

A review of "Zoogeography of amphibians and reptiles of Syria, with additional new records" (Herpetozoa 9 (1/2), 1996)

Kritische Anmerkungen und Ergänzungen zu "Zoogeographie der Amphibien und Reptilien Syriens, mit neuen Nachweisen" (Herpetozoa 9 (1/2), 1996)

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KURZFASSUNG

In der vorliegenden Arbeit wird eine kürzlich publizierte Analyse zur Zoogeographie der syrischen Herpetofauna ergänzt und kritisch kommentiert. Danach wären neun Taxa von der Faunenliste zu streichen und sechs andere in diese aufzunehmen. Bei drei Arten ist deren Vorkommen als fragwürdig anzusehen, bei zwei anderen werden der taxonomische und systematische Status diskutiert. Darüber hinaus wird eine Liste weiterer "fragwürdiger" Taxa für Syrien vorgelegt. Die numerische Faunenanalyse, die ökogeographische Unterteilung des Landes und die Interpretation der zoogeographischen Affinitäten werden einer kritischen Analyse unterzogen.

ABSTRACT

A review of a recently published analysis of the zoogeography of the Syrian herpetofauna is presented. Nine taxa are deleted from the faunal list, six subspecies and species respectively are added, in three the occurrences are questionable and in two the taxonomy and systematics are discussed; moreover, several additional "doubtful" Syrian reptiles are listed. Critical comments are made on the numerical analysis, the ecozones of the country and the zoogeographical affinities of its herpetofaunal elements.

KEY WORDS

Syria; herpetofauna; faunal list; zoogeography, review.

INTRODUCTION

Recently, an updated list of the Syrian herpetofauna and a brief discussion on its zoogeographical relationships to adjacent countries were published by DISI & BÖHME (1996).

The authors present an annotated compilation of the amphibians and reptiles of the Syrian Arab Republic, including new records, and some ideas on zoogeographical affinities and territories in the Near East. This survey is the first one of its kind since WERNER's brief and incomplete list of the Syrian herpetofauna (1939).

Unfortunately, both misinformation and incomplete data are presented by the authors due to uncritical and fragmentary review of the available literature as well as

questionable or even wrong interpretations of their own results. In order to avoid that future studies will uncritically refer to this synopsis I present my comments on the survey of DISI & BÖHME (1996).

The following abbreviations are used: SVL (snout-vent length); BM (British Museum, Natural History, London, United Kingdom); MNHN (Muséum National Historique Naturelle, Paris, France); NMP (National Museum, Prague, Czech Republic); NMW (Naturhistorisches Museum Wien, Austria); SMF (Natur-Museum und Forschungsinstitut Senckenberg, Frankfurt a. M., Germany); ZFMK (Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn, Germany).

Comments on records new to Syria

Acanthodactylus ophiodurus ARNOLD, 1980: Because of its superficial re-

semblance this species has often been confused with *A. boskianus* (DAUDIN, 1802) in

other countries of the Middle East, the latter being widespread in Syria (e. g. SALVADOR 1982). Only two of the characteristics listed with the new records of *A. opheodurus* from Syria are generally considered as diagnostic features (1. number of dorsalia, 2. SVL), all the remaining ones show no differences or largely overlapping ranges between the two species (cf. SALVADOR 1982; ARNOLD 1986). However, the number of dorsal scales can only be used to distinguish specimens from the Arabian Peninsula *sensu strictu* (*A. opheodurus* / *A. boskianus*: 25-38 versus 18-30, rarley 36; ARNOLD 1986) while *A. boskianus* from Iraq, Syria and Jordan - sometimes considered as a distinct subspecies *A. b. euphraticus* BOULENGER, 1919 - have smaller scales and thus higher numbers of dorsalia (36-55: SALVADOR 1982; SMF 75335-6, 75584-7, 75630, NMP 34863/1-5, 34864/1-2, SVL 71,8-87,8 mm, pers. unpubl. data). The SVL of a single specimen (62 mm; DISI & BÖHME 1996), too, is no clear indication to any of the two species (*A. opheodurus*: up to 62 mm, *A. boskianus*: up to 95 mm; ARNOLD 1986). Accordingly, scale counts and measurements presented do not only fall within the ranges of *A. opheodurus* (DISI & BÖHME 1996) but also within those of *A. boskianus*. Since data on other external diagnostic characteristics are lacking (SALVADOR 1982: pectination of the eyelid and 4th toe; ARNOLD 1986: back pattern, colouration of the tail) the identification of the two Syrian specimens must be considered as highly doubtful unless a more detailed examination is presented.

Acanthodactylus schreiberi syriacus BOETTGER, 1879: Two individuals of this species originating from "Syria" and "Syrien" respectively are listed as new records for the Syrian Arab Republic. Apart from the fact that records lacking an exact locality should always be treated with care the interpretation of the origin "Syria" requires particular caution.

