

Anuran studies from Tiaret region, north-west of Algeria

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RESUMEN: Se dispone de pocos datos herpetológicos de Argelia. Durante la primavera del 2008 se realizaron prospecciones a la provincia de Tiaret en la búsqueda de anuros. En un total de 10 sitios de reproducción se encontraron las siguientes especies: *Pelophylax saharicus*, *Discoglossus pictus*, *Bufo mauritanicus*, *Bufo boulengeri* e *Hyla meridionalis*. Se encontraron hábitats favorables para la reproducción de anfibios en todas las localizaciones. Estudios genéticos y demográficos permitirán entender la biología de los anfibios que viven en zonas semiáridas.

Introduction

Within the Maghreb, herpetological data from Algeria are very scarce due to the socio-political situation. Although the Algerian list is constituted by 13 anuran species (*Bufo boulengeri*, *Bufo bufo*, *Bufo mauritanicus*, *Bufo regularis*, *Bufo xeros*, *Discoglossus pictus*, *Hyla meridionalis*, *Hoplobatrachus occipitalis*, *Pelophylax perezi*, *Pelophylax saharicus*, *Pleurodeles nebulosus*, *Pleurodeles poireti* and *Salamandra algira*, data from the AmphibianWeb, 2009), only 32 records are available data for all the species. Also, most of the observations belong to a single species, *Discoglossus pictus*.

General distribution ranges of species from Algeria were extracted from Schleich *et al.* (1996). The distribution of *Bufo xeros* shows the presence of few populations in the south of the country especially around the Niger border. According to Salvador (1996), *Bufo xeros* and *Bufo regularis* from Algeria are conspecific. Because of that, *B. regularis* is not included in this revision. In the same

genus, *Bufo bufo* is restricted to north Algeria but, in fact, it has not been found in Tiaret region. *Bufo mauritanicus* displays a wide distribution in the north of the country, from the Mediterranean coast to the Atlas. The species is absent from the Sahara desert, and only three records for Algeria are available: two near Oran (Mediterranean coast), and one in the Atlas, in the zone of Biskra (34°85' / 5°73'). The distribution of *Discoglossus pictus* includes the Mediterranean coast and the mountain range of the Atlas. There are 18 observation in the country: nine in the zone of Oran (35°73' / 0°78'), six in the Atlas of Bougtob (34°15' / 0°07'), one in the Atlas of Saïda (34°83' / 0°15'), one in the centre of the Mediterranean coast and near Jaziar (36°75' / 3°58'), and one in the East of the Mediterranean coast, in Annaba (36°90' / 7°77'). The genus *Hyla* is only represented by *H. meridionalis*. Its distribution is from the coast until the first foothills of the Atlas. There are not geographical data for the spe-

cies. The distribution of *Hoplobatrachus occipitalis* is restricted to a spot in the South of the country next to the Libyan border. *Pelophylax saharicus* shows a wide distribution, with the exception of the erg systems where water bodies are rare. Nevertheless, there are no precise data. One record of *Pelophylax perezii* should be verified. The distribution of *Pleurodeles nebulosus* ranges from the Mediterranean zone of Oran until the Tunisian border. There are no observation data for the species. There is one record of *Pleurodeles poireti* in Annaba (36°90' / 7°77'). Its distribution ranges a narrow zone near Annaba in the Mediterranean coast. *Salamandra algira* shows a discontinuous distribution in the study area close to the Mediterranean coast.

Methodology and field sampling

The study was carried out in the province of Tiaret. This province occupies an area of 20.399 km² in North-West of Algeria. The study area is bounded by 35°37'22"N / 35°11'51"N and 0°31'57"E / 1°40'10"E. A high plateau dominates its geomorphology with an altitude comprised between 800 and 1200 masl. Tiaret is delimited in the North by the massif of Ouarchenis and in the South by a steppe where cereals are mostly cultivated. Aleppo pine (*Pinus halepensis*) is the dominant species in the forest areas with minor proportion of Holm oak (*Quercus ilex*) and cedars (*Cedrus atlantica*) in the shady slopes. Temperatures are characterized by high fluctuations during the year. Average temperature in winter is 6° C and increases to 26° C in summer. Annual average precipitation is 350 mm concentrated on January. The dominant wind is the Sirocco from South to North. The region is classified as semiarid

according to Emberger pluviometric index (Emberger, 1950).

