

Discovery of a population of
Phrynocephalus maculatus ANDERSON, 1872
in the Hashemite Kingdom of Jordan
(Squamata: Sauria: Agamidae)

Erstnachweis von *Phrynocephalus maculatus* ANDERSON, 1872
für Jordanien
(Squamata: Sauria: Agamidae)

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KURZFASSUNG

Die vorliegende Arbeit beinhaltet den Erstnachweis von *Phrynocephalus maculatus* ANDERSON, 1872 in Jordanien. Diagnostisch relevante morphologische Daten werden angegeben und der Lebensraum wird beschrieben. Taxonomie und Variabilität innerhalb *P. maculatus* werden diskutiert und mit dem Untersuchungsmaterial verglichen. Trotz einiger geringfügiger Unterschiede zur Originalbeschreibung werden die aufgesammelten Exemplare der Unterart *P. m. longicaudatus* HAAS, 1957 zugeordnet.

ABSTRACT

The present study represents the first record of *Phrynocephalus maculatus* ANDERSON, 1872 in Jordan. Morphological data of diagnostic relevance are presented along with habitat characteristics. Taxonomy and variation within *P. maculatus* are discussed and compared with material described herein. Despite minor differences from the original description, the specimens collected are tentatively referred to as *P. m. longicaudatus* HAAS, 1957.

KEY WORDS

Reptilia: Sauria: Squamata: Agamidae: *Phrynocephalus maculatus*, distribution, taxonomy, Jordan, new country record

INTRODUCTION

Currently, two subspecies of *Phrynocephalus maculatus* ANDERSON, 1872 are recognised within its wide and discontinuous range: the nominotypic form distributed in Iran, Afghanistan and Pakistan and *P. m.*

longicaudatus HAAS, 1957 distributed mostly along the Arabian Gulf (ANDERSON 1999). The latter subspecies is reported from Oman, United Arab Emirates and Saudi Arabia (ARNOLD 1986).

MATERIAL AND METHODS

During a field trip by the authors in June 2003 five specimens of *P. maculatus* were collected in an area about 1.5 km south of the police station in Abar al Hazim, Jordan (31°34'N, 37°14'E, altitude approximately 500 m a.s.l., 26.-27. June 2003). Despite recent studies on the herpetofauna of Jordan and especially the Eastern Desert (DISI et al. 1999, 2001), this is the first

record of *P. maculatus* in this country. The specimens were photographed, preserved in alcohol and deposited in the herpetological collections of the Museum of the Jordan University for Science and Technology, Irbid, Jordan (JUSTM 0194-5) and Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn, Germany (ZFMK 82718-20).

RESULTS

Morphology – All collected specimens are of considerable morphological uniformity, and in agreement with the diagnosis of *P. maculatus* (figs. 1, 2). Basic measurements and scale counts are summarized in table 1. The pholidosis largely corresponds to the data given by HAAS (1957) in the description of *P. m. longicaudatus* (see Discussion). Typically, the nostrils are directed forwards in all specimens examined (fig. 3), with the nasals being separated by three scales. There is an area of enlarged scales dorsally on the head, in the parietal region (fig. 4). Dorsal scales are smooth, granular, fingers show only moderate pectination.

Dorsal ground color in life very pale, sandy-yellowish to greyish, with a fine dotted pattern. Five brownish cross bars on the body, consisting of dense, more or less fused dots, first bar between shoulders, fifth in posterior pelvic region, just in front of hind limbs. Legs spotted; 10 to 12, more or less complete cross bars on the dorsal side of the tail, in some specimens tending to disrupt into alternating dark spots. Tail tip black; ventral side of head and body completely white. Ventral side of tail white in one male and one female, orange-red in three females. Caudal third of underside of tail black.

Habitat description and field observations – The area of Abar al Hazim is situated on the edge of a large geomorphological depression and represents a mosaic of various habitats. The lizards were collected in a flat habitat at the margins of a mud flat (sabkha). The vegetation was dominated by sparse bushes of *Nitraria*

retusa, growing at a distance of around 10 m from each other. The relatively hard soil consisted of a mixture of flint stone gravel and sand (fig. 5). The habitat of *P. maculatus* merged with an area of little sand dunes, formed mostly around more densely growing *N. retusa* bushes. Other recorded plants in the site include *Haloepelis amplexicaulis*, *Tamarix* sp., *Halocnemum strobilaceum*, *Atriplex halimus*, *Juncus maritimus*, and *Hycium shawii*.

