the gulars; Dorsals (D): Number of dorsal scales across midbody; Number of dorsal scales between hindlimbs (BHLD): number of dorsal scales in longest row between right and left hindlimb; Ventrals across abdomen (VA): Number of ventral plates in longest row across abdomen; Transverse rows of ventrals (TV): Number of complete transverse series of ventral plates counted along the venter to the scales separating, if present, the series of femoral pores; Femoral pores (*FP); Scales between rows of femoral pores (Number of scales seperating the two series of femoral pores) (BFPS); Subdigital lamellae of the 1st finger of forelimb (*SDL1.FLF): Along underside of 1st finger, defined by their width, the one touching the claw included; Subdigital lamellae of the 4th toe of hindlimb (*SDL4.HLT): Along underside of 4th toe, defined by their width, the one touching the claw included; Preanals (PA): Number of preanal plates in straight median series between anus and the scales seperating, if present, the series of femoral pores; number of tail circles (NTC): Transversal scale rows arranged in rings from base to tip of tail.

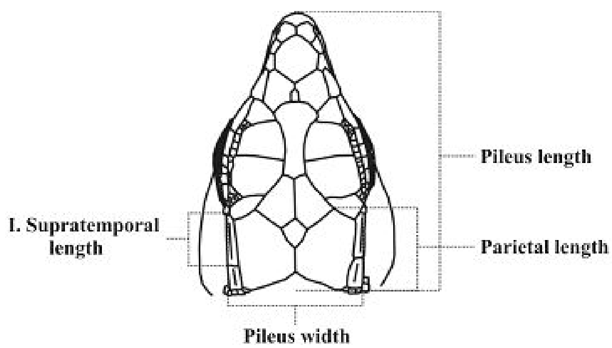


Figure 2. Measurements on the head and plates of *Acanthodactylus schreiberi*.

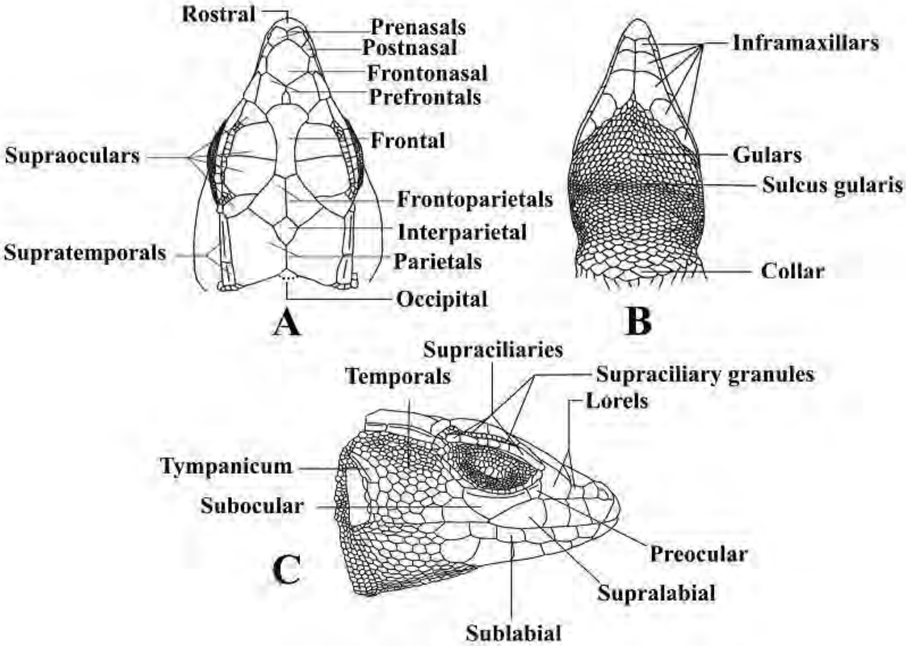


Figure 3. Dorsal (A). ventral (B) and lateral (C) aspects of head in *Acanthodactylus schreiberi*.

Computed characters

TL/RA: Ratio of tail length to rostrum-anus length; PilL/PilW: Ratio of pileus length to pileus width; RA/PiL: Ratio of rostum-anus length to pileus length; D/FP: Ratio of number of dorsal scales across midbody to femoral pores (Moravec et al. 1999); BFPS/FP: Ratio of scales between rows of femoral pores to femoral pores (left side) (Moravec et al. 1999); Temporal scale index (TSI): Number of temporal scales in a vertical row between 1st supratemporal plate and posterior supralabial plate × Number of temporal scales in a horizontal row between the largest temporal scale - anterior of typmanicum, accepted as massetericum- and posterior circumocular scale (Franzen 1998); Head index-I (HL×100/HD): (Ratio of head length to head depth) × 100; Head index-II (HL×100/HW): (Ratio of head length to head width) × 100.

Qualitative characters

Supraocular plates form half-domes (protuberant) over eyes; (+) or not (-); Occipital plate present (+) or absent (-); Tympanicum present (+) or absent (-); Sulcus gularis present (+) or absent (-); Supralabial in contact with prenasale (+) or not (-); Supranasals in contact (+) or not (-); Division of the 1st supraocular* (0, undivided on both sides, or nearly intact with a small granule medially; 0.5, divided on one side; 1, divided on both sides); Contact of the subocular with the mouth* (0, excluded from the mouth by supralabials on both sides; 0.5, reaching the mouth on one side; 1, reaching the mouth on both sides).

Meristic characters were counted under a stereo microscope. Metric characters were measured with digital calipers of 0.01 mm sensitivity, except RA and TL, which were measured with a millimetric ruler.

Summarized statistics of the metric and meristic values of the populations, inter-population and intra-population comparison analyses were conducted with SPSS vers. 15.0. In comparing, for both the meristic and metric characters, Student t test were used. Furthermore, to control the test results of raw data, data on raw metric characters were again exposed to Student t test, taking index values of PERCRA (percents of rostrum-anus length; [each metric character/head+trunk length] × 100), according to Werner (1971). So, the evaluations on similarities or differences between the populations were strengthened. The evaluations of all statistical analyses were based on the statistical significance level of $P \leq 0.05$.

Results and Discussion

Acanthodactylus schreiberi ataturi **n. ssp.**
(Figures 4-10, Tables 1-4)

Differential Diagnosis

The four supraoculars above the eyes form half-domes (71.4% of the population) (Figure 4A). Usually one or two plates between the prefrontals (73.6%) (Figures 5A and B). Temporal region scales, usually near the tympanicum and supralabials in contact with temporals, are slightly keeled in less than half the length of each scale (63.7%) (Figure 6A). There are 8-21 supraciliary granules; 31-40 gulars; 29-38 transversal rows of ventral plates; 47-67 longitudinal rows of dorsal scales; 22-32 femoral pores; 17-25 subdigital lamellae at 4th toe of hind foot. Parietal plate and 1st supratemporal plate lengths vary within the ranges 3.34-5.51 mm and 2.20-3.66 mm, respectively. The specimens are divided into four pattern types, based on the dark maculations on the dorsum, which were resulted from the fragmentation of the light juvenile longitudinal stripes in adults, whether they are in regular rows or randomly distributed, whether they are in contact or not. These maculations are rather large and enclose 2-36 scales (Figure 7/1) (Table 1).

Various differences distinguish *A. s. ataturi* n. ssp. from the other races of the species.

(a) Supraoculars formed half-dome shaped structures over the eyes in *A. s. ataturi* n. ssp. (71.4%) (Figure 4A), but similar structures were not seen either in *A. s. schreiberi* (87.6%) (Figure 4B) or in *A. s. syriacus*.

(b) There were generally one or two plates between the prefrontals in *A. s. ataturi* n. ssp. (73.6%) (Figure 5A and B). But in the nominate race *A. s. schreiberi* usually no plate was present between the prefrontals (68.5%) (Figure 5C), while no plate was seen between the prefrontals of *A. s. syriacus* (100%).