During March and beginning of April, several field trips were carried out in order to locate habitats with presence of amphibians in the Tiaret zone. This constitutes one of the first modern expeditions to Tiaret as well as for all the country. In this study, anuran records for a total of 15 localities are presented (Table 1, Figure 1). We searched for amphibians in several water bodies as streams, canals and water reservoirs. The sampling sites were only visited during the day due to logistic constraints. Sex was determined for all the captured animals; body mass, snout-vent-length (SVL) and leg length were also measured directly in the field.

Results and Discussion

A total of 126 adults of five species, *Discoglossus pictus*, *Pelophylax saharicus*, *Bufo mauritanicus*, *Bufo boulengeri* and *Hyla meridionalis*, were captured (see Table 1). The most collected species were *D. pictus* and *P. saharicus*. The reduced number of specimens of the genus *Bufo* could be due to their nocturnal habits. Toads pass the day buried or lain hidden under rocks, so their localization is difficult. *Hyla meridionalis* was only found in a forest site. Table 2 shows the number of individuals captured in each zone for each species.

For *Pelophylax saharicus* and *Discoglossus pictus*, measures were enough for the biometrical characterisation. SVL and body mass could be recorded from 15 males, 27 females and 12 juveniles of *P. saharicus*. The SVL of the adult *P. saharicus* attained 21.65 - 81.85 mm in males and 19.96 - 106.8 mm in females. Body mass ranged 3.5 - 135.11 g in females and 4.2 - 66.6 g in



Figure 1: Situation of the different visited places. 00 Climatological station, 01 Sewage treatment plant of Tiaret, 02 SN Metal, 03 Rass el Aïn, 04 Oued Boughadou, 05 Tiguiguest, 06 Oued Mina, 07 Djebel Ghzoul, 08 Oued Sousselem, 09 Sidi Ouadah, 10 Tiaret, 11 Barrage Bokhada (no samples found), 12 Swamp near road (no samples found), 13 Hill of Djebel Ghzoul (no samples found), 14 Sidi Abed.

Figura 1: Situación de las localidades visitadas: 00 Estación meteorológica, 01 Planta de tratamiento de residuos de Tiaret, 02 SN Metal, 03 Rass el Aïn, 04 Oued Boughadou, 05 Tiguiguest, 06 Oued Mina, 07 Djebel Ghzoul, 08 Oued Sousselem, 09 Sidi Ouadah, 10 Tiaret, 11 Barrage Bokhada (sin citas de anfibios), 12 Pantano cerca de la carretera (sin citas de anfibios), 13 Hill of Djebel Ghzoul (sin citas de anfibios), 14 Sidi Abed.

males. Juveniles had a SVL between 20.55 and 32.2 mm and body masses between 0.7 and 2.8 g. A total of 36 males and 18 females *D. pictus* were measured. No juveniles were found. SVL oscillated between 19.6 and 70.85 mm in males and between 22.2 and 55.25 mm in females. Body masses were 1.6 - 17.7 g in females and 0.7 - 43.4 g in males. The maximum size was for a male of 70.85 mm and 43.4 g.

Although general distribution maps are available (Schleich *et al.*, 1996), few data exists about amphibians from Algeria. Some relevant information as the presence of *Pelophylax perezi* should be revised. Probably this record corresponded to *P. saharicus* (see Harris *et al.*, 2003) as both species are very similar.

Our study includes a total of 126 new records corresponding to 5 species in the area; two of them, *P. saharicus* and *D. pictus*,

Table 1. Geographic coordinates of the different places visited.

Tabla 1. Coordenadas geográficas de los distintos lugares visitados.

Geographic coordinates	Sidi Ouadah	Rass El Aïn	Djebel Ghzoul	Oued Sousselem	SN Metal	Ouled Boughadou	Sidi Abed	Oued Mina	Sewage treatment plant of Tiaret	Tiguiguest
Latitude	35°17'	35°26'	35°25'	35°08'	35°20'	35°25'	35°16'	35°19'	35°21'	35°25'
Longitude	1°16'	1°17'	1°17'	1°32'	1°18'	1°22'	1°22'	1°13'	1°18'	1°18'

Table 2. Number of individuals captured in each zone and each species.
Tabla 2. Número de individuos capturados para cada zona y especie.

