Book of Abstracts

LOW FREQUENCIES NOISE EFFECTS ON BEHAVIOUR OF *Sparus aurata* JUVENILES.

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Human activities in the oceans, such as marine traffic and Deep Sea Mining (DSM), are increasing in the last years (Ross 2005; Calvo et al 2016). Underwater noise in the oceans, especially at lower frequencies, is mainly produced by marine traffic and DSM could increase this noise in the next future. Marine Strategy Framework Directive promotes the achievement of a good quality environmental status and aims to monitor "continuous low frequency sound" trend in the ambient noise level within the 1/3 octave bands centred at 63 and 125 Hz.

The aim of this study is to evaluate the behavioural changes of *Sparus aurata* juveniles exposed to a four different acoustic signals in a tank. The emitted signal was white noise filtered at 1/3 octave band centred respectively at 63 Hz, 125 Hz, 500 Hz, and 1 kHz (SPL: 140-150 re 1µPa). For each frequency we tested three independent groups of 6 specimens and video monitored them for a total of 7:30 hours (15 min before, one hour during and 6 hours after the sound exposition) using two cameras located above the tank and in the water column. Moreover, three control group (no acoustic emission) tests were performed (no sounds were dispensed). Behavioural data (cohesion, motility, swimming height) were collected from the 15 minutes of each hour except in during sound exposition, where we considered the entire hour. The bottom of the tank was divided into squares. Cohesion was evaluated counting the number of squares occupied by the group; motility counting the number of squares crossed by each fish; swimming height counting the fish presence in three zones (deepest, intermediate, and highest). Using Kruskal-Wallis tests and multiple comparisons post-hoc we assessed that the cohesion was significantly affected at 63,125 and 500 Hz. At 63 and 125 Hz, significant increase in cohesion was observed during and up to the third and sixth hour of exposition respectively; at 500 Hz cohesion increased only during the exposition. Significant increase in motility was observed during the 63 and 125Hz stimuli. For swimming height, all frequencies significantly increase the number of fish in the deepest zone and decrease in the intermediate zone. The juvenile of *S. aurata* exhibit different behaviours depending on the acoustic frequencies. This study evidences an impact at short and medium time on juvenile. This could determine an effect on budget energy and, consequently, a potential threat for their recruitment in a noise-polluted environment.

Calvo, G., Mudd, G., Valero, A., Valero, A., (2016). "Decreasing ore grades in global metallic mining: a theoretical issue or a global reality?," Resources 5, 36. www.mdpi.com/journal/resources

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