

Attempted predation on a Smooth Newt, *Lissotriton vulgaris* (Linnaeus, 1758), by an Italian Crested Newt, *Triturus carnifex* (Laurenti, 1768), in Slovenia

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During the breeding season, newts can occur at high densities in breeding ponds, resulting in frequent interspecific interactions, including predator–prey encounters (Denoël and Lehmann, 2006; Mori et al., 2017). As both predators of aquatic organisms and prey for larger vertebrates, newts occupy an intermediate trophic position within freshwater food webs (Toledo et al., 2007; Wells, 2007).

The genus *Triturus* comprises some of the largest European newts and is characterised by prolonged aquatic breeding phases, complex courtship behaviour, and considerable ecological plasticity (Griffiths, 1996; Sillero et al., 2014). Species of *Triturus* are opportunistic generalist predators whose diet reflects local prey availability and habitat characteristics (Careddu et al., 2020; Iannella et al., 2020). The majority of their prey consists of aquatic invertebrates (imagines and larvae), crustaceans, molluscs and annelids, although larger *Triturus* species also consume vertebrate prey, particularly amphibian eggs and larvae (Villero et al., 2006; Careddu et al., 2020). Such trophic flexibility enables large newts to exploit a broad spectrum of prey resources and may facilitate opportunistic predation on other amphibians occurring within the same breeding ponds.

The Italian Crested Newt, *Triturus carnifex* (Laurenti, 1768), is among the largest European newts, reaching approximately 18 cm in total length and occurring throughout Italy and parts of the western Balkan Peninsula (Sillero et al., 2014). The species inhabits a variety of lentic freshwater habitats, including natural

ponds, marshes, and artificial water bodies, where adults remain aquatic throughout the breeding season (Jehle and Arntzen, 2000). Dietary studies indicate that *T. carnifex* is an opportunistic predator. Using stomach-content analyses and stable isotope analyses, Careddu et al. (2020) demonstrated that its diet is dominated by aquatic invertebrates but also includes conspecific eggs, larvae, and shed skin, indicating occasional exploitation of amphibian-derived food resources. Similarly, a broad trophic niche for *T. carnifex* inhabiting karst ponds was reported in central Italy (Iannella et al., 2020).

Lissotriton vulgaris (Linnaeus, 1758) frequently occurs syntopically with the substantially larger *T. carnifex* during the breeding season (Sillero et al., 2014; Mori et al., 2017). Although *T. carnifex* is an opportunistic predator that can consume amphibian eggs, larvae, and other amphibian-derived prey (Careddu et al., 2020; Iannella et al., 2020), direct observations of attacks on adult *L. vulgaris* are rarely documented. Predation on adult heterospecific newts has rarely been documented, but records include *T. marmoratus* preying on adult *Lissotriton boscai*, *Ichthyosaura alpestris*, and *L. helveticus* (Orizaola and Rodríguez del Valle, 2000; Crespo-Díaz and Sanz-Azkue, 2009; Baptista et al., 2015). Although this predator–prey interaction has previously been documented photographically in Slovenia (Mazej Grudnik and Triglav Brežnik, 2015), the present record provides the first detailed behavioural account of prey handling, ingestion attempts, and escape behaviour.

On 11 May 2024, at 21:30 h, we observed an attempted predation event by a female *Triturus carnifex* on a male *Lissotriton vulgaris* at Vodice, a karst pond approximately 400 m west of Abitanti village, southwestern Slovenia (45.4358°N, 13.8204°E; elevation 393 m). Air temperature was approximately 15 °C. The pond was approximately 1 m deep at its deepest point, with gently sloping shallow margins and abundant submerged and floating vegetation dominated

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by *Veronica beccabunga*, *Alisma plantago-aquatica*, *Eleocharis* sp., and *Chara* sp.; the surrounding landscape consisted of mixed karst forest and dry meadow. The predator was identified as *T. carnifex* by its overall morphology and distinct yellow dorsal line and sexed as female by the absence of the dorsal crest and white lateral tail stripe characteristic of breeding males. The prey was identified as *L. vulgaris* by its characteristic mottled ventral pattern with black spots, while the enlarged cloaca and blue and orange markings on the tail crest indicated a breeding male; identification and sex determination followed Speybroeck et al. (2016).

