



Effects of invasive species on native predator-prey and pathogen-host webs

A new project in the call on bilateral Wadden Sea research

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The Pacific oyster (*Crassostrea gigas*) is arguably the most prominent invasive species in the Wadden Sea. Although it has received increased attention, we still have a limited knowledge on the overall risks for the Wadden Sea ecosystem. Here we present the outline of a new bilateral (NL-D) project which has started in 2012 under the ZKO umbrella. **The main objective of this project is to investigate the direct and indirect effects of Pacific oysters on native predator-prey and pathogen-host webs and to assess the associated risks for the Wadden Sea ecosystem.**

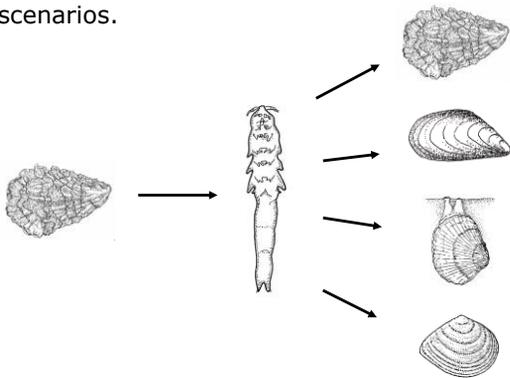


Effects on pathogen-host webs

Invaders like the Pacific oyster can introduce new parasites into their recipient regions that can spread to native species (*spill-over*). In addition, they can also amplify (*spill-back*) or reduce (*pathogen dilution*) native parasites.

Aims:

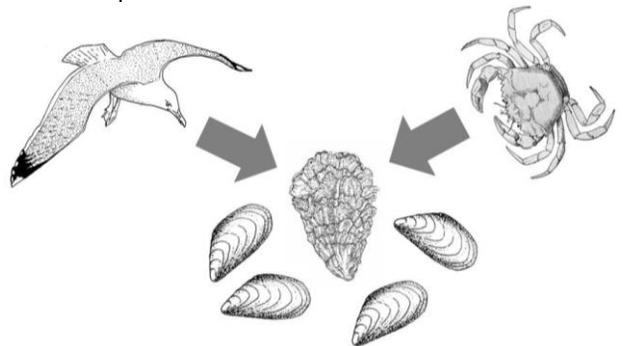
- To compile the first inventory of pathogens of oysters and mussels along the entire Wadden Sea.
- To experimentally assess oyster associated disease risks via spill-over and spill-back scenarios.



Example for spill-over: The copepod *Mytilicola orientalis* was introduced with oysters and now also infects other bivalves

Effects on predator-prey webs

Invaders often have a reduced set of natural enemies like predators in their recipient regions (*enemy release hypothesis*) and are thus dead ends in native food webs. However, invaders can also exert indirect effects. For example, they may provide a spatial predation refuge for native species.



Aims:

- To identify and quantify important predators of invasive oysters.
- To empirically and experimentally assess the direct and indirect effects of invasive oysters on the risk of food chain dead ends for higher trophic levels.

Effects on the Wadden Sea food web

Finally, we will integrate the data into an existing pathogen-inclusive food web (i.e. with predator-prey and pathogen-host sub-webs) to investigate the effects of invader mediated changes on the topology and dynamics of the Wadden Sea food web.

Final aim:

To assess the overall risks involved in the spread of this invader in the Wadden Sea ecosystem.

Wadden Sea food web without (left) and with (right, black nodes) parasites.

