

# Prolific

Integrated cascades of PROCesses for the extraction and valorisation of proteins and bioactive molecules from Legumes, Fungi and Coffee agro-industrial side streams

## Summary

Agro-industrial residual biomass, side streams and food production by-products such as legumes, fungi and coffee are likely to constitute rich sources of valuable ingredients. Their potential is yet to be fully realised. The Prolific project will apply a range of processing technologies to agro-industrial residues of legumes, fungi and coffee in order to recover significant amounts of proteins/peptides, fibres and other value-added compounds.

Once extracted by economically and environmentally sustainable protocols, the outputs will undergo enzymatic modification and conditioning techniques in an upscaled, industrially-relevant environment. Ultimately, this will provide viable amounts of the compounds and fractions necessary to produce 16 prototypes for the food, feed, packaging and cosmetic sectors. The Prolific project's R&D&I activities and partners are streamlined around a core innovation cycle, principally driven by industrial end-users that know precisely what their customers need and the what are the technical and industrial demands of their sector.

### Type of Action:

Research & Innovation Action

**Value Chain:** VC4 – organic waste

**Start date:** 01 September 2018

**End date:** 31 August 2022

**BBI JU contribution:** € 4,672,383

## Objectives

The overall objective of the Prolific project is to apply, validate and scale up an integrated array of processes for recovering significant amounts of proteins/peptides and other value-added compounds from the agro-industrial residues of legumes (seeds of peas, beans and chickpeas), fungi (cuttings and mycelia of different species) and coffee (silver skin and non-compliant roasted seeds). The Prolific project will pursue the following specific objectives.

- Mapping the availability and sustainability of the chosen feedstocks (legumes, fungi and coffee residues) during and after the project;
- Defining the specifications and compliance of residue-derived compounds with existing regulations;
- Establishing flexible and fully-scalable biorefinery extraction protocols for isolating proteins and bioactive compounds from plant residues;
- Converting extracted fractions into valuable

## Expected impacts

The overall impact of the Prolific project is to address specific challenges posed by the valorisation of untapped biomass streams. Specifically, these include:

- Addressing the present European food policy for the provision of safe, nutritious, high quality and affordable food to European consumers by valorising the increasing amounts of side-streams from the processing of legumes, fungi and coffee;
- Become the leading solutions' provider for ingredients/additive alternatives or complementary to those currently available
- Contributing to meet the increasing demand for bio-based, active, and biodegradable molecules and polymers to be used for polymer formulations and applications;
- Introducing and validating bio-polymers and green additives in packaging applications

- Ingredients tailored to the specific final applications of industrial end-users;
  - Selecting, validating and demonstrating the use of extracted/converted fractions as ingredients in the food sector;
  - Selecting, validating and demonstrating the use of extracted/converted fractions as ingredients in cosmetic sector;
  - Selecting, validating and demonstrating the use of extracted/converted fractions as ingredients and additives in packaging sector;
  - Selecting, validating and demonstrating the use of extracted/converted fractions as ingredients in the animal feed sector;
  - Successful disseminating the project results and preparing them for efficient exploitation.
- Growing the bio-plastics sector and thus mitigating climate change;
  - Contributing to produce new generation of functional feed products also aiming at reducing the dependency from antibiotics
  - Contributing to produce innovative cosmetic products using more sustainable bio-based ingredients

- Alma Mater Studiorum – Università di Bologna - Italy
- Innovacio I Recerca Industrial I Sostenible SL - Spain
- Università degli Studi di Parma - Italy
- Stazione Sperimentale per l'industria delle Conserve Alimentari - Italy
- Celabor SCRL - Belgium
- IGV Institut für Getreideverarbeitung GMBH - Germany
- Stolzenberger Reiner Erich - Germany
- Bio Base Europe Pilot Plant VZW - Belgium
- CONSERVES FRANCE - France
- RTD Talos Limited - Cyprus
- Cosmetic - Greece
- Illycaffè S.P.A - Italy
- Nutrition Sciences NV - Belgium
- Pleurette - France
- Femto Engineering SRL - Italy
- Innovacoop SRL - Italy

## Project coordination

**Name:** Fachhochschule Nordwestschweiz - Switzerland