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# (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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