

Additions to the knowledge of Müller's Snake, *Micrelaps muelleri* BOETTGER, 1880 (Squamata: Serpentes: Colubridae)

Weitere Angaben zur Kenntnis der Schlange *Micrelaps muelleri* BOETTGER, 1880
(Squamata: Serpentes: Colubridae)

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KURZFASSUNG

Wir berichten über weitere Nachweise von *Micrelaps muelleri* BOETTGER, 1880 aus Jordanien. Die Verbreitung der Schlange im Mittleren Osten wird in einer Karte auf Grundlage neuer und früherer Aufsammlungen dargestellt. Eine vollständige Synonymie-Chresonymie, Betrachtungen zur zoogeographischen Affinität von *M. muelleri* und Angaben zur Biologie ergänzen die Angaben.

ABSTRACT

Additional records of *Micrelaps muelleri* BOETTGER, 1880 from Jordan are given. The distribution of this snake in the Middle East is shown in a map based on records of current and previous collections. A complete synonymy-chresonymy, considerations on the zoogeographic affinity of *M. muelleri*, and notes on its biology are included.

KEY WORDS

Serpentes, Colubridae, *Micrelaps muelleri*, morphology, distribution, Jordan, Lebanon, Syria, Israel

Müller's Snake, *Micrelaps muelleri* BOETTGER, 1880, is a rare species with very few specimens available at museums (fig. 1).

In the literature, measurements are given for only seven specimens; two collected from Jerusalem (BOETTGER 1880) from which the genus *Micrelaps* and the species *M. muelleri* were described, two from Syria (LORTET 1883; BATTERSBY 1953), and three from Jordan (DISI 1985).

In this study, four further specimens from Syria and Jordan are included. Their distribution, morphology and measurements are given with speculations on the snake's zoogeography.

Eleven specimens of *M. muelleri* from several Jordanian and German museums (tables 1 & 2) were examined. The specimens are described by measurements and counts including the number of ventral and caudal scales, number of labials, body and tail length, number of dark bands across body and tail.

The following original description of the genus *Micrelaps* and the species *muelleri* was translated from BOETTGER (1880):

"*Micrelaps* BÖTTGER nov. gen. -

Characters: Similar to *Elapomorphus* WIEGM., but very few simple teeth in the anterior and a single grooved major tooth in the posterior supramaxilla. Loreals and preoculars absent; postfrontal in contact with third supralabial.

Dentition opisthoglyphous. In the upper jaw on both sides at the front, only two strong simple teeth separated by a large interspace, are present. In the back, at above the sutures of the 4th and 5th upper labials, there is a single, strong, slightly curved, deeply furrowed tooth. The size of the teeth of the upper jaw increases backwards, in a ratio of 1 : 2 : 3.

As in the genus *Elapomorphus* WIEGM., the eye is obviously small and has a rounded pupil; the nasal opening penetrates the middle of the single nasal shield and the loreal is absent. Differing from the genus *Elapomorphus*, *Micrelaps* has no preocular and the postfrontals on the right and left are in touch with the margin of the 3rd upper labial. There is a small postocular, 1+2 temporals, seven supralabials, seven infralabials five of which are touching two pairs of equal sized submentals. Fifteen rows of smooth scales, anal and

Table 1: *Micrelaps muelleri* BOETTGER, 1880, materials examined.Tab. 1: *Micrelaps muelleri* BOETTGER, 1880, untersuchtes Material.

