

## Predator cues and risky habitats affect foraging activity in salamanders

ANDREA MELOTTO<sup>1</sup>, GENTILE FRANCESCO FICETOLA<sup>2</sup>, MATHIEU DENOËL<sup>3,4</sup>,  
RAOUL MANENTI<sup>1,5</sup>

<sup>1</sup> *Università degli Studi di Milano Dipartimento di Bioscienze, via Celoria 26, 20133 Milano, Italy*

<sup>2</sup> *Université Grenoble Alpes Savoie, Laboratoire d'Ecologie Alpine (LECA), F-38000 Grenoble, France*

<sup>3</sup> *Behavioural Biology Unit, University of Liège, 22 Quai van Beneden, 4020 Liège, Belgium*

<sup>4</sup> *F.R.S.-FNRS Senior Research Associate*

<sup>5</sup> *corresponding author: raoul.manenti@unimi.it*

Predator-prey interactions are among the most important interactions occurring in natural habitats and a major driver of a considerable number of phenotypic traits. Predators may affect prey through consumption that kills or injures prey (consumptive effect) or through several other factors (nonconsumptive effects) altering prey morphology, life histories and behaviour. Nonconsumptive effects may be as important as consumptive effects in determining prey populations dynamics. In this study, we aimed to disentangle the role played by predator occurrence like dragonfly larvae on the spatial activity of the fire salamander larvae, considering larvae originating from habitats with very different conditions like epigeous streams and hypogeous caves . We exposed larvae from caves and streams to chemical cues of the dragonfly *Cordulegaster bidentata* and of damaged conspecifics, at the newborn stage and after 40 days of rearing in safe and different risky conditions. We found that foraging activity dynamics like distance moved, average velocity while moving, movement frequency and spatial distribution depended on whether predator cues occurred and on whether larvae were reared in conditions where predation risk was present. In the occurrence of dragonfly risk cues and when reared in risky conditions, salamander larvae moved less and with a lower average velocity. Moreover, larvae reared in risky conditions exploited less central sectors. Cave larvae generally moved less than stream larvae, decreased more their movements with predator cues occurrence and decreased more their velocity while moving when reared in risky conditions.

These results provide interesting insights of the pressures acting on the colonization of different environments like caves and help understanding the interplay of important predators of streams and springs, such as dragonflies and salamander larvae.

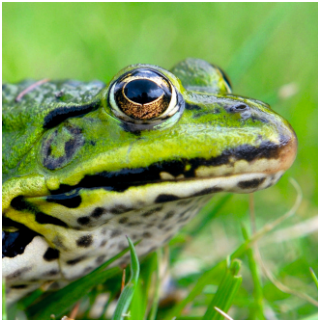
**Key words:** behavioural ecology, cave, foraging, predation, salamander



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