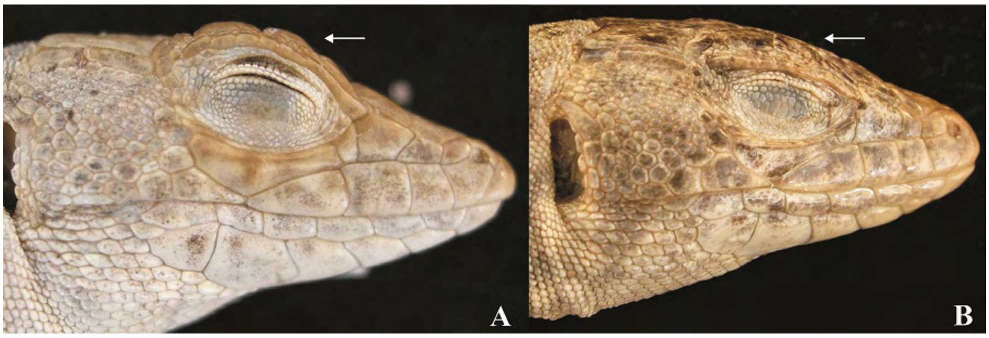


Figure 4. The difference between the populations regarding whether the supraoculars form half domes over the eyes as in *A. s. ataturi* n. ssp. (ZDEU 6/1999-2-♂) (**A**); or not as in *A. s. schreiberi* (ZDEU 79/1993-8-♂) (**B**).

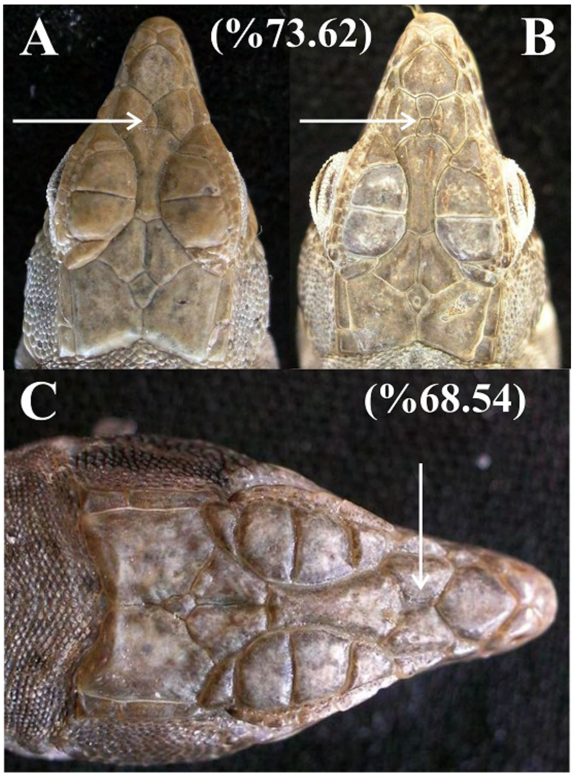


Figure 5. Presence or absence of additional plates between the pre-frontals: (**A** and **B**) one or two plates as in *A. s. ataturi* n. ssp. ; (**C**) no plates as in *A. s. schreiberi*.

Figure 6. The keel conditions of temporal region scales in different populations of *Acanthodactylus schreiberi*. **A:** *A. s. ataturi* n. ssp. (ZDEU 218/2005-4♀). **B:** *A. s. schreiberi* (ZDEU 79/1993-2♂). **C:** *A. s. syriacus* (ZDEU 2/1974-1♂).

(c) While in *A. s. ataturi* n. ssp. scales of the temporal region, especially the few in contact with the tympanicum and the posterior supralabials, were keeled basically at less than half the length of each scale (63.7%) (Figure 6A), in most of the specimens examined from the *A. s. schreiberi* population (86.5%) no such keels were present (Figure 6B). In *A. s. syriacus* temporal scales were distinctly sharply keeled (Figure 6C).

(d) Number of supraciliary granules were 8-21 in *A. s.*

Table 1. Percentages of occurrence (**1**) of pattern types of mature specimens belonging to *A. s.ataturi* n. ssp. and *A. s. schreiberi* populations together with the number scales within the maculations (**2**).

Pattern types	Type-A		Type-B		Type-C		Type-D	
	1	2	1	2	1	2	1	2
A. s. ataturi n. **ssp.**	%20.23	3-36	%39.28	4-30	%25.00	2-21	%15.48	2-30
A. s. schreiberi	%25.68	2-32	%24.32	4-74	%31.08	3-45	%18.92	4-62

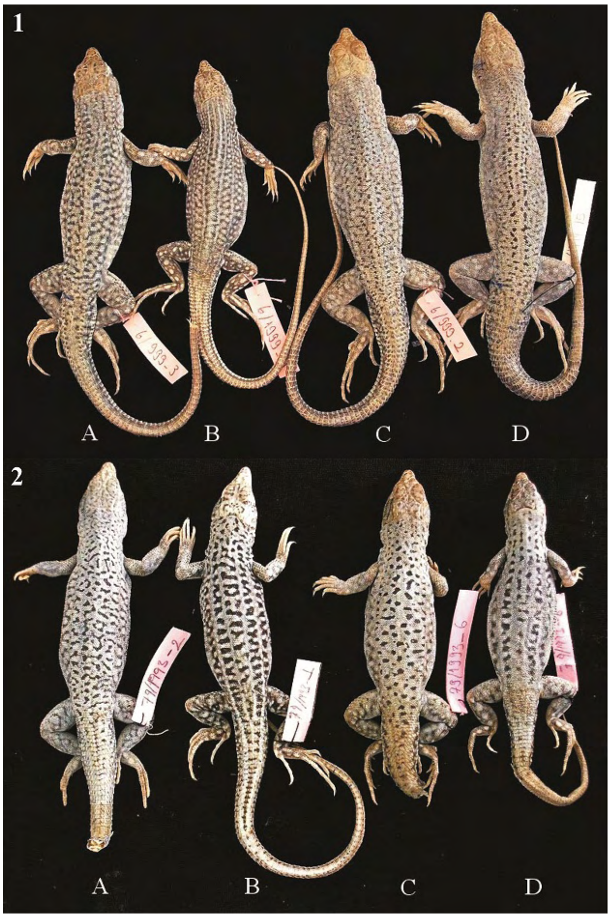


Figure 7. Pattern types in *A. s. ataturi* n. ssp. **(1)**.[**A**: pattern type A (ZDEU 6/1999-3 ♂). **B**: pattern type B (ZDEU 6/1999-9 ♀). **C**: pattern type C (ZDEU 6/1999-2 ♂. Holotype). **D**: pattern type D (ZDEU 6/1999-15 ♂)] and in *A. s. schreiberi* **(2)** [**A**: (ZDEU 79/1993-6♂). **B:** (ZDEU 79/1993-2♂). **C:** (ZDEU 79/1993-1♂). **D:** (ZDEU 79/1993-8♀)].

ataturi n. ssp., but 9-16 in *A. s. schreiberi* (Table 2). The same numbers were given by Osenegg (1989) as 10-25 for *A. s. schreiberi,* by Franzen (1998) as 14-19 for the Anatolian population and as 10-25 for the Cypriot population.

(e) Number of gulars was 31-40 in *A. s. ataturi* n. ssp. and 30-43 in *A. s. schreiberi* (Table 2).

(f) Number of longitudinal dorsal scale rows at midbody in *A. s. ataturi* n. ssp. was 46-67 while in *A. s. schreiberi* was 49-65 (Table 2). According to Franzen (1998) the same numbers were 52-59 and 43-75 in Anatolian and Cypriot specimens, respectively.

(g) Transverse rows of ventral plates numbered 29-38 in *A. s. ataturi* n. ssp. and 27-35 in *A. s. shreiberi* (Table 2).

(h) In *A. s. ataturi* n. ssp. number of femoral pores varied between 22-32, the usual numbers being 25-29 (79.7%), while in *A. s. schreiberi* the variation was 22-30, the usual numbers 23-28 (81.8%) (Table 2). The usually encountered numbers indicated a significant difference between the populations.

(i) The 4th toe subdigital lamellae numbered 17-25 in *A. s. ataturi* n. ssp., the usual numbers being 20-22 (73.1%); while in *A. s. schreiberi* the variation of the same was 18-25 (Table 2), the usual numbers being 21-23 (73.9%).

(j) The head width, horizontal diameter of ear, pileus length and width, parietal plate length, 1st supretemporal plate length, Head index-II, RA/PiL (ratio of rostum-anus length to pileus length), BFPS/FP (ratio of scales between rows of femoral pores to femoral pores) indicate a difference between *A. s. ataturi* n. ssp. and *A. s. schreiberi* populations (Table 3 and 4).