Museum	Museum Number Inventarnummer	Locality, Date, Collector Fundort, Datum, Sammler
JNHM (Jordan Natural History Museum, Yarmouk University. Irbid, Jordan)	229	Ash Shuna Shamaliyah, 8. 5. 1982, E. ABU-RUB.
JNHM	319	NE Jarash, 15. 6. 1982, D. SHAFEE.
JNHM	917	Zabdah, 4. 1. 1982, S. ISMAIL.
JUMR (Jordan University Museum. The University of Jordan. Amman, Jordan)	2046	As Sillihi, A. DIST.
JUMR	2055	Kurayyimah, 1996, N. DANEH.
JUSTM (Jordan University of Science & Technology Museum. Irbid, Jordan)	0138	Hartha, 12. 7. 1992, B. OMARI.
JUSTM	0188	Zabdah, March, 1994, M. QATRA-MEEZ.
JUSTM	0189	Irbid, 2. 5. 1994, S. JARADAT.
SMF (Senckenberg Museum. Frankfurt, Germany)	10349a	JERUSALEM, H. SIMON, 1879 (type specimen).
SMF	20350	Jerusalem, H. SIMON, 1879/1884.
ZFMK (Zoologisches Forschungsinstitut und Museum Alexander Koenig. Bonn, Germany)	60900	Qal'at al Hosn, Syria, W. BISCHOFF, 3. 5. 1994.

Table 2: *Micrelaps muelleri* BOETTGER, 1880; coordinates of localities from which materials were collected.Tab. 2: *Micrelaps muelleri* BOETTGER, 1880; Fundorte und Fundortkoordinaten des Untersuchungsmaterials.

Locality / Fundort	Coordinates / Koordinaten	Locality / Fundort	Coordinates / Koordinaten
As Sillihi	32°08'N/35°49'E	Jarash	32°17'N/35°54'E
Ash Shuaa Shamaliyah	32°37'N/35°36'E	Jerusalem	31°47'N/35°13'E
Hartha	32°42'N/35°51'E	Kurayyimah	32°16'N/35°36'E
Hims	34°44'N/36°43'E	Latakia	35°31'N/35°47'E
Irbid	32°33'N/35°51'E	Zabdah	32°33'N/35°50'E

Table 3: *Micrelaps muelleri* BOETTGER, 1880; pholidosis, counts and measurements of eleven specimens.Tab. 3: *Micrelaps muelleri* BOETTGER, 1880; Pholidose, Meß- und Zählwerte von elf Exemplaren.

Collection Specimen No. Sammlung Exemplar Nr.	Ventrals Ventralia	Caudals Caudalia	Midbody scale rows Rumpfschuppen in Körpermitte	Dark Bands on body Dunkle Rumpfbänder	Dark Bands on tail Dunkle Schwanzbänder	Total length (mm) Gesamtlänge (mm)	Tail length (mm) Schwanzlänge (mm)
JNHM 229	277	21	15	49	5	330	16
JNHM 319	272	22	15	44	4	330	27
JNHM 917	279	25	14	40	3	210	11
JUMR 2046	274	22	15	45	4	344	20
JUMR 2055	248	28	15	45	7	324	27
JUSTM 0138	262	30	15	46	5	322	24
JUSTM 0188	250	29	15	40	5	296	24
JUSTM 0189	275	20	15	42	6	360	19
SMF 10349a	248	32	15	34	—	370	31
SMF 20350	248	26	15	45	—	355	35
ZFMK 60900	242	31	15	37	—	300	26

subcaudals are divided.

The tooth structures and head scales differentiate this small snake, which is the first true Elapomorphid of the Circum-Mediterranean faunal region, from the true *Elapomorphus* and *Elapomorphus* species of America as well as from *Urobelus* in Africa (which JAN leaves, as subgroups, within the same genus - *Elapomorphus*). The relatives of *Micrelaps*, as well as the Oligodontids, can be separated from the Calamariids family and placed into an independent family. Dr. F. MÜLLER was correct in suspecting that this species belongs to a new genus.

Micrelaps mülleri BÖTTG. n. sp. - Characters: Pinkish-white above; nicely decorated with 34-45 brown or black transversal bands across dorsum, and 3-4 across the short tail.

The upper side is white, slightly pinkish (in life probably dark pink), with 34 (up to 45) irregular dark-brown to black semi-rings occupying 5-6 scale rows, while the light bands in between occupy 2-3 scale rows only. In young specimens, the dark cross bands are nearly three times as broad as the light bands. The first light band of the neck and the first and often the second light bands of the tail form closed rings. The head is very dark above; the ventral side is very dark brown, each ventral scale having a broad white posterior edge.

