# Marine vessels are unsuspecting hosts of invasive species

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Credit: Tel Aviv University

Invasive ascidians—sac-like marine invertebrate filter feeders—are nuisance organisms that present a global threat. They contribute to biodiversity loss, ecosystem degradation and impairment of ecosystem services around the world.

A new Tel Aviv University study finds that ships play an unknowing but dominant role in introducing and dispersing these tough-shelled non-indigenous organisms into new environments. The research showed that these marine invertebrates hitch a ride on half of all the marine vessels passing through Israel's Mediterranean coast.

The research was conducted by Mey-Tal Gewing, of TAU's School of Zoology and led by Dr. Noa Shenkar, also of TAU's Department of Zoology and of The Steinhardt Museum of Natural History and Israel National Center for Biodiversity Studies. It was published in *Marine Pollution Bulletin*.

## Hitching a ride

"These organisms are well known in the US and Canada," Dr. Shenkar said. "In Israel, they are passing through the Suez Canal, latching onto ropes and the bottom of the ship. They're filter feeders, so they cover and clog every surface they latch onto, creating a lot of drag for the ship and damaging marine biodiversity in their new environments. They're a major threat to our coasts and are very costly to ship owners."

The researchers inspected 45 vessels pulled from the sea and cleaned in various shipyards around Israel. They investigated both commercial and military boats, finding that the military vessels, which undergo maintenance every six months, were actually more prone to ascidian invasion. Commercial ships are cleaned every two years by law.

"Military vessels are cleaned every six months but are not being properly cleaned for these invasive species," said Dr. Shenkar said. "These species hide on the sea chest, under the bottom of the boat. Maintenance for commercial ships is much more thorough, including repainting and hosing down every nook and cranny of the vessel."

Dr. Shenkar recommends that all areas of the boats be checked. Boat owners should use the same paint for the bottom of the boat but use silicon-based paint, to which larvae can't attach, to cover areas such as the seachest.

They also found a correlation to seawater temperatures. "As

temperatures rise, so too do the ascidians' numbers," said Dr. Shenkar. "We recommend conducting maintenance before the warm season begins. Early detection and rapid response are essential when a new potential nuisance species is discovered."

## Discovery of new species in the region

In the course of their research, the scientists also discovered a Caribbean species new to the region. This suggests that the monitoring of marine vessels can serve as an effective tool for the early detection of non-indigenous ascidians.

"Our research is an example of the great cooperation that needs to exist between academia and commercial interests to form a realistic recommendation related to what is actually happening in the field," Dr. Shenkar said.

The researchers are currently working with policymakers in Israel and the EU to tailor environmental protection measures that would ward off non-indigenous ascidians.

**More information:** Mey-Tal Gewing et al, Monitoring the magnitude of marine vessel infestation by non-indigenous ascidians in the Mediterranean, *Marine Pollution Bulletin* (2017). DOI: 10.1016/j.marpolbul.2017.05.041

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