DIVERSITY OF ASSOCIATED FAUNA IN BEDS OF THE BLUE MUSSEL *MYTILUS EDULIS* L.: EFFECTS OF LOCATION, PATCH SIZE, AND POSITION WITHIN A PATCH

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Beds of the blue mussel *Mytilus edulis* L. constitute a conspicuous example of patch formation among epibenthic assemblages on both hard and soft substrata. In large mussel beds, patches of various sizes are succesively formed and broken down as a result of changing weather conditions, predation and competition. Besides mussels of various sizes, mussel beds are usually inhabited by a quantitatively rich associated fauna consisting of both infauna in the sediment between the mussels and attached epifauna on the shells. The dynamic properties of the mussel beds may importantly influence the distribution and abundance of this fauna.

Mussel patches can be distinguished according to their properties as isolated patches: discrete entities, surrounded by unsuitable habitat and invaded by dispersive propagules (recruitment), and non-isolated patches: pieces of habitat that are surrounded by other, suitable but pre-empted areas and invaded by dispersive propagules and organisms that already occupy areas adjacent to the patch (migration, even by organisms with poor dispersal ability). Based on these criteria *Mytilus*-patches can be considered as islands and used as models for island biogeography in relation to theories of species-area relationship, and apply to models of the patch dynamic concept. With few exceptions, large islands have more species thean small islands and the underlying mechanisms include most of those that are potentially important in regulating species diversity. This pattern is belived to be a consequence of a positive correlation between species richness and environmental heterogeneity.

In the inlet of two shallow and sheltered Danish fjords with relatively strong tidal currents, sandbars are formed and covered by dense beds of the blue mussel *M. edulis*. The sandbars are partly or fully submerged during high tides. The purpose of this study is to test the effects of patch size and position within a patch on the distribution and abundance of the associated fauna, and compare the two sites since their respective hydrodynamic and geomorphologic properties are very similar and may consequently be regarded as ecological replicates. A statistical analysis using a hierarchical nested three-factorial ANOVA on numbers of individuals and species richness/ evenness and the non-parametric Simpson's Index of Diversity were made. The results showed that effects of patch size and position within a patch were inconsistent, but the difference between stations was pronounced. The fauna at both sites was dominated by mobile species and the difference in composition between locations indicated higher organic enrichment at Kerteminde. The use of Simpson's Index of Diversity was found to be insufficient to describe differences compared to a hierarchical nested ANOVA since the latter provides a statistical test and an estimate of the contribution of the variation at each scale.