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Notes on some Egyptian Lacertidae, including a new subspecies of *Mesalina*, involving the Seligmann effect

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Abstract: These notes on some Egyptian lacertid lizards contribute to faunal data for the planning of biodiversity conservation. *Mesalina bahaeldini curatorum* n. subsp. is described from Suez, characterized by coloration and larger (fewer) body scales. Range extensions are documented for *Acanthodactylus aegyptius*, *Mesalina olivieri*, and *M. rubropunctata*. The previously reported occurrence of *A. opheodurus* in Sinai is doubted. The fact that the *M. b. curatorum* types were collected in the 1820s demonstrates the importance of museum collections.

Key words: *Acanthodactylus aegyptius, A. longipes, A. opheodurus, Mesalina bahaeldini, M. guttulata, M. olivieri, M. rubropunctata*, Suez

Introduction

The mounting worldwide concern for the preservation of biodiversity calls for increased efforts to describe the biodiversity, beginning with the identification of taxa and definition of their distribution ranges (Meffe and Carroll, 1997; Samper, 2004; Secretariat of the Convention on Biological Diversity, 2008). This is especially true in the Mediterranean Basin, which has been defined a global biodiversity hotspot for reptiles as well as for plants (Baha El Din et al., 2008). In this spirit we report here on some Egyptian lacertid lizards, relying on the recent review by Baha El Din (2006) as a baseline for assessing the significance of additional observations.

Our observations derive mainly from 2 sources. First, the historical type series of *Lacerta guttulata* Lichtenstein,1823, collected by Hemprich and Ehrenberg's expedition to northeastern Africa, 1819-1826 (Stresemann, 1954), comprised 9 specimens and was heterogeneous in both characters and geographical origin (Segoli et al., 2002). We discuss here the 3 specimens that in the aforementioned study were found to be irrelevant to *Mesalina guttulata*. Second, recently one of us (SA) had an opportunity to observe reptiles in southwestern Egypt, where the herpetofauna is relatively poorly researched, as is reflected in all major relevant reviews (Anderson, 1898; Flower, 1933; Marx, 1968; Saleh, 1997; Baha El Din, 2006).

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Abbreviations

BMNH, National Museum of Natural History, London

HUJ, The Hebrew University of Jerusalem

L, left

R, right

PCO, Principal Coordinate Analysis

RA, rostrum-anus length (Werner, 1971)

PERCRA, percents of RA (Werner, 1971)

ZMB, Museum für Naturkunde, Universität Humboldt , Berlin

Materials and methods

Museum specimens

Mesalina bahaeldini (26): 15 males and 11 females, from several museums, listed in Segoli et al. (2002).

Mesalina guttulata (56): 31 males and 25 females, in HUJR, from Sinai (Egypt) and the Negev (Israel).

Mesalina cf. *olivieri* (3): HUJR 14,498-14,499, Nabq Mangroves, Sinai (approx. 28°04′N, 34°25′E), 20 November 1981; ZMB 1118, Lower Egypt (probably near Alexandria or Siwa), 1820-1821, W. Hemprich and C.G. Ehrenberg (Stresemann, 1954).

Mesalina sp. (2): ZMB 1122, 63004, Suez, Egypt, 1820-1821, W. Hemprich and C.G. Ehrenberg.

Comparisons were made with congeneric material in HUJR.

Photographs

Photographs were taken in February 2008, by SA except as noted, and are deposited in the archive of the HUJ Herpetology Collection.

Acanthodactylus aegyptius: HUJR-PHO 504, 505, lizard, approx. 30 km west of the Oasis of Farafra (27°18′N, 27°45′E), 25 February 2008; HUJR-PHO 506, the habitat.

Mesalina rubropunctata: HUJR-PHO 502 (photo Amnon Bruchiel), HUJR-PHO 501, lizard, west side of Gilf Kebir Plateau approx. 40 km from Libyan frontier (23°25′N, 25°35′E), 21 February 2008; HUJR-PHO 503, the habitat.

Comparisons were made with congeneric material in HUJR and with photographs from Egypt (Baha El Din, 2007) and of *Acanthodactylus longipes* and *A. scutellatus* also from Libya (Adel Ibrahim, pers. comm.).

Characters

For taxonomy we examined the following characters (Boulenger, 1921), beyond verifying agreement of diagnostic characters with the *Mesalina guttulata-bahaeldini* group.

Mensural characters

Except for RA and tail length, which were measured to the nearest 0.5 mm, all characters were measured to the nearest 0.1 mm. Except RA, all are presented as PERCRA.

Rostrum-anus length (RA): Distance from tip of snout to cloaca.

