

OCEANZYME Investigates New Enzymatic Recycling Solutions for Marine Litter

AIMPLAS, the Institute of Marine Sciences and the Institute of Advanced Chemistry of Catalonia of the CSIC are collaborating on this project, coordinated by the Vertidos Cero Association.

Passive fishing campaigns will be carried out in the North Atlantic and Levantine-Balearic marine regions to remove marine litter and valorise it through enzymatic recycling using an integrated approach.

The project will also explore the application of the resulting products in sectors such as fisheries and aquaculture.

Valencia (17-7-2026).- Marine waste found in deep-sea environments shows a high degree of degradation. This leads to the loss of its original physico-mechanical properties, making recycling through conventional mechanical processes difficult and limiting its reintroduction into the plastics value chain. To provide an effective alternative for recycling this waste, the OCEANZYME project is investigating new enzymatic recycling solutions for marine litter.

The initiative, which will run from 2026 to 2028, is being carried out by a consortium comprising the Plastics Technology Centre AIMPLAS, the Institute of Marine Sciences, and the Institute of Advanced Chemistry of Catalonia of the CSIC and is coordinated by the Vertidos Cero Association. The project started at the end of January 2026 and is being developed in collaboration with the Biodiversity Foundation of the Spanish Ministry for Ecological Transition and Demographic Challenge through the Pleamar Programme. It is also co-funded by the European Union through EMFAF (European Maritime, Fisheries and Aquaculture Fund).

OCEANZYME adopts an integrated approach combining metagenomic analyses, enzymatic characterisation and molecular simulations, together with the isolation of bacteria with functional degradation capabilities. The aim is to valorise marine litter collected by fishers through enzymatic recycling and to explore the application of the resulting products in sectors such as fisheries and aquaculture.

To this end, passive fishing campaigns will be carried out in two of Spain's five marine regions, the North Atlantic and the Levantine-Balearic regions — where average densities range from 40 to 300 items per km² — in order to remove marine litter. The plastic waste collected will be characterised to analyse its associated microbial communities through metagenomics. At the same time, pure culture isolations of bacteria with the potential to degrade different plastic compounds will be carried out. In addition, enzymes with

degradation potential will be identified, modelled in 3D together with the plastic substrates, produced and tested to validate their possible use in enzymatic recycling applications.

The project brings together the expertise of all participating organisations in waste removal protocols, marine microorganism studies, molecular simulations and plastic recycling. OCEANZYME promotes the circular economy, the protection of the marine environment and technology transfer through a strong communication and dissemination strategy.

About AIMPLAS

At AIMPLAS, the Plastics Technology Centre, we are committed to building a better world by promoting sustainable innovation in the field of plastics. Our goal is to support companies in creating wealth and employment, while helping to address major societal challenges.

We provide comprehensive, tailored solutions that include R&D&I projects, training, competitive and strategic intelligence, technical and legal consultancy, as well as technological services such as analysis and testing.

We are firmly committed to sustainability and actively contribute to the 17 United Nations Sustainable Development Goals (SDGs) through both our operations and our social responsibility initiatives.

As a member of the Network of Technological Institutes of the Valencian Region (REDIT), we are further empowered to deliver value and foster knowledge transfer within the business community.

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