

Taxonomic and population structuring of blue mussels *Mytilus* in a small subarctic inlet (Tyuva Inlet, Kola Bay, the Barents Sea)

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The knowledge about blue mussels of the Barents Sea Murman Coast is mainly based on studies from the first half of the 20th century. Since that times the Arctic environment, the sampling methods and the taxonomy of mussels have changed. The single species *Mytilus edulis* (ME) was divided into ME and *M. trossulus* (MT). In the Northeastern Europe ME is considered as native species while MT as invasive one [3]. Little is known about ecological peculiarities of these “cryptic” species anywhere. Here we provide results of an extensive survey of mussels in a typical, anthropogenically undisturbed Tyuva inlet (Kola Bay). Using 78 quantitative samples accumulated through 2004-2018, we describe spatial-temporal patterns of taxonomic structure and basic population parameters of Tyuva mussels.

Population parameters analyzed were numbers, biomass, age structure, overall growth performance index (OGP), maximal size and taxonomic structure expressed as proportion of ME and MT among middle aged mussels. Taxonomic structure was predicted by mussels shell morphology. Canonical correspondence analysis was used to analyze the relationship between population parameters and environmental factors: distance from the top to the mouth of the inlet, salinity, depth, projective cover of macrophytes and presence of sublittoral kelp forests (KF).

Typical mussel habitats identified were littoral rocks in the mouth of the inlet, tidal shoals in its freshed top, the very river mouth with a large littoral-sublittoral mussel bed (MB), and KF. Intriguingly, mussels in KF were completely missed from historic studies of Murman mussels [2]. Against a background of high variability among settlements within and between habitats the next tendencies were observed. Overall numbers and numbers of young mussels (<4 years old) increased with the distance from the top of the inlet. Biomass was maximal in MB. OGP and maximal size increased with depth and distance from the mouth of the inlet. Proportions of ME positively correlated with the depth; in addition this species dominated the MB. During the 15 years long observation period total numbers and proportions of young mussels in settlements increased. Littoral part of MB disappeared. Proportions of MT decreased nearly everywhere. Following previous authors [1] we assume that temporal dynamics of mussel populations in the area is governed by large-scale factors (e.g. climatic). Our study provides the first insight into local scale habitat segregation of widespread ME and MT and interannual dynamics of their mixed settlements.

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References

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