

(Research Article)

**Effects of light and sound stimuli on spatial distribution and swimming activity of *Daphnia* under laboratory conditions**

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**Abstract**

Aquatic ecosystems are heterogeneous in terms of light and sound distribution. The aim of this study was to investigate the effect of environmental abiotic factors, light and sound stimuli, on *Daphnia* (*Daphnia magna*) swimming behaviour. Here, we examined behavioural changes of *Daphnia* (N=24) in response to light and sound treatments simultaneously. The treatments concerned a 2×2 design with bright or dim light conditions and sound or quiet in an aquarium with dimensions 30×15×25 cm. Swimming behaviour changes were assessed include: the number of hops, swimming speed and spatial distribution time. The results showed that the number of hops increased significantly in the bright compared to the dim light treatment ( $P<0/05$ ), while in the sound treatment, the number of hops did not significantly change compared to ambient treatment ( $P>0/05$ ). The sound and bright light treatments increased swimming speed but these changes were not statistically significant ( $P>0/05$ ). Also *Daphnia* spent more time in the lower layer of water in the dim light compared to the bright light treatment ( $P<0/05$ ), while no significant difference was found between sound treatments on spatial distribution of *Daphnia* ( $P>0/05$ ). More studies are needed to assess the multimodal effects of abiotic stimuli on the behaviour of aquatic species.

**Keywords:** Abiotic stimulus, Light, Multiple effects, Sound, Swimming behavior.

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