A report of leucism in an *Alytes dickhilleni* tadpole in southern Spain

Germán Franco[1], Raúl Arroyo-Morales[2] & Adrián Martín-Taboada[2]

[1] Cl. Alcalde Manuel Reina, 6. 3º B4. 29700 Vélez-Málaga. Málaga. Spain. C.e.: german.francopolo@gmail.com
[2] Biogeography, Diversity and Conservation Research Team. Department of Animal Biology. Faculty of Sciences. University of Málaga. 29071 Málaga. Spain.

Fecha de aceptación: 28 de mayo de 2023.
Key words: Almijara, anomalies, anuran, coloration, midwife, pigmentation.

Resumen: Durante un muestreo nocturno en las afueras del núcleo urbano de Frigiliana (Málaga), en el Parque Natural de las Sierras de Tejeda, Almijara y Alhama, el 9 de abril de 2022 fue encontrado un renacuajo de *Alytes dickhilleni* con una coloración atípica, pudiendo representar un caso de leucismo en la especie.

Chromatophores are pigment-containing cells that, under the incidence of light, reflect different colours in the skin and eyes of various animal taxa. Depending on the colours reflected by the pigments they contain, up to six types of chromatophores can be distinguished in amphibians: melanophores (black and brown), cyanophores (blue), xanthophores (yellow), leucophores (white), erythrophores (red) and iridiophores (iridescent sheens) (Lunghi *et al.*, 2017).

Leucism is manifested by the total or partial absence of pigmentation due to a de-

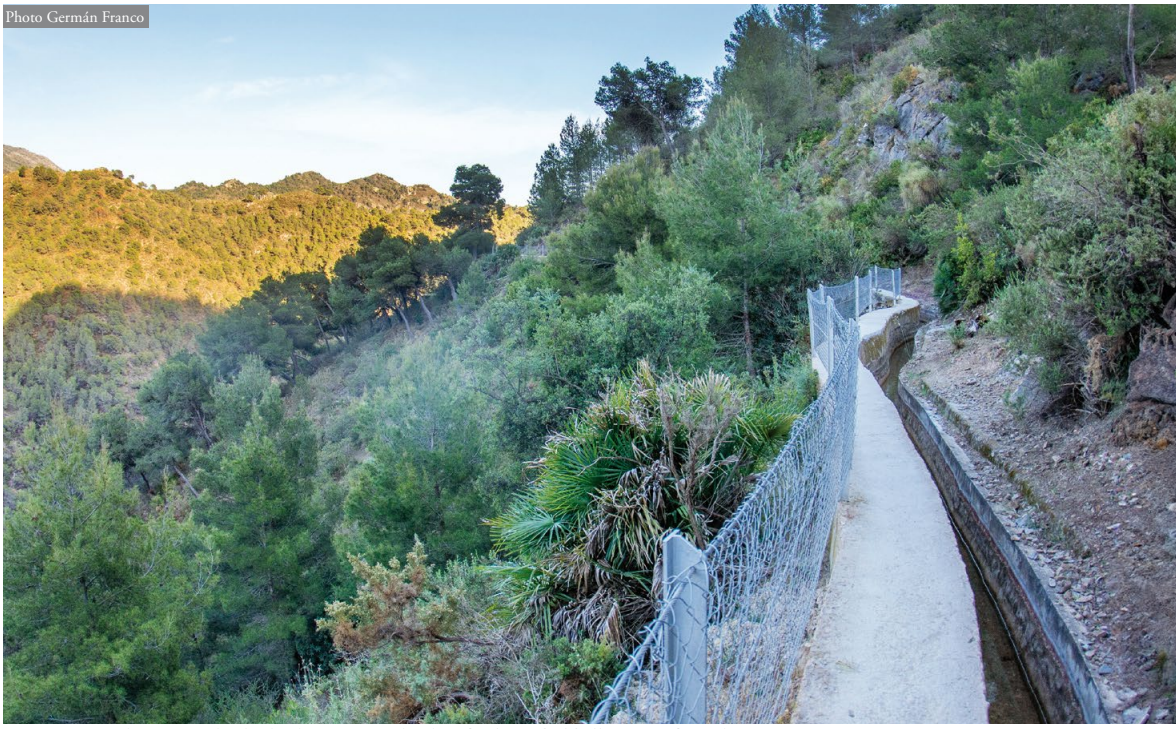

Figure 1: Habitat in which the leucistic tadpole of *Alytes dickhilleni* was found.
Figura 1: Hábitat en el que se encontró el renacuajo leucístico de *Alytes dickhilleni*.