The interaction occurred in approximately 20 cm of water among submerged vegetation near the pond margin. The interaction was observed for approximately 3 min, but its total duration is unknown. When first detected, *T. carnifex* was firmly grasping *L. vulgaris* sideways in its jaws, with the prey's dorsal surface facing outward from the predator's mouth (Fig. 1A). Throughout the observation, the male *L. vulgaris* remained alive and actively attempted to escape by wriggling, twisting its body, and using its forelimbs against the predator. The female *T. carnifex* remained largely stationary, drifting slowly over the submerged

vegetation while maintaining its grasp on the prey (Fig. 1B). The predator occasionally made strong head movements and repositioned the male *L. vulgaris* within its jaws, apparently in attempts to facilitate ingestion. The observation ended when vigorous movements by both individuals disturbed the sediment and aquatic vegetation, obscuring the animals from view. When last visible, the male *L. vulgaris* was still alive and remained held in the jaws of *T. carnifex*. Successful ingestion could not be confirmed, and the outcome of the interaction remained unknown.

The observation occurred during the breeding season, when the pond also supported *Bombina variegata*, *Bufo bufo*, *Hyla arborea*, and *Rana dalmatina*, potentially increasing opportunities for interspecific encounters as amphibians aggregate and aquatic activity intensifies (Griffiths, 1996; Jehle and Arntzen, 2000). A large dietary study of syntopic *T. carnifex* and *L. vulgaris* did not identify adult *L. vulgaris* as a prey item (Stellati et al., 2021), suggesting that adults are not commonly detected in the diet of *T. carnifex*. Comparable predation on adult heterospecific newts has also been documented in *T. marmoratus* (Orizaola and Rodríguez del Valle, 2000; Crespo-Díaz and Sanz-

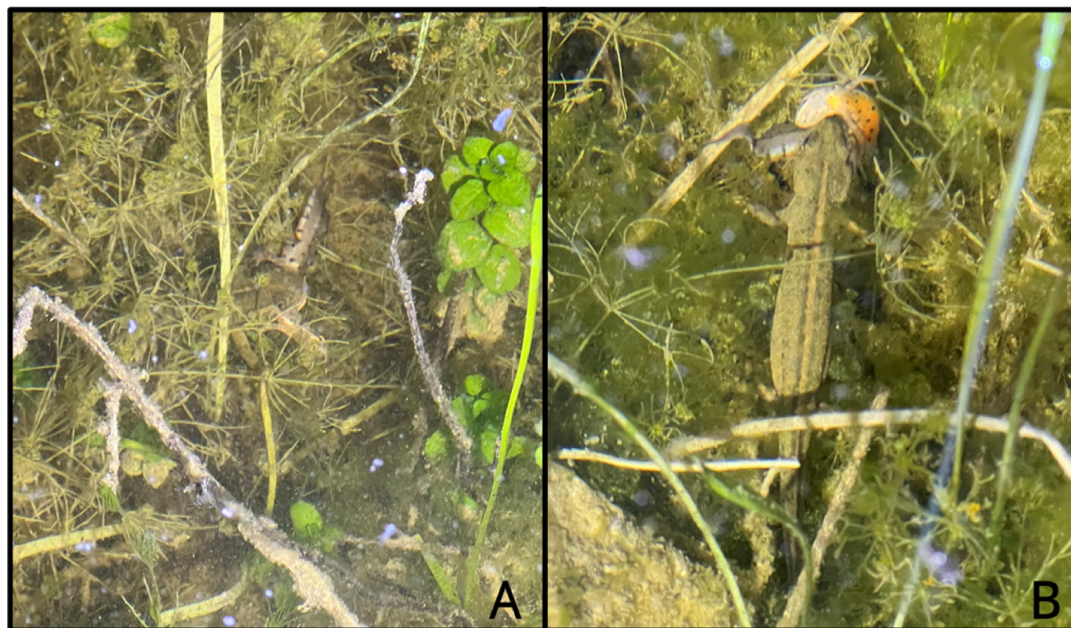


Figure 1. Female *Triturus carnifex* grasping a male *Lissotriton vulgaris* during an attempted predation event near Abitanti, southwestern Slovenia, on 11 May 2024. (A) Individuals when first observed. (B) The interaction shortly before the animals were obscured from view. Photos by Nik Šabeder.

Azkue, 2009; Baptista et al., 2015). Females were the predators in several published cases for which sex was documented, although the small number of records is insufficient to establish a female bias. This apparent pattern has been tentatively attributed to the increased energetic demands associated with egg production (Baptista et al., 2015), but the limited number of observations does not currently allow this hypothesis to be evaluated. Together, these observations suggest that predation on adult *Lissotriton* by large *Triturus* species is an opportunistic behaviour that may occur under suitable circumstances but is rarely documented. The scarcity of published records may partly reflect the brief and difficult-to-observe nature of these interactions. Additional well-documented observations are needed to assess how frequently adult heterospecific predation occurs in *Triturus* and whether apparent patterns, such as the predominance of females among some reported cases, have a biological basis.

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