

On the presence and distribution of the Gulf sand gecko, *Pseudoceramodactylus khobarensis* Haas, 1957 (Reptilia: Squamata: Gekkonidae) in Qatar

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ABSTRACT

The Gulf sand gecko (*Pseudoceramodactylus khobarensis* Haas, 1957) is a nocturnal gecko endemic to the Arabian Gulf countries. In this study we report the presence of this species in Qatar for the first time. Our findings bridge one of the current geographic gaps in the known distribution range of this species. In Qatar, the species has been found on the mainland and on two islands occupying coastal salty habitats with shrubs. The islands are the smallest where this species is known to occur. We believe that this gecko species is more widely distributed in Qatar than we report here and that an extensive inventory is required to map the full range of the species in Qatar and also in other countries of the Arabian Gulf.

Keywords: Arabian Gulf, reptile, range, *Stenodactylus khobarensis*, Atlas, biodiversity

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INTRODUCTION

The sand geckos (genera *Stenodactylus*,¹ *Tropicolotes*² and *Pseudoceramodactylus*³) are nocturnal geckos belonging to the Saharo-Arabian clade of the Palearctic naked-toed geckos main clade.⁴ This is a complex taxonomic group that has experienced many changes. Initially, current *Stenodactylus* species were described under different genera (*Ascalabotes*⁵; *Stenodactylus*¹; *Ceramodactylus*⁶; and *Trigonodactylus*).³ Changes in the genus of some species, as the inclusion of *Pseudoceramodactylus khobarensis* in the genus *Stenodactylus*^{7,8} and the recognition of other two species^{9,10} resulted in a list of 13 species within this genus.¹¹ Finally, the genus *Pseudoceramodactylus* was resurrected by Fujita and Papenfuss¹¹ with the single species *Pseudoceramodactylus khobarensis*, and the species *Stenodactylus khobarensis* was removed from the genus *Stenodactylus*.

The Gulf sand gecko (*Pseudoceramodactylus khobarensis*³) is one of the less known sand gecko species. Its type locality is Al Khobar (Saudi Arabia),³ but it is also present in other locations of Saudi Arabia¹² and in other countries of the Arabian Gulf, such as Kuwait,¹³ Bahrain,¹⁴ United Arab Emirates,¹⁵ Oman^{16,17} and Iran.¹⁸ Based on the current scientific literature, the only countries of the Arabian Gulf not having records of this species are Qatar and Iraq. It is quite likely that the species may be present in Iraq because there is a population in Kuwait at only nine kilometres from the border.¹³

In this study we report the presence of *Pseudoceramodactylus khobarensis* in Qatar for the first time, and provide images and information about the morphology of the lizards and their habitat.

METHODS AND STUDY AREA

We have conducted two biodiversity surveys in autumn 2012 and spring 2013 in order to document the presence and distribution of lizards across the Qatar Peninsula and in three Qatari islands (Halul, Al Saflia and Al Aaliya).^{19,20}

Active lizards were observed and photographed along transects conducted by foot during the day. We also searched for hidden specimens under rocks, woods, litter and other objects that lizards



Figure 1. Dorsal (a) and ventral (b) view of an adult male *P. khobarensis*. Images: A. Valdeón.



Figure 2. Lateral view of the head of *P. khobarensis* found in Qatar. Image: A. Valdeón.

normally use as refuge. At night we employed the same survey methods as during the day but used torchlights to locate nocturnal lizards. Twenty valve pits were also checked in the Ras Laffan area to find hidden or trapped lizards.

DESCRIPTION OF THE SPECIES

Pseudoceramodactylus khobarensis is a medium sized (up to 55 mm from snout to vent)¹⁸ ground dwelling gecko without enlarged tubercles on the dorsum. It has smooth grey to greenish scales forming some darker patches disposed on pairs along the dorsum (Figure 1a). Ventral scales are also smooth, but their colour is white (Figure 1b). Posterior ventral scales are bigger than dorsal scales. *P. khobarensis* has a very slender body with long legs (approximately 32% of total body length³) and very prominent snout (Figure 2). The species presents fringed toes and fingers (Figure 3), covered with sharply pointed scales in the lower side. It does not show preanal pores.³ The mental scale is much bigger and triangular than in the other sand geckos. This species can be easily distinguished from the



Figure 3. View of the fringed toes and fingers of *P. khobarensis* found in Qatar. Image: A. Valdeón.

