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ADTech



BIO ENHANCED BIOCONVERSION OF AGRICULTURAL RESIDUES THROUGH CASCADING USE

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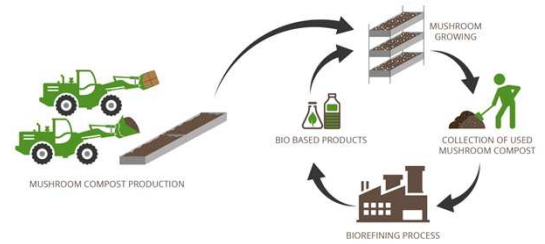
THE CHALLENGES

- Each year, over 3 million tones of mushroom compost is generated by mushroom production, thus creating significant economic and logistical problems for Europe's farmers.
- Mushroom compost, prepared solely for growing mushrooms, is only suitable for one to three harvests;
- The compost is currently disposed of, even though it contains valuable components;
- The mushroom industry lacks adapted technological solutions to upgrade this compost into valuable products.

THE BIOrescue CONCEPT

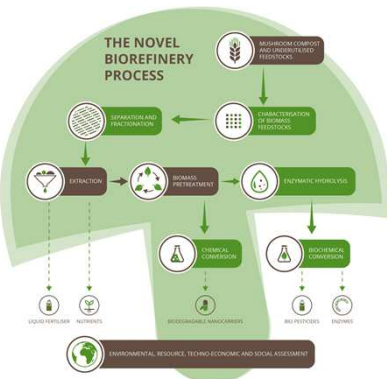
The BIOrescue project aims to develop and demonstrate a novel biorefinery concept based on the cascading use of mushroom compost supplemented by wheat straw (and other seasonal underutilised lignocellulosic feedstocks). This new concept will avoid disposal costs and allow for the production of some biodegradable bio-based products and bioactive compounds, all the while helping to replace existing products based on fossil fuels.

- To demonstrate an innovative and resource-efficient biorefinery concept for mushroom compost conversion;
- To create valuable bio-based products from mushroom compost and other lignocellulosic feedstocks;
- To achieve a 20% overall cost-reduction in the enzymatic hydrolysis process;
- To reduce disposal costs for mushroom compost and generate a new income stream for mushroom producers



SCIENTIFIC INNOVATIONS

- Deployment of improved methods for the lab-based rapid (NIR) analysis of biomass that could be applied for on-line real-time evaluation of biomass feedstocks and process outputs.
- Application of an innovative two-step fractionation process of mushroom compost with synergistic effects for complete glucan hydrolysis.
- New improved enzymes for lignocellulose conversion for formulating optimized enzymatic cocktails for hydrolysis of mushroom compost with increased monosaccharide yield.
- Development of an innovative enzyme immobilisation and recovery strategy that will include the use of mCLEAs.
- Formulation of novel lignin based nano- and micro-carriers and a biopesticide from monomeric sugars derived from the compost and their packaging into nanocarriers.
- Fermentation of the sugars obtained from the compost for the production of enzymes to be used within the biorefinery .



NOVEL BIO-BASED PRODUCTS FROM MUSHROOM COMPOST



FEEDSTOCK SUPPLY & SUSTAINABILITY ASSESSMENT



THE PROJECT TEAM



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