Appearance is elapid-like. The head is depressed, hardly recognizable from the rest of the long uniformly broad body. The

venter is somewhat flat; the tail is prominently short and broad and at its end, narrowing abruptly into a blunt tip. The rostral is arched from above to below, projecting over the mouth opening and extending a little between the prefrontals from above. Prefrontals are much narrower and a bit shorter than the postfrontals. Frontal small, hexagonal, half as long as the parietals, anteriorly with obtuse angle, posteriorly with acute angle. Parietals large, diverging posteriorly. Temporal often not touching the postocular, in that the fifth upper labial and the parietal form a suture in-between. Supraorbital quadrate, nearly as broad as long. From the seven upper labials, the third and fourth touch the eye; 3, 4 and 5 are the largest. Seven lower labials, the fifth very large. Scales without apical pores, smooth and rhomboid in shape."

All specimens examined by the authors have 7 upper and 7 lower labials, 1 postocular, 1+2 temporals and scale rows around the body range from 14-15. Third and fourth upper labials enter the eye (in one specimen only the fourth). 34-49, and 3-7 dark bands across the body and tail respectively. Further data on counts and measurements is provided in table 3; for a complete synonymy-chresonymy see table 4.

Biology

Virtually no information is available on the biology of this little known snake. We examined stomach contents of five

Table 4: Complete synonymy-chresonymy for *Micrelaps muelleri* BOETTGER, 1880.

Tab. 4: Vollständige Synonymie-Chresonymie von *Micrelaps muelleri* BOETTGER, 1880.

1880	<i>Micrelaps mülleri</i> - BOETTGER, Ber. Senck. Ges.; 1879-1880, p. 137-138, pl. iii/2.
1883	<i>Micrelaps mülleri</i> - LORTET, Arch. Mus. Hist. Nat. Lyon; p. 184, pl. xix/2.
1884	<i>Micrelaps muelleri</i> - TRISTRAM, Survey of Western Palestine. The Fauna and Flora of Palestine; p. 140.
1896	<i>Micrelaps muelleri</i> - BOULENGER, Cat. Snakes British Mus. (Nat. Hist.); vol. 3, p. 48.
1935	<i>Micrelaps muelleri</i> - BODENHEIMER, Animal Life in Palestine; p. 185.
1951	<i>Micrelaps muelleri</i> - HAAS, Bull. Res. Council. Israel; 1: 89.
1952	<i>Micrelaps muelleri</i> - HAAS, Istanbul Univ. Fen. Fak. Mecmuasi. 17: 101.
1953	<i>Micrelaps mülleri</i> (sic!) - BATTERSBY, Ann. Mag. Nat. Hist.; 6: 640.
1981	<i>Micrelaps muelleri</i> - HRAOUI-BLOQUET, Ecologia Mediterranea; 7: 99.
1983	<i>Micrelaps muelleri</i> - WELCH, Herpetology of Europe and Southwest Asia; p. 64.
1985	<i>Micrelaps muelleri</i> - DISI, The Snake; 17: 39.
1988	<i>Micrelaps muelleri</i> - DISI & al., The Snake; 20: 48.
1988	<i>Micrelaps muelleri</i> - WERNER, Y., The Zoogeography of Israel; p. 378 + fig. p. 388.
1989	<i>Micrelaps muelleri</i> - GRUBER, Die Schlangen Europas und rund ums Mittelmeer; p.165 + plate.
1995	<i>Micrelaps muelleri</i> - AMR & AL-ORAN, The Snakes of Jordan; p. 55. fig. 41.
1996	<i>Micrelaps muelleri</i> - DISI, Herpetozoa; 9: 79.
1996	<i>Micrelaps muelleri</i> - DISI & BÖHME, Herpetozoa; 9: 68.
1997	<i>Micrelaps muelleri</i> - BISCHOFF & SCHMIDTLER, Salamandra 33 (1): 25.



Fig. 1: Mueller's Snake, *Micrelaps muelleri* BOETTGER, 1880. JUSTM 0188, Zabdah, Jordan.
Abb. 1: *Micrelaps muelleri* BOETTGER, 1880. JUSTM 0188, Zabdah, Jordanien.

specimens, where no food remains were discovered. HOEVERS & JOHNSON (1982) reported *M. boettgeri* (BOULENGER, 1896) to feed on *Typhlops* sp. in Somalia. Müller's Snake fed on *Ablepharus kitaibelii* BIBRON & BORY, 1833 in captivity (Dr. DAVID MODRY Brno, Czech Republik, pers. comm.).