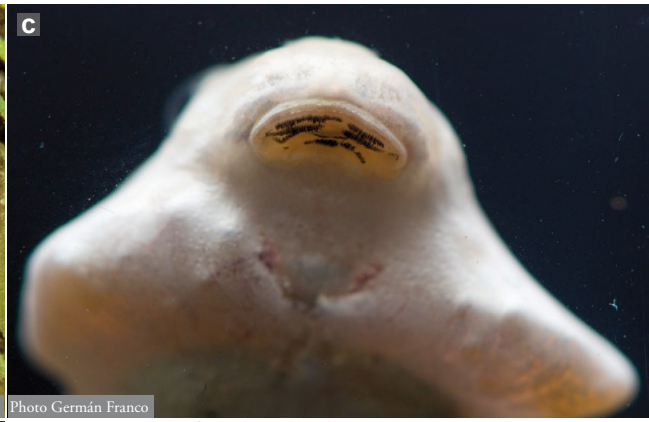

Figure 2: Images of a) the tadpole with normal colouration; b) Full body portrait of the leucistic individual; and c) Detail of the oral disc and dental formula of the leucistic individual.

Figura 2: Imágenes de a) un renacuajo con coloración normal; b) Retrato de cuerpo entero del individuo leucístico; y c) Detalle del disco oral y fórmula dentaria del individuo leucístico.

ficit of melanin present in the melanophores, which confers a pale or patchy coloration of the skin, except in the eyes, which show blueish or normal pigmentation. This last aspect differentiates it from albinism, in which the eyes are completely unpigmented, showing a pinkish or reddish colour due to the blood capillarity of the eyeballs (Bechtel, 1995; Lunghi *et al.*, 2017).

Albinism and leucism are well documented in Iberian amphibian species, with records for *Salamandra salamandra* (Dopereiro & Puras, 2018), *Lissotriton boscai* (Dopereiro *et al.*, 2018), *Rana temporaria* (Elizalde, 2019), *Pelobates cultripes* (Esteban, 2016; Kolesk a *et al.*, 2022), *Pleurodeles waltl* (Díaz *et al.*, 2019), and others.

The Betic Midwife Toad, *Alytes dickhilleni* Arntzen & García-París 1995, is a small, robust-looking species of anuran belonging to the family Alytidae, reaching a maximum length of less than 57 mm. It is endemic to the Sierras Béticas, in the southeast of the Iberian Peninsula. It prefers pine and/or holm oak forests, but it can be also found in open areas, but always close to permanent, clean waters (Salvador, 2015). Like other midwife toad species, after amplexus, the male Betic Midwife Toad carries the fertilized eggs until the tadpoles are ready to hatch, at which time it will deposit them in the water. This species is listed as EN (Endangered) by the IUCN on a global and European scale (IUCN, 2022).

On April 9th 2021 at ca 22:33 (local time) we observed approximately 15 adult specimen and countless tadpoles of *A. dickhilleni* in Sierras of Tejeda, Almijara and Alhama Natural Park, Andalu-

sia, Spain (36º48'N / 3º53'W; 450 masl). Animals were active during the nighttime; the ambient temperature was ca 14° C. The habitat is a steep mountainous terrain with dense shrubby vegetation dotted mainly with *Pinus pinaster* and *Pinus halepensis*, with the presence of Mediterranean scrub consisting of *Salvia rosmarinus*, *Cistus albidus*, *Smilax aspera*, *Buxus balearica*, *Chamaerops humilis* and other species. An irrigation ditch runs through the area and serves as a permanent water point (Figure 1).

