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## New reptile records from Morocco and Western Sahara

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### Introduction

The herpetofauna of Morocco (including the Atlantic Sahara or Western Sahara) is relatively well-known compared to other North African countries thanks to the books of Bons and Geniez (1996) and Geniez et al. (2004). The Western Sahara, however, is a large and mostly remote area, part of which was closed to independent travellers until recently. This is especially true of the road between Dakhla and the Mauritanian border which was for a long time open to foreigners only in military convoys. This explains the lack of locality records in this area in Geniez et al. (2004) and interesting records are thus to be expected when travelling through this area. Even in Morocco, the number of resident or visiting naturalists is still low and it is possible to add to the knowledge of the local herpetofauna during short field trips.

The present note aims at publishing several interesting records of reptiles obtained during three short visits to Morocco and the Western Sahara in September 2006, February 2008 and March 2011. All data obtained during these trips have been deposited in the database of Moroccan amphibians and reptiles records held by P. Geniez in Montpellier (UMR5175, EPHE, Centre d'Ecologie Fonctionnelle et Evolutive) and only the most remarkable of these records are presented here,

except for a record of *Acanthodactylus aureus* already published in Brito et al. (2008).

### Methods

The records of 2006 were obtained by PAC and JPR while crossing the area en route to Mauritania along the main coastal road. No detailed investigations were made for reptiles but we made several short stops in various habitats to get an idea of the commonest species. The Moroccan records of 2008 were obtained during a mainly herpetological field trip by PAC between 7 and 11 February 2008. The main aim of the trip was finding some of the rare snake species of south-western Morocco, and most time was spent looking at day and at night for these animals. The Moroccan records of 2011 were obtained by PAC and RL during a field trip dedicated to sampling populations of the *Acanthodactylus erythrurus* (Schinz, 1833) complex. Casual records of other species were obtained mainly while looking for these populations.

Coordinates are given in decimal degrees (WGS84 system, N latitude, E longitude) and were obtained from a Garmin GPS or from Google Earth. For each locality we provide the coordinates of a single point but specimens were sometimes found some distance away. We thus provide when possible an estimate of the maximum distance between the point where the specimens were found and the point whose coordinates are provided. When no precision is given, the maximum distance is 500 m.

The following abbreviations are used: BEV = EPHE - Biogeography and Ecology of Vertebrates / CEFE - UMR5175 collection. BEV.xxxx refers to voucher specimens, BEV.Txxxx refers to tissue samples without voucher, T to tissue sample collected with voucher. Ad. = adult, subad. = subadult, juv. = juvenile, m = male, f = female. "Photo" means a picture is deposited in the pictures collection of the authors and is available from request when not published here (Fig. 1).

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**List of records**

*Acanthodactylus busacki* Salvador, 1982.

- 39 km past the crossroad for Dakhla on the road to Boujdour; 24.1658°N/-15.4869°E; 1 subad. seen; active by day; 25 09 2006.

Unfortunately, no voucher or photograph are available for this locality; therefore we provide a brief description of the specimen which was observed with binoculars in the field: a typical *Acanthodactylus* lizard with small dorsal scales excluding *A. boskianus*, on the dorsum several continuous pale lines along the back, between these pale lines alternating black and pale spots, obtuse snout, red under surface of the tail.

This locality extends the range of *Acanthodactylus busacki* by 250 km southward (previous limit at Cape Boujdour: Geniez *et al.*, 2004, see also Fig. 2). This specimen was observed in a typical habitat for the species: hard hearth substratum (clay ground) with succulent euphorbia and scrubs.

Northern populations of typical *busacki* have blue coloration on the ventral of the tail while Brito *et al.* (2008) documented a red under tail colour (as for the specimen reported here) in southern populations currently attributed to *busacki*. Fonseca *et al.* (2007) suggest that there are two distinct evolutionary units in what is currently called *A. busacki*.

*Mesalina cf. olivieri* (Audouin, 1829), Western Sahara form.

