

Freshwater bivalves as reservoirs of multiresistant bacteria: the case of two endangered species (*Margaritifera margaritifera* and *Potomida littoralis*)

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Freshwater bivalves (FB), responsible for important functions and vital ecosystem services are sensitive to environmental changes, making them excellent bioindicators. The present study evaluated the dispersion of resistance to several classes of antimicrobials for the first time, simultaneously in freshwater mussels (*Margaritifera margaritifera* and *Potomida littoralis*) and water where they live, in sites subject to different anthropogenic pressures, in an EcoHealth perspective, integrated in the One Health approach. The study was conducted in the river Tua basin, located in northern Portugal. Water samples and individuals of *M. margaritifera* and *P. littoralis* species were collected at four sites in summer of 2018. The isolation of strains from water was performed by the filter membrane method and each bivalve was aseptically opened to get soft tissues, weighted, and diluted on Buffered Peptone Water into sterile stomacher bags. The resultant filters were put on selective and chromogenic media and incubated. The isolates from water and bivalves were tested for antibiotic susceptibility by using a disk diffusion test. Each bacterial isolate was tested for 21 antibacterial agents representing 5 drug classes: β -lactams, fluoroquinolones, aminoglycosides, sulfamides and amphenicos. Among the total of 135 isolates (water and FB), 64.44% were coliforms bacteria and mostly came from water 39.26%, comparing with coliforms bacteria from mussels 25.19%. Among *E. coli* isolates, multidrug resistant (MDR) was exclusively detected at sampling site T4 but for coliforms isolates, MDR was observed at T3 and T4, in both water and FB (*P. littoralis*). MDR level was higher for isolates from FB than from water. We consider that bacterial communities should be a priority for inclusion in the WFD monitoring and evaluation systems, improving programs of measures for the sustainable management of water resources and greater integration with other sectorial policies in order to contribute to the Sustainable Development Goals (SDGs).

Keywords: Freshwater bivalves, multidrug resistant, bioindicators

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