Head length: Distance from tip of snout to the posterior edge of the ear, measured parallel to long axis of body with special modified callipers (Goren and Werner, 1993).

Head width: Greatest width of head.

Head depth: Greatest depth of head.

Forelimb length: From axilla to tip of distal claw.

Hindlimb length: From groin to tip of distal claw.

Fourth toe length: From insertion of 5th toe, claw included.

Tail length: From cloaca to tip of tail, if original.

Meristic characters

Some meristic characters we examined bilaterally and tested for directional asymmetry (Werner et al., 1991). These are indicated by an asterisk (*). In the text the data are marked L, R.

*Supralabials, total: Number of supralabials from the most posterior clearly enlarged plate, to (excluding) the rostral, including the suborbital.

Gulars: Number of gular scales in a straight median series.

Plates in collar: Number of larger scales in collar.

Dorsals: Number of dorsal scales across midbody.

Ventrals across belly: Number of ventral scales in the longest row across belly.

*Transverse rows of ventrals: Number of transverse series of ventral scales, counted along the ventral side to (and excluding) the level of the femoral pores.

*Femoral pores.

*Subdigital lamellae: Along underside of the 4th toe, defined by their width, the one touching the claw included.

Computed characters

Head index = 100 × Head length divided by head width.

Head depth index = 100 × Head depth divided by head length.

Toe index = 100 × fourth toe length divided by total hindlimb length.

Lamella PERCRA = fourth toe length in PERCRA divided by the number of Subdigital lamellae under that toe.

Qualitative characters

Coloration was checked in the following terms: In *Acanthodactylus*, size of the light dorsal spots and presence of black spots. In *Mesalina*, dark dorsal stripes: number and position, continuous, broken, studded with light dots, with ocelli, represented by a chain of ocelli. Lateral stripe from ear region: light or dark, if dark, same options, position relative to ear (middle or upper or lower end). Extension to eye.

Research strategy

Bilateral characters were tested for the presence of directional asymmetry (Werner et al., 1991) and in its absence (here in all cases) the right-side data were used.

During the redescription of *Mesalina guttulata* (Segoli et al., 2002), 2 of the original syntypes were excluded from the redescription due to their deviant coloration. These syntypes somewhat resembled *M. bahaeldini* described in that paper. Therefore we applied PCO (run on Standardized Euclidian matrices using MVSP, the multivariate statistical package of Kovach Computing Services) to these 2 specimens together with available data of both species. This was done separately for each sex because of the sexual dimorphism prevalent in Lacertidae (Segoli, Cohen and Werner, 2002; briefly reviewed in Seifan et al., 2009). Originally *M. bahaeldini* had been compared only to sympatric *M. guttulata* to avoid confounding from geographical variation. However, herein we included all available *M. guttulata* data, i.e. from Sinai and southern Israel. Consequently the PCO failed to clearly separate the 2 species. Therefore we invoked the Seligmann effect and repeated the analysis excluding all specimens lacking complete tails. According to the Seligmann effect such individuals may be accident-prone with a statistical correlation of deviant morphometrics that can obscure differences existing between samples being compared (Almog et al., 2005; Lachman et al., 2006). The new PCO was instructive and thereupon we tested the significance of inter-sample differences by 2-tailed T-test.

Results and discussion

***Acanthodactylus aegyptius* Baha El Din, 2007** (Figures 1 and 2)

This species was recently described as new (Baha El Din, 2007) within the eastern part of the range earlier ascribed to *A. longipes* (Baha El Din, 2006).

One individual was photographed (Figure 1, HUJR-PHO 505) on 25 February 2008 approx. 30 km west of the Oasis of Farafra (27°18′N, 27°45′E), elevation of ca. 300 m, in the Western Desert. This is the eastern edge of the "Great Sand Sea" and beginning of limestone plateau and limestone structures. The habitat of the lizard was a foothill of mixed sand, limestone and some silt with scattered shrubs of *Anabasis* sp., *Zygophyllum* sp. and others (Figure 2, HUJR-PHO 506).

The individual was identified from photographs by its long tail (200-215 PERCRA), short snout (distance from snout tip to eye-centre smaller than from eye-centre to ear), and fine dorsal reticulation (diameter of light spots approx. 2 PERCRA, compared with approx. 3 PERCRA in *A. longipes*).

This observation extends the known range of the species in the Western Desert by about 150 km to SW (Figure 3 map), and increases the likelihood of sympatry with *A. longipes*, already indicated in some areas (Baha El Din, 2007: Figure 5).