- 3 km north of the Bir Gandus Moroccan border post along the road to Dakhla; 21.3963°N/-16.9579°E, <100 m.; 1 juv. seen; 1 subad. BEV.T1242; active by day; 24 09 2006.

This record extends the known distribution of the *olivieri* complex in the Western Sahara southward (Fig. 2, see also Geniez *et al.*, 2004) and suggests that lizards of this group are probably distributed along most of the Atlantic coast of the Western Sahara.

Preliminary results on morphological and genetic variation in “*Mesalina olivieri*” as currently understood show that the “species” comprises many evolutionary units, some certainly deserving species rank, which are not recognised yet. The animals from the southern Western Sahara have a very distinctive habitus and are genetically highly divergent from other populations attributed to *Mesalina olivieri* in Morocco but closer from populations attributed to *Mesalina simoni* (Boettger, 1881) (Kapli *et al.*, 2015). One of the two specimens reported here has been sequenced for one nuclear locus

and two mitochondrial fragments (specimen Mo WS 119.38 in the Figure 2 of Kapli *et al.*, 2015).

*Scelarcis perspicillata perspicillata* (Duméril and Bibron, 1839).

- 1.4 km east of the “Maison Forestière Aïn Almou”, Beni Snassen mountains; 34.8493°N/-2.1902°E, <10 m.; 3 ad. BEV.11316-318; 20 04 2011.

No record from the Beni Snassen massif were available in Bons and Geniez (1996) although the occurrence of this species there was expected given its presence in Algeria on the other side of the border (Bons and Geniez, 1996). Note that the occurrence of *S. perspicillata* in the Beni Snassen has already been reported anecdotally by Escoriza and del Mar Comas (2007) but without precise locality data or supporting evidence.

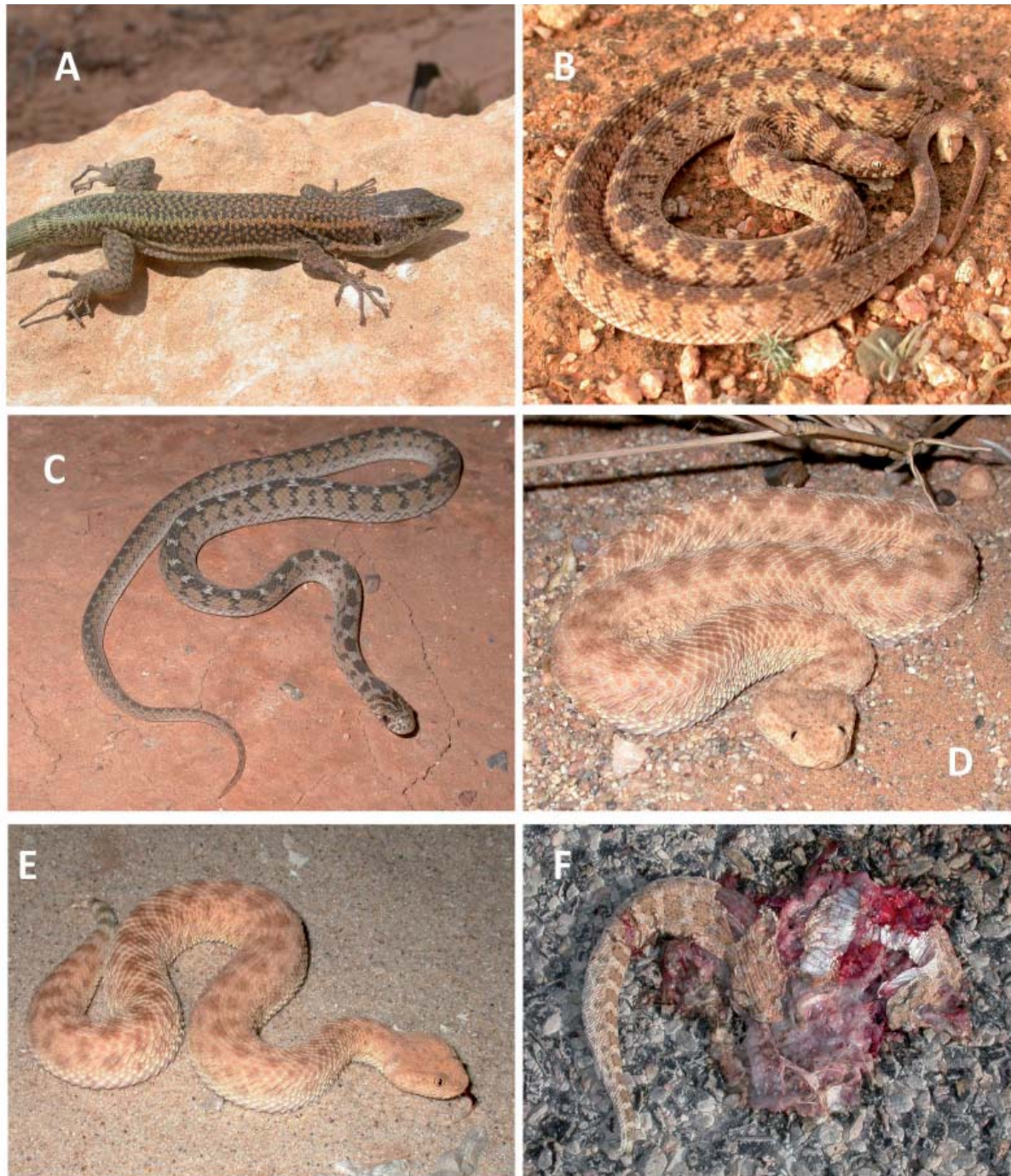
*Boaedon fuliginosus* (Boie, 1827).

