

Additions to the herpetofauna of Syria

by Petros Lymberakis and Antigoni Kalionzopoulou

Abstract. New information on the herpetofauna of Syria is provided, based on a collection made during a field trip from the Natural History Museum of Crete (NHMC) in April 1999. We collected 391 specimens of 43 species at 30 different localities. The results expand our knowledge of the distribution of several species. The systematic position of four taxa (*Rana bedriagae*, *Ptyodactylus* sp., *Lacerta kultzeri*, *Mabuya aurata*) is discussed in the light of recent revisions of the Syrian herpetofauna.

Kurzfassung. Anhand der Ergebnisse einer Sammelreise des Natural History Museum of Crete (NHMC) im April 1999 werden neue Ergebnisse zur Herpetofauna Syriens vorgestellt. Wir sammelten an 30 Lokalitäten insgesamt 391 Exemplare in 43 Arten. Die Ergebnisse erweitern unser Wissen über die Verbreitung mehrerer Arten. Die systematische Stellung von vier Arten (*Rana bedriagae*, *Ptyodactylus* sp., *Lacerta kultzeri*, *Mabuya aurata*) wird im Lichte neuerer Revisionen der syrischen Herpetofauna diskutiert.

Key words. Amphibia, Reptilia, Middle East, *Rana*, *Ptyodactylus*, *Lacerta*, *Mabuya*.

Introduction

Two recent publications on the herpetofauna of Syria (DISI & BÖHME 1996, MARTENS 1997) provide essential data for a long-overdue list of the amphibians and reptiles of this zoogeographically important country. During a field trip from the Natural History Museum of Crete (NHMC) in April 1999, covering a large area and various ecosystem types, new information on the herpetofauna of the country was collected which expands our knowledge of the distribution of extant reptiles and amphibians. As the authors of the two papers mentioned above disagree on the status of certain taxa in the area, we attempted to provide data for resolving some of the faunistic ambiguities.

Material and methods

The expedition took place 4–15.4.1999. Most of the material was collected by one of us (P.L.), using a rubber band to stun the animals. Other members of the expedition collected reptiles and amphibians only by chance along with other field activities. All animals were chilled and kept in 95% alcohol. The geographic position of each station was located by GPS. All specimens were deposited in the NHMC collections. Depending on the taxonomic and zoogeographic characteristics, we made identifications of certain taxa down to subspecific level.

Collecting sites. We sampled at 30 sites. The names are taken from the “Freytag & Berndt” road map of Syria. Names with an asterisk were provided by locals and are not on the map. 1- Buraq, 60 km S of Damaskus (33°10', 36°29'): 4.4.99. – 2- cone of Shi-Chan, 20 km N of As Suwayda (32°53', 36°37'):

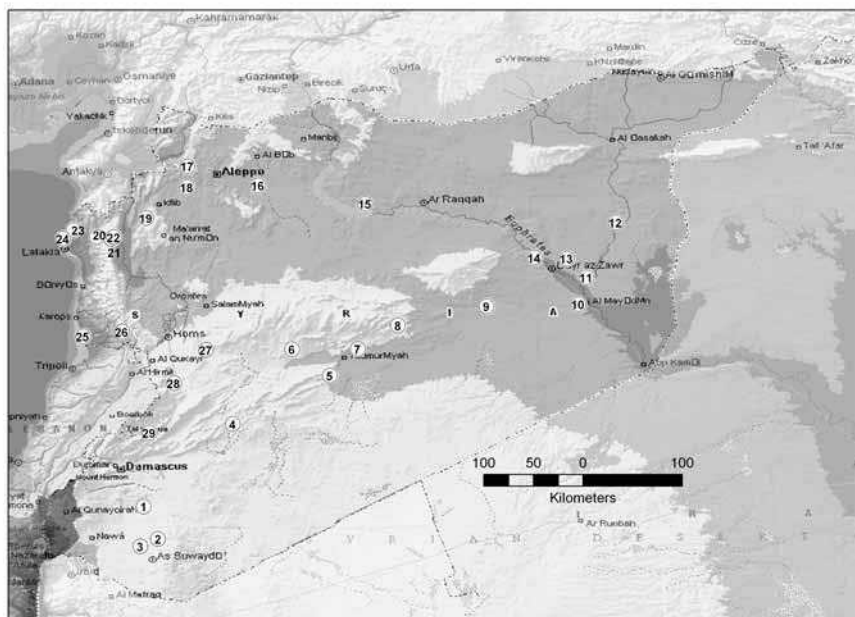


Fig. 1. Sampling stations. Increasing numbers indicate the progress of the itinerary.

