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Chennai lab develops microbes to eat away oil spill

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CHENNAI: After trying in vain to remove remnants of the recent oil spills off Chennai shores using men and machines, a Chennai lab has found the answer in nature.

RECOVERING FROM THE SPILLAGE



HOW MICROBES HELP?

- Microbes that 'eat' and **degrade oil** are naturally found in oceans
- These microbes utilize recalcitrant (resistant to breakdown) hydrocarbons as energy source and cell building blocks
- These microbes produce enzymes such as mono-oxygenases and di-oxygenases that **enzymes degrade toxic petroleum hydrocarbons** into simpler and less toxic molecules

A team of scientists from National Centre for Sustainable Coastal Management (NCSCM), Chennai has developed a consortium of microbes that can disintegrate pollutants. This, scientists say, will ensure there is no long-term impact of remnant oil in the waters.

The city coast suffered two oil spills in the past two years. A collusion of two ships at Ennore port in January 2017 resulted in spillage of 196 tonnes of furnace oil that spread across 24km distance to the south and 14 km to the north. On November 18, 2018, a ship spilled two tonnes of oil when a flexible hose snapped.

Though a large part of the spilled oil was removed physically, a significant portion of remnant oil got settled in the ocean and tar balls got washed ashore. "This prompted our team to look for a new solution," said NCSCM director R Ramesh.

Team leader R S Robin said the oil spill triggered a sudden change in structure of the marine ecosystem and caused damage to organisms such as oysters, mussels, fishes and turtles. Remnant oil in sea can affect the food chain and elemental cycling, he said. The NSCSM team turned to nature, which has its own mechanism to combat oil pollution by microbes communities. But the challenge was in identifying these largely elusive communities and put them to use in affected areas.

NCSCM joined hands with the state environment department to study the role of microbes in utilising toxic petroleum compounds. It found a difference in distribution of both bacterial and fungal communities in beach sediment and water after the oil spill. An analysis of resident microbes in the area revealed there were significant increase in oil degrading enzymes at the site. The team collected samples and developed a colony of such microbes to be let back into the affected area.

Another researcher, C Saravanakumar said the bloom composition of oil spill was unique, with a key role played by *Acinetobacter* sp, one of the microbes found in the Indian waters. The presence of these microbes in the waters indicated a competitive advantage of native population and possibilities of developing technologies for site-specific spill events, he said.