Referencias

AEMET. 2016. Servicios climatológicos. Datos climatologicos. <http://www.aemet.es/es/serviciosclimaticos/datos climatologicos/valoresclimatologicos?l=2462&k=mad> [Consulta: 25 octubre 2016].

Andrén, C. & Nilson, G. 1981. Reproductive success and risk of predation in normal and melanistic color morphs of the adder, *Vipera berus*. *Biological Journal of the Linnean Society*, 15: 235-246.

Bea, A. 1997. *Vipera latasti* Boscá, 1878. 394-395. *In*: Gasc, J.-P., Cabela, A., Crnobrnja-Isailovic, J., Dolmen, D., Grossenbacher, K., Haffner, P., Lescure, J., Martens, H., Martínez Rica, J.P., Maurin, H., Oliveira, M.E., Sofianidou, T.S., Veith, M. & Zuiderwijk, A. (eds.), *Atlas of Amphibians and Reptiles in Europe*. Societas Europaea Herpetologica & Muséum National d'Histoire Naturelle. Paris.

Brito, J.C. 2001. A record of melanism in *Vipera latasti*. *Herpetological Bulletin*, 76: 28-29.

Broennimann, O., Ursenbacher, S., Meyer, A., Golay, P., Monney, J.C., Schmocker, H. & Dubey, S. 2014. Influence of climate on the presence of colour polymorphism in two montane reptile species. *Biology Letters*, 10: 20140638.

Capula, M. & Luiselli, L. 1994. Reproductive strategies in alpine adders, *Vipera berus*: the black females bear more often. *Acta Oecologica*, 15: 207-214.

Climatedata.org. 2016. Clima: Rascafría. <http://es.climate-data.org/location/218041/> [Consulta: 16 octubre 2016].

Clusella-Trullas, S., Terblanche, J.S., Blackburn, T.M. & Chown, L. 2008. Testing the thermal melanism hypothesis: a macrophysiological approach. *Functional Ecology*, 22: 232-238.

ICNF. 2016. Geologia, Hidrologia, Clima. Instituto da Conservaçao da Natureza e das Florestas. <http://www.icnf.pt/portal/ap/pnpg/geo> [Consulta: 16 octubre 2016].

Lusis, J. 1961. On the biological meaning of colour polymorphism of lady beetle *Adalia bipunctata*. *Latvijas Entomologs*, 4: 3-29.

Martínez-Freiría, F., Pardavila, X. & Lamosa, A. 2012. Un nuevo caso de melanismo en *Vipera latastei*. *Boletín de la Asociación Herpetológica Española*, 23: 51-54.

Santos, X., Vidal-García, M., Brito, J.C., Fahd, S., Llorente, G.A., Martínez-Freiría, F. & Sillero, N. 2014. Phylogeographic and environmental correlates support the cryptic function of the zigzag pattern in a European viper. *Evolutionary Ecology*, 28: 611-626.

Schleich, H.H., Kastle, W. & Kabisch, K. 1996. *Amphibians and Reptiles of North Africa*. Koeltz Scientific Publishers. Koenigstein.

True, J.R. 2003. Insect melanism: The molecules matter. *Trends in Ecology and Evolution*, 18: 640-647.

Leucistic neoteny in *Pleurodeles waltl*. First observation recorded in Spain

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Resumen: La presente nota da a conocer el primer caso documentado en la península ibérica de un ejemplar neoténico leucístico de *Pleurodeles waltl*. La descripción del ejemplar se acompaña de una breve revisión de las anomalías pigmentarias en esta especie y del concepto de las mismas.

In general, the coloration of animal species plays an important role in avoiding predators, obtaining food, sexual selection, inter- and intraspecies communication and, in the case of ectotherms, also in thermoregulation (Alaminos & López, 2011; Hinckley *et al.*, 2015). Meanwhile, variations or anomalies in the pattern and the color of the species have been widely studied and the timely appearance of colorations and atypical patterns of some of them have been documented (García-Roa *et al.*, 2015). Sometimes the misuse of certain scientific terms is implanted in society, leading to their use with no rigor. This is the case of albi-

Figure 1: Comes pond in the village of El Perelló in the province of Tarragona, where the leucistic specimen, *P. waltl*, was found.
Figura 1: Charca de Comes en el municipio de El Perelló en la provincia de Tarragona, donde se descubrió el ejemplar leucístico de *P. waltl*.

nism, which has been stripped off its meaning and its use, has been generalized every time a living being presents a white coloration.

