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Manipulation-induced birth in a Fire Salamander, *Salamandra salamandra* (Linnaeus, 1758), from southern Italy

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The Fire Salamander (*Salamandra salamandra*) is a species distributed widely throughout Europe (Sillero et al., 2014). In the Italian Peninsula, it is present in hilly or mountainous environments, from the Alpine region to the Aspromonte Massif of Calabria (Caldonazzi et al., 2009). *Salamandra salamandra* is one of the most terrestrial urodeles in Europe, inhabiting wet forested areas with a fresh temperate climate and nearby oligotrophic streams where breeding occurs (Caldonazzi et al., 2009). Only breeding females move seasonally back to the water to lay aquatic larvae, while males never return to water after metamorphosis (Denoël, 1996; Caldonazzi et al., 2009). Breeding occurs during the rainy seasons, mostly in autumn and spring, although the latter gathers the majority of observations (Thiesmeier and Grossenbacher, 2004; Lanza et al., 2009).

During fieldwork performed on the night of 14 November 2024, we surveyed a breeding site of *S. salamandra* near the village of San Fili, Cosenza Province, Calabria, Italy, at an elevation of 809 m. The site is characterized by a deciduous forest in a hilly area crossed by a stream. We observed some salamander larvae inside the stream. Among other *S. salamandra* individuals, we captured a large adult female (snout–vent length 129 mm, weight 44 g; Fig. 1A), on which we performed stomach flushing. During the manipulation, the salamander released three larvae that were fully formed and in perfect health (Fig. 1B), probably as a result of the mechanical stress. We quickly placed the larvae in a plastic container and released them in pools along the stream. This report not only provides one of the first observations of the late autumnal breeding of *S. salamandra* in southern Italy but also emphasizes the need to pay attention to the potential impact that manipulating breeding females may have on their brood.

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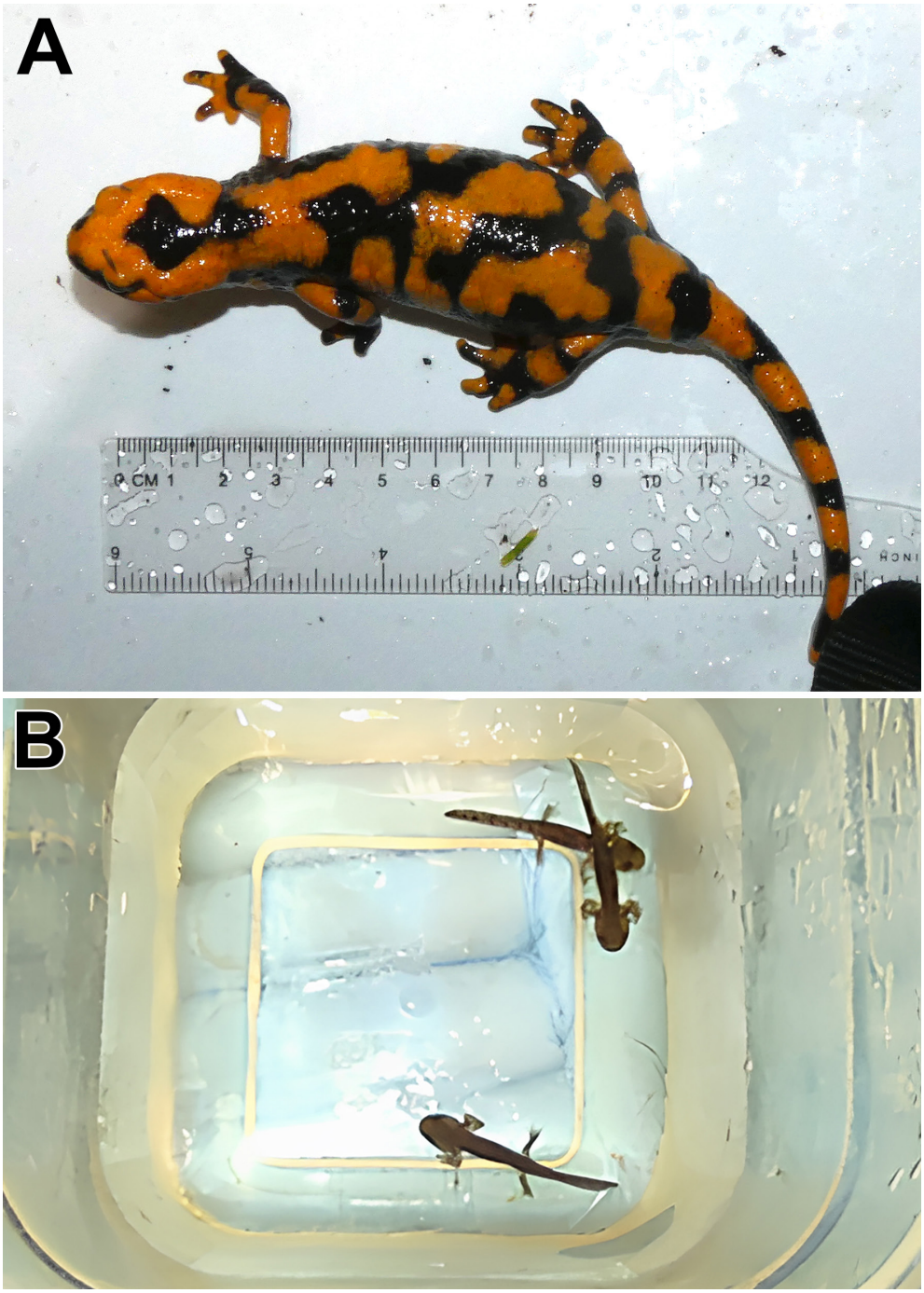

Figure 1. (A) A gravid female *Salamandra salamandra* from Calabria, Italy. (B) The three larvae released by the female as an unintended consequence of our manipulation.

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