One of the tadpoles we observed had an unusual colouration, being completely white. We photographed this specimen for approximately 30 minutes using a small aquarium in order to capture as many details as possible. Special emphasis was laid on photographing the oral disc structure of the tadpole, as well as the mottling of the tail and other parts of the animal's anatomy that might be relevant (Figure 2). The specimen had no visible wounds and appeared to be in good general condition, being close to the development of its front legs, stage 41 according to Gosner (1960). After taking the pictures, the individual was released at the same place. This case is added to the large list of sightings of individuals within the genus *Alytes* showing pigmentary anomalies (Benavides *et al.*, 2000; Diego-Rasilla & Luengo, 2007; Barnestein & González de la Vega, 2011).

Acknowledgements: We would like to thank F. Alfonseca, J.J. González, M. Ruiz and J.M. Merchán for their company and help during the night expedition in which the animal featured in this article was detected.

References

Barnestein, J.A.M. & González de la Vega, J.P. 2011. Albinismo en *Alytes cisternasii* (Boscá, 1879) en Sierra Morena, Córdoba (Andalucía, Sur de España). *Butlletí de la Societat Catalana d'Herpetologia*, 19: 139–141.

Bechtel, H.B. 1995. *Reptile and amphibian variants: Colors, patterns, and scales*. Krieger Publishing Company. Malabar. Florida. USA.

Benavides, J., Viedma, A., Clivilles, J., Ortiz, A. & Gutiérrez, J.M. 2000. Albinismo en *Alytes dickhilleni* y *Salamandra salamandra* en la Sierra de Castril (Granada). *Boletín de la Asociación Herpetológica Española*, 11: 83.

Díaz, C.C., Pérez, M.Á., Díaz, A., Montes, G.S. & Martínez-Solano, I. 2019. A report of complete albinism in an adult *Pleurodeles waltl* in the wild. *Boletín de la Asociación Herpetológica Española*, 30(2): 29–31.

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

Dopereiro, D. & Puras, M. 2018. Leucismo en *Salamandra salamandra* de Galicia. *Boletín de la Asociación Herpetológica Española*, 29(1): 25–26.

Dopereiro, D., Espasandín, I. & Cuervo, M. 2018. Nuevo caso de mutación leucística en *Lissotriton boscai* de Galicia. *Boletín de la Asociación Herpetológica Española*, 29(1): 32–33.

Elizalde, Á.R. 2019. A unique case of albinism in *Rana temporaria parvipalmata* in Cantabria. *Boletín de la Asociación Herpetológica Española*, 30(2): 25–29.

Esteban, M.R. 2016. Nuevo registro de un ejemplar de *Pelobates cultripes* albino en Zamora. *Boletín de la Asociación Herpetológica Española*, 27(1): 50–51.

Gosner, K.L. 1960. A simplified table for staging anuran embryos and larvae with notes on identification. *Herpetologica*, 16: 183–190.

IUCN. 2022. *Alytes dickhilleni*. *The IUCN Red List of Threatened Species* 2022: e.T979A89697540. <https://dx.doi.org/10.2305/IUCN.UK.2022-1.RLTS.T979A89697540.en> [Accessed: April 28, 2023].

Koleska, D., Koleskova, V. & Franco, G. 2022. A report of leucism in an adult *Pelobates cultripes* in the wild. *Boletín de la Asociación Herpetológica Española*, 33: 23–25.

Lunghi, E., Monti, A., Binda, A., Piazzi, I., Salvadori, M., Cogoni, R., Riefolo, L.A., Biancardi, C., Mezzadri, S., Avitabile, D., *et al.* 2017. Cases of albinism and leucism in amphibians in Italy: new reports. *Natural History Sciences*, 4(1): 73–80.

Salvador, A. 2015. Sapo partero bético - *Alytes dickhilleni*. *In*: Salvador, A., Martínez-Solano, I. (eds.). *Enciclopedia Virtual de los Vertebrados Españoles*. Museo Nacional de Ciencias Naturales, Madrid. <http://www.vertebradosibericos.org/>.