

Polymely in the smooth newt *Lissotriton vulgaris* and the palmate newt *Lissotriton helveticus*

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The smooth newt (*Lissotriton vulgaris*) is a widespread amphibian species found throughout western Europe and is the most common newt species in the British Isles (Speybroeck et al., 2016). Adults grow to 11 cm in length and can be found in a variety of habitats from garden ponds to lakes and streams. The palmate newt (*Lissotriton helveticus*) is the smallest newt species in Britain reaching a maximum length of 10 cm (Speybroeck et al., 2016). Its range is more restricted in mainland Europe and Britain than the smooth newt and it is typically found in shallow pools on heathland and moorland, but can on occasion be found in less acidic environments and sometimes in the presence of other native newts (Speybroeck et al., 2016).

Amphibians can exhibit a number of different limb deformities (Laurentino et al., 2016). The presence of an additional limb (polymely) is often the most cited amphibian deformity in the scientific literature although as extra limbs are particularly conspicuous they may be reported disproportionately (Ouellet, 2000). Polymely mostly results from an incomplete injury that sometimes causes a limb to both heal and regenerate (Nye et al., 2003) but it may also result from parasitic infection (Sessions & Ruth, 1990). The presence of additional limbs has been recorded in many amphibian species, but mostly from frogs and toads rather than newts (Canestrelli et al., 2006). Polymely has previously been recorded in smooth newts (see Vershinin & Berzin, 2018) but there do not appear to be reports of this anomaly occurring in palmate newts.

The first case is of a female smooth newt with a supernumerary left hindlimb (Fig. 1). This newt was discovered during an evening toad patrol organised by the Hampshire and Isle of Wight Amphibian and Reptile Group on 21st February 2020 at Wildmoor Lane, Sherfield-on-Loddon (51° 18' 24.4" N 1° 00' 48.2" W). The newt was collected from a road surface while migrating towards a pond on the nearby Sherfield Oaks Golf Course and placed in a bucket. Before the newt was released in the nearby pond it was sexed and at that time the supernumerary hindlimb was detected. The extra limb comprised a secondary fibula, tibia and foot, attached to the anterior surface of the right hindlimb (Fig. 1). Apart from being less developed than the adjoining limb (the extra foot was roughly 60 % smaller) all five digits were present and moved independently of the main foot.

The newt's movement did not seem to be impaired by the additional limb.



Figure 1. Female smooth newt (*Lissotriton vulgaris*) with an extra limb on the anterior surface of the right hindlimb, anterior view (left) and dorsal view (right)

The second case was of a female palmate newt with a supernumerary right forelimb (Fig. 2). The newt was maintained in a captive population in North Wales, housed in an artificial greenhouse pond along with two other newts species, the Macedonian crested newt (*Triturus macedonicus*) and the Bosnian alpine newt (*Ichthyosaura alpestris reiseri*).

The pond was stocked with hornwort (*Ceratophyllum demersum*) and contained potential predators such as dragonfly larvae and water beetles. Similar to the first case, the affected newt had an entire additional limb complete with humerus, radius and ulna although digits II and III were united (syndactyly) (Fig. 2).

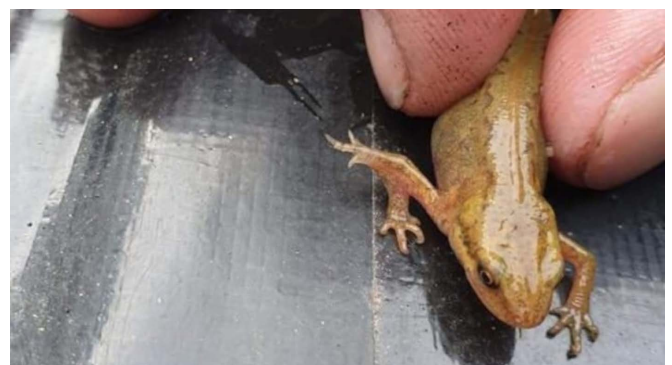


Figure 2. Female palmate newt (*Lissotriton helveticus*) with an extra limb extending from the distal end of the right humerus (NB the pale stripe on both front forelimbs is believed to be a reflection of light from the wet skin)

In both cases the supernumerary limbs are most likely to have been caused by an injury, such as an unsuccessful predation attempt.

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