

Rediscovery of *Acanthodactylus spinicauda* Doumergue, 1901 in Algeria

Boualem Dellaoui¹, Menad Beddek^{2,3}, Olivier Peyre³, Philippe Geniez², Benjamin Allegrini³, Fatiha Koudache¹ and Pierre-André Crochet^{2,*}

Acanthodactylus spinicauda was first described by Doumergue (1901) based on specimens from north-western Algeria as a variety of *Acanthodactylus pardalis* (Lichtenstein, 1823). According to Doumergue (1901), this taxon is quite similar to *Acanthodactylus pardalis* from which it differs essentially by a spiny tail basis, made of the prominent, elongated and curved keels of the scales on the basis of the tail. Pasteur and Bons (1960) afforded a full specific rank to *Acanthodactylus spinicauda*, a systematic rank also accepted by Salvador (1982).

Both Pasteur and Bons (1960) and Salvador (1982) only examined museum specimens and indeed as far as we know, the entire material available for this species until now had been collected by Doumergue himself or sent to him by a Mr. Pouplier who was living in El Abiod Sidi Cheikh (Algeria) and is now housed in Paris (Muséum national d'Histoire naturelle, specimen MNHN-RA-0.8958, Fig. 1), London (Natural History Museum, specimens BMNH 1946.8.5.34 to 43) and Rabat (Institut Scientifique de Rabat, ISR 360.003). More material is probably still housed in the Musée national Zabana d'Oran, previously Musée Municipal

d'Oran, where the Paris specimens originated from (as per the online database of the MNHN) and where a large part of Doumergue's collection is still housed (pers. obs.). Since there has been no lectotype designation for this species, all these specimens are syntypes of *Acanthodactylus spinicauda*.

All the available material comes from two localities, which together constitute the type locality: El Abiod Sidi Cheikh (32.89°N / 0.54°E) and Les Arbaouats (=Arba Tahtani, 33.09°N / 0.58°E). Both localities are approximately 20 km from each other and are situated in the Saharan Atlas mountains of Algeria (Fig. 2), in the wilaya of El-Bayadh, between 900 m and 1000 m above sea level. Doumergue (1901) reports that he found the species behind the "bordj" (fort) of El Abiod Sidi



Figure 1. Specimen MNHN-RA-0.8958, adult male, syntype of *Acanthodactylus spinicauda*. Notice the typical dorsal pattern and the enlarged tail basis covered in strongly keeled scales giving a spiny aspect to the basis of the tail; compare with figures 3 & 4. Photo PG.

¹ Département de l'Environnement, Faculté des Sciences, Université Djillali Liabes, route de Tlemcen, BP 89, Sidi Bel Abbès, Algérie

² CEFE UMR 5175, CNRS - Université de Montpellier - Université Paul-Valéry Montpellier – EPHE, 1919 route de Mende, 34293 Montpellier cedex 5, France

³ NATURALIA Environnement, 20 rue Durrell, BP 31285, 84911 Avignon cedex 9, France

