Feeding ecology of metamorphic and paedomorphic palmate newts (*Lissotriton helveticus*) in Larzac

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It is generally suspected that increased phenotypic divergence among conspecifics may reduce competition between them. Heterogeneous environments can favour the evolution of such polymorphisms by allowing differential resource use. Facultative paedomorphosis, a heterochronic polymorphism, is an example of phenotypic variation in which paedomorphs retain larval traits, such as gills and gill slits, whereas metamorphs are fully metamorphosed. The aim of this study was to determine the feeding habits of palmate newt paedomorphs and metamorphs (*Lissotriton helveticus*) coexisting in three small ponds in Larzac, France. To determine the specialisation in terms of prey between the two phenotypes we identified stomach content samples and examined the number of each prey per newt stomach, as well as, the dry mass of each prey per newt stomach, to check on the input that these ingestions have. Our results showed population variation in feeding habits. Food use and energy intake segregation was found among morphs suggesting that the morphological differences between paedomorphic and metamorphic newts cause a variation of foraging efficiency between morphs and can allow differentiation of diets and microhabitat use. Paedomorphs foraged significantly more on benthic organisms than metamorphs, while metamorphs also relied on amphibian eggs for energy. The total dry mass ingestions were higher for metamorphs than paedomorphs and for females than males, as well. This resource partitioning may facilitate the coexistence of the alternative morphs in ponds and food diversity may thus favour the evolutionary maintenance of facultative paedomorphosis.

keywords: resource partitioning, trophic polyphenism, feeding ecology, facultative paedomorphosis, amphibians

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