4.4.99. – **3**- Nizran, 25 km S of As Suwayda (32°49', 36°27'): 4.4.99. – **4**- Al Badiah desert, 150 km SW of Palmyra (33°55', 37°17'): 5.4.99. – **5**- 20-25 km SW of Palmyra, rocky desert (34°21', 38°10'): 6.4.99. – **6**- 20 km N of Ar Raml (34°36', 37°49'): 6.4.99. – **7**- Palmyra, oasis and antiquities (35°54', 38°29'): 6.4.99. – **8**- 4 km W of As Sukhnah (34°48', 38°47'): 7.4.99. – **9**- 60 km W of Dayr az Zawr (34°59', 39°35'): 7.4.99. – **10**- Qal' at Rabah castle (35°00', 40°25'): 8.4.99. – **11**- Sabhah*, 20 km NE of Dayr az Zawr (35°14', 40°29'): 8.4.99. – **12**- 5 km N of As Suwar (35°44', 40°45'): 8.4.99. – **13**- 15 km NNE of Dayr az Zawr (35°25', 40°19'): 8.4.99. – **14**- Hawaig* gorge (35°25', 40°01'): 9.4.99. – **15**- Al Asad lake near Qal' at Jabar (35°54', 38°29'): 9.4.99. – **16**- Jabboul (Salt lake) (36°04', 37°31'): 10.4.99. – **17**- Qal' at Samaan (36°15', 36°53'): 10.4.99. – **18**- Taftanaz (36°03', 36°52'): 11.4.99. – **19**- 3 km S of Ariha (35°47', 36°30'): 11.4.99. – **20**- Al Haffah (35°36', 36°03'): 12.4.99. – **21**- Slinfah (35°35', 36°11'): 12.4.99. – **22**- Qal' at Burzay (35°40', 35°51'): 12.4.99. – **23**- Lattakia beach (35°35', 35°45'): 13.4.99. – **24**- 5 km S of Jablah (33°55', 37°17'): 13.4.99. – **25**- Al Hamidiyah (34°42', 35°56'): 13.4.99. – **26**- Krak des Chevaliers (34°45', 36°17'): 14.4.99. – **27**- Buhayrat Qattinah lake, 15 km SW of Homs (34°36', 38°25'): 14.4.99. – **28**- 40 km E of Homs (34°35', 37°03'): 14.4.99. – **29**- 5 km S of Hisyah (34°17', 36°45'): 15.4.99. – **30**- Ma'lula (33°50', 36°32'): 15.4.99.

Results and discussion

We collected 391 specimens belonging to 43 species. Species and specimens collected per sampling station are presented in Tab. 1. There is an ongoing discussion concerning the presence and the validity of the records of certain species (DISI & BÖHME 1996, MARTENS 1997). With our new material and according to recent publications on the taxa involved, we

Tab. 1. Species collections per sampling station.

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
<i>Triturus vittatus</i>																									2	4				
<i>Bufo viridis</i>	2														3	2	5	1			1		3		8					
<i>Hyla savignyi</i>																						21	3		22					
<i>Rana bedriagae</i>										2			3		2							8	1			1				
<i>Mauremys caspica</i>											1			1																
<i>Testudo graeca</i>		2																												
<i>Cyrtopodion heterocercus</i>									4		3																			
<i>Cyrtopodion kotschyi</i>																							1							
<i>Hemidactylus turcicus</i>																				1										1
<i>Ptyodactylus puiseuxi</i>	2		5																											
<i>Ptyodactylus</i> sp.							3		7																					
<i>Chamaeleo chamaeleon</i>																	1													
<i>Laudakia stellio</i>			2	3											1	5		1			1		1							1
<i>Trapelus pallidus haasi</i>				2	8	9		2			1																			
<i>Trapelus persicus</i>									1																					
<i>Trapelus ruderatus</i>	4		1												5		1								2			1	4	
<i>Acanthodactylus boskianus</i>						7																								
<i>Acanthodactylus grandis</i>								1	1		2																			
<i>Acanthodactylus orientalis</i>		1		1					1			1		4																
<i>Acanthodactylus robustus</i>						3																								
<i>Acanthodactylus tristami</i>	2																													
<i>Lacerta cappadocica</i>																		4												
<i>Lacerta kulzeri</i>																														4
<i>Lacerta laevis</i>																														
<i>Mesalina brevisrostris</i>					1	4		3				3																		1
<i>Ophisops elegans ehrenbergi</i>	5		7					1				1		2			1	1				3	12		14			4	2	1
<i>Ophisops elegans blanfordi</i>	1			3	2					1				2																7
<i>Ablepharus chernovi</i>																								1						
<i>Ablepharus kitaibelli</i>																				2										
<i>Ablepharus rueppellii festae</i>																														1
<i>Chalcides ocellatus</i>							1	1												2				1		4				
<i>Mabuya aurata</i>										3	1	1			1															
<i>Mabuya vittata</i>		1														2	3	1	5		1	8	1		7	1	1	4	1	
<i>Novoeumeces sch. pavimentatus</i>					1	1										1								1						
<i>Ophiomorus latastii</i>	1																													
<i>Typhlops vermicularis</i>																				1	1									
<i>Coluber jugularis</i>																		1		1										
<i>Coluber rubriceps</i>																														
<i>Coluber ventromaculatus</i>							1				1		2																	
<i>Eirenis modestus</i>																					3		1							
<i>Eirenis rothi</i>																														
<i>Natrix tessellata</i>																														
<i>Psammophis schokari</i>						2																								
<i>Rhynchocalamus melanocephalus</i>																									1					