* Corresponding author e-mail: pierre-andre.crochet@cefe.cnrs.fr

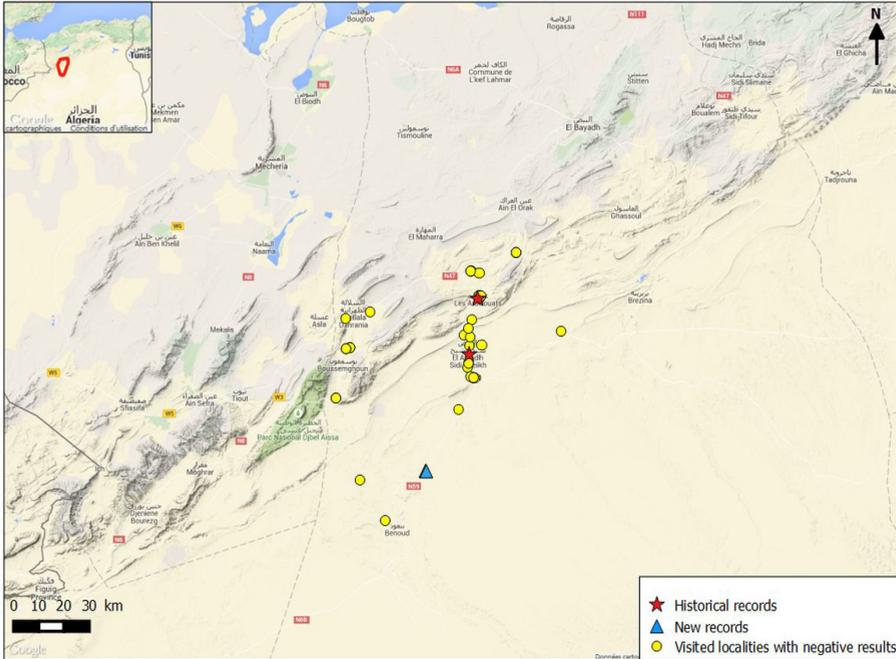


Figure 2. Map of north-western Algeria showing historical Doumergue’s localities, new locality and localities visited without finding the species.

Cheikh and around the oasis of Arba Tahtani, where it occurs with *Acanthodactylus dumerili* (Milne Edwards, 1829), on mixed sandy and stony terrain, avoiding pure sands. He explained that the species was mainly active in spring and autumn, being abundant in May, rare in August and common again in September and October. Based on the material he examined, Doumergue (1901) suggested that laying takes place in spring, with around 8 eggs being laid in two clutches, while he could not exclude the possibility of a third clutch in autumn. In September the specimens he examined had fed on ants, ant larvae and small coleopterans.

As far as we are aware of, there have been absolutely no records of the species following Doumergue’s reports (its records were made before 1899 as the introduction in Doumergue’s book is dated to 1899). Based on the information available, Joger *et al.* (2006) classified *A. spinicauda* as critically endangered (CR) in the IUCN red list, but without evidence that it still existed and the species has been feared to be extinct. Locating extant populations of the species was thus of prime importance to us in the context of our current field research for a

project of an atlas and red list of amphibians and reptiles of Algeria.

As a consequence, this species was particularly targeted during field work by one of us (OP) in northern Algeria between 2006 and 2011. The area of the “Monts des Ksour” and the southern High Plateaus, particularly in a radius 50 km around El Abiod Sidi Cheikh and Les Arbouats, was visited several times between April and May, totaling 6 days of surveys and covering around 15 sites, including the localities mentioned by Doumergue (Fig. 2), with soil and habitat considered suitable for the species based on Doumergue’s ecological data. Not only was *Acanthodactylus spinicauda* not located, but the habitats around the type locality were found to be severely disturbed and we started to question the survival of this lizard.

In a second step the prospection area was extended to other habitats corresponding to the Doumergue’s description further away from the type locality (see Fig. 2 and Table 1). The first author (BD), sometimes joined by OP, MB and BA, made repeated visits to this region in 2010, 2013 and 2014, again without success. After

Table 1. List of visits made specifically to look for *Acanthodactylus spinicauda* around the type locality between 2006 and 2015. Successful visits (first three lines) are in *italic*. Latitude and longitude are given in decimal degrees in WGS84 coordinate system.