- 15.5 km after Tan-Tan on the road to Tarfaya; 28.4784°N/-11.2496°E, < 20 m.; 1 ad. BEV.9145; dead on the road, already dry; 26 09 2006.
- 13 km past Sidi Ifni on the road to Guelmim; 29.31984°N / 10.13338°W, < 10 m.; 1 ad. BEV.9426; freshly dead on the road, at night, wet and cool weather; 09 02 2008.

The Tan-Tan record is in a classical locality for a species that remains very rare in Morocco (still less than 15 published records). The Sidi Ifni record fills the gap between the Souss valley records and the Tan-Tan area (see Bons and Geniez, 1996); Barnestein *et al.* (2010, which see for a map) have previously published a record obtained from the same area a few weeks later.

*Dasypeltis sahelensis* Trape and Mané, 2006.

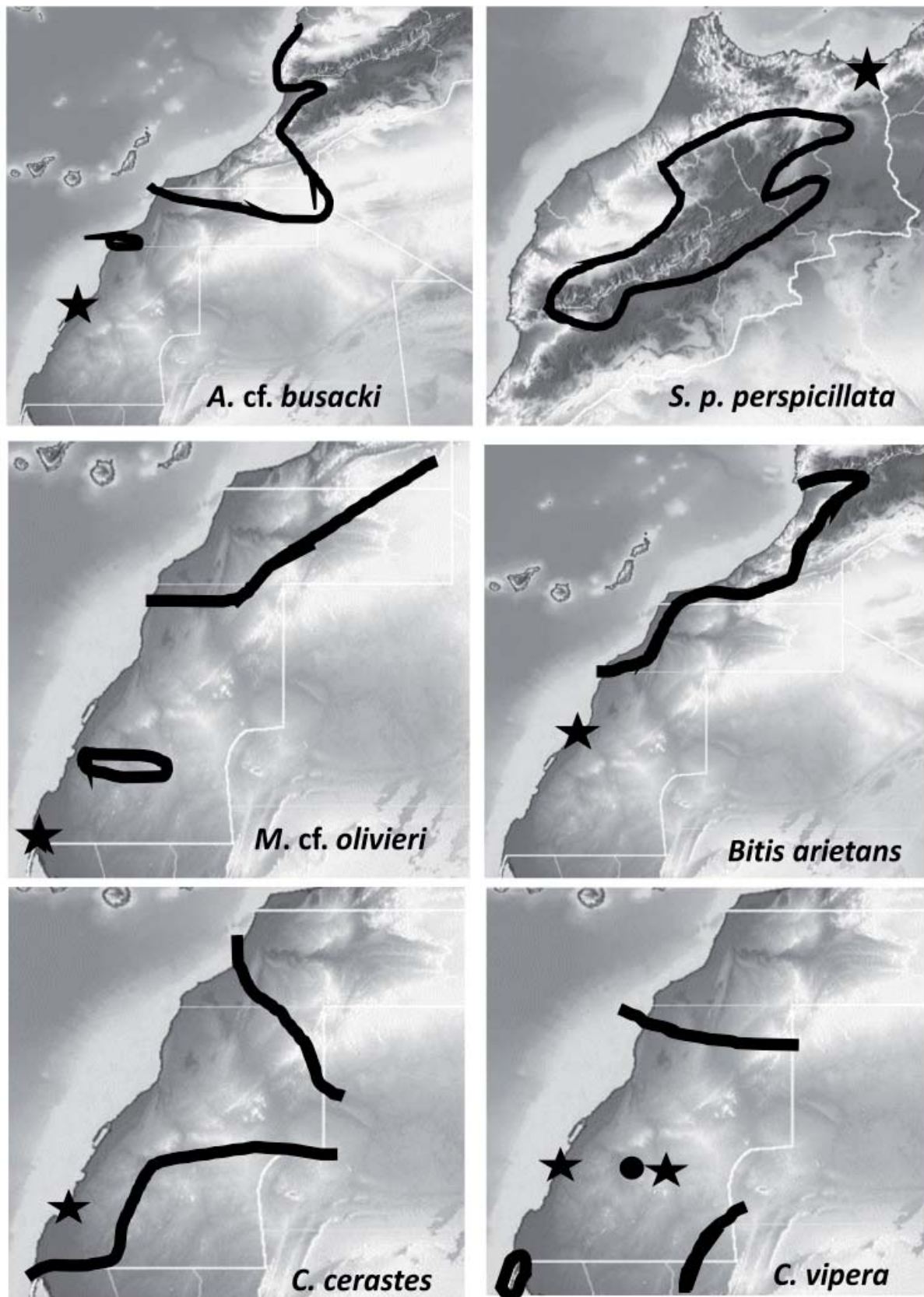
- Approx. 19 km past Tiznit on the road to Mirleft; 29.6303°N/-9.8831°E, < 10 m.; ad. photographed BEV.T1205; active at night on the road; 09 02 2008.