The modern state of Syria represents a rather new political entity; its borders as depicted and considered by DISI & BÖHME (1996) were established during the Second World War only. Before that, the term "Syria" was used in various historical, geographical or political senses and thus was referring to different parts of the region

between the Mediterranean Sea and the Syrian Desert from the Amanus and Taurus mountains in the north to the Sinai Peninsula in the south (for details see e. g. WIRTH 1971). It is obvious that many questionable records of reptile species from "Syria" lacking exact localities are attributed to the misinterpretation of their geographical origin (see also below).

The two *A. schreiberi syriacus* were collected in times - 1886 and 1927 respectively - when "Syria" included also parts of the modern states of Israel and Lebanon. Accordingly, reptile species e. g. from Beirut were commonly treated as "Syrian" by contemporary herpetologists (e. g. BOETTGER 1877; WERNER 1939). Today, *A. schreiberi syriacus* occurs both in Israel and Lebanon mainly in sand dune areas along the Mediterranean coast up to Beirut (ZINNER 1967; HRAOUT BLOQUET 1981; SALVADOR 1982; Y. WERNER 1988), whereas no records of this conspicuous taxon were ever published for Syria proper. The only recent report of this subspecies from southern Syria (Mzeirib; KATTINGER 1970) is based on a misidentified *Ophisops elegans ehrenbergii* WIEGMANN, 1835. For all these reasons it is unlikely that the two *A. schreiberi* were once collected in the territory of the Syrian Arab Republic.

Pseudotrapelus sinaitus (HEYDEN, 1827), *Uromastyx aegyptia microlepis* BLANFORD, 1874: Both species were already recorded by VESELY (1991) from the Syrian basalt desert east of Jebel ed Drouz. Later, WILMS (1995) published a photograph of a specimen of *U. aegyptia* from Abu Kemal in eastern Syria. Probably the first one who listed the two species from Syrian territory was OPPENHEIM (1899) although he did not indicate the scientific names. However, he mentioned the "Dabb" (Dornschwanz) in a list of animals occurring in the Syrian basalt desert and described the second distinct lizard from the oasis of Ruhbe: "Besonders schön war eine schon auf dem Nemara-Hügel gesehene, etwa 25 cm grosse Eidechse, mit kleinen, aber starken Schuppen, breitem Kopf, ziemlich hohen Beinen, von zierlicher Figur und braunroter Färbung, die etwa von der Mitte des Leibes an nach dem Kopf zu und besonders auf der Bauchseite in ein intensives schillerndes Blaugrün übergeht."

Leptotyphlops macrorhynchus (JAN, 1861): According to the authors a single specimen was collected "...5 km südl. Haran/Syr., S. Türkei (Syrische Steppe)...". Despite the misleading abbreviation "Syr." the collecting site can be easily identified as a locality within the Turkish territory (and is indicated as such), about 15 km north of the Syrian border town Tell Abyad. Even if it seems most likely that the

species occurs in Syria considering its entire distribution range (see e. g. HAHN 1978) a first record of *L. macrorhynchus* from this country is still lacking.

Coluber rogersi (ANDERSON, 1893): The authors claim that this species is reported for the second time from Syria. However, there already exist two published records of *C. rogersi* from this country (SCHMIDT 1939; MARTENS 1993).

List of amphibians and reptiles from Syria: Remarks, additions and deletions

Although DISI & BÖHME (1996) mention several museum collections and present a list of publications dealing with Syrian species they unfortunately failed to specify the sources they referred to in listing a taxon. Consequently, it cannot totally be excluded that the listing of a species or subspecies is based on an unpublished record. However, since I checked several hundred of publications concerning the Syrian herpetofauna, studied specimens from various museum collections (BM, MNHN, NMP, NMW, SMF, ZFMK) and collected almost 700 specimens in all parts of Syria, the deletions of nine taxa from the list of DISI & BÖHME (1996) seem to be justified. Moreover, six species mentioned in the literature but overlooked by the authors are to be added, the occurrences of three have to be considered as questionable and the taxonomy and systematics of two others are discussed.

Salamandra salamandra (LINNAEUS, 1758): According to JOGER & STEINFARTZ (1995) the Levantine fire salamanders represent a distinct species, *S. infrainmaculata* (MARTENS, 1885).

Rana cf. *ridibunda* PALLAS, 1771: To be added. As noted by the authors the distinctness of the water frogs from western Syria has still to be demonstrated (*R. levantina* SCHNEIDER, SINSCH & NEVO, 1992 and *R. bedriagae* WERNER, 1912, respectively). However, even if *Rana* specimens from the Syrian Levant will prove to belong to one of these taxa those from Mesopotamia most probably will not. For hydrogeographic and biogeographic reasons (see e. g. POR 1989) it appears justified to consider the populations of the Euphrates drainage as a distinct taxon tentatively assigned to the species which is commonly

listed for this region (cf. GÜNTHER 1990; LEVITON & al. 1992).

Mauremys caspica caspica (GMELIN, 1774): To be added. Beside the western subspecies listed by DISI & BÖHME (1996) the nominate form *M. caspica caspica* has been recorded from the rivers Euphrates and Khabur in Syria, too (EISELT & SPITZENBERGER 1967; Meskene; KRUPP 1992; Ras al Ain).