would like to comment on some of the controversial species. In addition to these species, we consider that the taxonomic status of at least two more taxa, namely *Ophisops elegans* ssp. and *Ablepharus* spp., is not resolved beyond any doubt. The lack of incontestable morphological characters for these taxa may be counterbalanced by complementary approaches, such as electrophoretic and/or partial DNA sequence comparisons, which may assist in clarifying the current taxonomic problems.

Tab. 2. Morphometrics of the samples belonging to the species *Prodoxylus* sp. sensu WERNER & SIVAN (1993). Ra: Rostrum-annus length, i.e. distance from tip of snout to cloaca, perera: percentage of ra. Head length: distance from tip of snout to posterior edge of ear, measured parallel to long axis of body; Head width: greatest width of head; Head depth: greatest depth of head; Eye size: longest diameter of visible spectacle; tail length: from cloaca to tip of tail, if complete; Head index: head length as a percentage of head width; Head flatness: head length as a percentage of head depth; Eye % head: eye size as a percentage of head length; Subdigital lamellae: along underside of fourth toe, defined by their width, hence the series may begin proximally of the free toe. Collection numbers refer to NHMC specimens.

Collection number	Station 6			Station 8						
	80.3.48.6	80.3.48.7	80.3.48.8	80.3.48.11	80.3.48.12	80.3.48.13	80.3.48.14	80.3.48.15	80.3.48.16	80.3.48.17
Sex	♂	♀	♂	♂	♀	♂	♀	♀	♀	♂
Ra, mm	48.4	60.5	61.9	49.7	59.1	56.7	60.3	61.3	46.8	46.6
Head length, perera	36.83	36.24	34.75	33.65	31.06	33.87	32.86	33.36	36.27	33.66
Head width, perera	23.84	22.84	21.79	21.22	22.21	24.80	23.51	22.76	25.70	22.48
Head depth, perera	15.66	14.16	15.86	14.50	14.68	14.77	16.03	13.17	16.53	15.26
Eye size, perera	5.99	5.92	5.23	6.95	6.96	7.52	6.63	5.94	7.14	6.50
Tail length, perera	92.54	89.28	96.62	84.23		87.15		74.80		84.97
Head index	154.51	158.65	159.53	158.54	139.86	136.58	139.77	146.52	141.15	149.76
Head flatness	235.22	255.96	219.14	232.08	211.65	229.27	204.96	253.28	219.38	220.53
Eye % head	16.26	16.34	15.06	20.65	22.40	22.20	20.18	17.81	19.67	19.32
Subdigital lamellae	9	10	10	10	9	10	9	8	10	7

