In general, rehydration behaviour under natural conditions is little known in small lizards, because it is arduous to approach them without interrupting their activity, and in this species, it has not been previously described. This opportunistic behaviour allows rapid rehydration in a dry rocky environment, completely devoid of water and subjected to elevated temperatures during the summer months.

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Limb malformations in a 1982 museum collection of *Pleurodeles waltl* larvae

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Resumen: Las malformaciones en extremidades están ampliamente documentadas en anfibios. En este artículo estudiamos los 32 individuos de *Pleurodeles waltl* de la colección del 'Museu do Mar Rei D. Carlos'. Detectamos malformaciones en 26 de los 32 especímenes, de las cuales la mayoría se adscriben a braquidactília (65%). Aunque no pudimos determinar las causas de estas malformaciones, estudios como este aumentan nuestro conocimiento de las mismas y su prevalencia.

Limb malformations in amphibians are well-known, especially among Caudata (Johnson *et al.*, 2003; Laurentino *et al.*, 2016). However, most of the reported cases are of single observations with malformation prevalences in a population, rarely exceeding 2% (Ouellet *et al.*, 1997; Vandenlangenberg *et al.*, 2003; Mester *et al.*, 2015; Martínez-Silvestre *et al.*, 2014; Laurentino *et al.*, 2016). The majority of reported cases show that the number and proportion of limbs and digits (ectromelia – absence or unproportioned limbs; ectrodactyly – absence of digits; polymely – excess of limbs; and polydactyly – excess of digits) are the most common types of malformations (Ouellet, 2000; Laurentino *et al.*, 2016).

Several deformities have been registered in sharp-ribbed newts (*Pleurodeles waltl* Michaelles, 1830) such as: bifurcated limbs (Martins d'Alte, 1941), polymely, polydactyly, brachy-

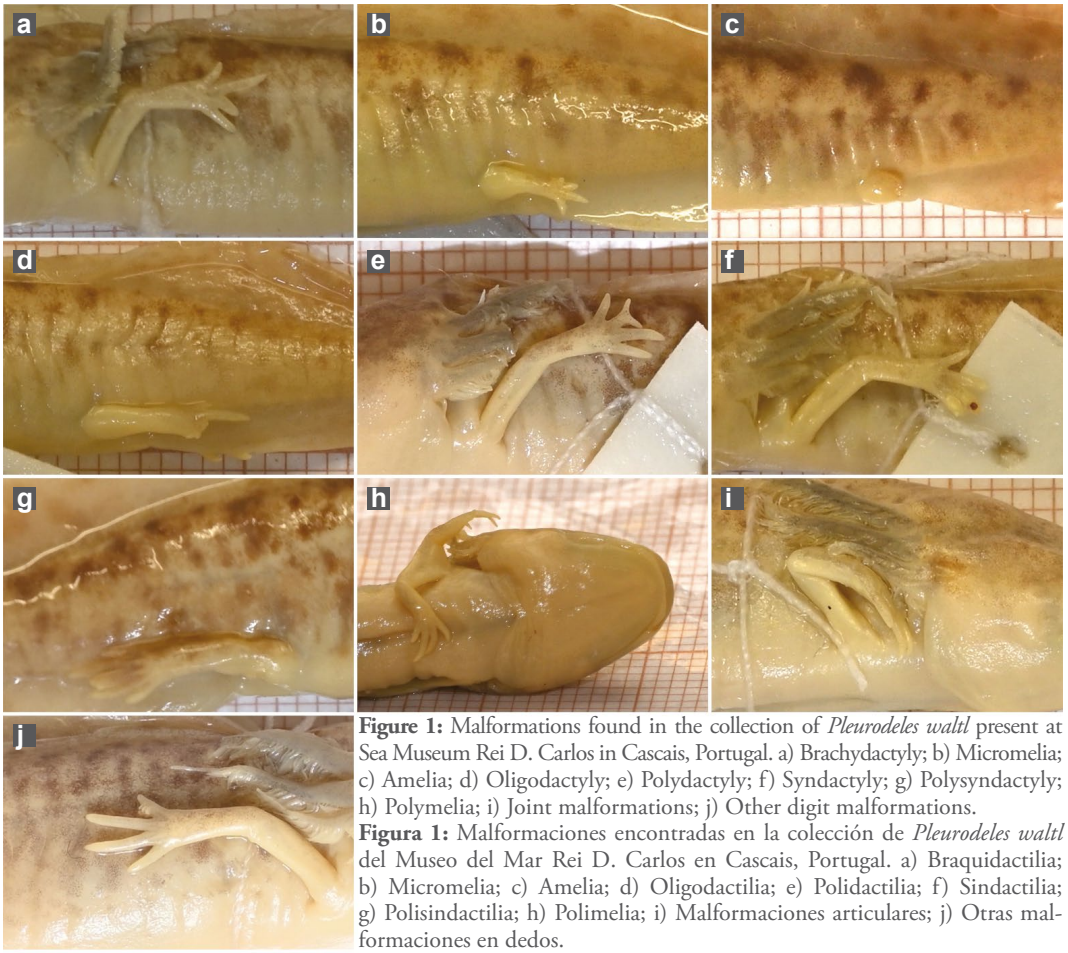

Figure 1: Malformations found in the collection of *Pleurodeles waltl* present at Sea Museum Rei D. Carlos in Cascais, Portugal. a) Brachydactyly; b) Micromelia; c) Amelia; d) Oligodactyly; e) Polydactyly; f) Syndactyly; g) Polysyndactyly; h) Polymelia; i) Joint malformations; j) Other digit malformations.
Figura 1: Malformaciones encontradas en la colección de *Pleurodeles waltl* del Museo del Mar Rei D. Carlos en Cascais, Portugal. a) Braquidactilia; b) Micromelia; c) Amelia; d) Oligodactilia; e) Polidactilia; f) Sindactilia; g) Polisindactilia; h) Polimelia; i) Malformaciones articulares; j) Otras malformaciones en dedos.

dactyly (short digital bones) (Héron-Royer, 1884; Lyedig, 1879; Zamora-Camacho, 2016, 2020), limb synostosis (two or more bones fused together) (Sanchiz & Pérez, 1974), ectrodactyly, ectromelia (Lauthier, 1971, Zamora-Camacho, 2020), polyphalangy (presence of extra digital bones) (Torres & Hidalgo, 2016), syndactyly (fused digits) and ectrodactyly (Zamora-Camacho, 2020).