Ptyodactylus hasselquistii (DONN-DORF, 1798): To be deleted. Within its Near Eastern range this species only occurs in southernmost Israel and southern Sinai (HEIMES 1987; WERNER & SIVAN 1993). The listing for Syria may be attributed to the confusing systematics of *P. hasselquistii*, *P. guttatus* HEYDEN, 1827 and *P. puiseuxi* BOUTAN, 1893 the latter two once recognized as subspecies of the former (for details see WERNER & SIVAN 1993).

Laudakia stellio stellio (LINNAEUS, 1758): The intraspecific systematics of *L. stellio* is still subject to controversial discussions (see e. g. DAAN 1967; BEUTLER 1981; Y. WERNER 1988; LEVITON & al. 1992). According to a recent view regarding the populations of the eastern Mediterranean region (BÖHME & WIEDL 1994) the Levant is inhabited by the subspecies *L. stellio brachydactyla* (HAAS, 1951). However, this view is no longer maintained by the senior author in his current list for Syria without giving any explanation (DISI & BÖHME 1996). In order to avoid further confusion Syrian populations should be indicated as *L. stellio* ssp. (except for *L. stellio picea* (PARKER, 1935)) unless detailed studies on the morphological heterogeneity of Levantine *L. stellio* are carried out.

Acanthodactylus ophiodurus ARNOLD, 1980: Occurrence questionable (see above).

Acanthodactylus pardalis (LICHTENSTEIN, 1823): To be deleted. This listing obviously refers to a few misidentified *Acanthodactylus* specimens collected in Syria (PERACCA 1894; BOULENGER 1918; ANGEL 1936; WERNER 1939). According to SALVADOR (1982) and ARNOLD (1983) *A. pardalis* is restricted to Israel and Jordan within its Near Eastern range. With the exception of a few Jordan localities (see also Y. WERNER 1991) "...reports from Jordan and Syria are incorrect owing to confusion with other species...", e. g. *A. grandis* BOULENGER, 1909 (SALVADOR 1982).

Acanthodactylus schreiberi syriacus BOETTGER, 1878: To be deleted (see above).

Acanthodactylus scutellatus (AUDOUIN, 1829): To be deleted. Apart from some historical records (BOULENGER 1918, 1923) referring to "Syria" (see above) there are no published records from the territory of the Syrian Arab Republic. The nearest collecting sites of this species associated with soft-sand habitats are located in central Iraq and at the northern coast of Israel (SALVADOR 1982; ARNOLD 1983).

Blanus strauchi aporus WERNER 1884: To be added. This species is recorded from Latakia (LORTET 1883; ALEXANDER 1966) and Qal'at el Hosn (BISCHOFF & SCHMIDTLER 1994).

Leptotyphlops macrorhynchus (JAN, 1860): To be deleted (see above).

Typhlops simoni (BOETTGER, 1879): Occurrence questionable. Although this species is commonly listed for Syria (e. g. WELCH 1983; GRUBER 1989) no records with exact localities have been published so far. Recently, however, SIVAN & WERNER (1992) presented distribution maps of reptiles of the Golan plateau and Mt. Hermon including *T. simoni*. Unfortunately, no localities were given for this species but one dot apparently symbolizes a collecting site in Syrian territory north of the Lake Genezareth.

Eryx jaculus (LINNAEUS, 1758): Nominative form to be deleted. According to the most recent revision of this species (TOKAR & OBST 1993) the populations east of Egypt have to be assigned to the subspecies *E. j. turcicus* (OLIVIER, 1801) although some uncertainty regarding their taxonomic status still exists ("Die Populationen

im Nahen Osten nehmen eine Zwischenstellung zwischen der Balkan / Kaukasus-Gruppe und den afrikanischen Gruppen ein."; TOKAR & OBST 1993).

Coluber jugularis asianus (BOETTGER, 1880): To be added. This subspecies is a common herpetofaunal element of the Levant and was reported for Syria e. g. by BOULENGER (1923), ANGEL (1936), WERNER (1939), ZINNER (1972) and SIVAN & WERNER (1992). Additional voucher specimens are deposited e.g. in the collections of the ZFMK (no. 30533, 30538).

Eirenis modestus (MARTIN, 1838): To be deleted (see *E. levantinus*).

Eirenis levantinus SCHMIDTLER, 1993: To be added. The first Syrian records of this species were published by SCHMIDTLER (1993) together with the description of the new taxon. According to the author all Levantine dwarf snakes south of the Amanus mountains formerly recognized as *E. modestus* (MARTIN, 1838) have to be assigned to the new species or to a closely related but yet undescribed taxon (see also SCHMIDTLER & BARAN 1993).

Natrix natrix persa (PALLAS, 1814): To be added. The Grass Snake was reported from Lake Homs by PERACCA (1894). At this site and in the Syrian Orontes valley the species has been recently rediscovered (MARTENS 1996).