***Acanthodactylus opheodurus* Arnold, 1980**

Werner (1986) presented locality records of *A. opheodurus* from Sinai but Baha El Din (2006)

Figure 1. *Acanthodactylus aegyptius* at approx. 30 km west of the Farafra Oasis (27°18´N, 27° 45´E), 25 February 2008, photo SA (HUJR-PHO 505).

Figure 2. Habitat of *Acanthodactylus aegyptius,* approx. 30 km west of Farafra Oasis (27°18' N, 27°45´E), 25 February 2008, photo SA (HUJR-PHO 506).

considered this identification erroneous, ascribing the records to *A. boskianus*, because he had seen in Sinai hundreds of *A. boskianus* and no *A. opheodurus*. This question seems to require re-examination, which, however, cannot be undertaken at this time.

***Mesalina bahaeldini curatorum* n. subsp.** (Figure 4)

Lacerta guttulata Lichtenstein, 1823, part.

Material examined

Holotype: ZMB 1122, ♂ collected during 1820-1821 by the W. Hemprich and C.G. Ehrenberg expedition to the Near East.

Type locality: Suez, Egypt.

Figure 4. *Mesalina bahaeldini curatorum* n. ssp holotype, male, ZMB 1122. Scale bar, 10 mm.

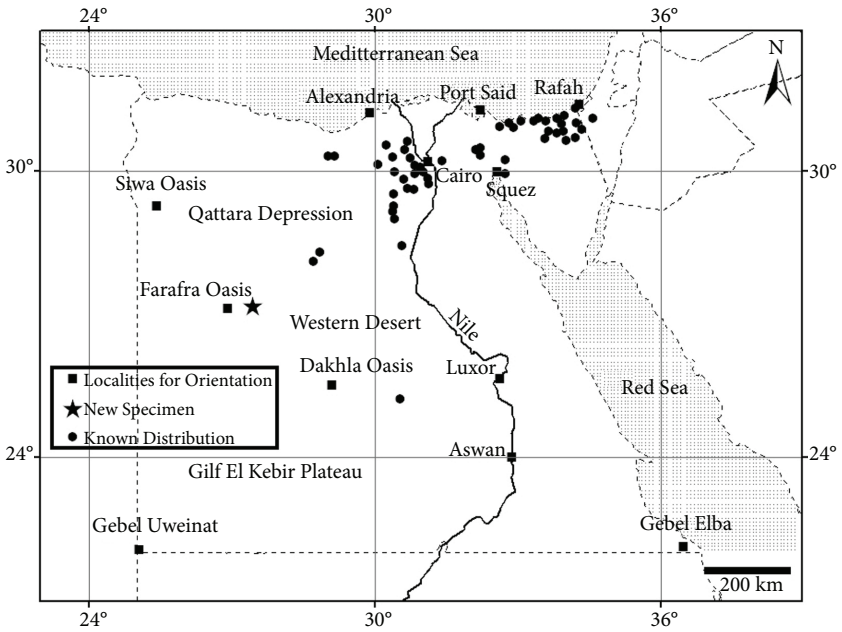

Figure 3. Locality records of *Acanthodactylus aegyptius* in Egypt from Baha El Din (2007); star, new record approx. 30 km west of the Farafra Oasis (27°18´N, 27°40´E).

Paratype: ZMB 63004, ♀ same data as the holotype.

Diagnosis

A *Mesalina* with a prominent occipital in contact with the interparietal; moderately curved collar; transparent disc of lower eyelid comprising 2 major scales, with black vertical bar; upper labials in front of the subocular usually 4, exceptionally 5. Dorsals across mid-body approx. 35-40. Ventral plates in 10 straight longitudinal rows. Scales on the upper surface of the tibia keeled. Lamellae under the 4th toe, 21-22. Scales on ventral side of tail smooth. Coloration semi-striped. Laterally a light stripe from the middle of the ear towards the groin, accompanied above by a broader dark band, accompanied above by a dorso-lateral chain of black-and-white spots; mid-dorsally anteriorly plain, posteriorly speckled.

Description

Description of the male holotype (female paratype data in parentheses): Well-preserved alcohol specimens. Male (female); somewhat delicate lacertid proportions; head a little wider than the similarly wide neck and shoulders. Tail base slightly swollen for a stretch equaling head length, slightly wider than inter-femoral distance (tapering). Precaudal vertebrae, 27 (28).