Phrynocephalus maculatus was the only reptilian species observed in this habitat, whereas surrounding sand dunes were inhabited by a dense population of *Acanthodactylus schmidti* HAAS, 1957. In June 2003, the agamids were observed to be active from 08:30 on, either displaying on small stones or foraging in between bushes. If pursued, animals usually ran several meters; when they stopped they curled the tail tightly up over the back and then uncurled it backwards. If they felt further approached, they escaped to the shade of a nearby bush, where they buried themselves rapidly and completely in the sand by lateral oscillation.

Other reptile species observed within the Abar al Hazim area included *Bunopus tuberculatus* BLANFORD, 1874, *Stenodactylus doriae* (BLANFORD, 1874), *Stenodactylus slevini* HAAS, 1957, *Trapelus persicus fieldi* (HAAS & WERNER, 1969), *Acanthodactylus opheodurus* ARNOLD, 1980, *Mesalina olivieri* (AUDOUIN, 1829), *Scincus scincus meccensis* (WIEGMANN, 1837), *Varanus griseus* (DAUDIN, 1803), *Psammophis schokari* (FORSSKÅL, 1775) and *Cerastes gasperettii* (LEVITON & S. ANDERSON, 1967).

DISCUSSION

Phrynocephalus maculatus is the second *Phrynocephalus* species known to occur in Jordan. *Phrynocephalus arabicus* ANDERSON, 1894 is distributed in sand dunes of the southernmost part of the Jordanian territory (DISI et al. 2001). From what we know, the ranges of these two species do not overlap in Jordan.

In Arabia, *P. maculatus* is widely distributed (fig. 6) being reported from Saudi Arabia (HAAS 1957; ARNOLD 1986; ROSS 1989), Oman (ARNOLD 1980), Yemen (HAAS & BATTERSBY 1959), and United Arab Emirates (HAAS & WERNER 1969; ARNOLD 1984; BAHA EL DIN 1996). Occurrence in Syria, mentioned in the literature

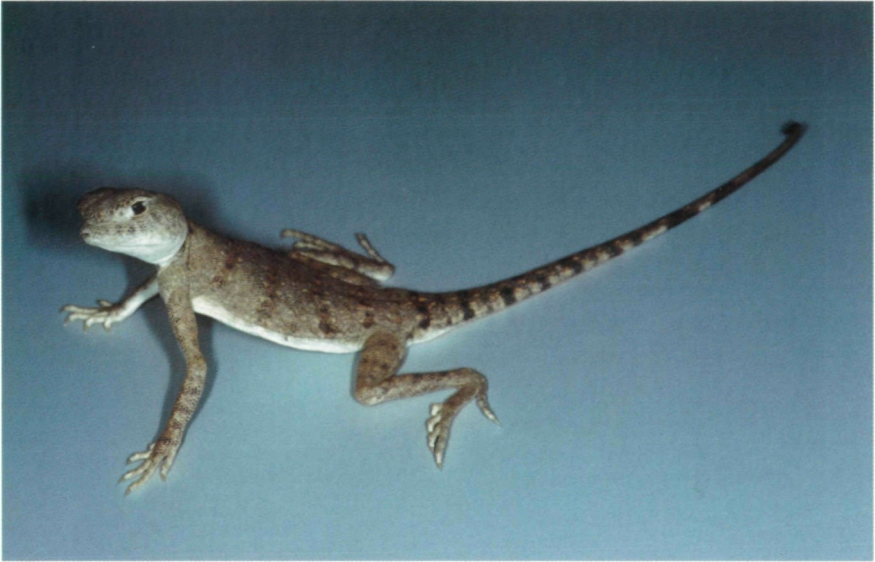


Fig. 1: Female *Phrynocephalus maculatus* ANDERSON, 1872 from Abar al Hazim, Jordan (ZFMK 82719).

Abb. 1: Weibchen von *Phrynocephalus maculatus* ANDERSON, 1872 aus Abar al Hazim, Jordanien (ZFMK 82719).