Habitat

Most of the specimens were collected within the Mediterranean biotope characterized by mild summer and cold winter. The soil is typically terra rossa with scattered rocky areas. Most specimens were collected during March-July. Two specimens from Irbid area were found under hay piles near wheat fields during daytime. HAAS (1952) stated that it is a nocturnal, fossorial and rather sluggish snake.

One other specimen was taken from Kurayyimah area, located in the upper part of the Jordan Valley. This is an agricultural area dominated by Irano-Turanian elements and known for its high temperature

and humidity. Another specimen was caught by Dr. MODRY near King Talal Dam (in the vicinity of Jarash).

Zoogeography

It seems that the distribution of this species is confined to the northern region of Syria and extends southwards to the mountains of Jordan and Palestine. BATTERSBY (1953) noted that both Syrian localities of *M. muelleri* are within the low coastal region while the snake apparently does not occur in the coastal plains in the southern part of its range. HAAS (1951) stated that this species is restricted to the Mediterranean biotope and can endure low temperatures. Furthermore, HAAS (1951) refers to the African affinity of this species that penetrated into our area during past warm and wet climatic conditions.

Apparently, *M. muelleri* is a relict species of Ethiopian origin, from where two other species, *M. boettgeri* (BOULENGER, 1896) and *M. vaillanti* (MOCQUARD, 1888) are known from Somalia (HOEVERS