Walterinnesia aegyptia LATASTE, 1887: To be deleted. Although this species is commonly listed for Syria (e. g. WELCH 1983; JOGER 1984; GRUBER 1989; LEVITON & al. 1992) I am not aware of any published record or museum specimen from the Syrian Arab Republic (see also GASPERETTI 1988). It can be assumed that the listing is attributed to the misinterpretation of the term "Syria" (see above) since the species is reported from Israel and Jordan (e.g. HAAS 1951; Y. WERNER 1988; DISI & al. 1988).

Cerastes cerastes (LINNAEUS, 1758): To be deleted. According to GASPERETTI (1988), WERNER & al. (1991) and WERNER & SIVAN (1992) the northern distribution limits of *Cerastes (cerastes) gasperettii* LEVITON & ANDERSON, 1967 are extending from Israel via Jordan and Saudi Arabia to Iraq but do not reach the territory of the Syrian Arab Republic where no suitable habitats for this psammophilous taxon are

found (for desert types in Syria see e. g. ZOHARY 1973). Even recent listings for "Syria" (e. g. LEVITON & al. 1992) are not supported by published records and may be attributed to the misinterpretation of the geographical origin (see above) or to misidentified *Pseudocerastes persicus fieldi* SCHMIDT, 1930.

Vipera ammodytes (LINNAEUS, 1758): Occurrence questionable. Many herpetologists have discussed the (possible) occurrence of *V. ammodytes* in the Levant (e. g. BOETTGER 1880; HAAS 1951; JOGER 1984; NILSON & ANDREN 1986). However, no convincing explanations of the origin of three specimens supposed to be collected in the Near East were ever given. According to TRISTRAM (1894) the first individual stems "... from the lower slopes of Lebanon." This find was listed by BOULENGER (1896) who indicated "Syria" as the distribution range of *V. ammodytes* in the Near East. Later, he reported on two additional "Syrian" specimens of unknown origin listed beside the individual from "Lebanon" (BOULENGER 1913). Subsequent authors have suspected that "Syrian" *V. ammodytes* may be attributed to misidentified material of *V. (xanthina) bornmuelleri* (WERNER 1939; HAAS 1951) or to a mistaken origin from the Greece island of Syra (NILSON & ANDREN 1986).

Apart from the questionable records mentioned for "Syria" by DISI & BÖHME (1996) there are several additional species listed in the literature but obviously over-

looked by the authors which actually need to be discussed in a faunal synopsis. Due to limited space I only list these taxa and specify the references; a detailed discussion including a complete checklist of the Syrian herpetofauna will be presented elsewhere (MARTENS, in MS):

- *Testudo leithii* = *Testudo kleinmanni* LORTET, 1883: BOULENGER 1889

- *Laudakia nupta nupta* (DE FILIPI, 1843): LEVITON & al. 1992

- *Uromastix ocellatus ornatus* HEYDEN, 1827: BOULENGER 1885, WERNER 1939, WERMUTH 1967, WELCH 1983, ARNOLD 1986, GROOMBRIDGE 1988, LEVITON & al. 1992

- *Phrynocephalus maculatus* ANDERSON, 1872: WERMUTH 1967, WELCH 1983, ARNOLD 1986

- *Bunopus crassicauda* NIKOLSKY, 1907: ANGEL 1936

- *Platydictylus mauretanicus* = *Tarentola mauritanica* (LINNAEUS, 1758): TRISTRAM 1884

- *Lacerta taurica* = *Podarcis taurica* (PALLAS, 1814): LORTET 1883

- *Ablepharus pannonicus* FITZINGER, 1823: WELCH 1983

- *Periops algira* = *Coluber florulentus* (GEOFFROY, 1827): LORTET 1883, TRISTRAM 1884

- *Tropidonotus viperinus* = *Natrix maura* (LINNAEUS, 1758): CAMERANO 1891

- *Echis carinata* = *Echis pyramidum* (GEOFFROY, 1809): FLOWER 1933, HAAS 1951, JOGER 1984.

Remarks on the faunal and zoogeographical analysis of Syria

Considering the numerous additions and deletions proposed above, it is impossible to comment on every detail of the analysis of DISI & BÖHME (1996). However, I would like to draw the reader's attention to some major aspects which should be carefully reexamined before the synopsis is considered for discussions on the herpetology and biogeography of Syria.

F a u n a l a n a l y s i s: It is difficult to trace back the details of the faunal analysis for the Near East since the data base for Syria's neighbouring countries is not specified. A spot check of the figures, however, reveals some unintelligible details.

1. Contrary to the information given

in the capture the illustration on the faunal relationships refers to the number of subspecies rather than species, at least as far as Syria is concerned. The numbers indicated in the map - 7 (Amphibia), 6 (Testudines), 48 (Sauria), and 38 (Ophidia) - are almost identical to those of the subspecies listed by DISI & BÖHME (1996; table 2: 7, 7 (sic!), 48, and 38 respectively) but are clearly different from the species' numbers (7, 7, 44, and 37 respectively). This analysis on the subspecific rather than specific level, too, was apparently carried out for Israel when comparing the figures of DISI & BÖHME (7, 10, 43, and 40 respectively) to the herpetofaunal list compiled by Y. WERNER (1988: 7, 11, 43, and 41 respectively; spe-

cies numbers for comparison: 7, 9, 37, and 39 respectively). Probably, the same applies to the remaining countries Jordan, Iraq and Turkey.