Measurements and proportions: RA, 38.0 (34.0) mm; head length, 10.0 (7.5) mm [26.3 (22.1) PERCRA]; head width, 6.0 (5.1) mm [16.8 (15.0) PERCRA]; head depth, 4.6. (3.6) mm [12.1(10.6) PERCRA]; head index, 166.7 (147.1); Head depth index, 46.0 (48.0); forelimb length, 12.5 (11.0) mm [32.9 (32.3) PERCRA]; hindlimb length, 23.0(21.0) mm [60.5 (61.8) PERCRA]; 4th toe length, 11.5 (11.0) mm [30.3 (32.3) PERCRA]; toe index, 50.0 (52.4); Lamella PERCRA, 1.38 (1.54); tail length 93.0 (70.5) mm [245 (207) PERCRA].

Pholidosis: The window in the lower eyelid is divided by a black vertical bar. Tympanic plate, large, narrow; supralabials anterior to the suborbital 4, 5 (4, 4); behind the suborbital 3, 3 (3, 3); infralabials, 8, 8 (7, 8); gulars, 25(24); plates in collar, 11 (11). Dorsals across midbody, 40 (35); ventrals across belly, 9, 10; transverse rows of ventrals, 28, 28 (32, 31); scales on the dorsal side of the tibia distinctly keeled; subdigital lamellae, 22, 22 (21, 21); femoral pores, 11, 11 (12, 12). Ventral tail scales not keeled.

Coloration (in alcohol; Figure 4): The holotype male is overall brownish-grayish with lighter and darker markings as follows. Laterally a light stripe from the middle of the ear towards the groin, accompanied above by a broader dark band and below by a thin, feint, dark margin. These light and dark stripes extend forwards to the eye. Posteriorly, the light stripe reaches the thigh, the upper dark band continues above the thigh into the tail. Both are accompanied above by a dorso-lateral black-and-white band broken into ocelli-like spots; in each the black is medial, the white is lateral but on its other side (ventro-laterally) again bordered by a black streak. Between these paired dorso-lateral chains of pseudo-ocelli the middle of the dorsum is anteriorly almost plain, posteriorly a little spotted with blackish markings. The hindlimbs carry roundish blackish spots. Ventrally overall whitish or light gray but the gular area is adorned with dark gray spots.

The female paratype is a faded version of the above, particularly the spots on the hindlimbs are only weakly indicated, and the gular spots are totally absent.

Comparisons

The holotype of *M. b. curatorum* and *M. b. bahaeldini*, head and neck, are compared in Figures 4 and 5 in lateral view. Note that in the holotype (Figure 4) the light band between eye and ear is light-colored like the venter but in *M. b. bahaeldini* (Figure 5) this area is light brown like the dorsal ground color. The dorsal pattern of *M. b. curatorum*, anteriorly missing, clearly differs from the striped pattern of typical *M. b. bahaeldini* (Segoli et al., 2002: figure 2) and the gular coloration, spotted in the holotype, is plain in typical *M. b. bahaeldini*.

In PCO analysis with males of *M. b. bahaeldini* and *M. guttulata* (Figure 6) the holotype appears as an extreme individual of *M. bahaeldini*, justifying its assignment to this species. However, the characters used in PCO analysis excluded the coloration that justifies its separation as subspecies. Interestingly when all males were included in the analysis (Figure 6A), *M. bahaeldini* and *M. guttulata* were not separated but when only those with complete tails were included (Figure 6B) separation was improved due to the Seligmann effect. The 2 specimens of *M. guttulata* penetrating the lower right corner of Figure

Figure 5. *Mesalina bahaeldini bahaeldini,* male, from near the Jabaliya tribe housing, Ar-Rabba valley, near St. Catherine's monastery, Sinai, Egypt. Scale bar, 10 mm.

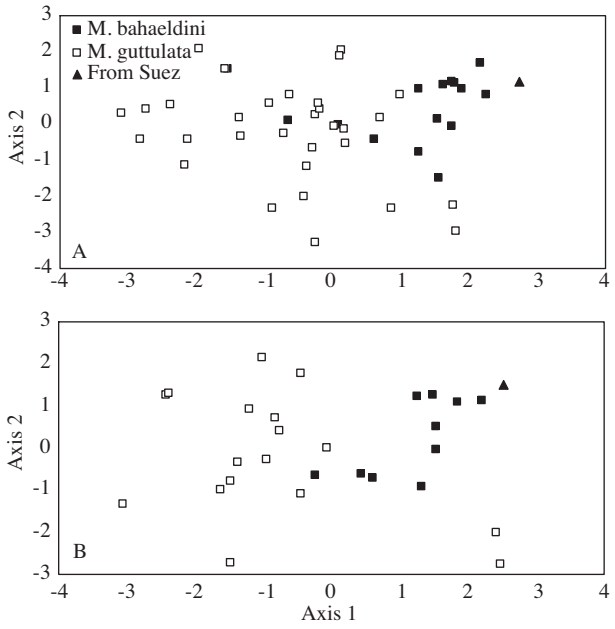

Figure 6A. PCO analysis of all utilized males of *Mesalina guttulata* (N = 31), *M. b. bahaeldini* (*N*=15) and the holotype of *M. b. curatorum.* 6B, PCO analysis of whole-tailed males of *Mesalina guttulata* (N = 17), *M. b. bahaeldini* (N = 10) and the holotype of *M. b. curatorum.*

6B originated from a far northern locality, near Beer Sheva.

