

Multiple haemolymph extraction as a tool for neoplasia diagnosis and real time disease tracking in *Macoma balthica* clams

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Haemocytic neoplasia (HN) is a leukemia-like disease characterized by the presence of altered haemocytes – neoplastic cells (NCs). NCs, during disease progression, infiltrate other tissues leading to their malfunction and, ultimately, premature death of the organism. HN affects marine organisms of great ecological and economic importance, including bivalves. Importantly, in some cases, the disease can take up a horizontally transmitted form (bivalve transmissible neoplasia, BTN). *Macoma balthica*, which inhabits the Gulf of Gdańsk (southern Baltic Sea) is a tiny clam and one of the species identified with susceptibility to BTN development and, due to high incidence of the disease in some areas of the bay, provides a perfect study model. Given the leukemia-like nature of HN, haemolymph collection is essential for studying the disease. Non-lethal haemolymph extraction from retractor muscle has been applied as an efficient tool in diagnostics of the disease in some bivalve species. Here, we provide cytology analyses results of haemolymph cells derived from BTN-positive clams as well as preliminary results of multiple haemolymph extraction for real-time disease progression tracking in *M. balthica*. Morphological features of haemolymph cells such as hypertrophy, anaplasia, large nucleus volume were distinguished using light microscopy and considered typical for neoplastic cells. Maximal volume of extracted haemolymph with concomitant survival was estimated to 150 μ L per individual. Additionally, four haemolymph extractions at 10-day interval without lethal effects were performed. These findings may constitute a significant element in optimizing future studies of neoplasia in bivalves and other studies in which real-time diagnostic is needed.