other closely related species because it has one or two pairs of enlarged postmental scales (Figure 4) that are not present in any *Stenodactylus* gecko.^{12,16}

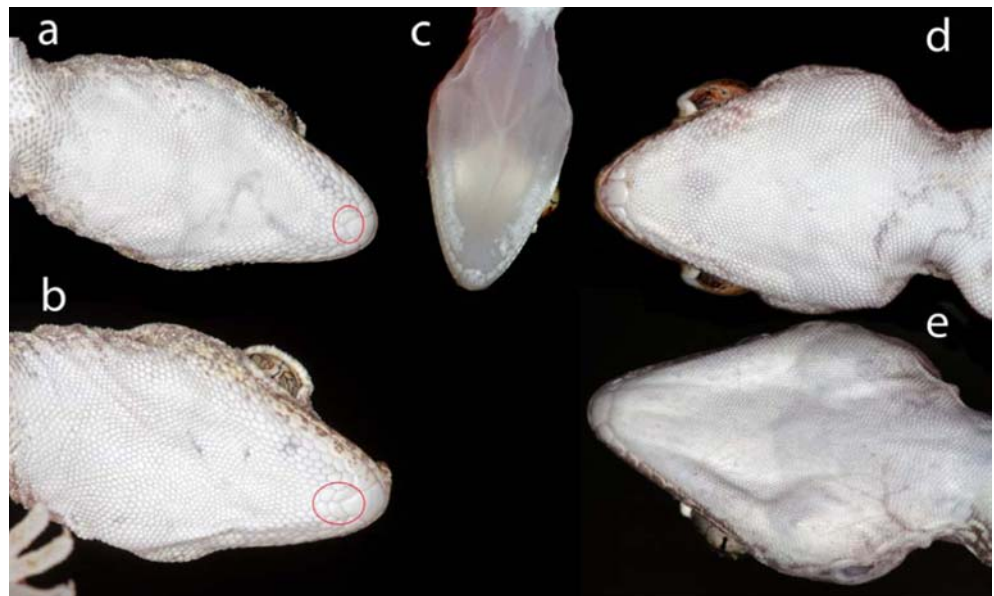


Figure 4. Gular view of *Pseudoceramodactylus khobarensis* showing one pair (a) and two pairs (b) of postmental scales. It is also shown the gular area of other closely related gecko species living in Qatar: *Stenodactylus arabicus* (c), *Stenodactylus slevini* (d) and *Stenodactylus doriae* (e). Images: A.Valdeón.

RESULTS AND DISCUSSION

This study is the first to describe the presence and localities of *P. khobarensis* in Qatar (Figure 5). According to the National Biodiversity Surveys and studies conducted in Qatar,^{21–24} and all the reviewed bibliography, there are no records for *Pseudoceramodactylus khobarensis* in Qatar. Our finding bridges the current geographic gap in the known distribution of the species between Saudi Arabia and UAE (Figure 6).

The lizards were found on two mainland localities (Abu Samra and Ras Laffan) and on two islands situated at a distance of 3.4 km (Al Safliya) and 2.5 Km (Al Aaliya) from the Eastern coast of Qatar near Doha city (Table 1; Figure 5).

In Abu Samra and in northern Ras Laffan a single specimen each were observed and photographed. In south-eastern Ras Laffan one individual was found trapped into a valve pit with evident symptoms of starvation. In Al Aaliya Island, two specimens were seen; one hidden under a rock and other active during the night. In Al Safliya Island, we found four specimens under rocks or wood.

P. khobarensis is present in other islands of the Arabian Gulf, such as Marawah (UAE) (P. S. Soorae, pers. comm.), Bahrain and Hawar (Bahrain)¹⁴ and Queshm (Iran).¹⁸ However, the Qatari islands are the smallest where this species has been found. Al Safliya Island has a maximum length of 1.7 km and Al Aaliya Island 1.6 km.

P. khobarensis seems to be a coastal species in Qatar. However, in the United Arab Emirates, the species has been found in one inland sabkha at 150 km from the coast.²⁵ The type of habitat where we saw the geckos in all locations is characterized by coastal sandy and compact saline soils with bushes (Figure 7). This is a quite similar habitat to that previously described for the species in other zones of its range.²⁶ The tolerance to salt led *P. khobarensis* to be categorized as a “sabkha dweller”.²⁶ Sabkhas or salt flats are one of the most unsuitable habitats for life, causing dehydration to the non-adapted animals that try to colonize it. That makes *P. khobarensis* a very interesting species to investigate animal adaptation to salinity.