According to García-Morales *et al.* (2010), we should differentiate between albinism, dilution, squizocroism and leucism. Albinism is a rare genetically determined abnormality in wild animals, defined as the absence of melanin produced by a defect in its synthesis by the melanophores in the skin and hair (Diego-Rasilla & Luengo, 2007; Romero & Real, 2007; García-Morales *et al.*, 2010; Alaminos & López, 2011; Jiménez-Cazalla, 2011; Modesti *et al.*, 2011; Ayllón, 2013). In this case, the iris of the eye does not contain pigment, showing a red coloration due to the blood capillaries (Romero & Real, 2007; Galán, 2010; Jiménez-Cazalla, 2011; Modesti *et al.*, 2011; Ayllón, 2013). Dilution occurs when the color tone is reduced (García-Morales *et al.*, 2010). The squizocroism happens when a pigment is not expressed without affecting another (García-Morales *et al.*, 2010). Finally, leucism is a deficiency of a particular pigment (melanin) or all pigments and differs from albinism that generally possess white or clear yellow skin, hair and scales, but with darkly pigmented eyes and nails (García-Morales *et al.*, 2010; Modesti *et al.*, 2011). In this sense, the leucistic animals do not appear to be more vulnerable to exposure to sunlight and have no vision problems as in albinos (Alaminos & López, 2011; Modesti *et al.*, 2011).

Given these definitions, this paper provides the first record of an individual neotenic leucistic of Iberian ribbed newt (*Pleurodeles waltl*, Michahelles 1830) in the Iberian Peninsula. The specimen was found in the Comes pond (10x10: 31N CF02), 283 masl, Ø = 17.5 m and 1.30 m average depth (Figure 1), in the municipality of El Perelló, Baix Ebre (Tarragona). The discovery was made on 11th February 2016, during the work of management and conservation of that species made by technicians of the Generalitat de Catalunya.

The individual had light-coloured yellow pigmentation in the cutaneous tissue which made it very visible in relation to their congeners (Figure 2, 3 and 4). The yellowing is because these individuals have normal xanthophores and iridophores (Galán, 2010; Jiménez-Cazalla, 2011; Modesti *et al.*, 2011). You can see the external gills with red colouration due to the visualization of blood capillaries (Figure 2 and 3). The iris was golden and the pupil was brown (Figure 4), showing some pigmentation in the retina. This individual lacked design dorsal black spots, except tail, which showed some of them, mainly in the caudal region (Figure 2). The usual coloration of the upper parts of the Iberian ribbed newt have irregular dark spots on olive, brown or gray background and allows them to camouflage in both terrestrial and aquatic habitats (Rivera *et al.*, 2011; Salvador & Martínez-Solano, 2014). In this regard, coloration and absence of spots make these animals more vulnerable to their predators and more visible by their prey. The specimens that have the

Figure 2: Individuals of *P. waltl*, neotenic with normal colour (left) and leucistic neotenic (right).
Figura 2: Ejemplares de *P. waltl*, neoténico con coloración normal (izquierda) y neoténico leucístico (derecha).

Figure 3: Side view of a leucistic individual, where the spots are seen in the caudal region. Note the pigmentation of external gills and the development of their limbs.
Figura 3: Vista lateral del individuo leucístico, donde se aprecian las manchas en la región caudal. Obsérvese la pigmentación de las branquias externas y el desarrollo de sus extremidades.

Figure 4: *Pleurodeles waltl* larva. Front detail of a normal neotenic morphotype (left) and of a leucistic neotenic individual (right). Both individuals showed the normal pigmentation of the pupil and the iris.
Figura 4: Larva de *Pleurodeles waltl*. Detalle frontal de un neoténico de morfotipo normal (izquierda) y del neoténico leucístico (derecha). Se puede observar la pigmentación normal de la pupila e iris en ambos individuos.

mentioned phenotypic abnormalities are easily detectable by their predators and their survival rate is usually rare (Martínez-Silvestre *et al.*, 2009; Galán, 2010; Busack & Donaire, 2014). However, being a crepuscular / nocturnal species and being in a pond with muddy water could have helped their survival.

In this capture session, a total of 88 individuals, 31 adults (10 females, 21 males) were collected and 57 neotenous, this being the only specimen showing an abnormal coloration. In turn, it had captured several individuals of *Pelophylax perezi* (approximately 20 adult individuals) and two larvae of *Pelobates cultripes* in the same pond.

