BioLaMer NEWSLETTER

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September 2025 | Fifth Edition

BioLaMer welcomes you to the fifth edition of the newsletter

BioLaMer is in the last year of its project and has achieved significant advancements across its research pathways. In this edition, we highlight the latest updates and the progress.

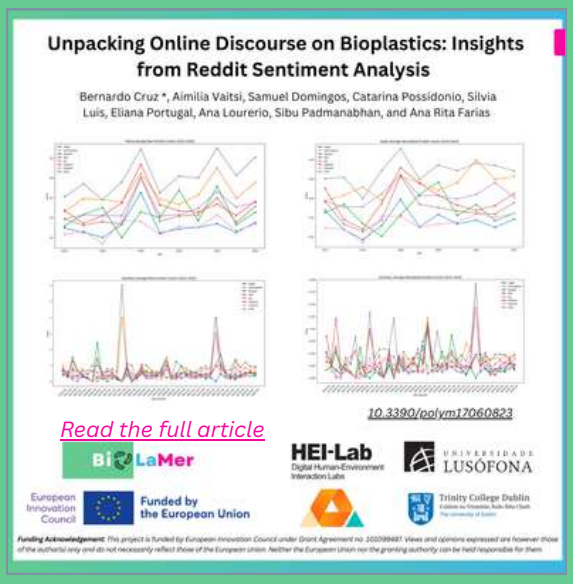
- Designed a larvae cultivation bioreactor with optimized growth conditions and successfully producing larvae batches.
- Demonstrated the extraction of chitosan from larval shells and PHBV (poly(hydroxybutyrate-co-hydroxyvalerate)) and PHA (Polyhydroxyalkanoates) using optimized methods from the larval biomass derived compounds.
- Developed machine learning models, employing deep learning and hybrid methods to digitize and enhance the biorefinery process.
- Implemented Physics-Informed Neural Networks for bioreactor modeling and optimized supercritical CO_2 extraction of lipids from larvae biomass, achieving 90% efficiency.
- Primary sustainability assessment has identified the key environmental and economic hotspots of the proposed biopolymer biorefinery.

BioLaMer Intellectual Properties: Strengthening its impact pathway

BioLaMer partner **TCD** has filed a patent titled **"Super-absorbent biopolymer (SAB) materials and methods of preparation thereof"** (Application number: EP25196113.2).

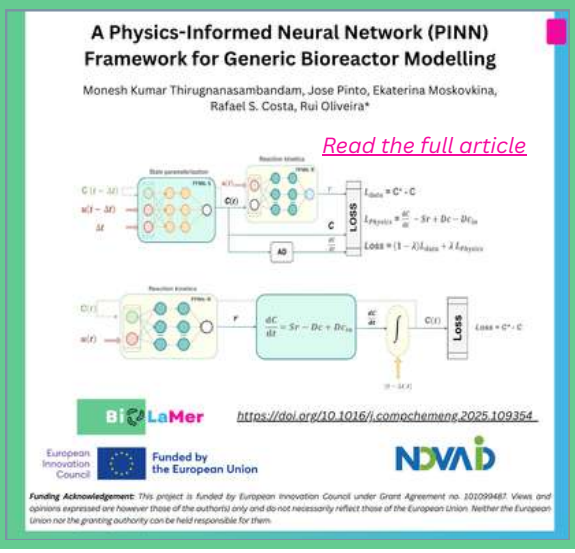
BioLaMer partners **NOVAID** and **TCD** are in the final stages of a patent application focused on the preparation of Polyhydroxyalkanoates (PHA) from insect larvae biomass.

Research in Print



BioLaMer has recently published two Open Access research articles in collaboration with our project partners.

In collaboration with **COFAC, BioLaMer's** article in the "Polymers" journal, titled "**Unpacking Online Disclosure on Bioplastics: Insights from Reddit Sentiment Analysis**", explores Reddit discussions on bioplastics, showing how . public sentiment shits in response to major policy events.



Though our partnership with **NOVAIDFCT, BioLaMer's** article in "Computers & Chemical Engineering" journal, titled "**A Physics-Informed Neural Network (PINN) framework for generic bioreactor modelling**", presents a comparative analysis of dual-FFNN PINNs, hybrid semiparametric, and conventional ANN models for generic bioreactor systems.

Annual Meeting Highlights

BioLaMer project hosted its Second Annual Meeting on April 9th -10th, 2025 at the University of Bologna, Ravenna campus, Italy.

The meeting kicked off with the steering board sessions addressed risk assessment, mitigation strategies, and project progress, while the SIAB meeting with **Neil Crabb, Filippo Baioli** and **Stefano Longo** provided key insights on emerging opportunities and priorities to refine exploitation strategy.