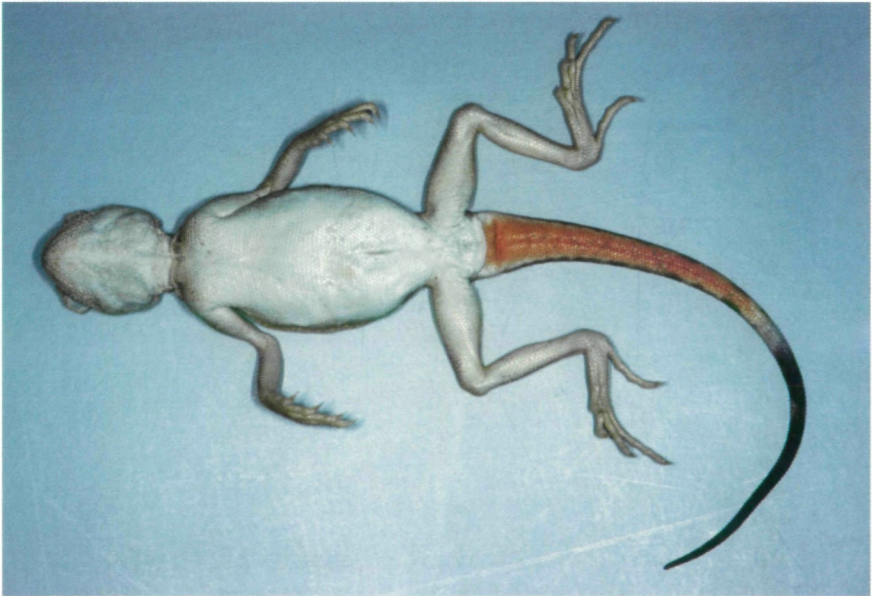


Fig. 2: Ventral view of female *Phrynocephalus maculatus* ANDERSON, 1872 from Abar al Hazim, Jordan (JUSTM 0194).

Abb. 2: Ventralansicht eine Weibchens von *Phrynocephalus maculatus* ANDERSON, 1872 aus Abar al Hazim, Jordanien (JUSTM 0194).

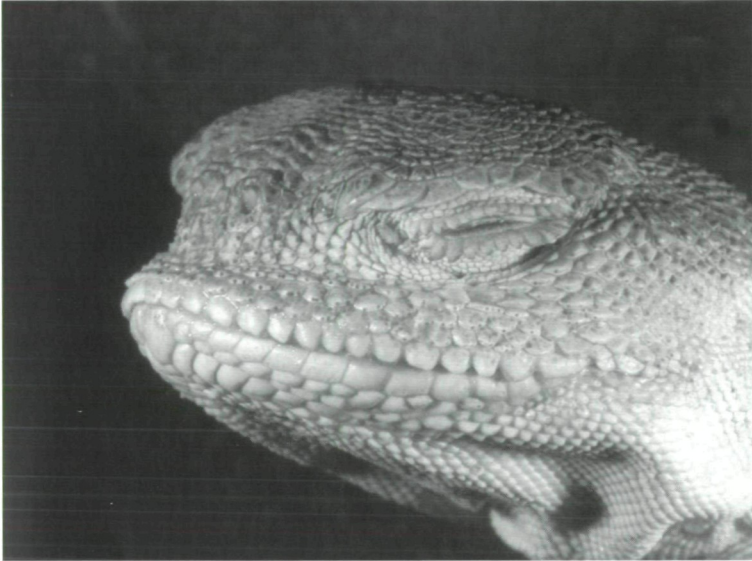


Fig. 3: Head of female *Phrynocephalus maculatus* ANDERSON, 1872 from Abar al Hazim, Jordan (ZFMK 82719) from lateral; note forward oriented nostrils, typical for ssp. *longicaudatus* HAAS, 1957.

Abb. 3: Kopf eines Weibchens von *Phrynocephalus maculatus* ANDERSON, 1872 aus Abar al Hazim, Jordanien (ZFMK 82719) von seitlich; man beachte die nach vorne gerichteten Nasenöffnungen wie sie für die Unterart *longicaudatus* HAAS, 1957 typisch sind.

