

Observation of a paedomorphic palmate newt (*Lissotriton helveticus*) in Scotland

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Paedomorphosis or neoteny is one of two developmental pathways that amphibians can follow (Denoël, 2006), and is characterised by the maintenance of juvenile features, such as external gills, through to adulthood (Whiteman, 1994). In newts, neoteny may be dependent on environmental determinants (Denoël, 2005) and is uncommon in Scotland (McInerny & Minting, 2016). Since 2012, the author has undertaken amphibian monitoring of up to 30 ponds in East Kilbride, South Lanarkshire, Scotland, utilising standard methods (Paterson, 2014). This note reports the presence of a single individual paedomorphic palmate newt, *Lissotriton helveticus*, in Central Scotland.

On the 20th April 2014 at 22:00 a paedomorphic palmate newt *L. helveticus* was captured in a hand net (Fig. 1). The animal was adult sized (c.75 mm), with light brown dorsal surface colouration. It had a low, smooth dorsal fin over the posterior two thirds of the torso continuing to the tip of the tail, which did not have a terminal filament. A pair of dark dorsolateral stripes posterior of the shoulder continued to the hip becoming less distinct on the tail. The lateral surfaces were mottled dark fading onto the ventral surface which was light tan to cream and unmarked. The head was the same light brown as the dorsal surface, with the external gills lighter tan-yellow. The cloaca was small, and the animal appeared to have a distended stomach suggested that it was a gravid female, though this was not confirmed.

The newt was found in a Sustainable Urban Drainage System (SUDs) pond located at NS 59444 54170, approximately 1500 m² in area, and up to 1 m in depth (Fig. 2). The pond is densely vegetated with aquatic plants, though dominated by reeds (*Phragmites* sp.), and subject to runoff water effluent from the adjacent A726 dual carriageway. In addition to palmate newts, both common frogs *Rana temporaria* and common toads *Bufo bufo* inhabit the pond, the nearest detected population of smooth newts *Lissotriton vulgaris* is 1.4 km away.

Denoël (2005) notes that paedomorphic populations of *L. helveticus* are particularly common on the Larzac plateau, France, mostly in man-made ponds surrounded by arid habitat, suggesting that paedomorphosis in these cases may be facultative. However, the East Kilbride SUDs pond is surrounded by non-arid habitat and so it is unlikely that avoiding unfavourable terrestrial conditions is an explanation for paedomorphosis here. An alteration of the chemical balance of water bodies are known to affect the development of amphibians (Mann et al., 2009) and has been suggested as a potential cause of paedomorphosis (Dodd &



Figure 1. Female neotenic palmate newt *L. helveticus*, East Kilbride, Scotland, April 2014



Figure 2. The East Kilbride, Scotland SUDs in which the neotenic newt was found, April 2013

Callan, 1955). The East Kilbride SUDs pond is subject to run-off effluent from a road which may have altered the chemical composition, though this is untested. However, O'Brien (2015) noted in 12 SUDs throughout Inverness, Scotland that the inorganic chemical concentrations were lower than would be sufficient to cause adverse effects in amphibians. It has also been suggested that an explanation

for the presence of neotenic newts in higher latitudes is due to the cooler climate and shorter summers causing slowed larval development resulting in failure to reach maturity before winter (Banks, 1985).

No other paedomorphic newts have been found at the site. However, paedomorphic palmate newts have been reported in Fife, Scotland (Dodd & Callan, 1955) though are considered to be rare in Scotland, with paedomorphic great crested newts *Triturus cristatus* even rarer (McInerny & Minting, 2016). In the UK, paedomorphic smooth newts are encountered most often (Banks, 1985; Leeke, 1990) with paedomorphic great crested newts less commonly reported (Baker, 2006).

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