2. As can be seen from the numbers indicated the Mt. Hermon endemics *Cyrtopodion amictopholis*, *Elaphe hohenackeri*, and *Vipera bornmuelleri* are regarded both in the faunal lists of Syria and Israel. However, according to the definition of the political borders by DISI & BÖHME (1996) they represent Syrian herpetofaunal elements only.

3. The numbers of Testudines given for the Near East countries include also marine turtle species. It is completely incomprehensible why these reptiles are considered in an analysis of terrestrial faunal regions.

Biogeographical zones: It should be noted that in the list of so-called biogeographical zones prepared by DISI & BÖHME (1996) the eastern regions of the Syrian Arab Republic are disregarded since ATALLAH (1977: 248) considered the Syrian territory west of Palmyra only. This author himself stated clearly: "Only the western two-thirds of Syria are incorporated in this study...", thus, excluding e. g. the Mesopotamian plains and the hilly area of the northern Khabur. Moreover, it must be emphasized that these zones were described as physiographic but not as biogeographical units. Accordingly, ATALLAH (1978) referred to the phytogeographical regions identified by ZOHARY (1973) when grouping the mammals of the eastern Mediterranean region in his zoogeographical analysis. For more useful information on the zoogeographical and ecogeographical situation in the Syrian Arab Republic e. g. the following publications should be consulted: FREY & KÜRSCHNER 1989; KERBE 1989; POR 1975, 1987, 1989; ŠČERBAK 1982; Y. WERNER 1987; WIRTH 1971.

Zoogeographical analysis: Y. WERNER (1988) presented a very useful discussion on the difficulties in the conventional zoogeographical analysis of Near Eastern herpetofaunas. Among three major aspects he raised one deserves particular attention in this context: The interpretation of the zoogeographical affinity of a taxon is clearly linked with the taxonomic level the zoogeographer is referring to. According to

Y. WERNER (1988) different results are achieved e.g. in *Chamaeleo chamaeleon musae* STEINDACHNER, 1900 depending on whether the subspecific (Saharo-Arabian), specific (Mediterranean, i.e. western Palearctic) or generic level (Afrotropical) is considered. This problem is also manifested in the faunal list of DISI & BÖHME (1996). Although the zoogeographical affinity is indicated for each subspecies or species several inconsistencies with reference to the taxonomic level are obvious. For example, *Ch. chamaeleon recticrista* is recognized as an Afrotropical faunal element which would be conclusive if the generic rather than the subspecific level is considered since this taxon is distributed in the eastern Mediterranean region only (e.g. BÖHME & WIEDL 1994). On the other hand, e. g. *Trapelus ruderatus* is regarded as a Palearctic faunal element according to its current distribution but the genus *Trapelus* is classified as Saharo-Sindian (JÖGER 1987). The zoogeographical affinities of the following (sub-)species, too, do not match with the respective ranges (for comparison the affinities according to DISI & BÖHME (1996) versus the distributions are indicated in parentheses): *Ptyodactylus pui-seuxi* (Arabian vs. southern Levant, mainly Mediterranean and steppic regions), *Laudakia stellio picea* (Palearctic vs. basalt hammadads of the Syrian Desert), *Acanthodactylus tristrami* (Arabian vs. steppic regions of the southern Levant), *Chalcides guentheri* (Arabian vs. southern Mediterranean Levant), *Eumeces schneiderii pavimentatus* (Saharo-Sindian vs. eastern Mediterranean region), *Mabuya vittata* (Saharo-Sindian or Arabian? vs. southern and eastern Mediterranean region and northern steppic regions of the Middle East), *Coluber rogersi* (Palearctic vs. semideserts and deserts of Northern Africa and the Middle East). It is evident that the analysis of DISI & BÖHME (1996) is based not only on chorological but also on phylogenetic considerations and thus represents a non-uniform interpretation of the current herpetogeographical situation in Syria. For this reason and others discussed by Y. WERNER (1988) I agree to this author's conclusion: "...to render conventional zoogeographical analysis, in terms of elements of sub-regions, very dubious. Hence I prefer to re-

strict myself to describing the zoogeographical composition of the herpetofauna merely in terms of the diversity of the actual distributions of the species."