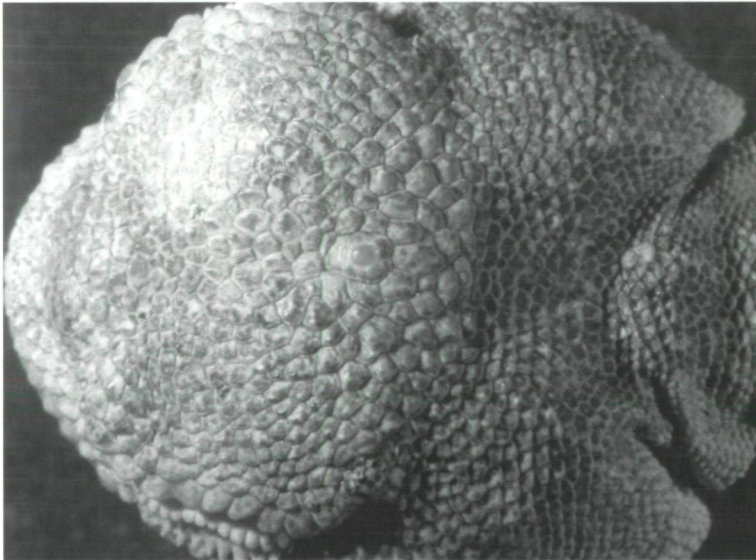


Fig. 4: Head of female *Phrynocephalus maculatus* ANDERSON, 1872 from Abar al Hazim, Jordan (ZFMK 82719) from dorsal; note enlarged scales around parietal eye, typical for ssp. *longicaudatus* HAAS, 1957.

Abb. 4: Kopf eines Weibchens von *Phrynocephalus maculatus* ANDERSON, 1872 aus Abar al Hazim, Jordanien (ZFMK 82719) von dorsal; man beachte die vergrößerten Schilde um das Parietalaugewie sie für die Unterart *longicaudatus* HAAS, 1957 typisch sind.

Table 1: Basic morphometrical features of five *Phrynocephalus maculatus longicaudatus* HAAS, 1957 from Abar al Hazim, Jordan (M – male; F – female; SVL - snout-vent length; TL - tail length; r/l – right/left; JUSTM - Jordan University for Science and Technology Museum, Irbid; ZFMK - Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn).

Tab. 1: Morphometrische Daten von fünf *Phrynocephalus maculatus longicaudatus* HAAS, 1957 aus Abar al Hazim, Jordanien (M – Männchen; F – Weibchen; SVL - Kopf-Rumpf-Länge; TL - Schwanzlänge; Maße in mm; Distance of Gular Fold to Vent - Entfernung von Gularfalte zu After; Number of Upper/Lower Labials - Anzahl Ober-/Unterlippenschilder; r/l – rechts/links; JUSTM - Jordan University for Science and Technology Museum, Irbid; ZFMK - Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn).

Museum Nr	Sex	SVL	TL	Distance of Gular fold to Vent	Number of Upper Labials r/l	Number of Lower Labials r/l	Nasals
JUSTM 0194	M	67	99	45	15\15	15\14	separated by 3 rows
JUSTM 0195	F	58	81	37	18\14	16\14	separated by 3 rows
ZFMK 82718	F	58	82	41	16\15	13\14	separated by 3 rows
ZFMK 82719	F	56	80	39	16\17	14\13	separated by 3 rows
ZFMK 82720	F	64	89	46	16\15	13\14	separated by 3 rows

(ARNOLD 1986), is probably erroneous. Similarly, there are no reliable locality data about the distribution of *P. maculatus* in Iraq and its occurrence reported there (SMITH 1935; KHALAF 1959) needs confirmation (ANDERSON 1999). Records of *P. maculatus* in the interior of Saudi Arabia are lacking and there is no evidence about its occurrence in areas closer to the Jordanian border.

The habitat structures (flat hard soil with gravel, known as sabhka) at the new record locality close to the Saudi Arabian border do not penetrate deeply into Jordanian territory. Hence, the occurrence of *P. maculatus* in Jordan may be only marginal. BAHA EL DIN (1996) gave a description of the habitats of *P. maculatus* in the United Arab Emirates. As similar habitats occur in Azraq, about 40 km northwest to Abar al Hazim, separated from the latter by a variety of apparently less suited habitats (sand dunes, hammada and ample sabkhas), it is possible, that the range of *P. maculatus* may extend deeper into Jordanian territory. Similarly, a surprising extension of the distribution range into the Jordanian territory was recently documented for *Acanthodactylus tilburyi* ARNOLD, 1986 (MODRÝ et al. 1999).

HAAS (1957) described the subspecies *longicaudatus*, based on material from Doha Dhalum, Persian Gulf coast of Saudi Arabia. The diagnosis is relatively short and repeated here in its original version: "Differs from *Phrynocephalus maculatus maculatus* in having the posterior supra-orbital scales strikingly flattened and enlarged, longer than wide, and larger than the

mid-dorsal scales; a few dorsal scales are keeled or with an indication of mucronation; nostrils are directed forwards instead of upwarding; tail is longer than twice the distance from the gular fold to the vent; dark coloration of the distal part of the tail is pronounced ventrally" (HAAS 1957, p. 68).

