Neck-teeth induction in *Daphnia hyalina* under natural and laboratory conditions

Julia Lüning-Krizan

With 1 figure and 2 tables in the text

**Abstract:** *Daphnia hyalina* held in water which previously contained their potential predators *Chaoborus flavicans* showed a marked dependence in their anti-predator response on both the predator density and the daphnid's age. More animals produced neck teeth in treatments with high *Chaoborus* densities as compared to lower densities. Neck-teeth production decreased on the other hand with increasing age of the prey. Both parameters are assumed to regulate the neck-teeth response in the laboratory. In the field, predator densities at which the daphnids responded were lower than those found under artificial conditions. A size dependence of this anti-predator response could not be found.

**Introduction**

Water-borne chemicals released by the predatory phantom midge *Chaoborus* are known to induce morphological modifications in its potential prey *Daphnia pulex* (Krueger & Dodson 1981, Lüning 1992). The cladocerans develop neck teeth at the dorsal margin of their heads when exposed to third- and fourth-instar larvae of *Chaoborus*. These protuberances are described as anti-predator defense mechanisms since they complicate the handling of this organism by its predator, and enhances its chance of escape once captured by a predatory larva (Krueger & Dodson 1981, Havel & Dodson 1984, Vuorinen et al. 1989). Predation is generally thought to be one of the major forces influencing population dynamics and community structure (SiH 1985). Therefore, it should be of substantial importance for the prey to evolve anti-predator defenses to insure further persistence. When producing morphological defenses, the costs and benefits of these structures should always be balanced (Riessen 1992). Concurrently, in times when there is no benefit of the defense mechanism to the prey (i.e. absence of predators) the costs of producing these