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REFERENCES

- ALEXANDER, A. A. (1966): Taxonomy and variation of *Blanus strauchi* (Amphisbaenia, Reptilia).- Copeia, New York; 1966 (2): 205-224.
- ANGEL, F. (1936): Reptiles et batraciens de Syrie et de Mésopotamie récoltés par M. P. PALLARY.- Bull. Inst. égyptien (d' Egypte), Le Caire; 18 (1): 107-116.
- ARNOLD, E. N. (1983): Osteology, genitalia and the relationships of *Acanthodactylus* (Reptilia: Lacertidae).- Bull. British Mus. (Natural History), Zoology series, London; 44 (5): 291-339.
- ARNOLD, E. N. (1986): A key and annotated checklist to the lizards and amphisbaenians of Arabia.- Fauna of Saudi Arabia, Basel, Jeddah; 8: 385-435.
- ATALLAH, S. I. (1977): Mammals of the eastern Mediterranean region; their ecology, systematics and zoogeographical relationships.- Säugetierkundl. Mitt., München; 24 (4): 241-320.
- ATALLAH, S. I. (1978): Mammals of the eastern Mediterranean region; their ecology, systematics and zoogeographical relationships.- Säugetierkundl. Mitt., München; 25 (1): 1-50.
- BEUTLER, A. (1981): *Agama stellio* (LINNAEUS, 1758) - Hardun. p. 161-177. In: BÖHME, W. (ed.): Handbuch der Reptilien und Amphibien Europas; Vol. 1, Echsen (Sauria) I; Wiesbaden (Akademische Verlagsgesellschaft).
- BISCHOFF, W. & SCHMIDTLER, J. F. (1994): Ergebnisse zweier Lacertiden-Exkursionen nach Syrien.- Die Eidechse, Bonn, Bremen; 5 (12): 4-22.
- BÖHME, W. & WIEDL, H. (1994): Status and zoogeography of the herpetofauna of Cyprus, with taxonomic and natural history notes on selected species (genera *Rana*, *Coluber*, *Natrix*, *Vipera*).- Zool. Middle East, Heidelberg; 10: 31-52.
- BOETTGER, O. (1877): Verzeichniss syrischer Reptilien.- Z. Gesamten Naturwiss., Berlin; 49: 285-288.
- BOETTGER, O. (1880): Die Reptilien und Amphibien von Syrien, Palaestina und Cypern.- Bericht über die Senckenbergische naturforschenden Gesellschaft in Frankfurt am Main, Frankfurt; 1880: 132-219.
- BOULENGER, G. A. (1885): Catalogue of the lizards in the British Museum (Natural History). Vol. 1. Geckonidae, Eublepharidae, Uroplatae, Pygopodidae, Agamidae; London.
- BOULENGER, G. A. (1889): Catalogue of the chelonians, rhynchocephalians and crocodyles in the British Museum (Natural History); London.
- BOULENGER, G. A. (1896): Catalogue of the snakes of the British Museum (Natural History). Volume 3, containing the Colubridae (ophistoglyphae and proteroglyphae), Amblycephalidae, and Viperidae; London.
- BOULENGER, G. A. (1913): On the geographical races of *Vipera ammodytes*.- Ann. Mag. Nat. Hist., London; 8 (11): 285-287.
- BOULENGER, G. A. (1918): Sur les lézards du genre *Acanthodactylus* WIEGM.- Bull. Soc. zool. France, Paris; 43: 143-155.
- BOULENGER, G. A. (1923): Étude sur les batraciens et les reptiles rapportés par M. HENRI GADEAU DE KERVILLE de son voyage zoologique en Syrie (avril - juin 1908). Voyage zoologique d' HENRI GADEAU DE KERVILLE en Syrie (avril - juin 1908). Paris; 4: 41-55, 1 pl.
- CAMERANO, L. (1891): Monografia degli ofidi Italiani. Parte seconda. Colubridi; Torino.
- DAAN, S. (1967): Variation and taxonomy of the Hardun, *Agama stellio* (LINNAEUS, 1758) (Reptilia, Agamidae).- Beaufortia, Amsterdam; 172 (14): 109-134.
- DISI, A. M. & AMR, Z. S. & DEFOSSE, D. (1988): Contribution of the herpetofauna of Jordan. III. Snakes of Jordan.- The Snake, Nittagun; 20: 40-51.
- DISI, A. M. & BÖHME, W. (1996): Zoogeography of the amphibians and reptiles of Syria, with additional new records.- Herpetozoa, Wien; 9 (1/2): 63-70.
- EISELT, J. & SPITZENBERGER, F. (1967): Ergebnisse zoologischer Sammelreisen in der Türkei: Testudines.- Ann. Naturhist. Mus. Wien, Wien; 70: 357-378.
- 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. London, London; 1933: 735-851.
- FREY, W. & KÜRSCHNER, H. (1989): Die Vegetation im Vorderen Orient. Erläuterungen zur Karte A VI 1 Vorderer Orient. Vegetation des "Tübinger Atlas des Vorderen Orients".- Beihefte Tübinger Atlas des Vorderen Orients, Reihe A (Naturwissenschaften), Nr. 30; Wiesbaden (Ludwig Reichert).
- GASPERETTI, J. (1988): The snakes of Saudi Arabia.- Fauna of Saudi Arabia, Riyadh, Basel; 9: 169-450.
- GROOMBRIDGE, B. (1988): World checklist of threatened amphibians and reptiles. Peterborough (NCC).
- GRUBER, U. (1989): Die Schlangen Europas und rund ums Mittelmeer; Stuttgart (Franckh).
- GÜNTHER, R. (1990): Die Wasserfrösche Europas; Wittenberg Lutherstadt (Ziemsen) [Die Neue Brehm-Bucherei, vol. 600].
- HAAS, G. (1951): On the present state of our knowledge of the herpetofauna of Palestine.- Bull. Research Council Israel, Jerusalem; 1 (3): 67-95.
- HAHN, D. E. (1978): A brief review of the genus *Leptotyphlops* (Reptilia, Serpentes, Leptotyphlopidae) of Asia, with description of a new species.- J. Herpet., Ann Arbor; 12 (4): 477-489.
- HEIMES, P. (1987): Beitrag zur Systematik der Fächerfinger (Sauria: Gekkonidae: *Ptyodactylus*).- Salamandra, Bonn; 23 (4): 212-235.
- HRAOUI BLOQUET, S. (1981): Les reptiles du Liban. 1. nomenclature et note écologique.- Ecol. mediterranea, Marseille; 2 (7): 93-101.
- JOGER, U. (1984): The venomous snakes of the Near and Middle East.- Beihefte Tübinger Atlas des Vorderen Orients, Reihe A (Naturwissenschaften), 12; Wiesbaden (Ludwig Reichert).
- JOGER, U. (1987): An interpretation of reptile zoogeography in Arabia, with special reference to Arabian herpetofaunal relations with Africa. p. 257 - 271. In: KRUPP, F. & SCHNEIDER, W. & KINZELBACH, R.