Site	Locality	Latitude	Longitude	Date	Number of persons
<i>1</i>	<i>Berr'mad, 50 km south of El Abiod Sidi Cheikh</i>	<i>32.5060</i>	<i>0.3628</i>	<i>11/03/2015</i>	<i>01</i>
<i>1</i>	<i>Berr'mad, 50 km south of El Abiod Sidi Cheikh</i>			<i>25/03/2015</i>	<i>01</i>
<i>1b</i>	<i>Berr'mad, 50 km south of El Abiod Sidi Cheikh</i>	<i>32.5045</i>	<i>0.3656</i>	<i>22/04/2015</i>	<i>03</i>
2	Les Arbaouats	33.0914	0.5858	30/04/2008	01
3	North of Les Arbaouats	33.0992	0.5920	30/04/2008	01
4	Mrit'aa	33.2459	0.7387	20/03/2010	01
4	Mrit'aa			18/04/2013	04
4	Mrit'aa			10/04/2014	01
5	El Hadjra Tayha, 4 km east of Chellala Dahrania	33.0451	0.1293	04/06/2010	01
6	Taughezoult, 12 km south of Chellala	32.9243	0.0452	05/06/2010	01
6	Taughezoult, 12 km south of Chellala			20/03/2013	01
7	2 km west of road to Les Arbaouats	33.1837	0.5551	18/04/2013	03
8	8 km north of El Abiod Sidi Cheikh	32.9669	0.5236	17/02/2014	01
9	El Abiod Sidi Cheikh (several sites along the southern ring road)	32.8713	0.5430	18/02/2014	01
9	El Abiod Sidi Cheikh (several sites along the southern ring road)			28/04/2014	01
10	between Arbaouat Tahtani and Arbouat Foukani	33.1006	0.5858	27/04/2014	01
11	2 km south of El Abiod Sidi Cheikh	32.8577	0.5385	27/04/2014	01
12	5 km south of El Abiod Sidi Cheikh	32.8221	0.5695	11/03/2015	01
13	20 km south of El Abiod Sidi Cheikh	32.7149	0.5009	11/03/2015	01
14	7 km south of the southern exit of El Abiod Sidi Cheikh	32.8230	0.5605	27/04/2011	01
14	7 km south of the southern exit of El Abiod Sidi Cheikh			26/04/2011	01
14b	7 km south of the southern exit of El Abiod Sidi Cheikh	32.8263	0.5511	26/04/2011	01
14c	7 km south of the southern exit of El Abiod Sidi Cheikh	32.8229	0.5636	26/04/2011	01
15	1 km east of El Abiod Sidi Cheikh	32.9331	0.5960	27/04/2011	01
16	2 km north of El Abiod Sidi Cheikh	32.9310	0.5465	26/04/2011	01
17	6 km north of El Abiod Sidi Cheikh	32.9602	0.5497	27/04/2011	01
18	2 Km north of Boussemgoun	32.9207	0.0281	03/04/2006	01
19	5 Km south of Boussemgoun	32.7534	-0.0139	03/04/2006	01
20	1 km west of Chellala	33.0286	0.0268	03/04/2006	01
20	1 km west of Chellala			25/04/2011	01
21	13 km north-west of Les Arbaouats	33.1832	0.5515	05/04/2006	01
22	6 km north of Les Arbaouats	33.1767	0.5858	05/04/2006	01
23	between Les Arbaouats and El Abiod Sidi Cheikh	33.0187	0.5565	30/04/2008	01
24	north of El Abiod Sidi Cheikh	32.9894	0.5422	30/04/2008	01
25	2 Km north of Boussemgoun	32.9207	0.0282	25/04/2011	01

Table 1. Continued.

Site	Locality	Latitude	Longitude	Date	Number of persons
26	5 Km south of Boussemghoun	32.7534	-0.0140	25/04/2011	01
27	13 km north-west of Les Arbaouats	33.1832	0.5515	25/04/2011	01
28	10 km north-west of Benoud	32.3399	0.1929	22/04/2015	03
29	20 km north of Benoud along road to Boussemghoun	32.4750	0.0869	22/04/2015	03
30	37 km north-east of El Abiod Sidi Cheikh	32.9799	0.9276	15/06/2010	01
30	37 km north-east of El Abiod Sidi Cheikh			March 2013	01
30	37 km north-east of El Abiod Sidi Cheikh			12/03/2015	01

this series of unsuccessful visits, we reasoned that *A. spinicauda* might have its northern distribution limit at the type locality and the search should be oriented to the south.

On 11/03/2015, BD started visiting suitable habitats from El Abiod Sidi Cheikh southward. *Acanthodactylus spinicauda* was found at the third locality explored approximately 50 km south of Doumergue's locality, in a place called Berr'mad (Table 1). One male and one female were captured and photographed. The species was observed again at the same site and at another site on the other side of a tarmac road 400 m away on 25/03/2015 and on 22/04/2015 (see Table 1). A total of 8 individuals have been observed in three visits to the locality (2 on 11/03 by BD alone, 1 on 25/03 by BD alone and 5 on 22/04 by BD, MB, OP, see Fig. 3, 4 &

5). No other specimens were seen in localities visited south of this site.

