

Jellyfish: out of the ocean and on to the menu

Sun, sea, sand and... jellyfish. Beach holidays have become a risky pursuit as jellyfish populations have exploded in warming seas worldwide in recent years. But thanks to EU-funded researchers, these gelatinous blobs could become a valuable resource - as food, ingredients in medicine and cosmetics, and even as a means to counter pollution.



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The groundwork for improving our understanding of jellyfish and potentially developing whole new industries around them has been laid by the EU-funded PULMO project, which set out to identify innovative and practical ways to mitigate the critical ecological and economic impacts of fast-growing jellyfish populations.

The project focused on *Rhizostoma pulmo*, the so-called barrel or sea lung jellyfish, one of the most common types in the Mediterranean. Large 'blooms' of jellyfish have been blamed for disrupting marine ecosystems, decimating fish farms, clogging up cooling systems at coastal power plants and causing substantial economic losses to marine and coastal industries – besides stinging millions of beachgoers each summer.

'The PULMO project aimed to turn the negative impacts of jellyfish outbreaks into a novel, more positive outlook, reconsidering them as an untapped sustainable source of bioactive compounds and biomaterials for cosmetics, pharmaceuticals and industry as well as a food

source,' says Stefano Piraino, a professor of zoology at Italy's University of Salento.

While jellyfish are eaten as a delicacy in Asia, their consumption would be a novelty in Europe – and *Rhizostoma pulmo* differs from its East Asian edible counterparts. One thread of Piraino's work – in collaboration with Antonella Leone, a researcher at Italy's Institute of Sciences of Food Production in Lecce – has involved analysing the Mediterranean jellyfish's biology and toxicity to ensure it is safe to eat, thereby beginning the process of convincing Europeans to put it on the menu.

But the PULMO team's research delved much deeper into the variety of potential uses for this unique and abundant sea creature. The project, a Marie Skłodowska-Curie Individual Fellowship, involved experienced researcher Lorena Basso who studied jellyfish biomasses and their associated microbial communities as an untapped source of bioactive compounds. These include peptides, collagen, gelatine and other potentially valuable materials that have industrial uses in the cosmetics, pharmaceutical and biomedical industries, and could also be used as ingredients for feed at fish farms.

Jellyfish-derived products

'PULMO provided baseline scientific information to establish best practices for jellyfish biomass exploitation. This could result in socio-economic benefits in terms of sensitising the public at large to regard jellyfish as a resource rather than pests, shed light on the potential uses of jellyfish, and open up pathways for the creation of new business and job opportunities,' Piraino says.

A follow-up EU-funded project, GoJelly, to which Piraino and Leone are contributing, will expand research into the biochemical, nutraceutical, microbiological and nutritional characteristics of Mediterranean and European jellyfish. It will also focus on innovative applications and use cases, such as developing new ways to counter microplastics pollution that devastates marine life.

'Studies have shown that jellyfish mucus can bind microplastics. Therefore, GoJelly is also testing whether biofilters can be produced from jellyfish. These biofilters could then be used in sewage treatment plants or in factories where microplastic is produced,' the GoJelly researchers say.

If successful, the work would bring jellyfish full circle. Instead of being a growing marine menace advantaged by climate change, overfishing and other human activity, in the future jellyfish could eventually play a key role in boosting the health of the world's marine ecosystems.

'When they are exceedingly abundant, jellyfish cause substantial ecological impacts on marine biodiversity, interfere with economic and recreational human activities, and may be harmful to public health. For these reasons, jellyfish blooms are regarded as a multi-million euro problem for human activities in the sea and coastal zones,' Piraino says. 'However, our research suggests they have the potential to become an important new sustainable resource for humans and even a solution to some problems facing the marine environment.'

One day, following a long-standing Asian tradition, jellyfish could even become a sought-after culinary delicacy on Mediterranean holidays.

Project details

- Project acronym: **PULMO**
- Participants: **Italy (Coordinator)**
- Project N°: 708698
- Total costs: € 168 277
- EU contribution: € 168 277
- Duration: April 2016 to March 2018

See also

Project website:

<http://ec.europa.eu:80/research/headlines/news/xxxx>

Project details:

<https://cordis.europa.eu/project/rcn/200609/factsheet/en>

View the article online:

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