



Life history strategy and depth selection behavior as alternative antipredator defenses among natural *Daphnia hyalina* populations

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Limnol. Oceanogr., 50(4), 2005, 1284-1289 | DOI: 10.4319/lo.2005.50.4.1284

ABSTRACT: We analyzed distribution patterns and life history traits in 14 natural *Daphnia hyalina* populations. The populations at shallower depths during the day began reproduction at a smaller size and showed higher reproductive effort. Since surface avoidance and small maturation size both reduce likelihood of fish predation, these data suggest that depth selection behavior and life history patterns are mutually adjusted alternative ways of coping with predation. Even though the relationship between residence depth and size at first reproduction was the same in partially anoxic and fully oxygenated lakes, the two types of lakes differed in how the two strategies were exhibited. In the partially anoxic lakes the behavioral defense was realized to the maximum possible extent, since the animals were found just above the boundary of the anoxic zone, and the life history strategy was adjusted to defensive behavior. In some of the fully oxygenated lakes some populations resided well above the lake bottom and exhibited correspondingly small size at first reproduction. Thus, the behavioral defense was not fully used, which demonstrates that in some circumstances life history modifications can be preferred over behavioral defense.

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