

Charru Mussel: A Silent Threat to Ennore Coast of Tamil Nadu

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ABSTRACT

This article examines the invasion of Charru mussel (*Mytella strigata*, Hanley, 1843) in the Ennore wetlands of Tamil Nadu, India, highlighting the significant ecological and economic threats posed by this invasive species. Ecologically, the mussels displace native species, alter benthic communities, reduce biodiversity, and filter large volumes of water, which may lead to harmful algal blooms and oxygen depletion. Economically, the invasion disrupts local fisheries by reducing shrimp populations and making fish more difficult to catch, threatening the livelihoods of fishers. The invasion likely resulted from ballast water discharge from ships, weak regulations, and inadequate Environmental Impact Assessments (EIAs). Potential solutions include stricter ballast water regulations, improved EIAs, manual removal, the introduction of natural predators, community monitoring, and advocacy for stronger policies. Immediate action is crucial to prevent irreversible ecological damage and economic losses for the local fishing communities.

INTRODUCTION

Invasive Marine Species (IMS), also known as introduced marine pests, are among the top human-driven threats to

marine ecosystems. They can spread diseases, outcompete native species, damage habitats, disrupt ecosystem balance, and clog vital

marine infrastructure. Many Invasive Marine Species belong to the Mytilidae family, such as mussels valued in aquaculture for their rapid growth and high fertility—traits that also make them highly invasive. Human activities and climate change are accelerating the spread of these species by breaking down natural barriers. The American Charru mussel, *Mytella strigata*, highlights these impacts, threatening biodiversity, ecosystem health, and local economies in invaded regions (Lim *et al.*, 2018).

Mytella strigata (Hanley, 1843) was initially introduced to Florida in the 1980s (Boudreaux and Walters, 2006). The first recorded sighting of this bivalve species in Indian waters occurred in 2019 (Jayachandran *et al.*, 2019), and it has since rapidly expanded to other regions of the country. The species ability to quickly colonize new habitats and its resilience in different environmental conditions make it a formidable invader, necessitating monitoring and management efforts to mitigate its spread and impact on native ecosystems.

Mytella strigata (Hanley, 1843) is recognized as a potent global invader due to several key characteristics. Its robust life history traits allow it to survive long-distance travel, often through ballast water exchange or by hitching a ride on ship hulls (Lim *et al.*, 2018; Sanpanich and Wells, 2019). The species ability to thrive in a wide range of salinity and temperature conditions whether in marine or brackish environments further enhances its invasive potential. Upon establishing itself in a new habitat, *Mytella strigata* (Hanley, 1843) rapidly attaches to underwater structures, forming dense mats that alter the benthic community and sediment composition, often outcompeting native species. Its high fecundity, with females producing over a million eggs per year, combined with a short larval stage and rapid juvenile growth, further contribute to its success as an invader. These traits collectively make *Mytella strigata*

(Hanley, 1843) a formidable and notorious invader in the ecosystems it enters.

The Charru mussel (*Mytella strigata*), an invasive species native to South America locally known as Kakka Aazhi, has become a significant problem in Tamil Nadu, particularly in the Ennore and Pulicat wetlands. This species was likely introduced to the region through ballast water from ships, and it has rapidly spread, forming dense carpets on the riverbeds and backwaters. The invasion has severely impacted local fisheries, especially shrimp fishing, as the mussels have altered the sediment composition, making it difficult for shrimps to thrive. Fishermen have reported clear water in areas where the mussels are abundant, which disrupts their ability to catch fish, as the fish avoid visible nets. The mussels have also displaced native species like the yellow clam and green mussel, further threatening local biodiversity.

The Ecological Importance of Ennore Wetlands:

The Ennore wetlands, near the metropolitan city of Chennai, are a vital part of the region's ecological landscape. Located at approximately 13.13-54.48° N and 80.19-26.60° E on India's southeast coast, the Ennore estuary is a dynamic system connected to the Pulicat Lagoon in the north via the Buckingham Canal and to the Kosasthalaiyar River in the northwest. These wetlands serve as nursery grounds for fish, crustaceans, and other aquatic life, supporting marine biodiversity by providing safe breeding areas. Historically, mangroves in these wetlands have stabilized coastlines, filtered pollutants, and sheltered wildlife. Furthermore, Ennore's wetlands play a crucial role in flood control, water purification, and carbon sequestration, benefiting both the natural environment and nearby communities.

Impact on Local Fishers:

The invasion has already affected 11 out of 52 fishing sites in the Ennore-Pulicat stretch, with Ennore being hit the hardest so far. Fishers noticed small patches of mussels on bridge columns as early as 2015, but the problem began to intensify significantly after the Vardah cyclone in 2016. By 2021, the infestation had spread over two kilometers, but over the past year, it has expanded rapidly, turning into a severe threat.

