ABSTRACT

Characteristic high helmets in *Daphnia cucullata*, which increase resistance of *Daphnia* against various invertebrate predators, can be induced by chemical cues released by these invertebrates but also by small-scale turbulence. I evaluated the response of *D. cucullata* to both factors in several clones originating from two riverine pools differing in their predator regime. In a large pool, the dominant invertebrate predator is the cladoceran *Leptodora kindtii*, and the *Daphnia* population there shows a typical cyclomorphosis. In the second (small) pool, *Daphnia* do not produce helmets, despite the presence of the phantom midge larvae *Chaoborus flavicans*. I compared phenotypic changes of *Daphnia cucullata* clones from these pools to *Chaoborus* kairomones and to a small-scale turbulence in laboratory experiments. Kairomones induced significantly longer helmets in clones from both pools; however, only clones form the large pool reacted also to turbulence. As all daphnids in the experiments responded to chemical cues from *Chaoborus*, I assume that either the kairomone dose under natural conditions in the small pool is too low to induce helmets or the phenotypic response of the local population is mediated by other factors. On the other hand, the variation of response to small-scale turbulence suggests that selection in favour of this trait was much stronger in the larger pool. I suggest that the presence of *Leptodora*, which leaves strong turbulent traces while swimming, may be the key factor selecting for the response to turbulence of local clones, and maintenance of cyclomorphosis within the whole population.

Key words: phenotypic plasticity, inducible defences, kairomones, *Daphnia cucullata*, *Chaoborus flavicans*, *Leptodora kindtii*