Legend: SO = Sidi Ouadah; RA = Rass El Ain; DG = Djebel Ghzoul; OS = Oued Soussalem; SN = SN Metal; OB = Ouled Boughadou; OM = Oued Mina; SA = Sidi Abed; ST = Sewage treatment plant of Tiaret; Ti = Tiguiguest; BB = Barrage Bokhada

		SO	RA	DG	OS	SN	OB	OM	SA	ST	Ti	BB	Total
<i>Discoglossus pictus</i>	Male	2	5	10	13	5	1	0	P	0	0	0	36
<i>Discoglossus pictus</i>	Female	2	3	11	2	0	0	0	P	0	0	0	18
<i>Pelophylax saharicus</i>	Male	1	10	0	3	0	1	1	P	0	0	0	16
<i>Pelophylax saharicus</i>	Female	0	18	0	8	2	6	4	P	0	0	0	38
<i>Bufo boulengeri</i>	Male	0	2	0	0	0	0	0	0	0	0	0	2
<i>Bufo boulengeri</i>	Female	0	0	0	0	0	0	0	0	0	0	0	0
<i>Bufo mauritanicus</i>	Male	0	1	0	0	0	1	0	0	0	4	0	6
<i>Bufo mauritanicus</i>	Female	0	0	0	0	0	0	1	1	3	0	1	6
<i>Hyla meridionalis</i>	Male	0	0	0	0	0	2	0	0	0	0	0	2
<i>Hyla meridionalis</i>	Female	0	0	0	0	0	2	0	0	0	0	0	2
		5	39	21	26	7	13	6	1	3	4	1	126

are the more abundant species. We did not find any Urodela probably due to their distribution close to the coast. The winter cold and the drier zone probably determine the absence of Urodela in this region.

The maximum SVL measured in *P. saharicus* in the zone of Tiaret was higher (female of 106.8 mm) than individuals of the same species found in Morocco (female of 79 mm) by Esteban *et al.* (1999). These authors determined the age structure of *P. saharicus* in the surroundings of Erfoud (Morocco). The skeletochronological analysis about the population studied from Tiaret will allow the comparison of the two zones with similar characteristics.

The ecology of amphibian populations in the study area seems not to be affected by direct human impacts. The breeding sites for

reproduction of amphibians are in good conditions and any indications about the presence of pollutants on the water were observed. Reduced impact of industrialization and extensive agriculture characterise the landscape of Algerian steppe (Hadeid, 2008; Le Houérou, 1995). The distribution and conservation of anuran species seem to be affected primarily by climate. The specific characteristics of steppes, together with the Sahara desert influence, make future studies of the biology of amphibians in Algeria interesting. Up to now, there are not specific amphibian monitoring carried out in this zone. Thus, only future works, including genetic and demographic analyses, will allow understanding their biology strongly marked by dependence from semiarid climate characteristic of this zone.

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Evidencia de la reproducción otoñal del sapillo pintojo ibérico (*Discoglossus galganoi*) en España central (Salamanca)

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El sapillo pintojo ibérico *Discoglossus galganoi* es una especie endémica del oeste de la Península Ibérica donde muestra un periodo de reproducción dilatado y muy diverso en función de la localización de las poblaciones y de la climatología particular de cada región (Díaz-Paniagua, 1988, 1992; Rodríguez-Jiménez, 1988; Lizana *et al.*, 1989, 1990; Reques & Tejedo, 1991; Salvador & García-París, 2001; Pleguezuelos *et al.*, 2002; García-París *et al.*, 2004; Díaz-Paniagua *et al.*, 2005).

En España central existen pocos datos sobre la reproducción que se produciría exclusivamente en el periodo primaveral con emergencia de metamórficos durante el verano y otoño, a pesar de existir una marcada actividad de los ejemplares durante el periodo otoñal (Rodríguez-Jiménez, 1988; Lizana *et al.*, 1989,

1990; García-París *et al.*, 2004; datos propios).

El día 11 de noviembre de 2007 se registró una larva perteneciente a esta especie en una charca temporal con escasez de macrófitos en un área de dehesa (con dominancia de la encina *Quercus ilex*) en el término municipal de Monleras (UTM 1x1 km: 29T QF3256; 760 msnm). Esta larva no presentaba vestigios de patas posteriores y una longitud total de unos 29 mm, que se correspondería a las primeras fases de la vida larvaria señalando una reciente eclosión (Gosner, 1960; Díaz-Paniagua, 1986). Dado la escasa duración del periodo embrionario, entre dos y nueve días (Salvador & García-París, 2001; García-París *et al.*, 2004), la puesta se habría realizado entre el 2 y el 9 de noviembre de 2007.

En zonas cercanas a la charca estudiada (municipio de Ledesma: 21 km. en línea