



BIOICEP - Newsletter June 2021

Bio Innovation of a Circular Economy for Plastics

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1. CONFERENCES AND PUBLICATIONS

This year, PhD students involved in BioICEP project have presented their work at EFB2021 virtual conference. EFB2021 is the major scientific conference organized by the European Federation of Biotechnology (EFB) with 81 speaker and 206 poster presentations. EFB promotes the safe, sustainable and beneficial use of fundamental research and innovation in life sciences, while providing a forum for interdisciplinary and international cooperation.

- **Brana Pantelic**, Junior Researcher from IMGGE, presented his work on selected degradation of PET-related substrates by *Penicillium* sp. MM41 strain isolated from woodlice. This strain was able to completely degrade BHET in liquid culture after 10 days of incubation with MHET release. Additionally, it was shown that MM41 strain has an ability to use PET related monomers (PET-2mer and PET-2.5mer) as a sole carbon and energy source.
- **Diana Garza**, PhD student at AIT presented her research on enzymatic potential of microbes isolated from polluted sites. Selected sites proved to be good sources of potential PET degrading enzyme producer. Isolated strains showed an ability to use

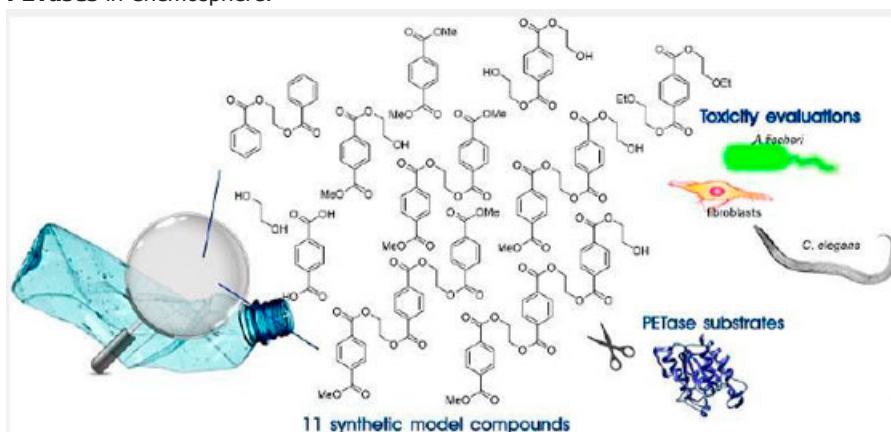
plastic related substrates as a sole carbon source. Further research will be focused on conversion rate of tested substrates in liquid culture.

- **Eduardo Lanzagorta Garcia**, PhD student at AIT presented his work on the enhancement of bacterial cellulose (BC) antimicrobial properties. Effective antimicrobial activity was observed as a result of curcumin supplementation and addition of TSNP. Further analysis will be performed for optimization of supplemented production and evaluation against a wider variety of bacterial strains



CHEMOSPHERE PUBLICATION

Our partners from Serbia and Greece published research study: **Synthesis and characterization of polyethylene terephthalate (PET) precursors and potential degradation products: Toxicity study and application in discovery of novel PETases** in Chemosphere.



Highlights

- PET plastic precursors and possible degradation products toxicologically evaluated.
- Low toxicity observed in vitro on human fibroblasts
- Three compounds harmful to nematode *Caenorhabditis elegans* only at high concentration
- Six compounds classified as toxic and moderately toxic against *Allivibrio fischeri*
- PET dimer and trimer are used as substrates for PET hydrolyzing enzyme.

<https://doi.org/10.1016/j.chemosphere.2021.130005>

2. PROJECT DISSEMINATION



PINT OF SCIENCE FESTIVAL
17-19 May 2021

Pint of Science invites scientists to their favourite local pubs and cafes to talk about their research. This year it went virtual and has brought the best researchers Ireland has to offer to living rooms all across the country. This annual event where scientists share their research with the public was organised by local volunteers and AIT PhD students. **Dr Margaret Fournet**, BioICEP coordinator, held a conversation on "Earth's Eco Challenges and Solutions". One benefit of using your newsletter as a promotional tool is that you can reuse content from other marketing materials, such as press releases and market studies.



