

Disease associated population effects of commercial fish and shellfish species (ToR g) - DTU Orbit (08/11/2017)

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Pathogens are increasingly reported from populations of aquatic animals. Variations in the frequency and abundance of pathogens depend on spatial or temporal factors as well as those related to host effects such as age or condition. Similarly, the development of a disease is a function of the combined effects of the pathogen, host and environmental factors. Diseases may be one of several biological and non-biological factors regulating the abundance and composition of stocks or populations of aquatic organisms. Here we review evidence for population effects associated with diseases in wild marine gastropods, bivalves, crustaceans, and fishes. The report provides information on the types of diseases, together with data on diagnostic criteria, causative agents, geographical ranges and effects at the individual and population level. A discussion of the significance of the findings and references to key publications are provided. The overview shows that the effects of diseases may occur at various life stages of affected hosts. The extent to which these effects lead to measurable population changes (e.g., in growth, reproduction, mortality, recruitment, population demography, geographical distribution) is best evident in those populations already subject to long-term population level monitoring, such as in commercial species. However, quantitative evidence of population effects is so far scarce. From the information available, it may be concluded that some diseases play a much larger role in population performance and dynamics in marine fish and shellfish than previously recognised. Therefore, methods for incorporating disease data into population/stock assessment models should be further explored. In the first instance, this will be relevant for commercial species, for which most information is available. However, the development of realistic mathematical models, taking into account population effects of diseases, are becoming also more relevant for non-commercial species, e.g., as part of coastal zone management or assessments of general marine ecology in the context of a more holistic ecosystem approach to marine management.

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