(k) Both *A. s. ataturi* n. ssp. and *A. s. schreiberi* specimens were divided into four different pattern groups according to the characteristics of their dorsal maculations (Figure 7). Regarding the number of scales enclosed by these maculations, especially in B, C and D types, a distinct difference existed between *A. s. ataturi* n. ssp. and *A. s. schreiberi* populations. In the pattern types of *A. s. schreiberi* (except the A type), the number of scales enclosed by the maculations (3-74) was usually (74.3%) more than twice of those in *A. s. ataturi* n. ssp. (2-30) (Table 1). A condition which separated the two populations from the viewpoint of their pattern characteristics.

(l) The obtained electropherograms of the examined blood-serum protein samples showed important qualitative differences between the Anatolian and Cypriot populations; in the Anatolian samples the total protein fraction number was 14-16 (Figure 8), while in Cypriot samples the number between 13 and 14 (Figure 9).

Holotype and Terra Typica

(Figure 10A) Mature male. ZDEU 6/1999-2. Botaş-Adana – TURKEY. 4 m. a.s.l.

Derivatio nominis

The name of the newly described geographical race is derived from the surname of Prof. Dr. Mehmet Kutsay Atatür, who had participated extensively to the herpetological knowledge of Turkey.

Description of the holotype

The bodily measurements of the holotype are: Rostrum-anus length (RA), 79 mm; Tail length (TL), 152 mm; Head length (HL), 20.50 mm; Head width (HW), 13.22 mm; Parietal plate length (ParL), 5.10 mm; Forelimb length (FLL), 24.04 mm; Hindlimb length (HLL), 45.32 mm.

A post- and prenasal plate at each side, always in touch with each other and the 1st supralabial; an interparietal between two parietal plates; a distinct lanceolate depression between the frontonasal and frontoparietals on the median line. Two keeled supratemporals; two lorelia; a preocular on each side; two half-domes over the eyes formed by a pair of four supraocular sets; ear opening large, with no pectination; temporal region scales, especially those few in contact with tympanicum and posterior supralabials, are keeled at less than half the length of each scale. Seven supralabials (SupL) on the left and eight on the right, four on each side in front of subocular. Supraciliary granules number 14 on the left and

Table 2. Summarized statistics for *A. s. ataturi* n. ssp. and *A. s. schreiberi* specimens on meristic characters, together with the P values of these characters according to Student t-test. The P values of characters which indicate a difference between the sexes in the same population (P1) and between the populations (P2) are in bold (P≤0.05). [(N: number of specimens. SD: Standard deviation, SE: Standard error of the mean) (The details of the characters were given in "Material and Methods")].

		***A. s. atatur*i n. ssp.**							***A. s. schreiberi***							
Characters	Sex	N	Mean	Min.	Max.	SD	SE	P1	N	Mean	Min.	Max.	SD	SE	P1	P2
	Male	32	7.98	7	9	0.45	0.057		28	7.98	7	9	0.52	0.070		0.980
SupL*	Female	52	7.84	7	9	0.50	0.049	0.051	46	7.98	7	9	0.49	0.051	0.964	**0.048**
	Total	91	7.90	7	9	0.49	0.036		89	8.02	7	9	0.49	0.037		**0.025**
	Male	32	6.14	5	7	0.47	0.058		28	6.07	5	7	0.32	0.043		0.475
SubL*	Female	52	6.23	5	7	0.51	0.050	0.181	46	6.10	5	7	0.36	0.038	0.647	**0.035**
	Total	91	6.18	5	7	0.48	0.036		89	6.08	5	7	0.33	0.025		0.052
	Male	32	5.08	2	7	0.96	0.121		28	5.11	3	7	0.89	0.119		0.864
2.SpOG*	Female	52	5.03	3	8	0.94	0.092	0.793	46	4.98	2	7	1.01	0.105	0.417	0.664
	Total	91	5.07	2	8	0.93	0.069		87	4.99	2	7	0.93	0.070		0.483
	Male	32	6.94	3	9	1.26	0.157		28	6.61	5	8	0.87	0.116		0.142
3.SpOG*	Female	52	6.76	5	9	1.03	0.101	0.476	46	6.66	5	9	0.91	0.094	0.709	0.485
	Total	91	6.87	3	9	1.14	0.084		87	6.58	4	9	0.91	0.069		**0.011**
	Male	32	13.31	8	19	2.00	0.250		28	12.61	9	15	1.30	0.174		**0.022**
SpCG*	Female	52	13.36	9	21	2.03	0.199	0.892	46	12.62	10	16	1.34	0.140	0.956	**0.003**
	Total	91	13.36	8	21	1.98	0.147		87	12.51	9	16	1.37	0.104		**0.000**
	Male	32	6.41	6	8	0.53	0.066		28	6.43	4	8	0.66	0.088		0.839
SpCP*	Female	52	6.15	5	8	0.55	0.054	**0.004**	46	6.20	5	8	0.65	0.068	0.956	0.631
	Total	91	6.26	5	8	0.55	0.041		89	6.26	4	8	0.66	0.049		0.934
	Male	11	206.73	192	232	11.81	3.560		13	201.38	176	241	16.62	4.608		0.369
SLEL	Female	14	207.36	187	228	13.14	3.512	0.901	12	195.42	168	216	15.74	4.543	0.366	**0.050**
	Total	25	207.08	187	232	12.32	2.464		25	198.52	168	241	16.15	3.230		0.041
	Male	32	36.81	33	40	1.80	0.319		28	35.36	30	43	3.14	0.594		**0.037**
G	Female	52	35.73	31	40	2.02	0.280	**0.013**	46	34.85	30	41	2.72	0.402	0.481	0.075
	Total	91	36.01	31	40	2.04	0.213		88	34.84	30	43	2.88	0.307		**0.002**
	Male	32	9.69	8	12	1.15	0.203		28	9.93	8	12	1.25	0.235		0.441
C	Female	52	9.96	8	12	1.27	0.176	0.280	46	9.37	8	12	1.14	0.168	0.059	**0.014**
	Total	91	9.96	8	13	1.26	0.132		89	9.54	8	12	1.21	0.128		**0.032**
	Male	32	61.09	57	66	2.69	0.476		28	58.00	49	65	4.17	0.788		**0.002**
D	Female	52	59.50	47	67	4.29	0.595	0.091	46	57.43	49	65	3.50	0.516	0.551	**0.002**
	Total	91	59.86	47	67	3.94	0.413		88	57.22	49	65	3.76	0.401		**0.000**
	Male	32	24.38	22	27	1.39	0.245		28	24.61	19	28	2.50	0.472		0.665
BHLD	Female	52	23.19	19	27	1.92	0.266	**0.002**	46	23.46	17	29	2.43	0.358	0.057	0.555
	Total	91	23.54	19	27	1.80	0.189		89	23.53	17	29	2.52	0.267		0.975
	Male	31	32.16	29	35	1.27	0.228		28	31.57	27	35	1.73	0.327		0.145
TV	Female	52	33.52	30	38	1.97	0.273	**0.000**	46	31.59	29	34	1.33	0.196	0.968	**0.000**
	Total	90	32.97	29	38	1.82	0.192		88	31.55	27	35	1.45	0.155		**0.000**
	Male	32	27.84	23	32	1.96	0.245		28	26.52	22	30	1.68	0.225		**0.000**
FP*	Female	52	26.39	22	31	1.68	0.165	**0.000**	46	25.07	22	30	1.86	0.194	**0.000**	**0.000**
	Total	91	26.90	22	32	1.93	0.143		88	25.53	22	30	1.86	0.140		**0.000**
	Male	32	5.47	5	6	0.51	0.090		28	5.64	5	6	0.49	0.092		0.181
PA	Female	52	5.69	5	6	0.47	0.065	**0.047**	46	5.48	5	6	0.51	0.074	0.170	**0.033**
	Total	91	5.60	5	6	0.49	0.052		89	5.55	5	6	0.50	0.053		0.468
	Male	32	8.36	7	10	0.76	0.095		28	8.18	7	10	0.72	0.096		0.184
SDL1.FLF*	Female	52	8.35	7	10	0.83	0.082	0.916	46	8.18	7	10	0.68	0.071	0.958	0.137
	Total	91	8.34	7	10	0.78	0.058		89	8.10	6	10	0.71	0.053		0.003
	Male	32	21.55	19	25	1.27	0.159		27	22.37	18	25	1.34	0.182		**0.001**
SDL4.HLT*	Female	52	21.14	17	24	1.48	0.146	0.071	44	21.77	19	25	1.23	0.131	**0.009**	**0.002**
	Total	91	21.26	17	25	1.40	0.104		85	21.89	18	25	1.43	0.110		**0.000**
	Male	15	109.13	83	120	11.22	2.896		15	109.27	76	121	11.31	2.920		0.974
NTC	Female	24	108.71	85	121	8.99	1.834	0.902	19	107.53	78	119	11.02	2.529	0.656	0.707
	Total	43	109.67	83	121	9.65	1.472		37	108.65	76	121	10.62	1.745		0.655
	Male	32	209.06	143	272	26.02	4.599		28	200.07	140	272	30.01	5.672		0.224
TSI	Female	52	185.85	143	240	22.51	3.122	**0.000**	46	188.83	110	240	30.88	4.553	0.127	0.591
	Total	91	192.80	132	272	27.21	2.853		89	190.44	110	272	30.89	3.274		0.596

Table 3. Summarized statistics on the mensural metric characters of *A. s. ataturi* n. ssp. and *A. s. schreiberi* specimens based on the raw data. The P values obtained from Student t-test of these characters according to the raw data (1) and the PERCRA indices (2) are also shown**.** The P values of characters which show a difference (P≤0.05) between the two populations are in bold. Since we did not find any difference between sexes. the related P values were not shown here [(N: number of specimens. SD: Standard deviation. SE: Standard error of the mean) (The details of the characters were given in "Material and Methods")].

