Does foraging plasticity favours adaptation to new habitats in fire salamanders? Preliminary data

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Predators often show strong plasticity of optimal foraging strategies. A major difference in foraging strategies occurs between sit-and-wait and active predators. Environmental conditions affect their efficiency, with active foraging behaviour being favoured when prey is scarce or its detection is difficult. Both phenotypic plasticity and local adaptations may cause a shift between the two strategies. Here we studied larvae of *Salamandra salamandra* originating from either typical epigeous streams and from caves. We evaluated whether local adaptations or phenotypic plasticity determine the shift of foraging strategy between stream and cave populations. The foraging behaviour of larvae was evaluated using a full-factorial design, taking into account three test conditions: light, prey availability, and starvation (larvae with and without an available prey in darkness and light, sate or starved larvae tested in light and in darkness). Behaviour was recorded both visually and through video-tracking. Salamander larvae modified their behaviour in response to environmental conditions. When in the darkness, salamanders moved longer distances. Movements also increased in starving larvae, and with prey occurrence. Furthermore, larvae from cave populations showed higher behavioural plasticity than stream larvae, as they changed more their foraging strategy according to light conditions. Cave larvae also better exploited the space available in test environments. Variation of foraging behaviour was strong, and involved complex interactions between plasticity and local adaptations. When larvae were in conditions similar to the ones encountered in caves, plasticity enabled behavioural shifts toward an active foraging strategy. The higher behavioral plasticity showed by cave larvae supports the importance of this trait for the exploitation of novel environments, as caves are for epigeous fauna.

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