European Commission

Science for Environment Policy

Oyster imports bring alien 'hitchhikers' and disease

The future of oyster farming in Europe is threatened by disease. However, a recent study highlights the risk of importing oysters to improve or replace lost stock, as this could accidentally bring further disease and invasive species.

The Pacific oyster (*Crassostrea gigas*), originally from East Asia, has been the main species of oyster farmed in Europe since the early 20th century. Populations were heavily hit by disease in the 1960s and 1970s and thousands of tons of Pacific oysters from Canada and Japan were subsequently imported to replenish French farm stocks. However, a number of other species inadvertently arrived with these imports as 'hitchhikers', including the invasive Japanese kelp (*Undaria pinnatifida*), considered to be one of the most invasive alien species in Europe today[1] and Japanese wireweed (*Sargassum muticum*).

Since 2008, the sector has again struggled with disease, particularly a devastating form of the herpes virus. The French Ministry of Agriculture has therefore been considering large-scale imports to rescue oyster farming once more.

This study, partly funded by the EU[2], compiled data on north-west Pacific species found as aliens on European shores. The researchers scored the likelihood of oyster imports being the route of introduction for these species, through a filtering and deductive method (for instance, based on the location of first observed occurrence).

By ruling out organisms that could have arrived through other vectors (including maritime traffic), they identified 48 species that 'very likely' arrived with oyster imports from the north-west Pacific. Among them, there were 32 algae and 11 invertebrates, commonly found on oyster shells ('hitchhikers'). The remaining species were oyster pathogens. All these species were discovered in Europe at a fairly steady rate of 1.16 per year between 1966 and 2010

The last official mass shipment of oysters for farming that the study could identify was in 1977. It is possible that the non-native species found since then were introduced in the 1970s, and it has simply taken time to discover them.

However, the researchers believe that it is more likely that European farmers have been importing small shipments of oysters from the Pacific after 1977, but no-one has officially documented this activity – partly because much of it is likely to be illegal, although current policy contains some loopholes (such as import for food purposes). Genetic evidence and the timings of the discoveries support this theory. For instance, the herpes virus in Europe is genetically identical to that currently found in East Asia, which suggests that it has recent East Asian origins.

The study therefore warns that transferring more oysters to Europe would risk bringing new diseases, triggering the need to import yet more oysters. This 'positive feedback loop' would also risk bringing other types of species, such as algae, that might upset the balance of the ecosystems.

International shellfish trade has been regulated in the EU by animal health directives for a number of years, beginning in 1991 with Directive (91/67/EEC). Upcoming environmental legislation, in the form of the EU Regulation on the prevention and management of the introduction and spread of invasive alien species, will further prioritise the prevention and control of biological invasions.

The study recommends education campaigns which inform farmers about the risks of introducing hitchhikers, and the implementation of preventative methods (such as flash boiling or immersion in concentrated brine). It also suggests research is needed to identify disease-resistant populations of Pacific oysters within Europe. These could be used to breed stock for farming and avoid the need for imports.

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Contact:
f.mineur@qub.ac.uk

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1.Listed in '100 of the worst species' by DAISIE (Delivering Alien Invasive Species In Europe): www.europe-aliens.org/speciesFactsheet.do?speciesId=50506#

2.This study was partly-supported by the INVASIVES (Invasive seaweeds in rising temperatures: impacts and risk assessments) project, which was financed by the EU's ERA-NET programme.