

Will climate change put mussels off the menu?

July 3 2015



A mussel farms in south India. Credit: Lucy Turner

Climate change models predict that sea temperatures will rise

significantly, including in the tropics. In these areas, rainfall is also predicted to increase, reducing the salt concentration of the surface layer of the sea. Together, these changes would dramatically affect the microscopic communities of bacteria and plankton that inhabit the oceans, impacting species higher up the food chain. Worryingly, future conditions may favour disease-causing bacteria and plankton species which produce toxins, such as the lethal PST (paralytic shellfish toxin). These can accumulate in shellfish such as mussels and oysters, putting human consumers at risk.

Recently, researchers investigated how climate change was likely to affect the fledgling Green Mussel industry in South-West India. Working on the Mangalore coast, the scientists raised [mussels](#) under high temperature/low salt conditions whilst simultaneously exposing them to toxic [plankton](#) and bacteria species. As lead investigator Dr Lucy Turner explained, "If the changes in the environment put the mussels' bodies under higher stress levels than usual, and we then challenge them with these microorganisms, the immune system may become compromised". The results showed that the combination of both a warmer temperature and reduced salinity had a significant effect on the health of the mussels.

According to Dr Turner, this could threaten the rapidly-growing tropical shellfish industry, already under pressure from India's increasingly urbanised population. "The demand for marine products is growing at an unprecedented rate...there is also a drive to move from small scale fishing methods to larger scale commercial operations". Meanwhile, global warming is thought to have already begun to affect these regions. "We know that climate change is causing a change in the timing and duration of the monsoon which can significantly lower the seawater salinity...this is likely to increase the chance of outbreaks of toxic plankton blooms and make farming bivalves such as mussels increasingly challenging" Dr Turner says.

Dr Turner hopes that the results will prompt governments to set up long-term monitoring programmes. "The Indian government needs to be vigilant about monitoring coastal water quality, particularly as the shellfish industry continues to grow". The researchers now plan to determine whether similar results are observed for oysters and clams, whilst a sister project is investigating how [climate change](#) may affect prawn farms.

More information: This research is being presented on Friday 3rd July at the Annual Meeting of the Society for Experimental Biology in Prague.

Provided by Society for Experimental Biology

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