- Between 20 and 21 km past Sidi Ifni on the road to Mirleft; 29.5081°N/-10.0599°E, < 10 m.; ad. BEV.9449 + T; freshly dead on the road at night; 09 02 2008.
- Between 8 and 9 km past Sidi Ifni on the road to Tiznit; 29.4390°N/-10.1095°E, < 10 m.; ad. photographed BEV.T1206; active at night on the road; 09 02 2008.
- Approx. 9 km past Tiznit on the road to Mirleft; 29.6793°N/-9.8466°E, < 10 m.; juvenile BEV.9450 + T; dead on the road; 10 02 2008.



**Figure 1.** Photographs of selected specimens reported in this paper; all photographs by PAC. A: *Scelarcis perspicillata perspicillata*, adult male, Beni Snassen massif 1.4 km east of the Maison Forestière Aïn Almou. B: *Dasypeltis sahelensis* adult, between 8 and 9 km past Sidi Ifni to Tiznit. C: *Dasypeltis sahelensis* adult, 19 km past Tiznit towards Mirleft. D: *Cerastes vipera* adult, 32 km past Aousserd on the road to Dakhla. E: *Cerastes vipera* adult, 59 km past El Argoub on the road to Mauritania. F: *Cerastes cerastes* dead on road, 207 km past Lagouira on the road to Dakhla.