The results of our study show that a larger number of individuals were observed in the islands when compared with the mainland. It should be interesting to explore if islands may offer better environmental conditions than the mainland to this species. On the other hand, the surveys are not yet completed and we may have not detected the species in many other locations of the mainland. Also,

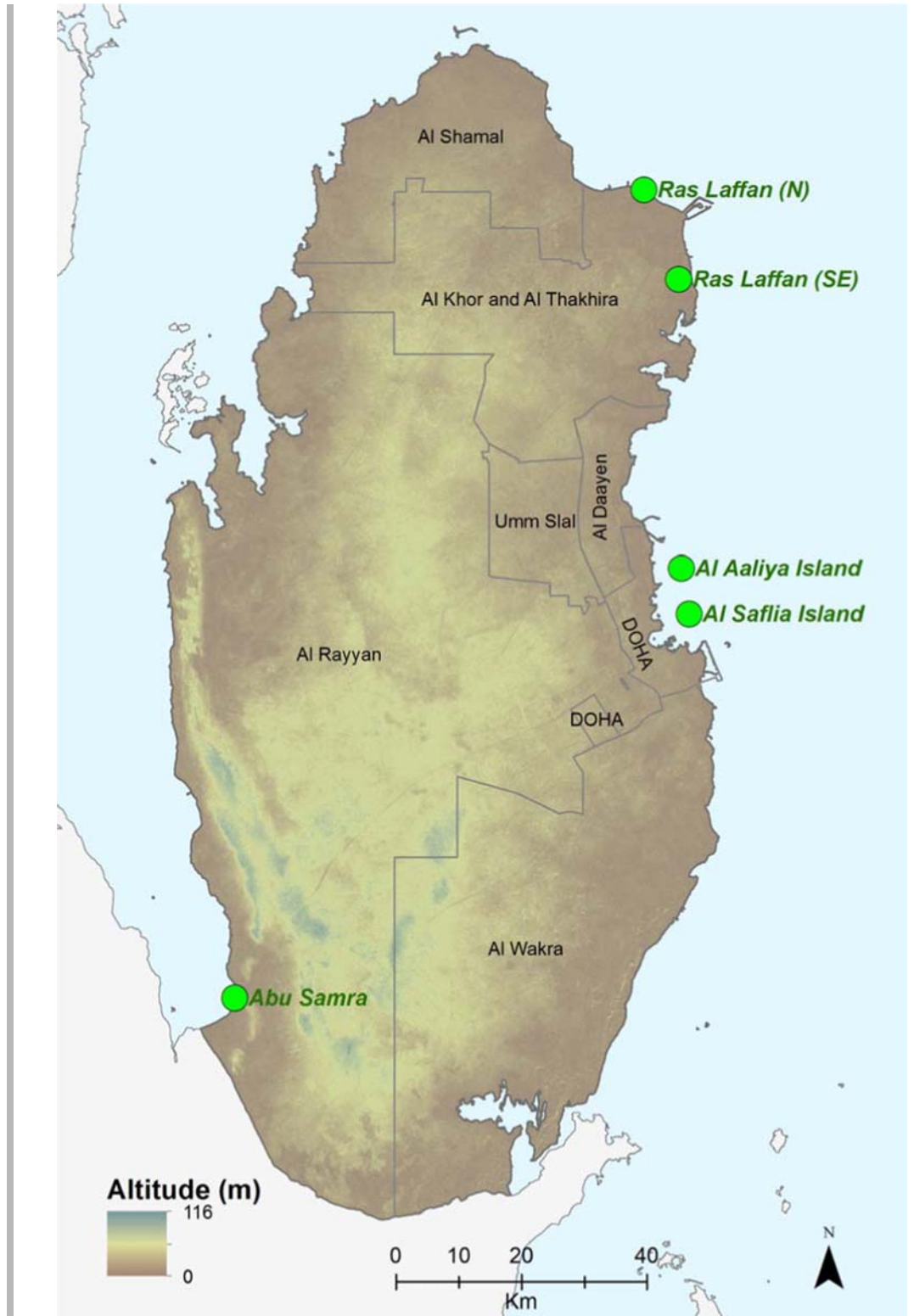


Figure 5. Localities (green dots) where *P. khobarensis* was found in Qatar. Map: A. Valdeón.

the number of individuals observed was very small, suggesting that the density of their populations could be low. This may also have contributed to make this species undetected until now in Qatar.