In the biometrical comparisons of the holotype with males of *M. b. bahaeldini* and *M. guttulata* (Table 1) and of the paratype with females of both species (Table 2), *M. b. curatorum* stood out most conspicuously in its low count of dorsal scales.

Comments

Anderson (1898) mentions one specimen of "*Eremias guttulata*" from the Plain of Suez. It is presumably the same specimen that Dr. Colin McCarthy described for us (2 February 2009) as "a rather pale individual but the ocelli are quite distinct and it lacks obvious stripes" (BMNH 1897.10.28.382 Plain of Suez, Dr J. Anderson).

Etymology

The epithet *curatorum* (=of the curators) cumulatively honors the museum curators, collection managers and other staff, whose efforts enable the study of biodiversity.

***Mesalina olivieri* (Audouin, 1829)**

Two specimens, HUJ-R 14,498-14,499, collected at the Nabq Mangroves, Sinai (approx. 28°04´N, 34°25´E), on 20 November 1981, had heretofore not been identified. These constitute a small range extension, approx. half a degree northwards and half a degree eastwards, relative to previous data (Baha El Din, 2006).

***Mesalina* cf. *olivieri* (Audouin, 1829)**

One of the syntypes of *Lacerta guttulata* Lichtenstein, 1823, agrees with the criteria of *Mesalina olivieri* (Haas, 1951; Baha El Din, 2006) except for its coloration (Werner, 1995; Baha El Din, 2006). As researched and explained by Segoli et al. (2002), ZMB 1118 was collected in lower Egypt (probably near Alexandria or Siwa) during 1820-1821 by the W. Hemprich and C.G. Ehrenberg expedition to the Near East (Stresemann, 1954).

The specimen seems exceptional in that the dorsal coloration lacks ocelli and comprises 3 solid dark stripes studded with light dots and slightly widened at the site of each light dot. Laterally a light band, accentuated by dark upper and lower margins, runs back from the ear but gradually fades towards the groin.

The specimen is a male of 38 mm RA (tail broken at 58 mm), head length 8.8, width 5.6, depth 4.2 mm; forelimb 12.5, hindlimb 22.5, 4th toe 10 mm. Supralabials 9, 9, gulars 22, collar plates 10. Dorsals 48, ventrals 10 longitudinal rows and 30, 30 transverse rows, femoral pores 10, 10 and subdigital lamellae 21, 21. The subcaudals become keeled after the first 25 mm.

Table 1. Comparison of the biometric characters of the holotype of *Mesalina bahaeldini curatorum* with those of whole-tailed males of *M. b. bahaeldini* and *M. guttulata.* * = P ≤ 0.05, ** = P ≤ 0.01.

Character	**Holotype**	***M. b. bahaeldini*** Mean ± SD Range, N = 17	***M. guttulata*** Mean ± SD Range, N = 10
RA, mm	38	41.7 ± 7.86 34.0-52.0	43.7 ± 2.95* 38.5-46.0
Tail length, PERCRA	244.74	200.5 ± 22.78* 167.4-238.8	201.7 ± 27.93 140-235.6
Head length, PERCRA	26.32	24.6 ± 1.51 23.0-28.40	24.1 + 1.85 21.1-27.3
Head width, PERCRA	15.79	14.9 ± 1.27 12.3-16.5	14.6 ± 1.02 12.7-16.4
Head depth, PERCRA	12.11	10.9 ± 0.75 10.3-12.6	11.2 ± 1.18 9.6-13.0
Forelimb length, PERCRA	32.89	35.1 ± 1.66 32.7-37.8	35.6 ± 2.28 32.1-38.8
Hindlimb length, PERCRA	60.53	58.3 ± 3.76 51.9-66.2	65.2 ± 3.07 58.7-70.0
Fourth toe length, PERCRA	30.26	28.0 ± 2.01 25.3-32.4	28.8 ± 2.35 23.3-32.5
Supralabials [R]	9	9.4 ± 0.52 9-10	10.5 ± 0.87 9-12
Gulars	25	23.7 ± 0.95 22-25	23.8 ± 2.14 20-27
Plates in collar	11	11.0 ± 0.82 10-12	11.5 ± 1.12 10-14
Dorsals	40	44.1 ± 1.59* 43-48	47.8 ± 3.58* 42-56
Ventrals across belly	9	10.0 ± 0.47* 10-11	9.8 ± 0.66 8-10
Transverse rows of ventrals [R]	28	30.9 ± 1.66 28-34	30.7 ± 1.83 29-36
Femoral pores [R]	11	12.6 ± 1.26 10-14	12.8 ± 0.75* 12-14
Subdigital lamellae [R]	22	21.2 ± 0.63 20-22	22.8 ± 1.24 21-25
Head index	166.67	165.7 ± 14.38 145.9-192.2	165.0 ± 14.95 140.9-193.9
Head depth index	46.00	44.7 ± 3.67 39.4-52.7	46.8 ± 5.75 39.1-61.3
Toe index	50.00	48.1 ± 2.42 43.1-51.9	44.2 ± 2.55* 36.8-49.02
Lamella PERCRA	1.38	1.3 ± 0.09 1.2-1.5	1.3 ± 0.13 1.1-1.6