- (eds.): Proc. symp. fauna and zoogeography of the Middle East, Mainz 1985. Beihefte Tübinger Atlas des Vorderen Orients, Reihe A (Naturwissenschaften) 28; Wiesbaden.
- JOGER, U. & STEINFARTZ, S. (1995): Protein electrophoretic data on taxonomic problems in East Mediterranean *Salamandra* (Urodela: Salamandridae). p. 33 - 36. In: LLORENTE, G. A. & MONTORI, A. & SANTOS, X. & CARRETERO, M. A. (eds.): Scientia Herpetologica. Papers submitted from 7th O.G.M. of Societas Europaea Herpetologica. Barcelona.
- KATTINGER, F. (1970): Vogelbeobachtungen im Vorderen Orient: Syrien und unteres Niltal.- Ber. Naturforsch. Ges. Bamberg, Bamberg; 45: 57-79.
- KERBE, J. (1989): Climat, hydrologie et aménagement hydro-agricoles de Syrie. Vol. I + II, Talence.
- KRUPP, F. (1992): The karst springs of Ra's al-Ain.- Aqua geographia, Neu Isenburg; 1 (1): 26-33.
- LEVITON, A. E. & ANDERSON, S. C. & ADLER, K. & MINTON, S. A. (1992): Handbook to Middle East Amphibians and Reptiles; Oxford, Ohio (SSAR).
- LORTET, L. (1883): Poissons et reptiles de lac de Tibériade et de quelque autres parties de la Syrie.- Arch. Mus. hist. nat. Lyon, Lyon; 3: 99-194.
- MARTENS, H. (1993): Three species of snake new for Syria.- Zool. Middle East, Heidelberg, 9: 49-58.
- MARTENS, H. (1996): The rediscovery of the Grass Snake *Natrix natrix* (L.) in the Levant.- Zool. Middle East, Heidelberg, 12: 59-64.
- NILSON, G. & ANDREN, C. (1986): The mountain vipers of the Middle East - The *Vipera xanthina* complex (Reptilia, Viperidae).- Bonner zool. Monogr., Bonn; 20: 1-90.
- OPPENHEIM, M. FREIHERRN VON (1899): Vom Mittelmeer zum Persischen Golf. (vol. 1), Berlin (Dietrich Reimer).
- PERACCA, G. (1894): Viaggio des Dr. E. FESTA in Palestina, nel Libano e regioni vicine. Rettili ed Anfibi.- Boll. Mus. Zool. Anat. comp. R. Univ. Torino., Torino, 9 (167): 1-20.
- POR, F. D. (1975): An outline of the zoogeography of the Levant.- Zoologica Scripta, Stockholm; 4: 5-20.
- POR, F. D. (1987): The Levantine landbridge: historical and present patterns. p. 23 - 28. In: KRUPP, F. & SCHNEIDER, W. & KINZELBACH, R. (eds.): Proc. symp. fauna and zoogeography Middle East, Mainz 1985. Beihefte Tübinger Atlas des Vorderen Orients, Reihe A (Naturwissenschaften) 28; Wiesbaden.
- POR, F. D. & DIMENTMAN, CH. (1989): The legacy of Tethys; Dordrecht, Boston, London (Kluwer Academic Publisher).
- SALVADOR, A. (1982): A revision of the lizards of the genus *Acanthodactylus* (Sauria: Lacertidae).- Bonner zool. Monogr., Bonn; 16: 1-167.
- SCHMIDT, K. P. (1939): Reptiles and amphibians from southwestern Asia.- Field Mus. Nat. Hist., Zool. Ser., Chicago; 24 (7): 49-92.
- SCHMIDTLER, J. F. (1993): Zur Systematik und Phylogenie des *Eirenis-modestus*-Komplexes in Süd-Anatolien.- Spixiana, München; 16 (1): 79-96.
- SCHMIDTLER, J. F. & BARAN, I. (1993): *Eirenis modestus* (MARTIN, 1838) - Kopfbinden-Zwergnatter. p. 279-292. In: BÖHME, W. (Ed.): Handbuch der Reptilien und Amphibien Europas, Vol. 3/1, Schlangen (Serpentes) I; Wiesbaden (Aula-Verlag).
