

IS IT POSSIBLE TO ESTIMATE THE POPULATION DENSITY OF MUSSELS BASED ON THEIR ACOUSTIC ACTIVITY?

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Several studies suggested that the species sensibility to the water features might affect its acoustic signaling pattern and indicate environmental changes. Although widely studied, the bivalves have few investigations about the acoustic detection and its role in the soundscape ecology of environments that these organisms inhabit. This study aims to analyze the variation of the acoustic activity rate emitted by the mussel *Perna perna* regarding the sample densities of the population. Six treatments were defined, divided in two groups of three, containing 10, 40 and 80 individuals each. In the first group the mussel signals were recorded with the totally submerged (TS) individuals and in the second the mussels were kept partially submerged (PS). The acquisition time of the signal was 10 minutes per treatment, and each treatment was recorded eight times, totaling eight hours of recordings. The recordings occurred in a tank with acoustic insulation, built for this study. In the end of the recordings, 4,344 selections of bivalve acoustic activities were performed. Mussels from TS treatment had a lower acoustic activity (37%, N = 1,620 selections) than mussels from PS treatment (63%, N = 2,724 selections). However, the acoustic activity was similar amongst mussels from treatments with the same number of individuals/tank, regardless of the emersion status (TS or PS) (TS10: 7%, N = 303 selections and PS10: 9%, N = 408 selections; TS40: 12%, N = 531 selections and PS40: 21%, N = 898 selections; and TS80: 18%, N = 786 selections and PS80: 33%, N = 1,418 selections). According to Kruskal Wallis and Nemenyi tests, the acoustic activity rate is dependent on the sample densities of the population. However, analyses with nonlinear regression showed low values of determination coefficients. Thus, there is a need for further research to estimate the population density of the mussel.

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