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(Research Article)
Measuring the spatial distribution of sound pressure in a fish tank under laboratory conditions

S. Shafiei Sabet*, F. Alizadeh Lademakhi

Department of Fisheries, Faculty of Natural Resources, University of Guilan

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Abstract

Sound-related behavioural studies explore the effects of sound on underwater animals in tanks under controlled laboratory conditions. In this study, we aim to assess sound pressure distributions and gradients in a small-sized water-filled tank that can be used in behavioural studies to examine anthropogenic sound effects on fish and invertebrates and to raise awareness among scientists in the field of underwater acoustics. To assess sound pressure, a water-filled fish tank was used with dimensions of 35*30*25cm; water depth 20cm. The playedback sound was a white noise file with continuous temporal pattern (200-4000 Hz). The results of the sound pressure gradient in the fish tank showed that in the side wall near the speaker location, there was a sharp sound pressure gradient. Moreover, near all the walls of the fish tank, despite moving away from the sound source, the walls of the fish tank played a role as a secondary source of sound and induced elevation of the sound pressure levels. Oscillation of sound levels and the lack of a clear gradient of sound in the longitudinal direction in the fish tank may be due to the presence of standing waves and related to the dimensions of the fish tank. It is essential to assess the acoustic field in any tank in which sound playbacks and bioacoustics are to be carried out.

Keywords: Fish tank, Distribution, Sound pressure, Behavioural biology, Aquatic animal.

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* Corresponding author E-mail s.shafiei.sabet@guilan.ac.ir

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