		A. s. ataturi n. ssp.						1	2	*A. s. schreiberi*					
Characters	Sex	N	Mean	Min.	Max.	SD	SE	P	P	N	Mean	Min.	Max.	SD	SE
HL	Male	23	18.63	16.59	21.17	1.42	0.295	0.196	0.889	25	19.12	17.51	21.75	1.15	0.230
	Female	38	16.84	14.90	19.92	1.15	0.186	0.381	0.895	36	16.60	14.92	19.39	1.13	0.188
	Total	61	17.51	14.90	21.17	1.52	0.195	0.674	0.793	61	17.63	14.92	21.75	1.68	0.216
HW	Male	23	12.35	10.34	13.93	0.86	0.180	0.463	**0.009**	25	12.17	10.62	13.74	0.83	0.166
	Female	38	10.70	9.42	13.23	0.87	0.141	**0.024**	**0.037**	36	10.25	8.83	12.36	0.82	0.136
	Total	61	11.32	9.42	13.93	1.18	0.151	0.194	**0.005**	61	11.03	8.83	13.74	1.25	0.160
HD	Male	23	10.08	8.36	11.64	0.98	0.204	0.989	0.254	25	10.08	8.32	12.04	0.98	0.196
	Female	38	8.58	6.06	10.62	0.86	0.140	0.298	0.584	36	8.37	6.70	9.93	0.82	0.137
	Total	61	9.14	6.06	11.64	1.16	0.149	0.734	0.353	61	9.07	6.70	12.04	1.22	0.156
RA	Male	23	71.87	61.00	81.00	5.37	1.120	0.213		25	73.60	67.00	83.00	3.92	0.783
	Female	38	66.11	58.00	79.00	5.09	0.825	0.327		36	65.03	55.00	72.00	4.28	0.713
	Total	61	68.28	58.00	81.00	5.87	0.752	0.806		61	68.54	55.00	83.00	5.91	0.756
BW	Male	23	16.40	12.35	19.39	1.66	0.347	0.623	0.790	25	16.70	10.83	21.05	2.60	0.520
	Female	38	15.14	8.22	18.58	2.34	0.379	0.345	0.558	36	14.65	9.37	18.27	2.13	0.355
	Total	61	15.61	8.22	19.39	2.18	0.279	0.774	0.528	61	15.49	9.37	21.05	2.53	0.324
TL	Male	10	136.00	91.00	152.00	18.86	5.965	0.837	0.533	12	137.58	105.00	164.00	16.31	4.709
	Female	15	124.67	103.00	177.00	22.47	5.803	0.112	0.130	13	113.46	85.00	141.00	12.63	3.502
	Total	25	129.20	91.00	177.00	21.45	4.290	0.469	0.322	25	125.04	85.00	164.00	18.79	3.757
FLL	Male	23	23.58	19.89	27.01	1.67	0.349	0.390	0.655	25	24.01	20.26	26.97	1.74	0.348
	Female	38	21.26	17.69	25.90	1.70	0.276	0.452	0.874	36	20.97	18.36	24.91	1.66	0.276
	Total	61	22.14	17.69	27.01	2.02	0.259	0.842	0.902	61	22.22	18.36	26.97	2.26	0.289
HLL	Male	23	42.89	36.65	47.71	3.13	0.653	0.457	0.663	24	43.59	36.30	51.65	3.20	0.652
	Female	38	38.37	34.33	46.53	2.69	0.437	0.718	0.422	36	38.15	33.69	45.62	2.50	0.417
	Total	61	40.08	34.33	47.71	3.60	0.461	0.714	0.754	60	40.33	33.69	51.65	3.86	0.499
FTL	Male	23	19.55	17.29	20.58	0.91	0.190	0.053	**0.002**	24	18.71	15.54	22.88	1.84	0.375
	Female	38	17.20	14.10	21.31	1.44	0.234	0.437	0.950	36	16.94	14.52	20.80	1.49	0.248
	Total	61	18.09	14.10	21.31	1.70	0.218	0.172	0.061	60	17.64	14.52	22.88	1.84	0.238
HDEa	Male	23	1.55	1.06	2.50	0.43	0.090	0.275	0.491	25	1.66	1.31	1.94	0.20	0.040
	Female	38	1.47	1.00	2.04	0.31	0.051	0.158	**0.039**	36	1.56	0.93	2.21	0.26	0.044
	Total	61	1.50	1.00	2.50	0.36	0.046	0.064	**0.050**	61	1.60	0.93	2.21	0.24	0.031
HDEy	Male	23	3.25	2.56	3.71	0.30	0.063	0.911	0.383	25	3.24	2.45	3.97	0.42	0.085
	Female	38	3.19	2.57	4.50	0.37	0.061	0.056	0.178	36	3.03	2.24	3.90	0.32	0.053
	Total	61	3.21	2.56	4.50	0.35	0.045	0.148	0.100	61	3.12	2.24	3.97	0.38	0.048
DES	Male	23	8.63	7.73	9.67	0.57	0.119	0.199	0.984	25	8.85	7.93	10.74	0.59	0.119
	Female	38	7.81	6.93	8.91	0.55	0.089	0.935	0.301	36	7.80	6.08	9.17	0.62	0.103
	Total	61	8.12	6.93	9.67	0.68	0.087	0.415	0.382	61	8.23	6.08	10.74	0.80	0.102
DEE	Male	23	6.80	5.57	7.91	0.65	0.135	0.701	0.485	25	6.87	5.55	8.04	0.66	0.131
	Female	38	5.80	4.89	6.61	0.49	0.079	0.784	0.613	36	5.76	4.93	7.30	0.57	0.095
	Total	61	6.18	4.89	7.91	0.73	0.094	0.763	0.892	61	6.22	4.93	8.04	0.81	0.104
PilL	Male	23	17.55	15.27	19.97	1.41	0.293	0.991	**0.039**	25	17.54	16.09	19.53	1.01	0.201
	Female	38	15.78	14.06	18.66	1.05	0.170	**0.031**	**0.041**	36	15.24	13.58	17.64	1.06	0.177
	Total	61	16.45	14.06	19.97	1.47	0.188	0.336	**0.005**	61	16.18	13.58	19.53	1.54	0.197
PilW	Male	23	8.22	6.92	9.18	0.62	0.129	0.228	**0.007**	25	7.94	4.37	9.03	0.93	0.185
	Female	38	7.26	6.40	8.66	0.54	0.087	0.076	0.196	36	7.03	6.07	8.06	0.52	0.087
	Total	61	7.62	6.40	9.18	0.73	0.094	0.139	**0.005**	61	7.40	4.37	9.03	0.84	0.107
ParL	Male	23	4.67	3.79	5.51	0.44	0.093	**0.011**	**0.000**	25	4.32	3.39	5.21	0.46	0.092
	Female	38	3.99	3.34	5.06	0.32	0.051	**0.000**	**0.000**	36	3.69	2.92	4.49	0.37	0.062
	Total	61	4.25	3.34	5.51	0.49	0.063	**0.001**	**0.000**	61	3.95	2.92	5.21	0.51	0.066
1.STL	Male	23	3.08	2.41	3.66	0.31	0.064	**0.013**	**0.000**	25	3.33	2.81	4.30	0.37	0.075
	Female	38	2.64	2.20	3.38	0.27	0.043	0.269	0.068	36	2.74	2.18	4.24	0.48	0.081
	Total	61	2.80	2.20	3.66	0.35	0.045	**0.030**	**0.000**	61	2.98	2.18	4.30	0.53	0.068

13 on the right. Seven supraciliary plates on the left and six on the right. There are 36 median gulars. Transverse rows of ventral plates number 31. There are 29 femoral pores on the left and 31 on the right. Longitudinal rows of dorsal scales number 58 at midbody; the number of hind foot 4th toe sub digital lamellae is 22 on the left and 21 on the right.