Within the Amphibia class, although rare, there are several citations of cases of albinism or leucism both in Urodela and in Anura (see for example collections of Rivera *et al.*, 2001; Romero & Real, 2007; Galán, 2010; Jiménez-Cazalla, 2011; or Modesti *et al.*, 2011). In these reviews pigmentary defects in any stage of development, even albin eggs (Ayllón, 2013), are reported.

However, in these records there are not any explicit descriptions of any neotenic individual with abnormalities in coloration. Consequently, this would be the first note reported on a neotenic leucistic amphibian as long as we know. In the case of the Iberian ribbed newt, these anomalies are reported infrequently, suggesting that individuals who survive are rare or that the condition itself is rare (Busack & Donaire, 2014). There are three registers of full albinism in larvae of *P. waltl*, four partial albino adults and leucistic larva and other not well defined cases in their pigmentary anomalies (see collection Busack & Donaire, 2014, or Salvador & Martínez-Solano, 2014).

Moreover, this individual can be neoteny - paedomorphosis in which sexual maturity is reached maintaining larval characters (Fuentes *et al.*, 2011), as it presents a big size and developed limbs of adult character and preserves the reduced external gills and a soft epidermis as characters of larval stage (Figure 3). However, we can not have absolute security that the individual is neotenic as we would have to check their sexual maturity watching its genitalia, surely killing him. In certain cases, neoteny can be considered as an evolutionary advantage determined by recessive genes and influenced by environmental conditions (Fuentes *et al.*, 2011). It would be advisable to study these populations, as they represent the northernmost limit of the northeastern end of the distribution of the species (Fontanet *et al.*, 1982; Llorente *et al.*, 1995; Orriols, 2009; Rivera *et al.*, 2011; Salvador & Martínez-Solano, 2014), and these are in sharp decline (Guinart-Patiño *et al.*, 2012).

Given that morphological variability and coloration of the populations of this species have not been studied in detail (Salvador & Martínez-Solano, 2014) and that the frequency of observation of these abnormalities is increasing, it would be justified an additional investigation recording future anomalies in more precise notes to allow a more detailed study (Busack & Donaire, 2014).

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References

Alaminos, E.A. & López, J.J.L. 2011. Un caso de albinismo en *Natrix maura* en el sur de la Península Ibérica. *Boletín de la Asociación Herpetológica Española*, 22: 81-82.

Ayllón, E. 2013. Primera observación de una puesta albina de *Bufo bufo* en la Península Ibérica. *Boletín de la Asociación Herpetológica Española*, 24: 69-70.

Busack, S.D. & Donaire, D. 2014. Albinism in *Pleurodeles waltl*. *Boletín de la Asociación Herpetológica Española*, 25: 12-14.

Diego-Rasilla, F.J. & Luengo, R.M. 2007. Varios casos de albinismo en *Alytes obstetricans* (Laurenti, 1768). *Boletín de la Asociación Herpetológica Española*, 18: 92-93.

Fontanet, X., Giménez, S., Guarner, N., Horta, H., Masso, J., Rovira, J. & Sáez, M. 1982. Notas sobre la distribución del *Pleurodeles waltl* ii Michahelles en el sur de Catalunya. *Publicaciones del Centro Pirenaido de Biología Experimental*, 13: 39-41.

Fuentes, J., García-Cardenete, L., Escoriza, E., Esteban, J.L. & Benavides, J. 2011. Neotenia en *Triturus pygmaeus*. Observación en el sur de Jaén. *Boletín de la Asociación Herpetológica Española*, 22: 96- 98.

Galán, P. 2010. Mutación leucística en *Lissotriton boscai* de Galicia. *Boletín de la Asociación Herpetológica Española*, 21: 58-61.

García-Morales, R., Gordillo-Chávez, E.J. & Bello-Gutiérrez, J. 2010. Primer registro de albinismo en *Glossophaga soricina* (Phyllostomidae) en México. *Chiroptera Neotropical*, 16: 743-747.

García-Roa, R., Ortega, J., López, P. & Martín, J. 2015. Coloración atípica en una hembra de *Iberolacerta cyreni* en la Sierra de Guadarrama (Madrid). *Boletín de la Asociación Herpetológica Española*, 26: 8- 9.

Guinart-Patiño, E., Martínez-Martínez. D., Such-Sanz. A. 2012. Distribution and Conservation problems of Spanish ribbed newt (*Pleurodeles waltl*) in the north-easter iberian population. 18. *In*: *Libro de resúmenes X Congreso Luso-Español de Herpetología*. Coimbra.

Hinckley, A., Herrero, D. & de Castro Vidal, A. G. 2015. First case of a facial dark pattern in *Mauremys leprosa*. *Boletín de la Asociación Herpetológica Española*, 26: 33- 35.

