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Tail bifurcation recorded in *Chioglossa lusitanica*

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RESUMEN: La cola bífida es una malformación que se ha registrado en diversas especies de anfibios en todo el mundo, estando asociada en numerosas ocasiones a una hiperregeneración desencadenada por un daño mecánico. En esta nota presentamos un nuevo caso de cola bifurcada para el salamándrido ibérico *Chioglossa lusitanica*.

The golden-striped salamander (*Chioglossa lusitanica*) is an endemic species found in the northwestern corner of the Iberian Peninsula. This streamside salamander is able to drop its tail as anti-predatory behaviour, a mechanism called caudal autotomy (Arntzen, 1999; García-París *et al.*, 2004; Vences, 2014).

Chioglossa lusitanica is the only Iberian urodele that has this ability and subsequently is able to regenerate the tail (Vences, 1990, 2014; Arntzen, 1999). The importance of the tail in this species is very remarkable, having functional importance in locomotion, respiration, energy storage and behaviour (Wake & Dresner, 1967).

Occasionally after mechanical damage, generally caused by an attempted predation, the tail may undergo a bifurcation process. This is the most common cause of the appearance of bifid-tail animals (Dawson, 1932; Lynn, 1950). In European urodeles, tail bifurcation has been reported in *Calotriton arnoldi* (Martínez-Silvestre *et al.*, 2014), *Ichthyosaura alpestris* (Hachtel, 2011), *Lissotriton helveticus* (Giltay, 1932; Gosá, 2018), *Lissotriton montandoni* (Smirnov, 2014), *Salamandrina perspicillata* (Romano *et al.*, 2017), *Triturus carnifex* (Brandt, 1933; Henle *et al.*, 2012), *T. cristatus* (Bruch, 1864) and *T. dobrogicus* (Henle *et al.*, 2012). In the case of *C. lusitanica*, Sequeira *et al.* (1999) have



Figure 1: Dorsal view of the *Chioglossa lusitanica* specimen with bifid tail.
Figura 1: Vista dorsal del espécimen de *Chioglossa lusitanica* con cola bifida.

previously recorded this anomaly in Serra de Santa Justa (Portugal).

On 26 October 2019, during amphibian surveys in Cotobade (Galicia, Spain; UTM 1x1 km: 29T NH4101; 441 masl), we observed a single specimen of *C. lusitanica* with an abnormal bifid tail (Figure 1). The specimen showed a secondary tail laterally attached to the first proximal third of the normal tail. Both tails had the same pigmentation and thickness but the bifurcated tail was noticeably shorter, more rigid and curved. The salamander exhibited no other deformities.

The specimen was found in a stony stream that runs through a native forest of *Quercus robur* and *Betula alba*. This area was surveyed several times and no other anomalous amphibian was detected.

Morphological anomalies of amphibians can be attributed to several causes such as pollution, UV radiation, parasites, predation, or synergistic interaction among some of these factors (Ouellet, 2000; Ankley *et al.*, 2004). Identifying which of these causes interfere is often difficult. However, given the absence of other individuals with malformations, hyper-regeneration after mechanical damage caused by predators seems to be the most likely hypothesis.

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Axanthism in *Phyllomedusa iheringii* (Anura: Phyllomedusidae) in the southern limit of distribution

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RESUMEN: La coloración atípica en los anfibios es un fenómeno raro que a veces ocurre en la naturaleza. Se encontró un espécimen de tono azul brillante de *Phyllomedusa iheringii* durante una sesión de encuestas en Maldonado, Uruguay. Esta coloración responde a una mutación genética que altera la producción de pigmentos amarillos y que podría estar indicando cierto grado de aislamiento local en las poblaciones del entorno. A pesar de tratarse de un registro aislado, es de destacar que la mutación se detectó en el límite sur de la distribución mundial de la especie.

Phyllomedusa iheringii or Southern Walking Leaf Frog is an anuran of the medium-sized (from 6.4 to 7.4 cm) Hylidae family (Achaval & Olmos, 2007). Of arboreal habits, *P. iheringii* occupies forest ecosystems of Rio Grande do Sul (Brazil) and Uruguay. According to distribution map shown in Maneyro & Carreira (2012), the species would

be present in 43% of the national territory of Uruguay. *P. iheringii* has an intense coloration with bright-green back and light-yellow belly, presenting a pattern of violet spots on a yellow background on the legs and lower region of the flanks (Maneyro & Carreira, 2012).

Some authors have published different cases of pigmentary anomalies in amphibians (Rivera *et al.*,