Pint of Science IE:
"Insightful talk by Dr. Margaret B. Fournet presenting the @BioICEP_H2020 project which she co-ordinates @AthloneIT - a new flagship EU-China Horizon 2020 spearheading the clean-up of the global plastic waste burden. #Pint21 #ClimateAction"

**Science
Powered Future
Sustainable
Prosperous
Living**

Bi-Annual Conference "Strategic Research Needs for the European Plastics and Composites Industry" took place on the 21st of April 2021 as a virtual event. This conference is organized by ECP4, The European Composites, Plastics and Polymer Processing Platform. BioICEP coordinator, **Dr. Margaret Brennan Fournet**, took a part in this conference and presented Bioinnovative solutions for packaging circularity.



European Composites, Plastics and Polymer Processing Platform

"Plastic hazards and microbial degradation" Clean the beach action!




Our partners from **Shandong University in China**, led by Professor Qi Qingsheng, vice president of Microbial Technology Research Institute, organized all teachers and students of the Microbial Synthesis and Metabolic Regulation Task group to carry out a public event in order to raise environmental protection awareness and cultivate public interest in plastic degradation research and social responsibility.

MBMR volunteers participated in the State Key Laboratory of Microbiology Technology 2021 "Qi Meng Wei Lai" public open day activities. Participants had a chance to learn about plastic pollution problems and possible ways of intervention. Using their own research, scientists talked about important topics, such as:

- Properties, advantages and disadvantages of different plastics and their degradation process,
- Environmental problems caused by petroleum-based plastics and serious consequences as a result of no intervention,
- Environment friendly bio-based plastic introduction and importance.

Children also learned about the dangers of plastic pollution and developed a love for biology and research. This popular science activity was intended to make everyone involved to get a better perspective on plastic pollution problem.

Net Beach Action. Shandong University Qingdao campus is located on the beautiful Yellow Sea coast, every evening nearby residents and tourists often go to the seaside Binhai Park to play, and usually they will find garbage on the beach. This garbage not only affects the mood of viewing, but also causes pollution to the marine environment. Volunteers from the MBMR team came to Marina Park on the afternoon of May 23rd. Teachers and students were divided in 3 groups: science group, sampling group and the net beach group. The science group gave residents and tourists advice on preventing plastic pollution and urged them not to throw away garbage. The sampling group went deep into the sea and sampled the sea water, sediment and plastic garbage. Last group searched for garbage along the coastline. Garbage mostly included food bags, beverage bottles and paper towels.

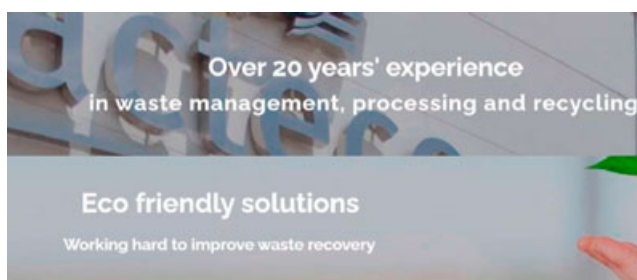
Tourists even joined our volunteers and participants in this noble act and helped with cleaning! ☺



3. MEET OUR PARTNERS



At **ACTECO**, they work hard towards a fully integrated management recycling and recovery process for both hazardous and non-hazardous industrial waste. Their plants are involved in all aspects of this process such as equipment hire, waste collection, transportation, storage and conditioning, as well as recycling and recovery, or, where necessary, waste disposal, thus contributing to a circular economy. At their premises, they correctly manage any hazardous and non-hazardous waste in full compliance with the current legislation, while providing advice in order to obtain all environmental certificates required to successfully complete any audits or inspections. Therefore, their environmental consulting service can provide the ultimate level of support for those that require additional assistance. They help companies to meet their environmental liability obligations and to project an image to match their commitment towards customers and society in general. Their social and environmental commitment towards people and nationwide institutions is central to our business, as evidenced by their constant support of R&D&I and their partnerships with technology entities such as AIDIMME, AIMPLAS and AIJU, in addition to their certifications endorsing the quality of our work (ISO 9001, ISO 14001, SONY GREEN PARTNER, R&D programme by the Ministry of Industry).



