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## Albinism in *Pleurodeles waltl*

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**RESUMEN:** Se describe la observación de diversas larvas y adultos albinos de *Pleurodeles waltl* en varias localidades de la Península Ibérica.

Albinism in *Pleurodeles waltl* is reported infrequently, suggesting that surviving individuals are rare in nature or that the condition itself is rare. While albinism occurs to varying degrees (see Dyrkacz, 1981:Table 1), specific details regarding this anomaly are sometimes not recorded. Three records of complete albinism, however, are available.

One complete albino larva (82 mm total length [TL]) was reported from Santa Marta (Albacete Province; N39.14561/W2.29331; ~740 masl; 19 April 2006; Villodre *et al.*, 2009). First found in a semi-natural, permanent pond without shoreline vegetation, and rediscovered in the same pond two weeks later, this larva died the afternoon of re-discovery. Cause of death was not determined, but high levels of solar radiation and lack of melanin were suspected to be contributing factors.

Complete albinism has also been discovered in heavily-populated southern Jerez de la Frontera, where the species continues to breed in a shallow pond bordered by apartment buildings and highway N-IV (Figure 1; N36.66963 / W6.14593; 17 masl) on former



Figure 1. Locality of Jerez de la Frontera.

Figura 1. Localidad de Jerez de la Frontera.

marshland close to the Laguna de Torrox. A larval red-eyed albino female found along with normal larvae in 2011 was brought to the attention of DD in 2013. The specimen, currently under captive conditions, transformed to the adult stage in captivity and continues to survive (DD, Figure 2).

Within western Cádiz Province, larval and adult albino *P. waltl* are also encountered occasionally, and appear to be somewhat widely-distributed in disturbed habitat. On 11 May 1969 SDB collected six larvae, all red-eyed albinos (Carnegie Museum 50846, and 50846B-50846F), in urban Puerto de Santa María (approximately N36.57930 /

Photo D. Donaire



**Figure 2.** Albino with xanthophores.

**Figura 2.** Albino con xantóforos.

W6.22249; ~ 7 masl) approximately 580 m from the shore of the Bahía de Cádiz. In preservative these larvae range between 38 mm and 45 mm TL, with gill remnants between 3.2 mm and 5.7 mm in length. Vernal ponds in which these specimens were collected were numerous, relatively deep (~1–2 m, but becoming dry), with sandy bottoms and pond margins surrounded by *Juncus acutus* and tall grasses. This area today is completely urbanized, and the pond area is no longer present.

The earliest citation for albinism in *P. waltl* (Schreitmüller, 1934) actually records partial albinism. A “fast erwachsenen” (almost adult) taken from a cistern in an unspecified locality in Spain was an albino with xanthophores. Fontanet *et al.* (1992)

followed this report 54 years later with the report of another adult partial albino with xanthophores having been found in a natural pond at Rasquera (Tarragona Province; N41.00000 / E00.60000; ~280 masl) on 10 April 1988. In Sevilla Province, May, 2008, an albino with xanthophores (fide DD) was recorded by Guillem *et al.* (2009) from off highway A-4 approximately 2 km southwest of the Airport of Sevilla (N37.41671 / W5.91801; ~ 20 masl).

On 4 March 2009, 97 km southwest from Rasquera, in Tortosa (Tarragona Province; N40.81258 / W0.52144; ~ 6 masl) Guillem *et al.* (2009) discovered a 20 cm TL female adult partial albino from an area of olive trees in a pond shared with cattle. While the description of this specimen in text (p. 119) suggests it to be an albino with xanthophores, Figure 13 (p. 131) suggests an albino with erythrophores. In November, 2003, a 16.8 cm TL (22.1 g) male albino with erythrophores (Figure 3) was collected by M. Tejedó in El Campillo (Huelva Province, ~ N37.69315 / W6.62810; ~ 439 masl).

One additional amelanotic *P. waltl*, published without clear definition of degree of albinism, has also been reported at La Venta Los Alazores (Granada Province,



**Figure 3.** Albino with erythrophores.

**Figura 3.** Albino con eritroforos.

Photo J.P. González de la Vega

N37.03527 / W4.24622; ~ 952 masl) in January, 2009 (Guillem *et al.*, 2009). In heavily-agricultural areas of central Cádiz Province, in March, 2009, approximately 750 m from the intersection of highways A-203 and A-389 in a “cañada real” (7.1 km [air] SE La Barca de la Florida; N36.62233 / W5.86107; 79 masl), DD observed a leucistic (no integumentary pigment, eyes normal) larva (approximately 1 cm TL) in a natural pond. In July, 2013, off highway A-390 approximately 6.5 km ESE of Chiclana de la Frontera (N36.41912 / W6.07031; 15 masl), several amelanotic adults and larvae were discovered in a wide-mouth well also housing *Pelophylax perezi* (D. Donaire, unpublished data).

To an extent, both amelanotic and complete albino individuals result from disruption of tyrosinase synthesis (Bechtel, 1995) and the hormonal nature of chromatophore stimulation, coupled with the morphological effect of melanophore-stimulating-hormone (MSH) on xanthophores, has been demonstrated through experimental manipulation of pteridine pigments in *P. waltl* between developmental stages 53-55c (~30–65 mm TL at

a constant developmental temperature of 18°C; see Gallien & Durocher, 1957) (Bagnara, 1957, 1976). Albinism and / or amelanism noted in non-captive *P. waltl* may be influenced by chemical changes to the habitat which, in turn, affect hormone function. Albino larvae, as postulated (Villodre *et al.*, 2009), likely have a reduced chance of survival. *Bombus ibis*, very common in Cádiz wetlands and known to feed upon *P. waltl* (Mateos & Lázaro, 1986), for instance, should be able to easily detect albinos. Increasing temperatures and shorter rainy seasons due to climatic change will also likely contribute to their inability to survive into adulthood under natural conditions. Whether frequency of albinism, or simply field observation of these anomalies, is increasing warrants additional investigation. Future records of these anomalies should contain detailed color notes and accurate locality designations to allow more detailed study.

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