Here we report the case for the collection of the Sea Museum Rei D. Carlos (Cascais, Portugal) that holds 32 specimens of *Pleurodeles waltl* larvae conserved in 4% formaldehyde. We found that 26 out of these 32 specimens (over 80% of the collection) had limb malformations (Table 1, Figure 1). All individuals were captured on March 30th, 1982 at Quinta do Marquês de Angeja in Alcabideche, Cascais (38º73'85"13N / 9º41'24"20W). Since 1982 the main water source has been diverted, and water quantity and quality are frequently compromised. It is doubtful that a relic population still persists.

The most common malformation was brachydactyly (Figure 1a) with over 65% of the affected individuals and over 50% of the collection having at least one malformation of this kind, followed by amelia (Figure 1c) (absence of limbs) and polydactyly (Figure 1e, g)

Table 1: Malformations found in the collection of *Pleurodeles waltl* present at Sea Museum Rei D. Carlos in Cascais per limb and in the total of individuals.
Tabla 1: Malformaciones encontradas por extremidad y en el total de individuos en la colección de *Pleurodeles waltl* del Museo del Mar Rei D. Carlos (Cascais).

	Limb				
	Forelimbs		Hindlimbs		
Malformations	Right	Left	Right	Left	Individuals
Brachydactyly	10	7	3	0	17
Micromelia	0	0	1	2	2
Amelia	1	1	1	1	4
Oligodactyly	0	0	0	1	1
Polydactyly	2	1	1	0	4
Syndactyly	0	1	0	0	1
Polysyndactyly	0	0	1	0	1
Polymelia	1	0	0	0	1
Joint malformations	1	1	0	0	2
Other digits malformations	3	1	0	0	4
Total	**18**	**12**	**7**	**4**	**26**

on over 15% of the individuals that had any malformation. Our findings support the idea that brachydactyly is one of the most common cases for skeletal malformations in urodeles (Diego-Rasilla *et al.*, 2007; Williams *et al.*, 2008). However, we also found syndactyly (Figure 1f, g) and polymelia (Figure 1h) that are among the most uncommon cases of malformations (Escoriza & García-Cardenete, 2005; Diego-Rasilla *et al.*, 2007; Williams *et al.*, 2008; Hinckley *et al.*, 2015).

Like most of the reported cases the reason(s) for the limb malformations could not be accessed (Johnson *et al.*, 1999; Blaustein & Johnson, 2003). Nonetheless the most commonly proposed reasons for limb deformities are related with the loss of limbs, extremely common during larval development due to predation and even cannibalism - and to the regeneration process, that does not always occur fully (Sessions & Ruth, 1990, Ballengée & Sessions, 2009; Bowerman *et al.*, 2010; Thompson *et al.*, 2014). However, there are other environmental and anthropogenic factors that are known to induce morphological malformations in amphibian populations such as parasites (Johnson *et al.*, 2003), pollution (Taylor *et al.*, 2005), UV radiation (Blaustein *et al.*, 1997), temperature (Dournon *et al.*, 1998) or the interaction among factors (Ouellet, 2000; Johnson *et al.*, 2006; Laurentino *et al.*, 2016). A better knowledge on cases like this can be very important for amphibian conservation as the majority of reasons associated with malformations are also associated with mortality events (Blaustein *et al.*, 1994, 1997; Paull *et al.*, 2012; Hayden *et al.*, 2015).

Although we could not point out a reason for these malformations, registers like this increase the knowledge on amphibian malformations, and might contribute for future studies as a historical record for the presence of a population with a high prevalence of deformities. This is especially relevant when considering the rate amphibian populations are decreasing worldwide and in biodiversity hotspots in particular such as the case for the sharp-ribbed newt in the Iberian Peninsula.

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Lesiones cutáneas en *Natrix maura* causadas por *Pachygrapsus marmoratus* (Decapoda, Brachyura)

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Natrix maura es una especie de colúbrido frecuente en la costa de Pontevedra, incluyendo el Parque Nacional de las Islas Atlánticas de Galicia (Galán & Fernández-Arias, 1993; Pino *et al.*, 1998). Estas poblaciones costeras, bien adaptadas al ambiente marino (Galán, 2003), suelen alimentarse en la zona intermareal rocosa, en las pozas de marea atacando diferentes especies de blénidos y góbidos. Según nuestras observaciones, en las áreas costeras del municipio de Cangas (Pontevedra), los individuos suelen ser menores de 60 cm de longitud total y se alimentan principalmente del blénido *Lipophrys pholis* (Linnaeus, 1758), del góbido *Gobius paganellus* Linnaeus, 1758 y del

Figura 1: *Natrix maura* atacadas por: a) un macho y b) una hembra de *Pachygrapsus marmoratus* a 2 m de profundidad en una grieta intermareal, el 29 de julio de 2004, en Cangas, Pontevedra (29T 516485; 4677602).