Cannibalism helps invasive warty comb jelly survive severe conditions

A species of jelly resorts to eating its own offspring to thrive in new habitats and cope with food shortages, according to new research.
For most people, jellyfish are nothing but a nuisance. However, recent years have seen massive movements of invasive species drastically disrupting whole ecosystems and causing economic harm and environmental change. Thus, it’s crucial to understand how they colonise or even dominate new habitats in order to better predict the future economic and ecological impacts of prolific species.

Partially supported by the EU-funded projects GoJelly and OCEAN-CERTAIN, a team of researchers has carried out high-frequency field observations of both prey and predators covering the pre-bloom to post-bloom periods of the invasive comb jelly Mnemiopsis leidyi A. Agassiz in the south-western Baltic Sea. The team has shown that this prolific marine invasive species with various opportunistic traits can expand its geographical range in order to meet its nutritional needs. To do this, it uses its own young.

The researchers have published their findings in the journal ‘Communications Biology’. “Based on both field and laboratory evidence, we show that adult comb jellies in the western Baltic Sea continue building up their nutrient reserves after emptying the prey field through a shift to cannibalizing their own larvae.” They add: “We argue, that by creating massive late summer blooms, the population can efficiently empty the prey field, outcompete intraguild competitors, and use the bloom events to build nutrient reserves for critical periods of prey scarcity.” Comb jellies, marine invertebrates of the phylum Ctenophora, come in blobby shapes and gelatinous, transparent bodies like jellyfish. However, comb jellies are entirely different from jellyfish, and they are not even close relatives, as explained on the Smithsonian Institution website.

**Effective conservation**

Quoted in a news item by GoJelly project coordinator the University of Southern Denmark, the study’s lead author Jamileh Javidpour says: “Because comb jellies trace their ancestry back to the beginning of most animal life as we know it during the Cambrian Period, 525 Million Years Ago, it remains possible that it is a basic, unifying feature across the animal kingdom.” As noted in the same news item, more research is needed to understand the role of cannibalism in a comparative context “among the earliest members of the animal kingdom and the evolutionary origins of cannibalism and the reasons why it is particularly prominent in aquatic ecosystems.”

In the ‘Communications Biology’ journal article, the researchers conclude: “Given the increasing disturbance of marine environments and spread of exotic species, our finding is important for devising more effective conservation strategies.”

GoJelly aims to turn the problem of jellyfish blooms into a solution to tackle microplastic pollution. To achieve this, the Go.jelly (Go.jelly - A gelatinous solution to
Microplastic pollution. To achieve this, the GoJelly (GoJelly – A gelatinous solution to plastic pollution) project utilises jellyfish mucus to develop a biofilter. In addition, it focuses on using jellyfish as fish feed in aquaculture and as agricultural fertiliser. It also examines the use of their collagen in cosmetic products. The OCEAN-CERTAIN (Ocean Food-web Patrol – Climate Effects: Reducing Targeted Uncertainties with an Interactive Network) project ended in October 2017. It explored whether climate change and changes in human activities involving marine resources can disturb the flow and deposition of carbon in the process of organic carbon uptake and sequestration in the ocean, a natural process of carbon capture from the atmosphere.

For more information, please see:
GoJelly project website
OCEAN-CERTAIN project

Keywords
GoJelly, OCEAN-CERTAIN, jelly, invasive species, cannibalism

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