- 43 km past Tan Tan on the road to Guelmim; 28.6272°N/-10.7718°E, <10 m.; ad. BEV.9448 + T; dead on the road; 10 02 2008.

The species was formerly known from Morocco as *Dasypeltis scabra* (Linné, 1578). When *D. sahelensis* was first described in 2006, no specimens from north of the Sahara were included in the material examined.



**Figure 2.** Black lines or black spots: distribution limits in the Western Sahara (for *Mesalina cf. olivieri*, *Cerastes cerastes* and *C. vipera*) based on Geniez *et al.* (2004) or in Morocco (for *Scellarcis perspicillata*, *Acanthodactylus busacki* and *Bitis arietans*) based on Bons and Geniez (1996). For *S. perspicillata* only the native range is depicted. Black stars: new localities reported in this paper.

These specimens exhibit the characters of *D. sahelensis*: the dark lateral blotches are situated next to the pale areas separating the dark dorsal blotches and the nasal scale is undivided (Trape et al., 2012). Two of these specimens (BEV.9448 & 9449) have been sequenced by Trape et al. (2012) and group with *D. sahelensis* specimens from Niger, confirming this morphological assignment.

These records all fall within the previously known distribution of the species in Morocco and bring the number of published records from nine (Barnestein et al., 2012) to 14. Four of them originate from Macaronesian vegetation habitats in the easternmost Anti Atlas around Sidi Ifni where most recent records have been obtained (Bons and Geniez, 1996; Geniez and Guillod, 2003; Barnestein et al., 2010; Escoriza, 2010; Barnestein et al., 2012). Only the specimen BEV.9448 found between Guelmim and Tan Tan was in a more arid environment.

Most of the animals were found active or freshly dead during the first few hours after sunset. Temperatures on the night of the 9<sup>th</sup> of February when we found three active animals on the road were quite cold (10 to 20 °C) with some light rain showers. The finding of five specimens of this otherwise very rarely reported species in just two days suggests that late winter corresponds to a peak of activity, possibly related to mating if we assume that the species behaves like many snakes that exhibit peaks of movement during mating periods (e.g. Bonnet et al. 1999; Martínez-Freiría and Brito 2012) but this would need to be verified in the future.

*Bitis arietans* (Merrem, 1820).

- 118 km past Dakhla on the road to Boujdour; 24.4200°N/-15.1887°E, < 100 m.; ad. BEV.9141; dead on the road; 10 09 2006.

This record constitutes the southernmost record for the species in North Africa (i.e. north of the Sahara). The southern limit of the distribution in North Africa was previously Boujdour, some 200 km north, although the presence of the species was suspected in the area between Dakhla and Boujdour according to Geniez et al. (2004). Favourable habitats (patches of coastal vegetation with succulent euphorbia and scrubs) extend further south than this locality (pers. obs.) so there is little doubt that the real limit of the range of the species lies further south than this.

*Cerastes cerastes* (Linnaeus, 1758)

- 207 km past Lagouira on the road to Dakhla;

22.4688°N/-16.4434°E, < 100 m.; ad. BEV.T1245, photo; dead on the road; 11 09 2006.

Records of *C. cerastes* were missing until now from the southern coastal area of the Western Sahara (Geniez et al., 2004) although, as for the following species, insufficient prospection is probably the main explanation.

*Cerastes vipera* (Linnaeus, 1758).

- 59 km past El Argoub on the road to Mauritania; 23.1481°N/-16.1083°E, <100 m.; 1 ad. BEV.9125 + T, photo; active on the road at night; 10 09 2006.
- 32 km past Aousserd on the road to Dakhla; 22.7393°N/-14.5561°E, < 20m.; 1 ad. BEV.10867 + T, photo; active on the road at night; 18 03 2010.

These records fall in gaps in the mapped distribution of the species in Geniez et al. (2004). Such gaps almost certainly result from insufficient knowledge rather than true absence of the species as favourable sandy habitats are widespread along the coast of Western Sahara. The specimen from 2006 was crossing the road despite very windy and relatively cold weather.

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