The ground colouration of the dorsum is grayish-black. The fragmentation and diffusion of the yellowish-white stripes seen in young individuals had lead to the formation of small, randomly distributed blackish-brown maculations. On the flanks

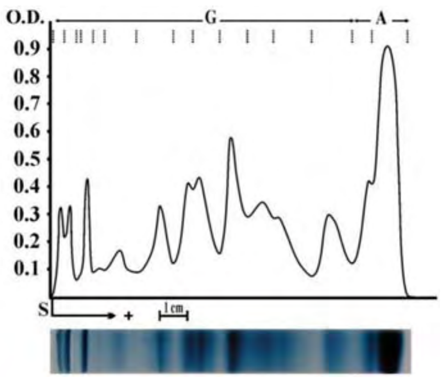
Table 4. Summarized statistics on the rational metric characters of *A. s. ataturi* n. ssp. and *A. s. schreiberi* specimens based on the raw data. The P values obtained from Student t-test of these characters according to the raw data are also shown. The P values of characters which show a difference (P≤0.05) between the two populations are in bold. Since we did not find any difference between sexes. the related P values were not shown here [(N: number of specimens. SD: Standard deviation. SE: Standard error of the mean) (The details of the characters were given in "Material and Methods")].

		A. s. ataturi n. ssp.						1	*A. s. schreiberi*					
Characters	Sex	N	Mean	Min.	Max.	SD	SE	P	N	Mean	Min.	Max.	SD	SE
HL/HD	Male	23	185.34	159.64	209.56	15.09	3.146	0.196	25	190.72	169.48	213.10	13.11	2.621
	Female	38	197.20	152.51	270.79	19.27	3.126	0.604	36	199.13	180.48	224.71	11.93	1.989
	Total	61	192.73	152.51	270.79	18.60	2.382	0.312	61	195.68	169.48	224.71	13.01	1.665
HL/HW	Male	23	150.61	139.78	162.78	6.09	1.269	**0.001**	25	157.25	146.81	168.14	6.63	1.325
	Female	38	157.63	133.13	181.21	8.79	1.427	**0.014**	36	162.27	149.56	180.29	6.96	1.160
	Total	61	154.98	133.13	181.21	8.55	1.094	**0.000**	61	160.21	146.81	180.29	7.21	0.923
TL/RA	Male	10	1.81	1.30	2.04	0.25	0.078	0.529	12	1.87	1.44	2.09	0.17	0.048
	Female	15	1.89	1.63	2.85	0.30	0.077	0.233	13	1.77	1.33	2.00	0.20	0.055
	Total	25	1.86	1.30	2.85	0.28	0.055	0.568	25	1.82	1.33	2.09	0.19	0.037
PilL/PilW	Male	23	2.14	1.98	2.24	0.06	0.013	0.125	25	2.24	2.02	3.76	0.32	0.065
	Female	38	2.18	2.03	2.77	0.12	0.020	0.531	36	2.17	2.02	2.31	0.07	0.011
	Total	61	2.17	1.98	2.77	0.11	0.013	0.284	61	2.20	2.02	3.76	0.21	0.027
RA/PilL	Male	23	4.10	3.76	4.65	0.20	0.042	0.053	25	4.20	3.88	4.51	0.12	0.023
	Female	38	4.19	3.84	4.74	0.20	0.033	0.056	36	4.27	3.97	4.51	0.14	0.024
	Total	61	4.16	3.76	4.74	0.21	0.026	**0.010**	61	4.24	3.88	4.51	0.14	0.018
D/FP	Male	23	2.14	1.90	2.46	0.15	0.031	0.161	25	2.20	1.86	2.52	0.15	0.029
	Female	38	2.27	1.93	2.78	0.19	0.031	0.332	36	2.32	1.83	2.82	0.22	0.037
	Total	61	2.22	1.90	2.78	0.19	0.024	0.171	61	2.27	1.83	2.82	0.20	0.026
BFPS/FP	Male	23	0.01	0.00	0.04	0.02	0.004	0.628	25	0.02	0.00	0.08	0.03	0.005
	Female	38	0.03	0.00	0.09	0.03	0.004	**0.002**	36	0.02	0.00	0.08	0.02	0.004
	Total	61	0.03	0.00	0.09	0.02	0.003	**0.022**	61	0.02	0.00	0.08	0.02	0.003

(A.)

%33.33
Mature adult ♂+♀

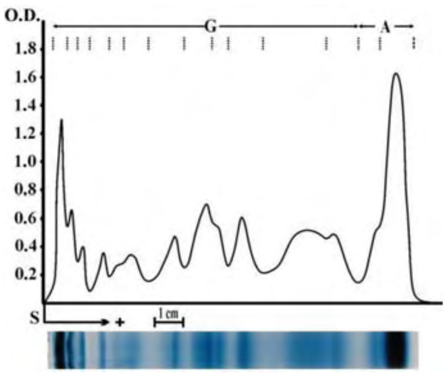
RA: 75-81 mm



(B.)

%33.33
Adult ♂+♀

RA: 68-72 mm



(C.)

%33.33
Subadult ♂+♀

RA: 62-63 mm

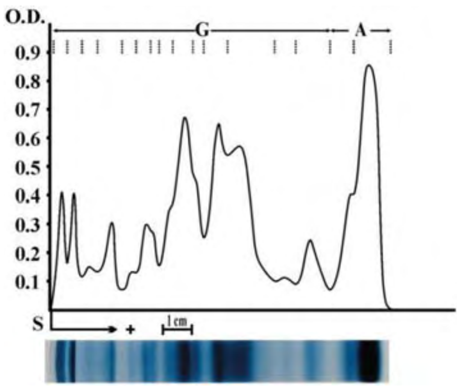


Figure 8. Electropherograms representing the electrophoretical separations of blood-serum proteins in *A. s. ataturi* n. ssp.. together with their corresponding densitometric curves [OD: optical density. S: start -the border between the stacking and separation gels- . G: globulin-like proteins zone. A: albumin-like proteins zone. RA: Distance from tip of snout to anus].

these maculations are partly in contact (Figure 7/1C).

Paratypes

The whole of the specimens investigated from the Anatolian population (except the holotype) (N=90) were accepted as paratypes (Figure 10B). Variations observed in some meristic and metric characters were summarized separately for males and females, and also the pooled data of the population in Tables 2-4, with those of *A. s. schreiberi*.

One each of postnasal and prenasal on each side. The two plates are always in contact with each other and with 1st supralabial. The lanceolate depression is evident on the me-

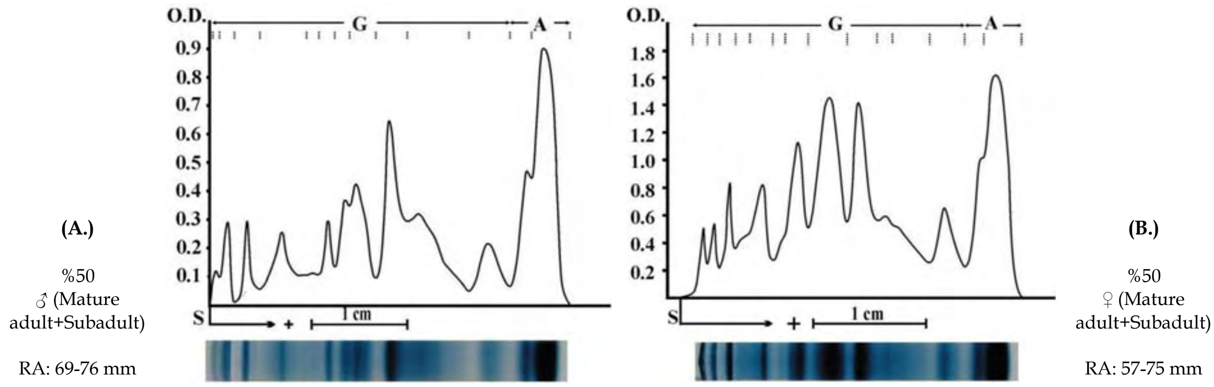


Figure 9. Electropherograms representing the electrophoretical separations of blood-serum proteins in *A. s. schreiberi*. together with their corresponding densitometric curves (OD: optical density. S: start -the border between the stacking and separation gels- . G: globulin-like proteins zone. A: albumin-like proteins zone. RA: Distance from tip of snout to anus).

