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DEMOGRAPHIC COSTS OF ANTIPREDATOR DEFENSES IN *DAPHNIA PULEX*[1]

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Abstract. Juvenile *Daphnia pulex* develop neck spines in response to a chemical agent released by predatory *Chaoborus* larvae. While these defensive structures reduce the vulnerability of *Daphnia* to the insect predator, they also entail a demographic cost. We investigated the nature and degree of this cost through an analysis of cohort life tables involving both the typical morph (TM), which lacks neck spines, and spined morph (SM) at 22°C in two different food regimes: "natural" food conditions (53-μm filtered pond water) and "ideal" food conditions (1×10^5 cells/mL *Chlamydomonas* sp.).

No consistent pattern of differences between TM and SM occurred with respect to survivorship, clutch sizes, body sizes, mean egg volume, or number of juvenile instars. Development rates of both juvenile and adult instars, however, were significantly slower in SM. The presence of neck spines increased the age at maturity for *D. pulex* by 8.4–14.6%, and the duration of adult instars exposed to *Chaoborus*-factor, whose eggs will develop into SM, was 2.8% longer than for those not exposed. This caused delayed reproduction in SM and resulted in a population growth rate (r) that was ≈8–9% lower than in TM. This relatively large demographic cost of spine formation in *D. pulex* produces a strong selection pressure to forgo the formation of these spines when *Chaoborus* predators are absent.

Key words: antipredator defenses; Chaoborus; *clutch size; cohort life tables;* Daphnia pulex; *demographic cost; development time; life history strategy; neck spines; population growth rate; survivorship.*