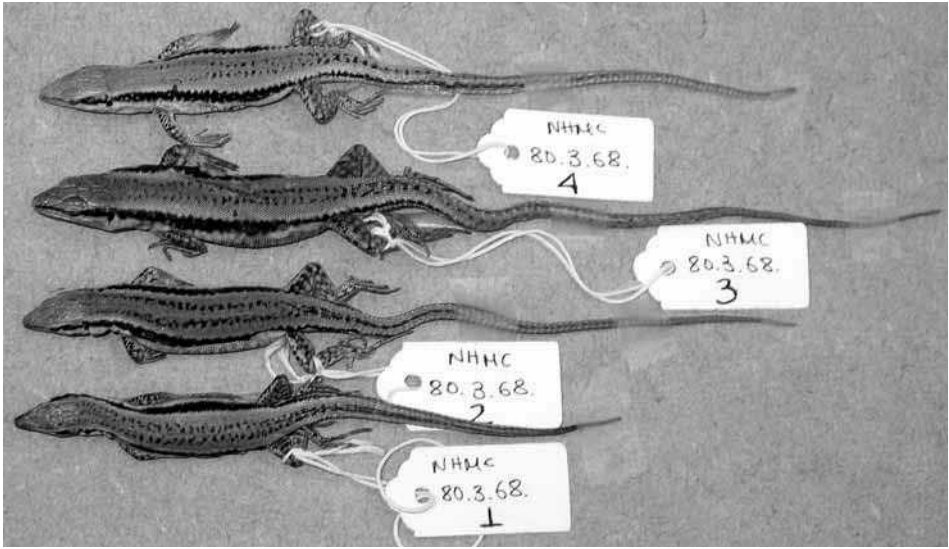


Fig. 2. Dorsal pattern of *Lacerta kulzeri* specimens collected.

***Rana bedriagae* Camerano, 1882**

New findings on bioacoustics and electrophoretic data (BEERLI et al. 1994) indicate the need for reevaluating the taxonomic status of *Rana ridibunda*, especially as regards the southern limits of its distribution. In the particular case of Syria, SCHNEIDER (1997) and SINCH & SCHNEIDER (1999) suggest that all *Rana* populations studied in Syria should be allocated to *Rana bedriagae*.

***Ptyodactylus* sp. (sensu Werner & Sivan, 1994)**

WERNER & SIVAN, in a series of articles (1993, 1994, 1996), have elucidated the situation with the species of this genus in the Middle East region. Based on morphometric characters, which they combined with data on distribution, the authors allocated most of the individuals studied to the three extant species of the area (*P. guttatus*, *P. hasselquistii* and *P. puiseuxi*). They considered the forms from most of the area of Syria and Iraq, and adjacent northern Arabia, as problematic and awaiting further research. We identified part of our material using the morphometric criteria they suggested, but ten individuals could not be assigned to any of the described *Ptyodactylus* species. These individuals were collected in the areas from which WERNER & SIVAN (1994) reported their "undetermined" populations. The morphometrics of the samples that could not be assigned to any *Ptyodactylus* species are presented in Tab. 2.

***Lacerta kulzeri* (Barbour, 1914)**

Recent studies have confirmed the specific status of *L. kulzeri* as well as its close relationship to *Lacerta laevis* (BEYERLEIN & MAYER 1999, BISCHOFF & SCHMIDTLER 1999).

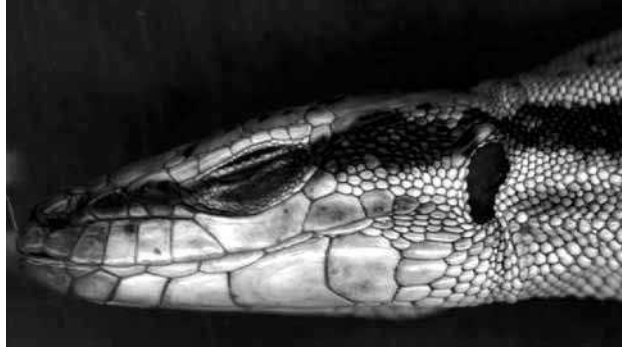


Fig. 3. Detail from individual NHMC 80.3.68.1 indicating indistinct massetericum.

Tab. 3. Morphometric characters of the specimens collected and assigned to the species *Lacerta kulzeri*. Characters of *Lacerta kulzeri* from DISI et al. (2001).

	DISI et al. (2001)	NHMC specimen no.			
		80.3.68.1	80.3.68.2	80.3.68.3	80.3.68.4
Sex		♂	♀	♂	♀
SVL	♂: 61.5mm, ♀: 64.4mm	42.1	45.6	51.6	44.1
TL (tail length in mm)		57.1	84.3	102.5	83.9
Tail partially regenerated		Yes	No	No	Yes
SVL/TL	2	1.4	1.8	2.0	1.9
Dorsalia	50-59	52	50	51	52
Ventralia (longitudinal)	6	6	6	6	6
Ventralia (transversal)	24-31	27	27	25	24
Preanal shields	4-7	5	4	5	4
Gularia	22-27	26	25	26	24
Collaria	8-10	10	9	9	11
Lamellae under 4th toe	28-32	29	28	31	29
Supraciliary granules	11-15	12	11	14	10
Supralabials	5	5	5	5	5
Massetericum	Small to indistinct	Small	Small	Indistinct	Indistinct
Femoral pores	17-22	21	18	19	18

Moreover, BISCHOFF & SCHMIDTLER (1999) refer to both species and add the term “sensu lato”, implying the possibility of “hidden taxa” being included under both valid Latin binomials. In their revision of the herpetofauna of Syria, DISI & BÖHME (1996) include *Lacerta* cf. *kulzeri*. We have collected 4 individuals of the species at station 30. Identification was based on the relative size of massetericum (considered by DISI et al. (2001) as the main distinction separating *L. kultzeri* and *L. laevis*) as well as the colour patterns described by BISCHOFF & SCHMIDTLER (1999). Morphological characters of the specimens collected are presented in Tab. 3 and Figs. 2-3.