During our surveys we saw other lizard species in the same areas where *P. khobarensis* is present (e.g., *Hemidactylus robustus*, *Cyrtopodion scabrum*, *Diplometopon zarudnyi*, and *Mesalina brevirostris*). Overall, the diversity of reptile species in Qatar is little known with almost no precise

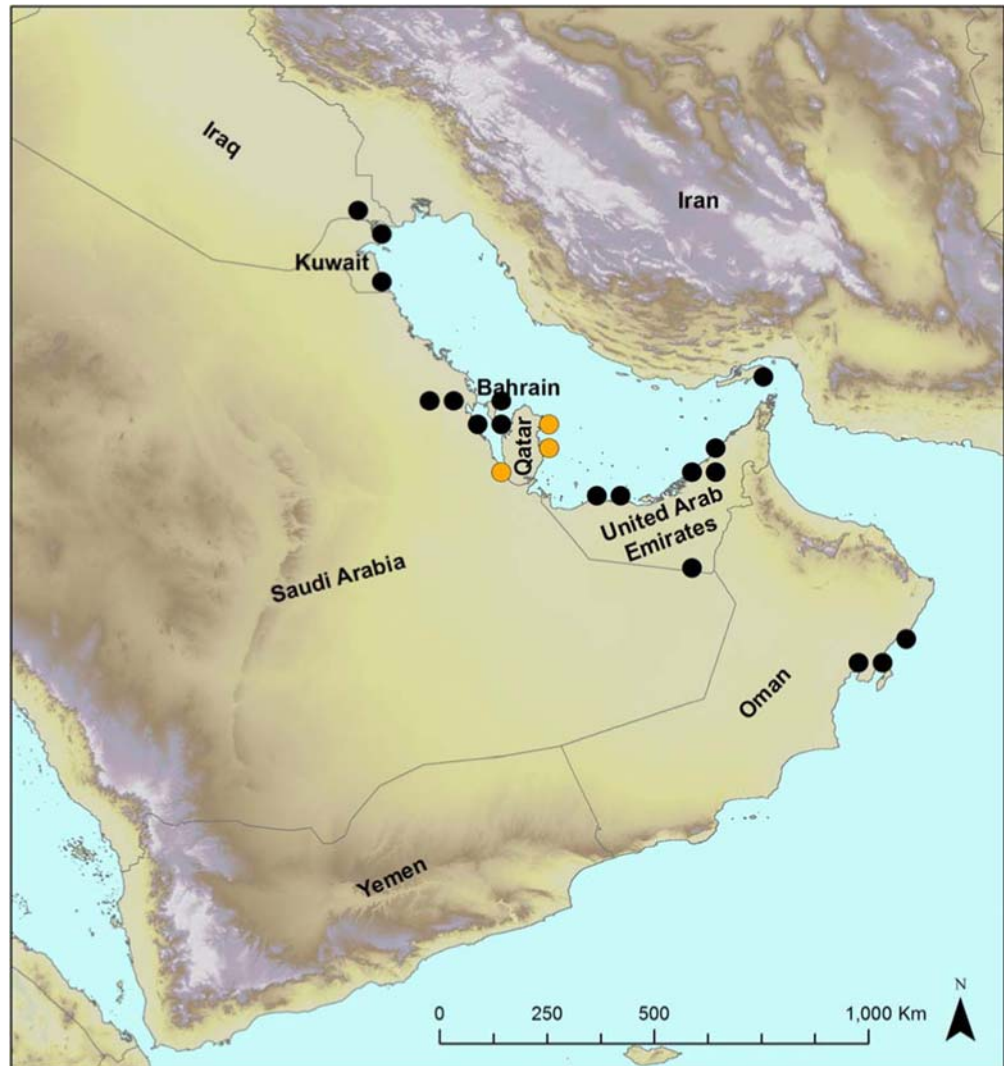


Figure 6. Global distribution map (30' grid) of *P. khobarensis*. Black dots show records outside of Qatar; orange dots show new records inside Qatar. Map: A. Valdeón.

locations found in the scientific literature.^{19,21} The number of lizard species that currently inhabit Qatar is high ($n = 21$) and belong to eight different families including Gekkonidae (with nine species) Lacertidae (four species) Agamidae (three species), Scincidae (two species), and Varanidae, Sphaerodactylidae and Trogonophiidae with only one species each.¹⁹ However, the lizard fauna of Qatar is insufficiently known, and more efforts and surveys including pitfall trapping and looking at the edges of sabkhas, are needed to complete the distribution range of *P. khobarensis* and the entire catalogue of lizards in Qatar.