Table 2. Comparison of the biometric characters of the paratype of *Mesalina bahaeldini curatorum* with those of whole-tailed females of *M. b. bahaeldini* and *M. guttulata*. * = P ≤ 0.05, ** = P ≤ 0.01.

Character	**Paratype**	***M. b. bahaeldini*** Mean ± SD Range, N=8	***M. guttulata*** Mean ± SD Range, N=5
RA, mm	34	38.2 ± 8.53 22.0-47.0	44.6 ± 2.48** 40.5-47.0
Tail length, PERCRA	207.35	208.7 ± 26.55 166.7-259.1	197.1 ± 24.49 170.2-228.3
Head length, PERCRA	22.06	24.2 ± 3.52 20.7-32.2	22.7 ± 1.3 20.9-24.4
Head width, PERCRA	15	15.5 ± 1.76 14.0-19.6	14.4 ± 0.54 13.5-14.8
Head depth, PERCRA	10.59	11.7 ± 1.53 10.2-14.6	11.1 ± 1.51 9.4-12.8
Forelimb length, PERCRA	32.35	35.1 ± 4.57 30.4-45.5	34.6 ± 2.39 31.9-38.0
Hindlimb length, PERCRA	61.76	59.1 ± 7.16 48.9-72.7	59.5 ± 4.5 54.4-65.2
Fourth toe length, PERCRA	32.35	29.1 ± 3.26 26.7-36.4	27.6 ± 2.33 24.5-29.6
Supralabials [R]	8	9.5 ± 0.76* 9-11	10.0 ± 0.71* 9-11
Gulars	24	23.0 ± 2.14 21-26	23.2 ± 1.92 21-26
Plates in collar	11	11.4 ± 0.52 11-12	12.4 ± 1.95 11-15
Dorsals	35	44.3 ± 3.24* 39-47	47.4 ± 2.19** 45-51
Ventrals across belly	10	10.0 10	9.2 ± 1.3 8-11
Transverse rows of ventrals [R]	31	30.1 ± 1.46 28-32	32.0 ± 1.00 31-33
Femoral pores [R]	12	12.3 ± 1.49 11-14	13.6 ± 0.89 13-15
Subdigital lamellae [R]	21	21.3 ± 0.71 20-22	21.8 ± 1.79 20-24
Head index	147.06	155.8 ± 7.23 143.9-166.0	158.6 ± 13.71 143.1-180.7
Head depth index	48	48.4 ± 3.61 43.8-53.6	48.6 ± 4.7 42.3-53.8
Toe index	52.38	49.3 ± 3.13 45.5-54.6	46.6 ± 3.88 43.4-53.1
Lamella PERCRA	1.54	1.4 ± 0.16 1.2-1.7	1.3 ± 0.16 1.0-1.5

Because *Mesalina o. olivieri* is known from the Alexandria area but not from Siwa, conceivably this differing specimen represents an unexplored population at Siwa, which deserves investigation.

***Mesalina rubropunctata* (Lichtenstein, 1823)**

One individual was photographed (Figure 7, HUJR-PHO 501) on 21 February 2008 on the west side of the Gilf Kebir Plateau in the south-western part of Egypt, approx. 40 km from the Libyan frontier (23°25´N, 25°35´E), at the elevation of ca. 900 m. The location lies between Wadi Sura and Aqaba pass (the only pass in the Gilf). The landscape in the site photographed is very flat, with coarse-grain sand. The area is very dry, lacking vegetation except for 2 thin and small *Acacia ehrenbergii* trees ca 10 m apart. The lizard was under one of these that had more dry branches on the ground (Figure 8, HUJR-PHO 503).