***Mabuya aurata* (Linnaeus, 1758)**

This species is not mentioned in the revisions already cited. Nevertheless, MORAVEC (1998) documented the presence of the species in the extreme southeastern part of Syria (Abu Kamal). We have found the species at three collecting stations (10, 11, 12,) to the NW of the locations cited by MORAVEC (1998), but also collected it at a fourth station (15) some 200 km to the west of the previous stations (see Fig. 1).

Acknowledgements. Thanks to Manolis NIKOLAKAKIS for helping to draw the map and Anna KAGIAMBAKI for translations. We also wish to thank an anonymous referee for valuable comments on the original manuscript.

References

- BEERLI, P., H. HOTZ, H. TUNNER, S. HEPPICH & T. UZZELL (1994): Two new water frog species from the Aegean islands Crete and Karpathos (Amphibia, Salientia, Ranidae). – *Notulae Naturae* 470: 1–9, Philadelphia.
- BEYRLIN, P. & W. MAYER (1999): *Lacerta kultzeri* – its phylogenetic relationships as indicated by DNA sequences. – *Natura Croatica* 8 (3): 181–187, Zagreb.
- BISCHOFF, W. & J. F. SCHMIDTLER (1999): New data on the distribution, morphology and habitat choice of the *Lacerta laevis-kultzeri* complex. – *Natura Croatica* 8 (3): 211–222, Zagreb.
- DISI, A. M. & W. BÖHME (1996): Zoogeography of the amphibians and reptiles of Syria, with additional new records. – *Herpetozoa* 9 (1/2): 63–70, Vienna.
- DISI, A. M., D. MODRY, P. NECAS & L. RIFAI (2001): Amphibians and reptiles of the Hashemite Kingdom of Jordan: An Atlas and Field Guide. – Frankfurt a.M.
- MARTENS, H. (1997): A review of “Zoogeography of the amphibians and reptiles of Syria, with additional new records” (*Herpetozoa*, 9 (1/2), 1996). – *Herpetozoa* 10 (3/4): 99–106, Vienna.
- MORAVEC, J. (1998): Taxonomic and faunistic notes on the herpetofauna of Syria (Reptilia). – *Faunistische Abhandlungen des Museums für Tierkunde Dresden* 21, Suppl. Nr. 10: 99–106, Dresden.
- SCHNEIDER, H. (1997): Calls and reproductive behaviour of the water frogs of Damascus, Syria (Amphibia: Anura: *Rana bedriagae* Camerano, 1882). – *Zoology in the Middle East* 15: 51–66, Heidelberg.
- SINCH, U. & H. SCHNEIDER (1999): Taxonomic reassessment of Middle Eastern water frogs: morphological variation among populations considered as *Rana ridibunda*, *R. bedriagae* or *R. levantina*. – *Journal for Zoological Systematics and Evolution Research* 37: 67–73, Berlin.
- WERNER, Y. L. & N. SIVAN (1993): Systematics and zoogeography of *Ptyodactylus* (Reptilia: Sauria: Gekkonidae) in the Levant: 1. Biometry of three species in Israel. – *Revista Española de Herpetología* 7: 47–64, València.
- WERNER, Y. L. & N. SIVAN (1994): Systematics and zoogeography of *Ptyodactylus* (Reptilia: Sauria: Gekkonidae) in the Levant: 2. Taxonomy, with a review of ecology and zoogeography. – *Revista Española de Herpetología* 8: 105–122, València.
- WERNER, Y. L. & N. SIVAN (1996): Systematics and zoogeography of *Ptyodactylus* (Reptilia: Sauria: Gekkonidae) in the Levant: 3. Experimental and natural hybrids of *P. guttatus* and *P. puiseuxi*. – *Israel Journal of Zoology* 42: 185–202, Jerusalem.

Author's address (corresponding author): Petros Lymberakis, Natural History Museum of Crete, University of Crete, P.O. Box 2208, 71409 Irakleio. E-mail: lyberis@nhmc.uoc.gr.