Acteco Productos y Servicios como gestores de residuos se va a encargar de recoger residuos posconsumo generados en la región de España, con el fin de obtener una muestra representativa de los residuos generados en la misma. Una vez recogidos se triturará el material y se pasará por la línea de densado para poder separar los diferentes materiales de los que se compone el residuo. Una vez realizada esa separación se realizarán las mezclas de polímeros indicadas, de esta manera se obtiene un residuo homogéneo que ya puede ser utilizado en el proceso de pretratamiento, así como proporcionar material a los Institutos Tecnológicos para que puedan realizar su caracterización tanto física como química. Además, contribuirá en las tareas de caracterización del residuo gracias a la utilización de equipos de Calorimetría de Barrido Diferencial para conocer los puntos de fusión de las mezclas preparadas o la cantidad de cargas inorgánicas presentes en la mezcla gracias a la reciente instalación de una mufla.



Ángel Martínez



Logoplaste Innovation Lab is an independent business unit of the Logoplaste Group, active in the research and development of high-performance plastic packaging solutions, through a 360° methodology. This methodology takes as its starting point the human factors (what people desire?) and combine them with technological and business factors allied with laboratory resources. The result is an integrated and supported by extensive creative, technical, and business analysis knowledge to deliver the best solution to the customer and consumer. Logoplaste Group is a leading global designer and manufacturer of value-added rigid plastic packaging solutions to a wide range of blue-chip clients, with its origin in Portugal. Founded in 1976, for over 42 years the company has pioneered by its innovation and customer service approach beyond the pure manufacturing process. Focused on a sustainable future, Logoplaste is one of the pioneer companies to sign the "New Plastics Economy Global Commitment" by the Ellen MacArthur Foundation. The "New Plastics Economy Global Commitment" aims to create a new scenario for plastic packaging, increasing the amount of reused or recycled plastics in new products and promoting innovation to ensure 100% of Plastic packaging can be reused, recycled or composted by 2025.

ILab team:

- **Paulo Correia:** R&D director and ILAB responsible | Advisory during all project activities, mainly during the packaging development phase
- **Maria Eugenia B. Zacarias:** R&D Raw Materials, Sustainability and Regulatory Affairs responsible | Technical raw materials support during the packaging development phase
- **Verónica Salgueiro:** Packaging Engineering Support Coordinator | Technical support during the packaging validation phase
- **Bruno Machado:** Technical Director | Technical support during the packaging development phase
- **Nuno Pereira:** FEA Coordinator | FEA support during the packaging development phase
- **Rudiney Souza:** CAD Coordinator | CAD support during the packaging development phase
- **Márcia Damas:** Project Manager Officer | Project activities coordination
- **Pedro Santana:** Project Manager | Project activities coordination

We partner with companies and entrepreneurs to research and develop the most relevant, feasible, viable and sustainable packaging solutions.

We offer you a complete and integrated breadth of expertise that supports all phases of packaging development, from research, design and engineering to full industrial implementation.

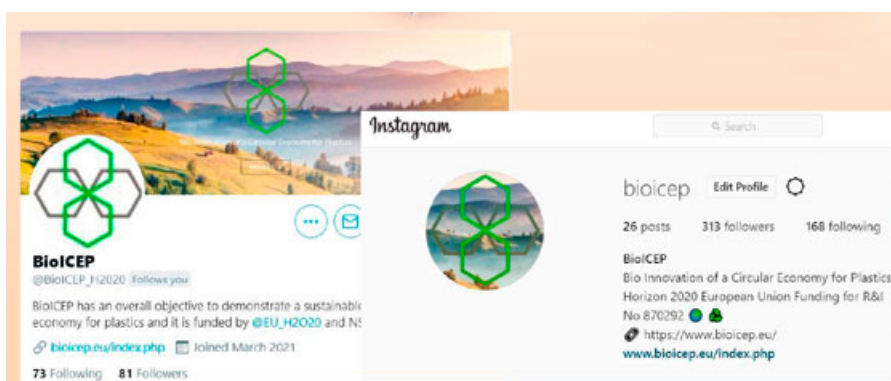


María Eugenia Zacarías

BioICEP on Social Networks

TWITTER: https://twitter.com/BioICEP_H2020

INSTAGRAM: <https://www.instagram.com/bioicep/>



The BioICEP consortium has prepared a short cartoon video to spread the objectives of the project. You can find it on our website:

<https://www.bioicep.eu>

The Biocep project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 870292.