Table 1. Different locations and number of specimens of the Gulf sand gecko found in Qatar during different days in spring 2013.

Date	Location	Latitude	Longitude	Altitude (m)	Number of specimens
May 13, 2008	Ras Laffan (N)	25° 56' 58"	51° 30' 49"	2	1
March 10, 2013	Abu Samra	24° 47' 23"	50° 52' 02"	5	1
March 27, 2013	Al Aaliya Island	25° 24' 24"	51° 34' 18"	6	2
April 3, 2013	Al Safliya Island	25° 20' 34"	51° 35' 00"	5	4
May 4, 2013	Ras Laffan (SE)	25° 49' 14"	51° 34' 08"	3	1

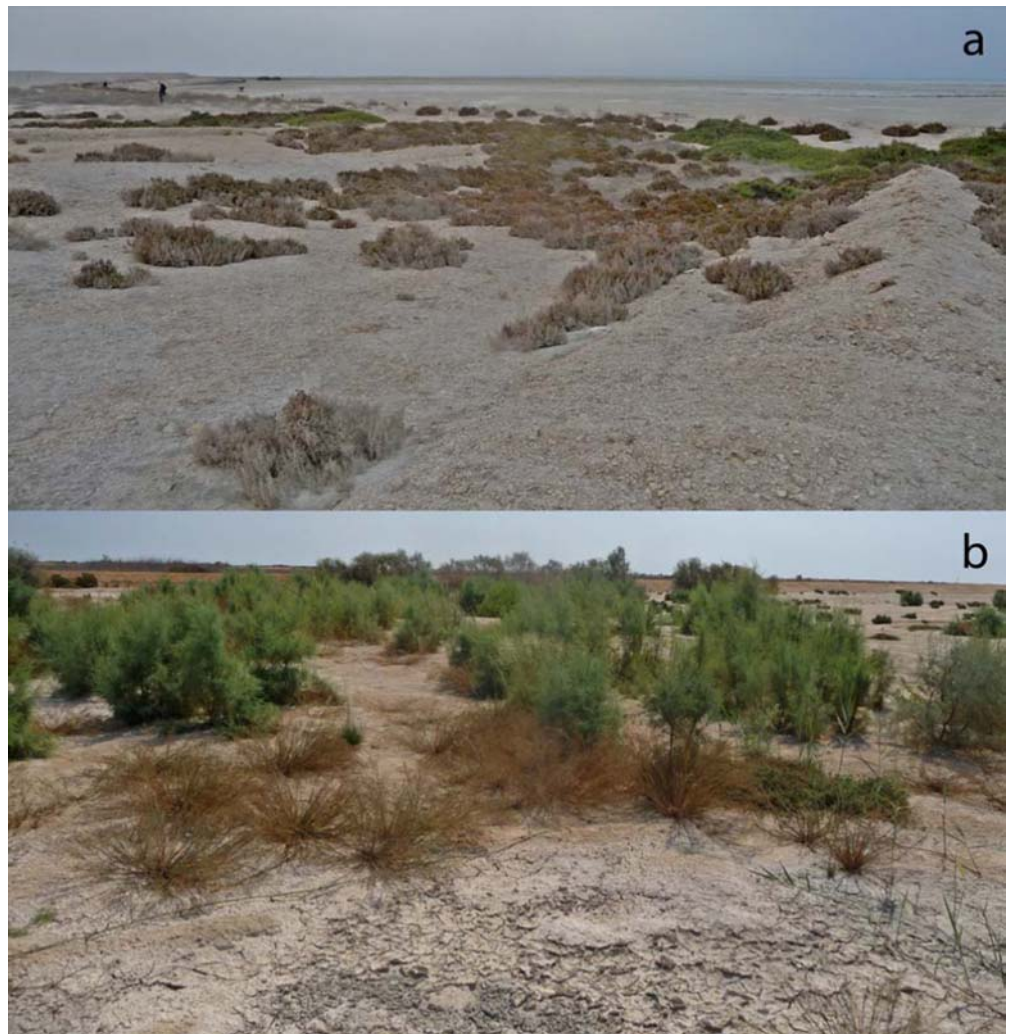


Figure 7. Habitat where *P. khobarensis* was found in Qatar: Al Safliya Island (a) and Ras Laffan (SE) (b). Images: A. Gosà.

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