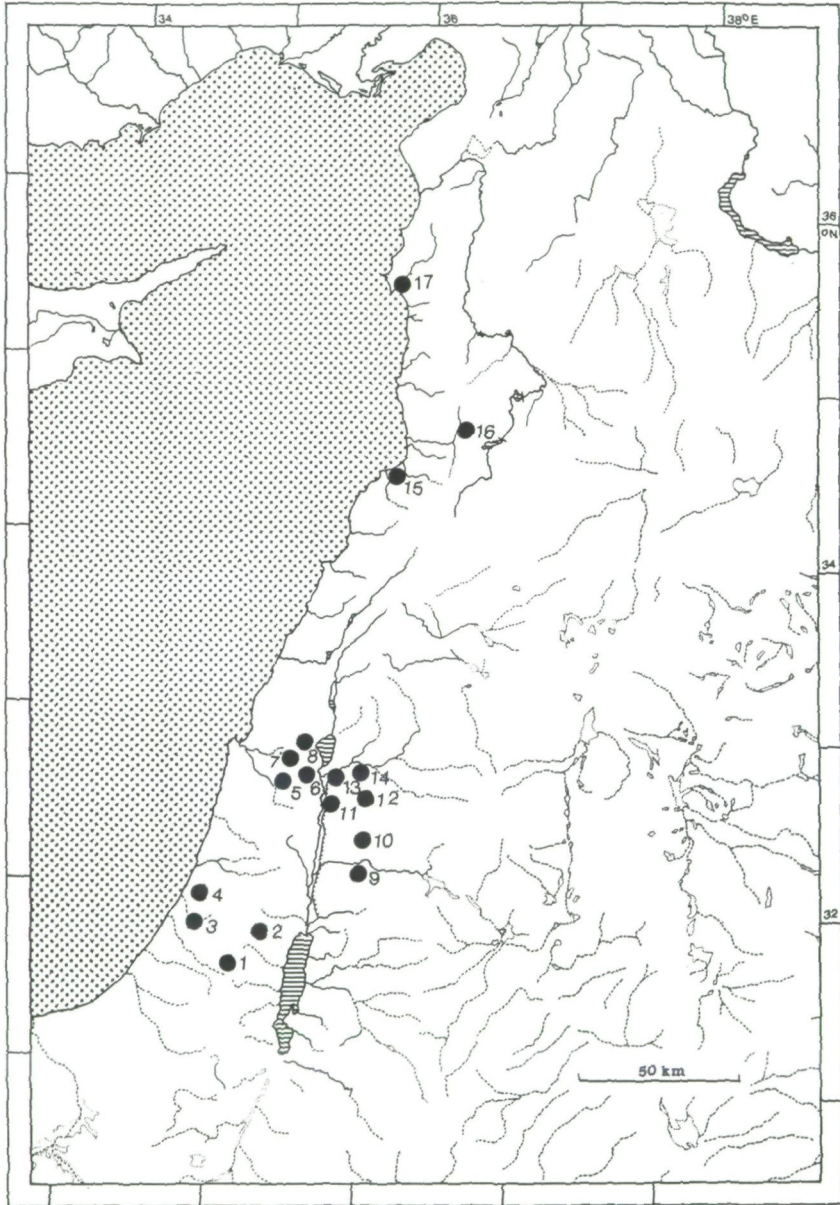


Fig. 2: Locality records of *Micrelaps muelleri* BOETTGER, 1880, based on data from BOETTGER 1880, LORTET 1883, BATTERSBY 1953, DISI 1985, BISCHOFF & SCHMIDTLER 1997, and the present work.

Abb. 2: Fundorte von *Micrelaps muelleri* BOETTGER, 1880 nach Angaben von BOETTGER 1880, LORTET 1883, BATTERSBY 1953, DISI 1985, BISCHOFF & SCHMIDTLER 1997, und aus der vorliegenden Arbeit.

- 1 - Devira; 2 - Jerusalem; 3 - Kerar eqron; 4 - Tel Aviv; 5 - SW Lake Tiberias; 6 - Nazareth;
- 7 - Upper Galilaea; 8 - Rash Pinah; 9 - As Sillihi; 10 - Jarash; 11 - Kurayyimah; 12 - Irbid;
- 13 - Ash Shuna Shamaliyah; 14 - Hartha; 15 - Tripoli; 16 - 10 km W Qal'at al Hosn; 17 - Latakia.

& JOHNSON 1982). At least in Jordan, the localities from which this species was collected are situated within the warm variety of the Mediterranean region (dry for most of the year) and the extension of the Irano-Turanian region.

DISI (1987) found that the snake's distribution in the area positively correlates with temperature and humidity. He also suggested that *M. muelleri* may have spread from the Jordan Valley into the Mediterranean biotope through the extensive wadi systems branching from the valley towards the eastern mountains.

As far as we know the present distribution of this little known species runs along the Great Rift Valley, that extends from southern Jordan into the Orontes ba-

sin further north to the Turkish frontier near Lattakia.

The distribution of *M. muelleri* in the Middle East is shown in figure 2. Its presence in Lebanon is speculative; HRAOUI-BLOQUET (1981) indicated a specimen at the American University of Beirut without data on the locality or date of collection. As for Syria, LORTET (1883) stated that "Cette petite espèce se voit assez fréquemment dans les environs de Lattakieh". This statement is doubtful, since only two specimens were collected from Syria (BATTERSBY 1953; BISCHOFF & SCHMIDTLER 1997).

Further studies addressing the evolutionary relationship of *M. muelleri* with other colubrids should be carried out

ACKNOWLEDGMENTS

We wish to thank KONRAD KLEMMER (former curator of the herpetology section at Senckenberg Museum, Frankfurt), for allowing us to examine the type specimen, to DARWEESH SHAFEE (Jordan Natural History Museum), and WOLFGANG BISCHOFF (Zoologi-

sches Forschungsinstitut und Museum Alexander Koenig, Bonn, Germany). Special thanks are extended to Ms. LINA B. RIFAI for translating articles and papers in German and for her help in the laboratory.

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DATE OF SUBMISSION: July, 10th, 1997

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Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Herpetozoa](#)

Jahr/Year: 1997

Band/Volume: [10_3_4](#)

Autor(en)/Author(s): Amr Zuhair S., Disi Ahmad M., Al-Melhim Walid N.

Artikel/Article: [Additions to the knowledge of Müller's Snake, *Micrelaps muelleri* Boettger, 1880 \(Squamata: Serpentes: Colubridae\). 163-168](#)