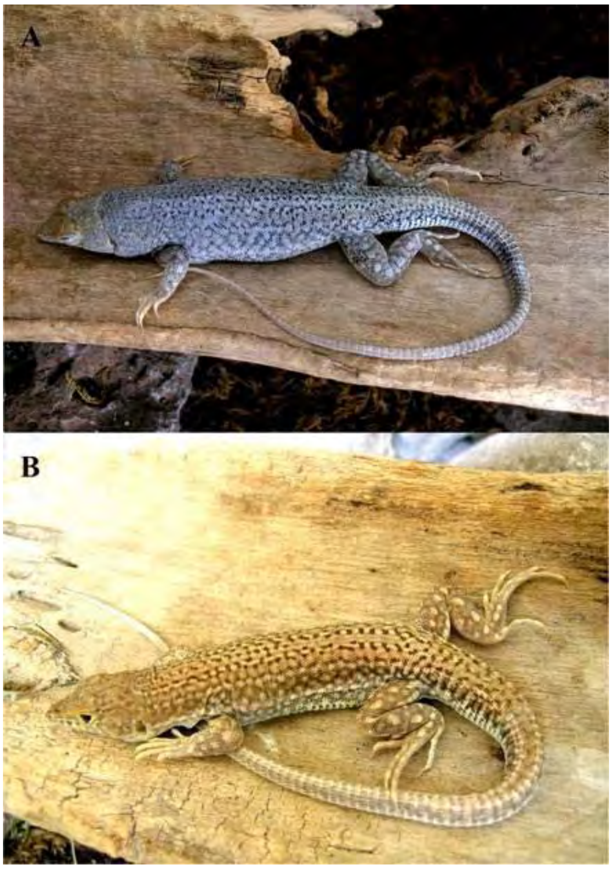


Figure 10. Holotype of *A. s. ataturi* n. ssp. (**A**) and a sample to the paratypes (**B**).

dian line between the frontonasal and frontoparietals. Two lorelia, the anterior plate is always shorter than the posterior one.

The supraocular plates generally (71.1%) form half domes over the eyes (Figure 4). 1st supraocular plate was observed to be unfragmented in 70 individuals (77.8%), fragmented at both sides in 8 individuals (8.9%), and fragmented on the left or right side in 12 specimens (13.3%).

Preocular plates one on each side of the head (45.1%), or absent on both sides (37.1%), or one on the left or right side (17.6%).

Supralabial plates varied between 7-9. Of the 90 studied specimens, 69 had 8 on the right side (76.7%) while in 71 the left side had 8 plates (78.9%). This condition establishes a partial asymmetry regarding supralabials.

Sublabial plates varied between 5-7. Of the 90 specimens, in 69 the right side had 6 (76.7%), while there were 6 plates on the left side of 66 individuals (73.3%).

Subocular plates were arranged between front and back supralabials, in the majority of our specimens (82.4%) not in touch with sublabials at each side of the head, below the mouth cleft, while in some individuals (10.9%) a contact was established at both sides, and rarely (6.6%) a contact was seen either on the left or right side of the head. There was some difference regarding between which two supralabials the suboculars were arranged. The left subocular plate was seen between the 4th-5th supralabials (92.2%) or 5th-6th supralabials (7.7%). The right subocular was generally seen between 4th-5th supralabials (93.4%), rarely between 5th-6th supralabials (6.6%).

There were one or two supratemporals: the keeled anterior plate was always bigger than the posterior one. In 82 specimens of the studied 90 individuals (91.1%) there were two at each side of the head, in four specimens (4.4%) one on the left and two on the right, and in the remaining four specimens (4.4%) two on the left and one on the right.

Generally one or two plates were seen between the prefrontals (73.6%) (Figure 5), or none at all (26.4%).

Number of a continuous row of supraciliary granules between the supraocular and supraciliary plates vary between 8-(13.36)-21: in 77 of the studied 90 individuals (85.6%) there were 12-16 granules on the right side, while in 80 (88.9%) the count was 11-16 on the left side.

In 58 of the studied 90 individuals (64.4%), temporal region scales close to tympanicum and supralabials in contact with temporals were basically slightly keeled less than half the length of each scale (Figure 6). In the remaining specimens (35.6%) these temporal region scales were smooth.

The number of femoral pores in males varied between 22-(26.90)-32: at right this count was generally (75.8%) 25-28, and at left (83.5%) 25-29.

In juveniles, above the black ground colouration, nine yellowish white stripes were always present at the nape of neck. Near the midbody level eight or nine longitudinal stripes (vertebral, supraciliary, subocular and ventral stripes on the left and right) were present. Between the vertebral stripes, two more narrow stripes originated from the posterior inner edges of parietals, more evident on the nape, extended towards the posterior, a little further from the level of the base of fore-legs they fused, sometimes shortly after, without reaching the midbody, and sometimes at the level of the base of the tail they became indistinct. In such cases nine stripes were counted. In five juveniles (71.4%) nine stripes were counted at the nape of the neck, and eight at midbody. While in two juveniles (28.6%) nine stripes were counted both at the nape and midbody. Over the black ground colouration between the stripes, dirty white roundish spots formed longitudinal rows. Over the extremities, roughly two-three times larger spots than those seen on dorsum were present which were yellowish and yellowish white with a red tinge. The venters of the juveniles were dirty white.

The black ground colouration of the juveniles changed to grayish black, yellowish brown or dark brown from subadults to mature individuals, related to their lengths. The yellowish white stripes of the juveniles slightly became indistinct and fragmented over the black ground colour. A pattern of regular and/or randomly distributed blackish maculations appeared. The yellowish gray spots over the extremities were not as distinct as those seen in juveniles. Based on the fragmentation of the black ground colour in adults, which resulted in randomly or regularly distributed rows of dark maculations on the dorsum, whether in contact or not, our specimens were divided into four pattern types (Figure 7/1).

The bodily measurements, indices and pholidotic characters obtained from our material were summarized in Tables 2-4. Sexual dimorphism was observed within the population ($P \leq 0.05$) regarding head width (HW), head depth (HD), fourth toe length of hindlimb (FTL), distance from posterior edge of eye to anterior edge of ear opening (DEE), pileus width (PilW), parietal length (ParL), 1st supratemporal length, numbers of supraciliary plates (SpCP), gulars (G), number of dorsal scales between hindlimbs (BHLD), transverse rows of ventrals (TV), femoral pores (FP), preanals (PA) temporal scale index (TSI), Head index-I, Head index-II, ratio of number of dorsal scales across midbody to femoral pores (D/FP) and ratio of scales between rows of femoral pores to femoral pores (BFPS/FP) (Table 2, 3 and 4).

Biological and Ecological Observations

The eastern Mediterranean shore region was scanned from Antalya to Lebanon in two consecutive activity seasons of the reptiles (April 2007-April 2008) to determine the distribution range of *A. s. atatur*i n. ssp. in our country. During our field studies, various biotope types (sandy, clayey, stony-soily, and rocky) were scanned but the species was found only in Botaş, Ceyhan/Adana, within a grassy-bushy-sandy area (at coordinates 35° 57′ 20″ E and 36° 54′ 50″ N) (Figure 11A). However in Cyprus, it was found in sandy areas (Altınkumsal and Erenköy biotopes) as well as rocky-stony regions (Gönyeli biotope) (Göçmen et al. 1996, Göçmen et al. 2008b) (Figure 11B, C and D).

The air temperature was established as 38° C and that of sand surface as 44° C between 13.30-15.00 hours in the free zone during the last week of May. Two points of importance during this period; the females were bearing eggs and no juveniles were in existence. An examination of six gravid females revealed the presence of two-three eggs in each. The ellipsoidal eggs had measurements of 14.98-(16.41)-17.62 mm × 7.19-(8.32)-9.46 mm. Two subadults and seven juveniles were captured between 16.45-17.30 hours under clear air conditions (air temp. 35° C, sand surface temp. 39° C) during the last week of October and the first week of November. The adults were again active during this period. The first appearance of the juveniles in these dates indicated that the breeding and pregnancy period began in the middle of May and continued to the last week of October.