The individual was easily identified from photographs by its head pholidosis and typical coloration.

Figure 7. *Mesalina rubropunctata* on the west side of Gilf Kebir, south-western Egypt (23°25´N, 25°35´E), 21 February 2008, photo SA (HUJR-PHO 501).

Figure 8. Habitat of *Mesalina rubropunctata* on the west side of Gilf Kebir, south-western Egypt (23°25´N, 25°35´E), photo SA (HUJR-PHO 503).

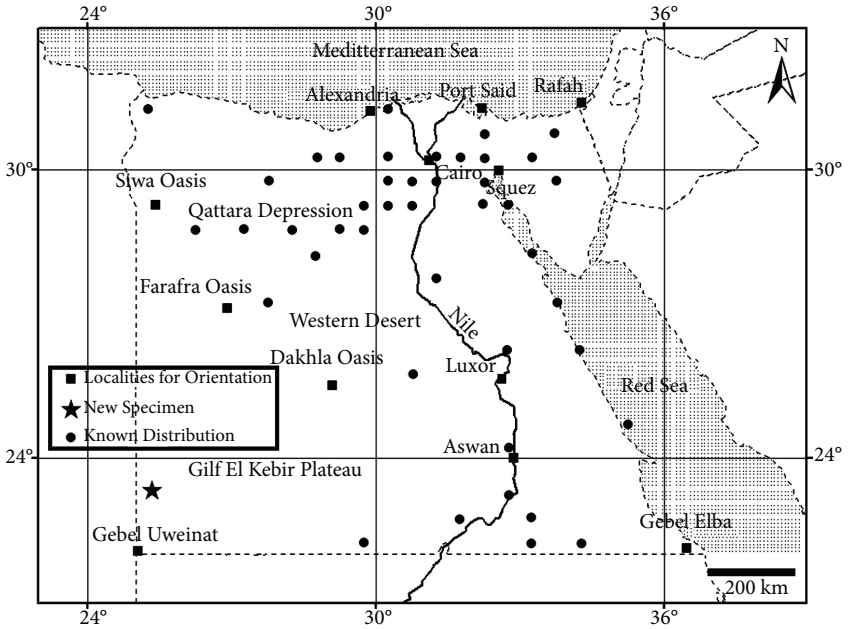

Figure 9. Locality records of *Mesalina rubropunctata* in Egypt, in terms of presence in half-degree squares, from Baha El Din (2006); star, new record on the west side of Gilf Kebir, south-western Egypt (23°25´N, 25°35´E).

This observation documents a considerable range extension to south-west within Egypt (Figure 9 map) but the species is widespread across North Africa (Schleich et al., 1996).

Concluding comments

These notes warrant 3 comments: (1) Despite all the efforts invested in researching the biodiversity of Egypt and the progress achieved (Anderson, 1898; Flower, 1933; Marx, 1968; Werner, 1973, 1982, 1988; Saleh, 1997; Baha El Din, 2006), careful observers can still make helpful additional contributions. (2) Once again it is demonstrated, how the knowledge of biodiversity depends on well maintained and properly documented museum collections. (3) The incidental observation of the Seligmann effect (Almog et al., 2005; Lachman et al., 2006) in the separation of *Mesalina bahaeldini* and *M. guttulata* validates its potential functionality and urges its wider exploration in morphology-based alpha-taxonomy.

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References

Almog, A., Bonen, H., Herman, K. and Werner, Y.L. 2005. Subspeciation or none? The hardun in the Aegean (Reptilia: Sauria: Agamidae: *Laudakia stellio*). J. Nat. Hist. 39: 567-586.

Anderson, J. 1898. Zoology of Egypt: Reptilia and Batrachia, Quaritch, London.

Baha El Din, S. 2006. A guide to the reptiles and amphibians of Egypt, The American University in Cairo, Cairo.

Baha El Din, S. 2007. A new lizard of the *Acanthodactylus scutellatus* group (Squamata: Lacertidae) from Egypt. Zool. Mid. East 40: 21-32.

Baha el Din, S., Böhme, W., Corti, C., Crnobrnja Isailovic, J., Lymberakis, P., Marquez, R., Miaud, C., Slimani, T., Uğurtaş, I. and Werner, Y.L. 2008. The status and distribution of amphibians in the Mediterranean Basin. In: Threatened amphibians of the world (Eds., Stuart, S.N., Hoffmann, M., Chanson, J.S., Cox, N.A., Berridge, R.J., Ramani, P., Young, B.E.), Lynx Edicions, Barcelona, Spain, IUCN Gland, Switzerland, & Conservation International, Arlington, Virginia, USA, pp.113.

