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SHORT COMMUNICATION

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‘Stress and wash’ may make great crested *Triturus cristatus* and smooth newts *Lissotriton vulgaris* palatable for grey herons *Ardea cinerea*, with a link to video evidence

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The smooth newt *Lissotriton vulgaris* is a widespread amphibian species widely distributed across western Europe, and notably common throughout most of Great Britain (Speybroeck et al., 2016). Growing up to 11 cm in length, *L. vulgaris* occupies a diverse range of aquatic and terrestrial environments. In contrast the great crested newt *Triturus cristatus*, Britain’s largest newt species reaching 16 cm in length, is found predominantly in deeper and more mature fish-free environments across northern Europe (Beebee & Griffiths, 2000; Speybroeck et al., 2016). In England, both species return to ponds to breed typically in February, and then in about June they leave water for terrestrial habitats, while the metamorphs leave water bodies later (Beebee & Griffiths, 2000). *Triturus cristatus* is known to produce defensive toxic secretions from glands within its skin, which are used to deter predators in combination with corresponding aposematic colouration (Kupfer & Teunis, 2001). The toxic secretion is often seen as a white foamy liquid that is released when the newt is agitated. It is known that the skin secretion of *T. cristatus* contains a heavy (long chain compound) proteinaceous toxin (Jaussi & Kunz, 1978) and that in both species there are low concentrations of tetrodotoxin and 6-epitetrodotoxin (Yotsu-Yamashita et al., 2007).

In the case of birds preying on amphibians with toxic skin secretions, it is known that some species use a ‘stress and wash’ technique to rid their prey of their toxins before swallowing them whole. Comparable behaviours have also been reported for bird species when predating on toxic amphibian species, such as the Australasian swamphen *Porphyrio melanotus* when feeding on cane toads *Rhinella marinus* (Wilk, 2018). The grey heron *Ardea cinerea* is known to be a predator of amphibians such as *T. cristatus* and *L. vulgaris*, fish, small mammals and other species that inhabit wetlands (Draulans et al., 1987; Jakubas & Mioduszewska, 2005; Inns, 2009). It is found in a variety of wetland habitats across Europe, Asia and parts of Africa. They stalk their prey within shallow water bodies and the surrounding terrestrial habitat (Cook, 1978; Draulans et al., 1987) and are extremely adaptable in their diet, being able to shift feeding strategies to exploit seasonally available food sources including ducklings (Marquiss & Leitch, 1990) and water voles *Arvicola amphibius* (Reid et al., 2022). However, there are no known written descriptions of *A. cinerea* using ‘stress and wash’ when preying upon amphibians, although the behaviour has been recorded in videos posted on YouTube, the earliest of which is by Linklater (2017) filmed at Dungeness in England.

From 2–18 April 2024, a juvenile *A. cinerea* was recorded in a pond by camera trap (Browning BTC-5DCL) feeding on

Figure 1. A juvenile grey heron *Ardea cinerea*, photographed by a camera trap, feeding on a great crested newt *Triturus cristatus*, using the ‘stress and wash’ technique

Table 1. Details of observations of a juvenile grey heron *Ardea cinerea* feeding on great crested *Triturus cristatus* and smooth newts *Lissotriton vulgaris*, at a pond in Shropshire using a Browning camera trap

Date	Time	Species consumed
2 April 2024	14:15 h	Smooth newt
2 April 2024	14:18 h	Great crested newt
2 April 2024	15:08 h	Great crested newt
8 April 2024	15:30 h	Smooth newt
18 April 2024	14:36 h	Great crested newt
18 April 2024*	22:43 h	Smooth newt

* indicates the observation of an adult heron feeding using the same technique

both *T. cristatus* and *L. vulgaris* (Fig. 1, Table 1). The pond, located in Acton Scott, Shropshire (52.4897679, -2.7982975), measured approximately 70 m by 25 m and approximately 2 m deep, with a mix of plant and animal species inhabiting it. This juvenile *A. cinerea* was apparently using the 'stress and wash' technique, whereby it can be seen agitating the captured newts by shaking them around, and then using the pond to wash the toxins released by the newts (BHS video, 2024). Additionally, an adult *A. cinerea* was photographed on 18 April 2024 at the same pond at night (22:43 h) feeding on an *L. vulgaris* using the same technique.

This is the first written record of *A. cinerea* using the 'stress and wash' technique when predating newts, although oddly, all of the observations of the juvenile *A. cinerea* predation on the newts were made in the afternoon (Table 1) and the one observation of an adult was at night. Herons are opportunistic predators of newts, and may consume toxic prey when they are more abundant, such as in the breeding season (Roulin & Dubey, 2013). These observations suggests careful behaviour in *A. cinerea* to reduce the concentration of toxin ingested when consuming the newts. Now while we cannot be sure that the newts were not regurgitated later, no newts were found around the area of the pond during the retrieval of the camera trap or routine monitoring, and given that Inns (2009) states that *A. cinerea* is a prodigious predator of great crested newts it very likely that the prey was digested.

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