
Parallel session 10: Chances for offshore shellfish culture.

Chairs: Bela Buck, Muki Shpigel

THE IMPLEMENTATION OF BIODIAGNOSTIC TOOLS HELPS TO SELECT APPROPRIATE SITES FOR OFFSHORE CULTIVATION OF BLUE MUSSELS (*MYTILUS EDULIS* L). M. BRENNER¹, B.H. BUCK^{1, 2}, M. STEDE³, A. KOEHLER^{1, 2, 4}

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The development of offshore wind farms offers a unique opportunity to co-use large marine areas with clean water and good O₂ conditions with submerged mussel culture systems. Modified and improved techniques withstand the high energy environment of the North Sea; however, will certainly cause higher investments costs. Therefore, site selecting criteria for a culture site should be clearly identified to calculate economic risks.

In a new approach biodiagnostic tools will be deployed to analyse the overall health status of mussels cultured in different areas. With these methods the tissue of the mussel's digestion system responsible for food uptake, storage of reserve substances and detoxification can be investigated and provide a clear signal on the health status of the mussel. The combinational analysis of macro- and micro parasites, extent of bacterial and viral infection and accumulation of toxins will allow a prediction of most rapid growth and best product quality for human consumption. By this approach higher investment costs for the culture systems are avoided and installations of functioning offshore aquaculture systems in the German Bight are supported.

The implementation of biodiagnostic methodologies to identify potential culture areas within the regions proposed for offshore wind farms is one focus of the project "MytiFit" financed by the Ministry for Construction, Environment and Transport in Bremen (Germany) and the Alfred Wegener Institute for Polar and Marine Research in Bremerhaven (Germany). In a test field 17 nautical miles off the coast from the city of Bremerhaven, three test moorings with large buoyancy are deployed to investigate the described parameters in different water depths. The test field is in the vicinity of a planned offshore wind farm called "Nordergründe".

The aim of this approach is to accumulate all relevant information for interested parties for the selection of appropriate cultivation sites for mussels in offshore wind farm areas. First results show excellent growth rates and good health status of offshore cultivated compared to inshore cultivated as well as wild mussels.

THE ATTACHMENT STRENGTH OF OFFSHORE GROWN BLUE MUSSEL *MYTILUS EDULIS* L. THREADS ACCORDING TO THE HARD SUBSTRATES' NANOSTRUCTURE AT DIFFERENT CURRENT VELOCITIES. A. PECHURA^{1,2}, M. BRENNER², B.H. BUCK^{2, 3}

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The blue mussel *Mytilus edulis* L. is an important species for the aquaculture industry in Europe. Due to stakeholder conflicts and a shortage in spat availability in nearshore areas the expansion of this production sector is limited. In offshore areas wind farms offer good opportunities for growing mussels on longlines installed in between the wind turbines. However, the conditions off the coast in the open ocean are harsh.

This ongoing study aims to evaluate which material provides the best attachment to the byssal threads of *Mytilus edulis* under various physical, chemical and biological aspects. Therefore, different collector materials with settled mussels will be deployed in two test locations in the German Bight. One test area is 17 nautical miles off the coast in the vicinity of the lighthouse "Roter Sand" (offshore test location), and one test area is close to the Jade Bay in Wilhelmshaven (nearshore test location). A control facility is installed in the recirculating system in the institute lab.

The detachment force, which is needed to remove a single mussel from the collector material, will be measured with a digital force gauge. Further, the nanostructure of the collector material will be analyzed by using electron microscopy. The attachment strength to different materials and at various locations will be compared to design a collector for offshore mussel cultivation withstanding a high energy environment.

OFFSHORE SHELLFISH FARMING – A DEVELOPING PROSPECT IN NEW ZEALAND. K.G. HEASMAN, N. KEELEY, C. BATSTONE AND B. KNIGHT.