Boulenger, O.A. 1921. Monograph of the Lacertidae, Vol. 2, British Museum (Natural History), London.

Flower, S.S. 1933. Notes on the recent reptiles and amphibians of Egypt, with a list of the species recorded from that kingdom. Proc. Zool. Soc. Lond. 1933: 735-851.

Goren, M. and Werner, Y.L. 1993. On measuring head length in fishes, amphibians and reptiles and on modified calliper rules. J. Zool. Lond. 230: 187-191.

Haas, G. 1951. Remarks on the status of the lizard *Eremias olivieri* Audouin. Copeia 1951: 274-276.

Lachman, E., Carmely, H. and Werner, Y.L. 2006. Subspeciation befogged by the 'Seligmann effect': the case of *Laudakia stellio* (Reptilia: Sauria: Agamidae) in southern Sinai, Egypt. J. Nat. Hist. 40: 1259-1284.

Lichtenstein, H. 1823. Verzeichniss der Doubletten des zoologischen Museums der Königl. Universität zu Berlin, T. Trautwein, Berlin.

Marx, H. 1968. Checklist of the reptiles and amphibians of Egypt, Special Publication, United States Naval Medical Research Unit Number Three, Cairo, Egypt, UAR.

Meffe, G.K. and Carroll, C.R., Eds. 1997. Principles of conservation biology, Sinauer, Sunderland, Massachusetts.

Saleh, M. A. 1997. Amphibians and reptiles of Egypt, Publication of National Biodiversity Unit No. 6, Egyptian Environmental Affairs Agency, Ministry of State for Environmental Affairs, Egypt. [City not given.]

Samper, C. 2004. Taxonomy and environmental policy. Phil. Trans. R. Soc. Lond. B359: 721–728.

Schleich, H.H., Kaestle, W. and Kabisch, K. 1996. Amphibians and reptiles of North Africa, Koeltz, Konigstein.

Secretariat of the Convention on Biological Diversity 2008. Guide to the global taxonomy initiative. Technical Series no. 30, Montreal, Canada.

Segoli, M., Cohen,T. and Werner,Y.L 2002. A new lizard of the genus *Mesalina* from Mt. Sinai, Egypt. (Reptilia: Sauria: Lacertidae). Faun. Abh. Mus. Tierkd. Dresden 23: 157-176.

Seifan, M., Gilad, A., Klass, K. and Werner , Y.L. 2009. Ontogenetically stable dimorphism in a lacertid lizard (*Acanthodactylus boskianus*), with tests of methodology and comments on life-history. Biol. J. Linn. Soc. 97: 275-288.

Stresemann, E. 1954. Hemprich und Ehrenberg, Reisen zweier naturforschender Freunde im Orient geschildert in ihren Briefen aus den Jahren 1819-1826. Akademie-Verlag, Berlin.

Werner, Y.L. 1971. Some suggestions on the standard expression of measurements. Syst. Zool. 20: 249-252.

Werner, Y.L. 1973. The reptiles of the Sinai peninsula, The Hebrew University of Jerusalem, Jerusalem [in Hebrew, English abstract and key to *Mesalina* in Sinai].

Werner, Y.L. 1982. Herpetofaunal survey of the Sinai Peninsula (1966-77), with emphasis on the Saharan sand community. In: Herpetological communities: A symposium of the Society for the Study of Amphibians and Reptiles and the Herpetologists' League, August 1977 (Ed. Scott, N.J., Jr.) Washington, US Fish and Wildlife Service, Wildlife Research Report 13, pp. 153-161.

Werner, Y.L. 1986. Geographic sympatry of *Acanthodactylus opheodorus* with *A. boskianus* in the Levant. Zoology in the Middle East 1: 92-95.

Werner, Y.L. 1988. Herpetofaunal survey of Israel (1950-85), with comments on Sinai and Jordan and on zoogeographical heterogeneity. In: Zoogeography of Israel (Eds., Yom-Tov, Y., Tchernov E.), Monographiae Biologicae, 62, Dordrecht, W. Junk, pp. 355-388.

Werner, Y.L. 1995. A guide to the reptiles and amphibians of Israel, Nature Reserves Authority, Jerusalem. [In Hebrew, scientific names for figures.]

Werner, Y.L., Rothenstein, D. and Sivan, N. 1991. Directional asymmetry in reptiles (Sauria: Gekkonidae: *Ptyodactylus)* and its possible evolutionary role, with implications for biometrical methodology. J. Zool. Lond. 225: 647-658.