LCA Conference

BioLaMer partner **Serena Righi** and **Floriana Coppola** presented poster and paper at **XIX Italian Network Association LCA Conference** in Cortina, Italy on 19th -21st March 2025, highlighting sustainability assessment methods for emerging bioproduct technologies, emphasizing case-by-case strategies that integrate complementary approaches to support early-stage decision-making.

Inspiring Future Researchers

BioLaMer Project partners **Floriana Coppola** and **Serena Righi** showcased the project's innovative vision at the **University of Bologna Open day**, which was held on 22nd May 2025.

Their presentation highlighted BioLaMer's innovative and circular approach to sustainable bioplastics and its potential in shaping a sustainable future and inspiring students to pursue careers in science, research and innovation.

Sustainability Spotlight

BioLaMer partners **Serena Righi, Floriana Coppola** and **Shamraiz Ahmad** from **UNIBO** took part in the workshop "**Plastics & Environment**" in Ravenna, Italy held on 5th - 6th June 2025. Their contributions included an oral and a poster presenting on the BioLaMer project, addressing sustainability challenges in assessing bio-based materials at low technology readiness levels, with preliminary results highlighting the benefit of combining early-stage assessment methods to guide material design.

Project Showcase

BioLaMer's circular strategy for sustainable bioplastics was showcased by our partners from UNIBO, **Serena Righi** and **Floriana Coppola** at **La.Bourinto** in Ravenna Campus, Italy, held on 24th July 2025.

The session highlighted how interdisciplinary research inspires future scientists and drives innovation in sustainability.

Public Outreach

BioLaMer's communication Partner **SocLineTech Solutions & Services** in collaboration with **Trinity College Dublin** showcased the sustainable project at the Manufacturing & Supply Chain Conference & Exhibition in Dublin on 28th -29th May 2025.

At this event, our project partners **Sibu Padmanabhan** and **Eniya Mariappan** presented engaging posters and showcased biopolymer/ bioplastics samples, engaging the manufacturing community, students, public, and collected feedback on perception of sustainable materials to guide future outreach strategies.

Research Showcase – ENBIS

BioLaMer project partners from **NOVAID FCT** took part in the the European Network for Business and Industrial statistics (**ENBIS**), spring meeting, held from 29th - 30th May 2025 at Coimbra, Portugal.

At this event, **Monesh Kumar** delivered a lecture on **"Physics-Informed Neural Network for Bioprocess digitalization"**, while **Roshanak Agharafeie** presented on title **"Hybrid Semiparametric Modelling of the Supercritical Carbon Dioxide Extraction Process"**.

Inspiring Young Minds

On 24th June 2025, **BioLaMer** partner, **Sivakumar Krishnan** from **Trinity College Dublin** had the pleasure of introducing the project's objective to a group of enthusiastic school students.

This session centered on the microplastics topic, sparking lively discussions on sustainability and real-world scientific research among the young minds.

Trash Talk Workshop

As a part of BioLaMer project, partner **Neda Tozija** and **Nada Tozija** from **TransfoLab BCN** hosted the **6th edition of the Trash Investigation Series: Organic Matters** on 27th - 28th May 2025, welcoming over 200 visitors.

This event offered a hands-on glimpse into the project's innovative approach to sustainability and circularity, allowing attendees to explore informative posters and examine the larvae and biopolymer samples developed.

Oral Presentation

BioLaMer project partner **Samuel Domingos**, from **COFAC** delivered an oral presentation titled **"Bioplásticos: Barreiras à produção industrial e à escolha do consumidor"** at the Symposium on Sustainable Development in Portuguese-Speaking Countries, held on 13th -14th March 2025, in Coimbra, Portugal.

During his presentation, he highlighted technological, regulatory and psychological barriers that currently hinder the production and commercialization of bioplastics.

BioLaMer at SNIP

BioLaMer partners from **COFAC**, participated in SNIP - National Symposium on Psychological Research 2025, presenting on **"From Lab to Market: Strategies and Challenges in Communicating Sustainability"** which was held on 29th May 2025.

In this session, **Catarina Possidonio**, **Bernardo Cruz, Eliana Portugal** and **Ana Rita Farias** emphasized key research contributions from the project and disseminated the project's innovative approach of transforming food waste into bioplastics.

BioLaMer at ESREL

BioLaMer partner, **COFAC** participated in the Safety and Reliability (ESREL) and Society for Risk Analysis Europe (SRA-E) Conference (ESREL/SRA-E 2025) held from 15th - 19th June 2025, in Stavanger, Norway.

At this event, our partner **Samuel Domingos** delivered a talk titled **"Risk management strategies, solutions, and recommendations for bioplastics production challenges: A co-production initiative".** His presentation highlighted the importance of bridging scientific research and practical solutions for sustainable bioplastics development.

BioLaMer Partners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Thank You

See you in the next edition of our newsletter

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