Most of the characters examined corroborate the identity of the Abar al Hazim specimens with *P. m. longicaudatus*. Namely, all animals have the tail longer more than twice the distance from the gular fold to the vent (see table 1). Similarly, the nostrils are directed anteriorly. Moreover, there is a distinct area of somewhat enlarged flat scales around the rudimentary parietal eye posterior to a hypothetical line connecting the lateral eye corners (fig. 2). If these scales are identical to HAAS' (1957) "posterior supra-orbital scales", then their relative size (larger than the mid-dorsal scales) agrees with the author's description. However, in our material, these enlarged scales are not longer than wide, but rather irregular (fig. 2). Similarly, we did not find keeled or mucronate dorsal scales. Despite these differences, we tentatively classify our material as *P. m. longicaudatus*.

ANDERSON (1999) reports on the significant overlap in both relative tail length and number of midbody scales between Iranian and Arabian specimens of *P. maculatus*. On the other hand, he pointed to the disjunctive distributional range, consisting of an eastern and south-western part, separated by the Zagros Mts. Thus, adhering to a phylogenetic species concept, both above-mentioned taxa might actually repre-



Fig. 5: Habitat at Abar al Hazim, Jordan ($31^{\circ}34'N$, $37^{\circ}14'E$, about 500 m a.s.l.), June 2003.
Abb. 5: Lebensraum bei Abar al Hazim, Jordanien ($31^{\circ}34'N$, $37^{\circ}14'E$, etwa 500 m ü. M.), Juni 2003.

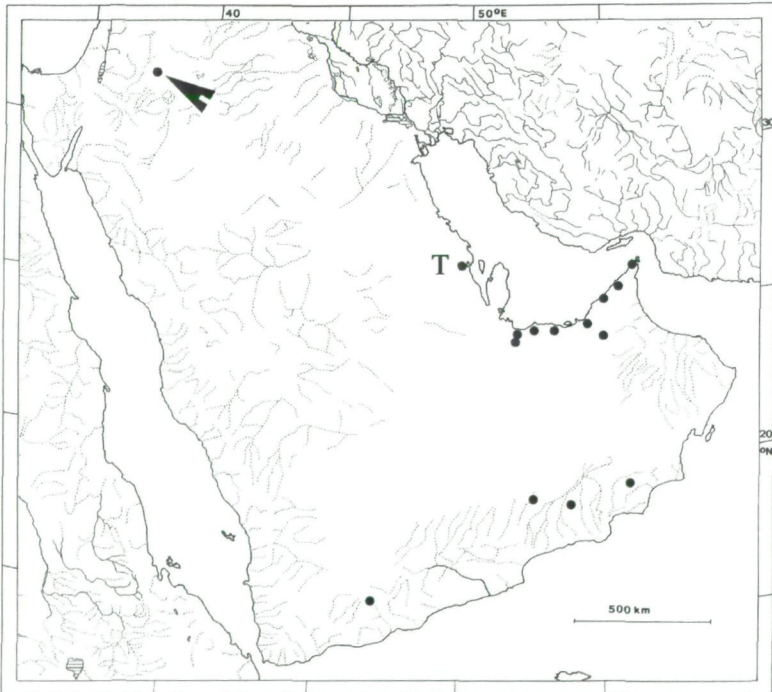


Fig. 6: Distribution of *Phrynocephalus maculatus longicaudatus* HAAS, 1957 in the Arabian Peninsula, based on published records. The type locality is marked by a T, the new Jordanian locality by an arrow.

Abb. 6: Verbreitung von *Phrynocephalus maculatus longicaudatus* HAAS, 1957 auf der Arabischen Halbinsel, nach Literaturangaben. Die terra typica ist durch ein T, der neue Jordanische Fundort mit einem Pfeil markiert.

sent two separate species, similarly to *Acanthodactylus schmidti* and *A. cantoris* GÜNTHER, 1864 or other reptilian taxa divided by the Zagros Mts. (ANDERSON 1999). Nevertheless, the taxonomy of the species is beyond the scope of this faunistic note. To solve the quest of conspecificity or separation of both forms needs widely focused morphological analyses, supported by molecular data.

The Al Hazim area is subject to severe habitat changes in the form of large scale irrigation agriculture that is depleting the ground water. In addition, greenhouse plastic and chemicals are used extensively, which drastically influence the environment of the Al- Hazim area. Protection of the unique habitat is urgently needed to ensure the survival of the detected *P. m. longicaudatus* population.

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