An average of 22 individuals were counted within an area of 100 m² between 10.00-12.00 hours, the most active period of the species. When disturbed they moved slowly initially, then suddenly reached escape velocity. When followed 8-10 meters, the lizards were seen to tire early and their movements became slower. In such a condition, they became immobile on a sandy substrate, which provide excellent camouflage characteristics, or burrowed into the sand or escaped into a previous burrow at the base of the nearest bush (Figure 12A). The typical feet and tail prints left on the sandy substrate while they were walking or running were good indicators of their presence or absence in a region (Figure 12B).

Plants such as *Euphorbia paralias* L., *Cakile maritima* Scop., *Salsola kali* L., *Phragmites australis* (Cav.) and *Juncus maritimus* Lam. were widespread throughout the study area.

The food source of the species consisted of various insects and their different developmental stages. Various grasshoppers of Acrididae and Tettigonidae families (order: Orthoptera), hemipteran *Ranatra* and praying mantises (order: Mantodea) were particularly abundant prey items.

Various frogs, toads and reptiles: *Pseudepidalea variabilis* (Pallas, 1769), *Hyla savignyi* Audoin 1827, *Trachylepis vittata* (Olivier, 1804), terrestrial forms of *Ommatotriton vittatus* (Gray, 1835), also *Hemidactylus turcicus* (Linneaus, 1758), *Laudakia stellio* (Linneaus, 1758), *Chalcides ocellatus* (Forskal, 1775), *Ophisops elegans* Ménétriés, 1832, *Testudo greaca* (Linnaeus, 1758) and *Typhlops vermicularis* Merrem, 1820 were found to be in sympatrical relationship with *A. s. atatur*i n. ssp.

Another important point observed regarding the biotope was active habitat destruction pursued by humans. In spite of its being legally prohibited, sand mining was widespread (Figure 13). Various building/construction debris were also seen dumped over the sandy biotope, seriously harming it. These may lead to the total destruction of the species' only known biotope in our country, obviously these lizards are unable to survive over hard-packed substrates.

Comparison with the Cypriot Material and Taxonomical Evaluations

In the majority (87.6%) of the Cypriot *A. s. schreiberi* specimens (N=89) the supraoculars did not form half domes (Figure 4B); while in *A. s. atatur*i n. ssp. the same plates usually (71.4%) formed half domes over the eyes (Figure 4A). Franzen (1998) had not considered this point while including the Anatolian material into the nominate race.

Usually (68.5%) no plates were present between the prefrontals of our Cypriot specimens (Figure 5C), while in the majority of *A. s. atatur*i n. ssp. specimens (73.6%) there were one or two small plates (Figure 5A and B).

While in a large percentage of the *A. s. schreiberi* specimens

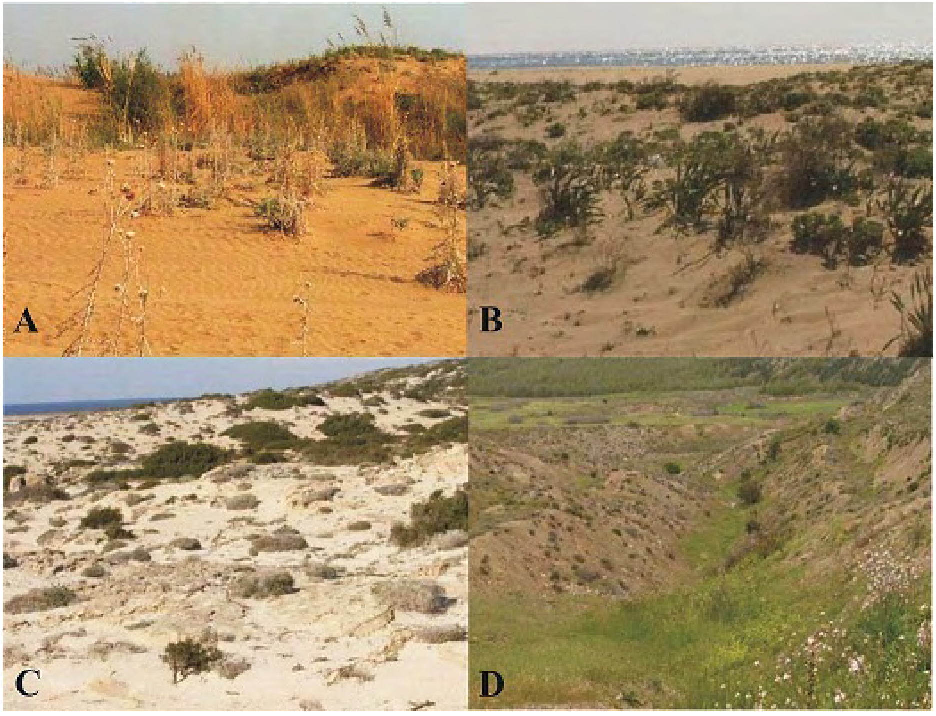


Figure 10. Views from biotopes for *A. s. ataturi* n. ssp. in Anatolia [**(A):** Botaş. ADANA] and *A. s. schreiberi* in Cyprus [**(B):** Altınkumsal (Karpas); **(C):** Ayios Philon (Yeni Erenköy. Karpas); **(D):** Gönyeli (Nicosia)].

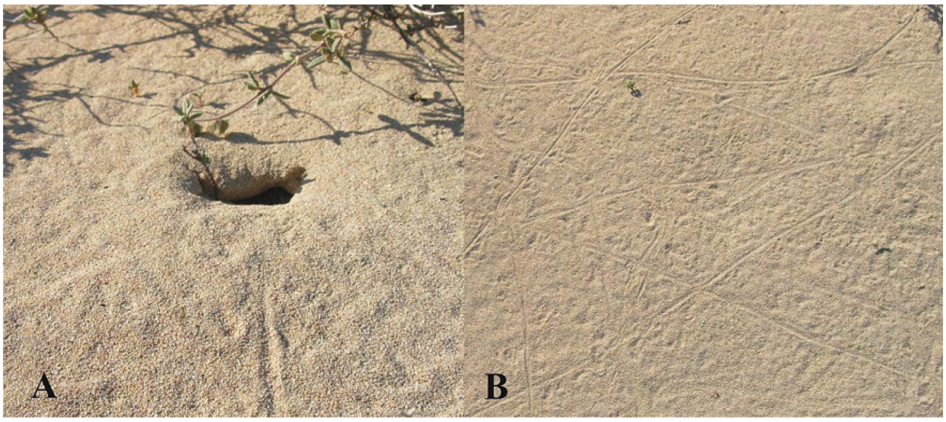


Figure 12. Burrow of an *A. s. ataturi* n. ssp. in sand (**A**) and a view of its foot-tail prints on sand (**B**).

Figure 13. Habitat destruction by means of sand mining within the only dispersal area of *A. s. ataturi* n. ssp.

(83.5%) temporal region scales were smooth, in *A. s. ataturi* n. ssp., especially in a few scales in contact with the tympanicum and posterior supralabials, basically in less than half the length of each scale usually (63.7%) they were keeled

(Figure 6A and B). In *A. s. syriacus* the temporal region scales are distinctly and sharply keeled, one of the definite differentiation points between the three subspecies (Boulenger 1878, Başoğlu & Baran 1977, Salvador 1982, Franzen 1998,Budak & Göçmen 2005) (Figure 6C). According to Franzen (1998), temporal region scales were smooth in four *A. schreiberi* specimens from Anatolia. This shows that it is not possible to reach a definite decision about a population from the viewpoint of a character when the sample size is small.

The number of supraciliary granules was 9-16 in the nominate race while it was 8-21 in *A. s. atatur*i n. ssp. The values given by Franzen (1998) (10-25 for Cypriot and 14-19 for Anatolian samples) are relatively within our results. An important point here, both Osenegg (1989) and Franzen (1998), whom studied a small (14) sample from Cyprus, gave supraciliary granule numbers quite high at the maximal end -obviously they used the same value sets-. Our maximal value for 89 Cypriot specimens was 16. There is a high probability in Osenegg's (1989) values being faulty. Taking this into consideration, the differences we have established between *A. s. schreiberi* and *A. s. atatur*i n. ssp. populations regarding the number of supraciliary granules (Table 2).