For the fishers, the presence of these mussels has transformed the once-thriving waters into a hostile environment. The mussels filter and process hundreds of litres of water daily, leading to unusually clear water conditions. While this might sound beneficial, it is anything but for the fishers. Clear water means that fish can easily spot fishing nets, making them less likely to be caught. Furthermore, the riverbed, now covered in a foot-deep sludge of black, foul-smelling excreta from the mussels, has become inhospitable for shrimps. These shrimps, which typically bury themselves in the mud to escape predators, are now unable to survive in these altered conditions. For the fishermen of Kattukuppam, who rely heavily on shrimp fishing for their livelihood, this is a dire situation.



Source- The News Minute

Consequences for Fishermen:

The impact on the economy is noticeable already. Even though some fishermen have

been able to harvest significant amounts of shrimps in the near future, there is growing concern that this may not last. For instance, over the span of 12 days, two fishermen from Konamudukku caught shrimps valued at Rs 1,04,000. If the unchecked growth of mussels continues, the commercially important shrimp fisheries of the Ennore- Pulicat wetlands would be severely harmed in the future year. The fishers are now calling for urgent action. They point to the lack of ballast water regulations and inadequate environmental impact assessments at local ports as the primary reasons for the mussel invasion. The mussels are believed to have been transported in the ballast water of ships from South America.



Fishermen say the trouble created by invasion of alien species has been aggravated by the dumping of construction debris in the Kosasthalaiyar

Source- The New Indian Express

Fisher activists stress the need for immediate containment of the mussel spread and are demanding government intervention to help eradicate the invasive species. They also seek compensation for the affected fishers, as their livelihoods are increasingly at risk. Without swift action, the fishers of Ennore and Pulicat face an uncertain future, with their traditional way of life hanging in the balance.

Efforts to Address the Mussel Invasion:

The invasion of toxic Charru mussels (*Mytella strigata*) in the Ennore and Pulicat wetlands

has sparked a range of efforts to protect these vital ecosystems and the livelihoods of the local fishers. From government regulations to grassroots community action, various initiatives are underway to control the spread of these invasive mussels and mitigate their impact.

Government Actions:

While the government's response has been limited thus far, there is growing pressure for stronger measures. Local fishers and environmental activists are urging authorities to enforce stricter ballast water regulations for ships entering Indian waters. Ballast water, used to stabilize ships, often carries foreign aquatic species, including invasive mussels. By tightening regulations and monitoring ballast water discharge at ports like Kamarajar and Kattupalli, the risk of future invasions can be reduced. Additionally, there are demands for more rigorous Environmental Impact Assessments (EIAs) for new projects in the area. Many believe that current assessments are insufficient, allowing invasive species to thrive and disrupt local ecosystems. Improved EIAs would help identify potential threats early and implement preventive measures.

Conservation Efforts:

Environmental groups and NGOs are at the forefront of conservation efforts. The Save Ennore Creek campaign has been raising awareness, advocating for stronger regulations, and collaborating with scientists and fishers to study the mussel invasion. The findings from these studies are being used to push for better conservation policies and increased funding for restoration projects. Proposed conservation strategies include manual removal of the invasive mussels and the use of biological controls. While manual removal is labour-intensive and costly, it can help reduce the mussel population in heavily infested areas. Introducing natural predators to control the

mussel population is another option, but it carries risks of further ecological imbalance.

Community Initiatives: Fishers Take Action

Local fishers have not been sitting idle; they are actively involved in the fight against the invasive mussels. Understanding the threat to their livelihoods, fishers from Kattukuppam and other nearby villages are closely monitoring the spread of the mussels and documenting their impact. Their deep knowledge of the local environment has been crucial in identifying the most affected areas and determining the best times for fishing to minimize losses.

The fishers have also partnered with researchers and activists to develop practical solutions. This collaboration led to a community-driven study that highlights the scale of the invasion and provides valuable data for advocating government intervention and support. The findings have been instrumental in calling for compensation for affected fishers and stricter regulations to prevent future invasions. In addition, the local community has launched advocacy and awareness campaigns, using media platforms to highlight the crisis and demand swift government action. By sharing their experiences, the fishers are raising public awareness about the importance of protecting these wetlands and the need for urgent measures to address the mussel invasion.

CONCLUSION:

The spread of Charru mussels threatens the ecological health of wetlands and the economic stability of fishing communities in Ennore and Pulicat. By displacing native species, degrading water quality, and promoting harmful algal blooms, these invasive mussels disrupt biodiversity and shrink shrimp populations, making traditional fishing methods increasingly unviable. Immediate, effective management is essential

to safeguard both wildlife and local livelihoods. Readers can contribute by advocating for stronger environmental policies, supporting local conservation efforts, and spreading awareness of the dangers invasive species pose to preserve these crucial ecosystems for future generations.

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