

Neoplastic diseases of commercially important marine bivalves



This review summarizes the current state of knowledge regarding the two primary proliferative diseases of commercially important marine bivalves. Disseminated neoplasia is characterized by the presence of large (2–4 times the diameter of normal hemocytes), anaplastic, circulating cells that have a hyperchromatic and often pleomorphic nucleus containing one or more prominent nucleoli. Prevalence exceeding 90% has been reported; the disease is progressive and can result in significant mortality of affected populations. Softshell clams, *Mya arenaria*, and mussels, *Mytilus trossulus*, from the east and west coasts of North America, respectively, and cockles, *Cerastoderma edule*, from Ireland, appear to be especially susceptible. Disseminated neoplasia can be transmitted to uninfected individuals, indicating an infectious (perhaps viral) etiology, the expression of which may be aggravated by environmental degradation. Gonadal neoplasia consists of small, basophilic, undifferentiated cells that originate as small foci in gonadal follicles where they proliferate and eventually invade surrounding tissues. This disease primarily affects *M. arenaria* in Maine (USA) and *Mercenaria* spp. in Florida (USA) at prevalences up to 50%. Most affected individuals are female. Limited field studies to date indicate that the disease progresses slowly and mortality rates are low. The major impact is most likely a reduction in reproductive effort. The finding that prevalence of gonadal neoplasia is higher in hybrid *Mercenaria* spp. suggests a genetic etiology. Precise determination of the etiology and other aspects of both diseases will benefit greatly from future advances in cellular and molecular biological techniques.

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Obtenir le document : EDP Sciences

Mots clés : Neoplasia, Bivalves, Molluscs

Thème (issu du Text Mining) : FAUNE

Date : 2004-12-15

Format : text/xml

Source : <https://doi.org/10.1051/alr:2004052>

Langue : Anglais

Télécharger les documents : <https://www.alr-journal.org/10.1051/alr:2004052/pdf>

Permalien : <https://www.documentation.eauetbiodiversite.fr/notice/neoplastic-diseases-of-commercially-important-marine-bivalves0>

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