- SCHERBAK, N. N. (1982): Grundzüge einer herpetogeographischen Gliederung der Paläarkt.- Vertebrata hungarica, Budapest; 21: 227-239.
- SIVAN, N. & WERNER, Y. L. (1992): Survey of the reptiles of the Golan Plateau and Mt. Hermon, Israel.- Israel J. Zool., Jerusalem; 37: 193-211.
- TOKAR, A. A. & OBST, F. J. (1993): *Eryx jaculus* (LINNAEUS, 1758) - Westliche Sandboa. p. 35 - 53. In: BÖHME, W. (ed.): Handbuch der Reptilien und Amphibien Europas, Vol. 3/1, Schlangen (Serpentes) I; Wiesbaden (Aula-Verlag).
- TRISTRAM, H. B. (1884): The survey of western Palestine. The fauna and flora of Palestine; London.
- VESELY, M. (1991): O herpetofaune Syrie.- Akvárium a terárium, Praha; 34 (9): 24-25.
- WELCH, K. R. G. (1983): Herpetology of Europe and southwest Asia: a checklist and bibliography of the orders Amphisbaenia, Sauria and Serpentes; Malabar (Krieger).
- WERMUTH, H. (1967): Agamidae.- Das Tierreich, Berlin; 86: I-XIV, 1-127.
- WERNER, F. (1939): Die Amphibien und Reptilien von Syrien.- Abh. Ber. Mus. Naturkunde Vorgesellschaft Naturwiss. Verein Magdeburg, Magdeburg, 7 (1): 211-223.
- WERNER, Y. L. (1987): Ecological Zoogeography of the Saharo-Arabian, Saharan and Arabian reptiles in the sand desert of southern Israel. p. 272-295. In: KRUPP, F. & SCHNEIDER, W. & KINZELBACH, R. (eds.): Proc. symp. fauna and zoogeography Middle East, Mainz 1985. Beihefte Tübinger Atlas des Vorderen Orients, Reihe A (Naturwissenschaften) 28; Wiesbaden.
- WERNER, Y. L. (1988): Herpetofaunal survey of Israel (1950-85), with comments on Sinai and Jordan and on zoogeographical heterogeneity. p. 355 - 388. In: YOM-TOV, Y. & TCHERNOV, E. (eds.): The zoogeography of Israel. Dordrecht (W. Junk).
- WERNER, Y. L. (1991): Notable herpetofaunal records from Transjordan.- Zool. Middle East, Heidelberg; 5: 37-41.
- WERNER, Y. L. & LE VERDIER, A. & ROSENMAN, D. & SIVAN, N. (1991): Systematics and zoogeography of *Cerastes* (Ophidia: Viperidae) in the Levant: 1. Distinguishing Arabian from African "*Cerastes cerastes*".- The Snake, Nittagun; 23: 90-100.
- WERNER, Y. L. & SIVAN, N. (1992): Systematics and zoogeography of *Cerastes* (Ophidia: Viperidae) in the Levant: 2. Taxonomy, ecology, and zoogeography.- The Snake, Nittagun; 24: 34-49.
- WERNER, Y. L. & SIVAN, N. (1993): Systematics and zoogeography of *Ptyodactylus* (Reptilia: Sauria: Gekkonidae) in the Levant: 1. Biometry of three species in Israel.- Rev. Espanola Herpet., València; 7: 47-64.
- WILMS, T. (1995): Dornschwanzagamen; Offenbach (Herpeton-Verlag).
- WIRTH, E. (1971): Syrien. Eine geographische Landeskunde; Darmstadt (Wissenschaftliche Buchgesellschaft).
- ZINNER, H. (1967): Herpetological collection trips to the Lebanon 1965 and 1966.- Israel J. Zool., Jerusalem; 16: 49-58.
- ZINNER, H. (1972): Systematics and evolution of the species group *Coluber jugularis* LINNAEUS, 1758 - *Coluber caspius* GMELIN, 1789; unpublished thesis; Jerusalem.
- ZOHARY, M. (1973): Geobotanical foundations of the Middle East. Vol. I & II; Stuttgart, Amsterdam (Gustav Fischer).

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