Number of median gular scales was 30-43 in *A. s. schreiberi* and 31-40 in *A. s. atatur*i n. ssp. Median gular scale numbers given by Franzen (1998) (33-37 for the Anatolian and 26-41 for the Cypriot population) were within the observed values of both subspecies. However, Student t-test established a difference (P≤0.05) regarding the median gular scale counts between *A. s. atatur*i n. ssp. and *A. s. schreiberi*, especially between the males but also when the values of the sexes were pooled, looked like an important taxonomical characteristic (Table 2).

Number of longitudinal dorsal scale rows at midbody was 49-65 in *A. s. schreiberi* and 47-67 in *A. s. atatur*i n. ssp. The values given in related references on three races [for *A. s. schreiberi*, Boulenger (1921) 48-59; Salvador (1982) and Budak & Göçmen (2005) 43-64, Franzen (1998) for Anatolian specimens 52-59 and for Cypriot specimens 43-75] were quite similar to those numbers of longitudinal dorsal scale rows in our samples. But again, Student T-test established a difference (P≤0.05) between *A. s. atatur*i n. ssp. and *A. s. schreiberi* populations regarding this character (Table 2). Apparently, the maximal value (75) established by Franzen (1998), based on 55 Cypriot specimens, revealed a difference, which was in discordance with the other measurement sets.

Number of transverse rows of ventrals was 27-35 in the nominate race and 29-38 in *A. s. atatur*i n. ssp. Franzen's (1998) values for the number of transverse rows of ventrals (Anatolian, Cypriot and Lebanon-Israel populations: 31-33, 28-33, 30-33, respectively) are in agreement with the values of specimens studied by us. However, Student T-test results indicated a difference regarding this character between the females of *A. s. atatur*i n. ssp. and *A. s. schreiberi* populations, also between the pooled values of the sexes (P≤0,05), while no difference was evident between the males (P>0.05) (Table 2).

Number of femoral pores was 22-30 in *A. s. schreiberi*, in the majority (81.8%) being 23-28, while in *A. s. atatur*i n. ssp. it was 22-32, but mainly (79.7%) 25-29. Salvador's (1982) values regarding the same character were 22-29 for the nominate species, Boulenger's (1921) were 23-29; Franzen's (1998) values for his Anatolian specimens were 25-29, those for his Cypriot specimens were 19-29. While our values were quite similar to those given in the related references, Student t-test result revealed a discernible difference between the nominate race and *A. s. atatur*i n. ssp. (Table 2). Furthermore, since there was a sexual dimorphism regarding this character both in *A. s. atatur*i n. ssp. and the nominate race (the values of the males were higher) (Table 2), a significant taxonomical difference (P≤0.05) regarding this character was evident.

Hindfoot 4th toe subdigital lamellae varied between 18-(21.89)-25, in majority (73.9%) between 21-23 in *A. s. schreiberi*, while in *A. s. atatur*i n. ssp., the related values were 17-(21.26)-25 and (73.1%) 20-22, respectively. According to Boulenger (1921) values of the same character were 21-23, in Salvador (1982) and Osenegg (1989) 20-23. Franzen's (1998) values for the Anatolian specimens were 21–22 (N=4), for the Cypriot specimens 20–27 (N=55). Our values regarding the two populations were very similar to those given in related literature. Regarding this character, the result of the Student t-test on our *A. s. atatur*i n. ssp. and *A. s. schreiberi* samples indicated a significant taxonomical difference (P≤0.05) between them (Table 2).

In comparing the two populations, in Table 2, the P values on the supralabial (SupL), numbers of granules in contact with 3rd supraocular plate, collars (C) and subdigital lamellae of the 1st finger of forelimb indicated differences (P≤0.05). But this situation is not important taxonomically, since it stems from the frequencies of unequal numbers of males and females (*A. s. atatur*i n. ssp: 32 ♂♂ 52 ♀♀; *A. s. schreiberi*: 28 ♂♂ 46 ♀♀) in our samples. This condition was also supported by the fact that no sexual dimorphism was seen regarding these characters, either in *A. s. atatur*i n. ssp. or in *A. s. schreiberi* (Table 2).

The results of the Student t-test based on both some of the raw data and all PERCRA (Werner, 1971) index values of the metric characters of *A. s. schreiberi* and *A. s. atatur*i n. ssp. samples indicated differences (P≤0.05) between the two populations, regarding the head width (HW), the horizontal diameter of ear (HDEa), the pileus length (PilL), the pileus width (PilW), the length of the parietal plates (ParL), 1st Supratemporal length (1.STL), Head index-II (ratio of head length to head width), RA/PiL (ratio of rostrum-anus length to pileus length) and BFPS/FP (ratio of scales between rows of femoral pores to femoral pores) indicate a difference between *A. s. atatur*i n. ssp. and *A. s. schreiberi* populations (Table 3 and 4), i.e., a significant taxonomical differences existed between the Anatolian and Cypriot populations regarding the mentioned characteristics.

In juveniles of both *A. s. atatur*i n. ssp. and *A. s. schreiberi* the yellowish white stripes gradually became indistinct, fragmented and produced maculations over the black ground colour. A difference was evident between the populations, regarding the sizes of these dorsal maculations (Figures 7A and B). In *A. s. schreiberi* the number of scales within the maculations was more than two times (74.3%) than those within the maculations of *A. s. atatur*i n. ssp. (Table 1).

In 12 [6 ♂♂ (4 mature adults + 2 subadults) and 6 ♀♀ (4 mature adults + 2 subadults)] specimens investigated from the *A. s. atatur*i n. ssp. population, blood-serum proteins consisted of 14-16 fractions with an age dependent variation (Figure 8). While in 8 specimens [4 ♂♂ (2 mature adults + 2 subadults) and 4 ♀♀ (2 mature adults + 2 subadults)] investigated from *A. s. schreiberi*, blood-serum proteins consisted of 13-14 fractions with a sex dependent variation. According to the serological studies, in *A. s. schreiberi*, the fraction variations seen within the globulin-like proteins zone were possibly stemming from sexual differences since these variations were grouped in sexes (Figure 9). Whereas, it was understood that the fraction variations seen within the same zone of *A. s. ataturi* n. ssp. were dependent on age since they were grouped their RA sizes (Figure 8). A condition which points to another significant difference between the populations.

To our present knowledge, *A. s. ataturi* n. ssp. is squeezed within a sandy area at a single locality in Anatolia (Figure 11A). Whereas *A. s. schreiberi* is found, besides sandy environments, also in rocky-stony areas in Cyprus (Figure 11B, C, D) (Göçmen et al. 1996, 2008b). Franzen (1998) had reported that he had carried out several excursions at eastern Mediterranean shores of Turkey, observed some localities similar to the biotopes of previously caught specimens but couldn't find the species at those areas. Since the near vicinities of Botaş and Yukarı Burnaz biotope were not investigated, he said that it is not possible to say whether the lizard is limited to sandy areas or not. According to Franzen (1998), during Tersier, as a result of local fluctuations, some hollowed-out areas, sandy sedimentary grounds i.e., a medium preferable by the species were formed at Karataş and Botaş (Adana). Furthermore, he was of the opinion that the present taxonomical states of the species' allopatrically distributed populations should be supported with biochemical and genetic studies.

Considering the geological past of Cyprus and this part of the Mediterranean region (Göçmen & Böhme, 2002), it is understood that the last land bridge between the mainland and the island coincided with the salinity crisis of Miocene (Messinian crisis: regression of the sea with an extreme increase in salinity) (7.246 – 5.332 mybp). It is thought that *A. schreiberi*, which is present as small populations in Anatolia and Lebanon-Israel today, had diverged from the mother stock in Cyprus during this period, forming two relict populations in Botaş-Adana and in Lebanon-Israel. The largeness of the population in Cyprus, compared with the others, supports this thought. However, it is also possible that the regions of the relict populations might faced some habitat degradation, hence the populations shrank in time.

Summarily, there were significant differences between *Acanthodactylus schreiberi* populations from Anatolia and Cyprus, regarding their pholidotic characters, bodily measurements, morphologies and blood-serum proteins. So, it was not possible to include the *A. schreiberi* population from Anatolia within the nominate race *A. s. schreiberi,* which has been described from Cyprus, as suggested by Franzen (1998). The new geographical race was coined as *A. s. ataturi* n. ssp. Another important point was the ongoing habitat destruction regarding *A. s. ataturi* n. ssp. In spite of its being legally prohibited, sand mining was, and still is, widespread in the area (Figure 13). Various building/construction debris were also being dumped over the sandy biotope. Unless some measures of conservation are taken, there is a danger of total destruction of this endemic subspecies's only known biotope in our country.

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