Jiménez-Cazalla, F. 2011. Albinismo en un adulto de *Pelophylax perezi* en el sur de Cádiz (SO de la Península Ibérica). *Boletín de la Asociación Herpetológica Española*, 22: 62- 64.

Llorente, G.A., Montori, A., Santos, X. & Carretero, M.A. 1995. *Atlas de distribució dels anfibis y rèptils de Catalunya i Andorra*. El Brau. Figueres.

Martínez-Silvestre, A., Soler, J., Gener, J.M., García, M. & Martí, C. 2009. Albinismo total de *Coronella girondica* en la Península Ibérica. *Boletín de la Asociación Herpetológica Española*, 20: 44-45.

Modesti, A., Aguzzi, S. & Manenti, R. 2011. A case of complete albinism in *Lissotriton vulgaris meridionalis*. *Herpetology Notes*, 4: 395-396.

Orriols, F.A. 2009. Síntesi biogeogràfica dels amfibis i rèptils del Montseny. *Lauro*, 30: 47.

Rivera, X., Arribas, O. & Martí, F. 2001. Revisión de anomalías pigmentarias en los anfibios de la Península Ibérica y de Europa. *Butlletí de la Societat Catalana d'Herpetologia*, 15: 59-75.

Rivera, X., Escoriza, D., Maluquer-Margalef, J., Arribas, Ó., & Carranza, S. 2011. *Amfibis i rèptils de Catalunya, País Valencià i Balears*. Lynx Edicions & SCH. Bellaterra. Barcelona.

Romero, D. & Real, R. 2007. Albinismo parcial en un macho de *Triturus pygmaeus* (Wolterstorff, 1905). *Boletín de la Asociación Herpetológica Española*, 18: 93.

Salvador, A. & Martínez-Solano, I. (eds.). 2014. Gallipato– *Pleurodeles waltl* Michahelles, 1830. *Enciclopedia Virtual de los Vertebrados Españoles*. Museo Nacional de Ciencias Naturales, Madrid. <http://www.vertebradosibericos.org/> [Accessed: February 23, 2016].

Predation of *Bufo calamita* eggs by *Discoglossus pictus* tadpoles

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Resumen: El sapillo pintojo (*Discoglossus pictus*) es una especie introducida desde el norte de África que presenta una expansión continua en el noreste de Cataluña y el sur de Francia. En las charcas usadas como punto de reproducción coincide sobre todo con el sapo corredor (*Bufo calamita*), comúnmente considerado su principal competidor nativo. En esta nota informamos de una observación nocturna de un grupo de renacuajos de *D. pictus* alimentándose de una puesta de *B. calamita* en una charca natural cerca del límite sur de expansión de la especie invasora. Posteriores observaciones en charcas cercanas en las que se podría repetir la depredación por la presencia tanto de renacuajos de *D. pictus* como de puestas de *B. calamita* no han dado lugar a observaciones similares, lo que hace pensar a los autores que no se trata de un hecho muy común.

The Mediterranean Painted Frog (*Discoglossus pictus*) is a species native of North Africa and lives in Eastern Morocco, Algeria and Tunis and in the islands of Sicily, Malta and Gozo (Lanza *et al.*, 1986; Pabijan *et al.*, 2012). It was introduced in Banyuls de la Marenda, Southern France, at the beginning of the 20th century (Wintrebert, 1908) and since then, it has expanded north and southwards, with similar rates of spread (Montori *et al.*, 2007; Llorente *et al.*, 2016). It is still expanding (SIARE, 2016), being the southern limit of the continuous expansion found nowadays near St. Celoni (Barcelona Province, NE Spain).

In its invasive range, *D. pictus* usually reproduces in temporary or ephemeral ponds commonly shared with native species with similar preferences, like *Bufo calamita* or *Pelodytes punctatus* (Montori *et al.*, 2007; Llorente *et al.*, 2016). Concretely, Richter-Boix *et al.* (2013) estimated a niche overlap in breeding areas between *Discoglossus pictus* and *Bufo calamita* of 0.99 over 1, meaning that is it very common to see them as larval competitors in the same ponds. When they share ponds, previous studies suggest a displacement of *B. calamita* to non-preferred food resources and greater competitive abilities of *D. pictus* (San Sebastián *et al.*, 2015a).

On 9th March 2016, approximately at 19:00 h, during a nocturnal survey to check the southern expansion front of *D. pictus*, we found in a pond near La Batllòria (UTM: 31T 4619000m N , 463802m E), a group