Inter-annual weather variability can drive the outcome of predator prey match in ponds

Timm Reinhardt^{1*}, Sebastian Steinfartz², Markus Weitere¹

¹Helmholtz-Centre for Environmental Research - UFZ, Department River Ecology, Brueckstr. 3a, D-39114 Magdeburg, Germany

²Department of Evolutionary Biology, Zoological Institute, Technische Universität Braunschweig, Mendelssohnstr. 4, 38106 Braunschweig, Germany

Supplementary Material

Supporting information temperature dependence of growth of *Salamandra* larvae under unlimited food conditions

In order to quantify the dependence of growth and temperature, a total of 154 larvae were raised to metamorphosis in the laboratory in the year 1996. The larvae originated from two different populations in North Rhine Westphalia (Germany), i.e., Overath and Königsdorfer Wald as described by Weitere et al. (2004) and were reared at constant temperatures of 8, 10, 11, 15, 20, 21°C with several new born individuals for each temperature (table S1). All individuals were housed in groups of same sized individuals in aquaria with a minimum of 2 l water per individual and a water level of 20 cm. All larvae were provided with unlimited supply of food and the water was changed every 5 days. The larvae were weighed weekly until they metamorphosed. For an overview of experimental setups see table S1. From the weight increase over the entire larval period, we calculated the mean (cohort) growth rate (r , d⁻¹) for all setups during the exponential growth phase by calculating the slope of the linear regression of ln-transformed fresh weight versus time (t , d). Growth rates for all setups were plotted against temperature (fig. S1). The relationship between growth rate (r) and temperature (T , °C) was linear between 8 and 21°C with $r = 4.896 \cdot 10^{-3}T - 0.03127$ (fig. S1). The minimum possible growth temperature ($r = 0$) can be calculated to be at $T = 6.473 \pm 0.751$ °C (fig. S1). Additionally we calculated the amount of thermal time (in °C d) necessary for newly born larvae (average weight: 0.17 g) to reach a theoretical mean weight for the initiation of the metamorphosis of 0.84 g. The calculated mean thermal time requirement was 326 ± 21 °C d.

Table S1. Overview over all individual temperature setups.

Individuals per vessel	Initial size [mm]	Temperature [°C]
17	29- 32	10, 20
12	30-37	8, 15, 21
17	28-35	15, 21
10	30-33	15
18	36-43	9, 20

Figure S1. Mean growth rate (r) versus temperature (°C) under laboratory conditions and unlimited food supply. Linear regression: $r = 4.896 \cdot 10^{-3} T - 0.03127$, confidence bands at 95% confidence interval.