The contemporary specimens conform perfectly to the characters given by Doumergue (1901) and Salvador (1982) and visible on the Paris syntype. The most remarkable feature is the widened and spiny tail basis of the male (Fig. 4). In females this character is less developed (Fig. 5) but the wide tail base and strongly keeled scales on the basis of the tail should allow easy distinction from similar species of the "*Acanthodactylus pardalis* species group", to which *A. spinicauda* belongs to according to Salvador (1982). Coloration is typical of the *pardalis* species group but males (Fig. 1, 3) differ from all other populations we have examined, alive or in photos, by the large elongated yellow spots on the back, which are closely spaced and tend to form broad



Figure 3. Adult male of *Acanthodactylus spinicauda*, Berr'mad, 50 km south of El Abiod Sidi Cheikh, Algeria (loc. 1b in Table 1), 22 April 2015. Photo OP.



Figure 4. Close up of tail basis, dorsal view, of an *Acanthodactylus spinicauda* adult male from locality 1 in Table 1, 11 March 2015. Photo BD.



Figure 5. *Acanthodactylus spinicauda*, adult female, from locality 1b in Table 1, 22 April 2015. Photo MB.



Figure 6. Habitat of *Acanthodactylus spinicauda* at locality 1b in Table 1. Photo OP.

lines on the dorsum and the back of the neck. The two innermost rows of spots are closer to each other than to the outer rows of spots (usually the opposite in the other species). The tips of the keels of the scales at the basis of the tail of males are white (Fig. 4), enhancing their conspicuousness. Females (Fig. 5) have a coloration similar to many other populations of the *pardalis* group.

The habitat where the species was found (Fig. 6) is a flat stony semi-desert with abundant eolian sand deposits interspersed with sparse vegetation dominated by *Helianthemum lippii* and *Calligonum comosum* with a few *Retama retam* bushes. It fits very well with Doumergue's (1901) description of the habitat where he found his specimens. Other species seen in the same localities are *Acanthodactylus taghitensis* Geniez & Foucart, 1995 and *Trapelus* cf. *mutabilis* Merrem, 1820. Notably, no record of other members of the *Acanthodactylus pardalis* species group were obtained during our samplings or are known to us from the same area.

The fact that the species was observed on all three visits to the locality suggests that its detectability is not low; therefore the species was probably not overlooked in most of other surveyed localities. If this is indeed the case, *Acanthodactylus spinicauda* is probably now genuinely rare at least in the area around the type locality where we have concentrated our efforts. Further field work is urgently needed to assess the extent of its distribution range, width of its ecological niche, frequency of occurrence within its range and ultimately provide us with the data required to evaluate its conservation status. With a single locality currently

known to host the species, the CR status proposed by Joger et al. (2006) remains clearly adequate.

Acknowledgments. We thank Dihia Gaci, Abdelkader Allali and Mr. Moulay, the driver from the Haut Commissariat du Développement de la Steppe (HCDS), and the HCDS itself for their help with field work. We thank Ivan Ineich, Annemarie Ohler and Laure Pierre (MNHN, Paris) and Adila Taibi and Yamna (Musée national Zabana, Oran) for their help with accessing material housed in the collections they have in charge and Abderrahmane Mataame (ISR, Rabat) for sending photos of the Rabat syntype. Aurélien Cheylan helped with the map in Figure 2. Amina Fellous (ANN, Alger) helped with the identification of the plants found in the new locality. MB's PhD is funded by the CIFRE doctoral program of the ANRT.

References

- Doumergue, F. (1901): Essai sur la faune erpétologique de l'Oranie avec des tableaux analytiques et des notions pour la détermination de tous les reptiles et batraciens du Maroc, de l'Algérie et de la Tunisie. Oran, Algérie, L. Fouque.
- Joger, U., Slimani, T., El Mouden, H., Geniez, P. (2006): *Acanthodactylus spinicauda*. The IUCN Red List of Threatened Species. Version 2015.2. <www.iucnredlist.org>. Downloaded on 03 July 2015.
- Pasteur, G., Bons J. (1960): Catalogue des Reptiles actuels du Maroc: révision de formes d'Afrique, d'Europe et d'Asie. Travaux de l'Institut scientifique chérifien. Série zoologique **21**: 1-132.
- Salvador A. (1982): A revision of the lizards of the genus *Acanthodactylus* (Sauria: Lacertidae). Bonner Zoologische Monographien **16**: 1-167.