First record of invasive shell-boring worm in the Wadden Sea means trouble for oysters

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Mud blisters caused by *Polydora websteri*. Credit: Dagmar Lackschewitz

In October 2014, the suspicion arose that the parasite worm *Polydora websteri* had found its way to the Wadden Sea. Following years of research, that suspicion has now been confirmed: the worm, that likely

originates from the Asian Pacific, has arrived in European waters. Researchers from the German Alfred Wegener Institute (AWI) and the Royal Netherlands Institute for Sea Research (NIOZ), confirm in a publication in *Marine Biodiversity,* that they have found the shell-borer in oysters near Sylt and Texel and speculate that it is likely to have spread much further.

"Trouble maker' leaves oyster unsellable

The worm *Polydora websteri* is a known 'trouble maker' that causes mud blisters as it bores its way through an oyster's shell, leaving the oyster vulnerable for predators in the wild, and unsellable on the market. Thieltges: "The worm maneuvers between the inner and outer world of the oyster. It isn't strictly speaking a parasite as it leaves the oyster's body in peace, but by attacking its shell, it drains the energy of the oyster that now needs to focus on its repair." Wild populations of Pacific oysters, exotic species that were themselves introduced to the Wadden Sea ecosystem in the 1970s and '80s, have till now been rather safe from predators. The worm might change this. The oysters might be weakened and their shell softened, making them easier prey for crabs and birds. On the long-term, this could mean a shift in the ecosystem.

While the worm might form a big threat to aquaculture farming, it is also likely that aquaculture itself acted as the primary vector of introduction. NIOZ researcher and co-author David Thieltges: "A large part of the invasive species in the marine ecosystem arrive with the import of commercial species and the transfer of farmed specimens between aquaculture sites." The worm's favorite host, the Pacific oyster, is traded and cultured globally. By moving the oyster, the worm, though not -intended, becomes an international traveler as well. The researchers, including Thieltges and AWI-scientist Andreas Waser, found the first *Polydora websteri* in the direct vicinity of an oyster farm that imports juvenile oysters from a nursery in southern Ireland. Their travel path

illustrates the global character of the trade. Thieltges and Waser: "This site of the first record was also the site with the highest infestation. We suspect that the arrival of the worm in the northern Wadden Sea may be related to the oyster imports."

Polydora websteri drilling mud blisters in a Pacific oyster. Credit: Dagmar Lackschewitz

Here to stay and to be reckoned with

Once introduced, the further spread of invasive species can continue either via dispersal of larval stages or human-aided secondary vectors such as fouling on ship hulls. This may explain that the worm was also

found during sampling at the Mokbaai on Texel, an island without oyster farms. Thieltges underlines, that it is unlikely that the worms found near Texel came from Sylt. "That they made their way from Sylt to Texel, along almost 500 kilometers of coastline, seems rather unlikely. We think there might be a different origin."

An option would be that larval stages of the worms found in the Dutch Wadden Sea came from Zeeland where there is commercial oyster aquaculture. However, the team still needs to investigate whether the worm is already present in Zeeland as well." Thieltges comments, "Sampling at other places in the Netherlands and in Europe together with genetic research is now needed to establish the origin and distribution of the worm. We don't know its exact origins yet, but we know that it's here and that it is very likely to keep extending its range."

More information: Andreas M. Waser et al, Spread of the invasive shell-boring annelid Polydora websteri (Polychaeta, Spionidae) into naturalised oyster reefs in the European Wadden Sea, *Marine Biodiversity* (2020). DOI: 10.1007/s12526-020-01092-6

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