Press Release

INCREASE – Intelligent Collections of Food-Legumes Genetic Resources for European Agrofood Systems

Participatory research approach to characterise genetic resources in food legumes

Università Politecnica delle Marche, Ancona, Italy, 4 June 2020 – 28 international partners from 14 different countries are launching the new EU research project INCREASE at a virtual Kick-off meeting today. Looking into the status of plant genetic resources of four important traditional European food legumes (chickpea, common bean, lentil and lupin), the consortium aims to develop efficient and effective conservation tools and methods to foster agricultural biodiversity in Europe. For a period of five years, the project will receive a budget of EUR 7 million from the European Union's Horizon 2020 research and innovation programme.

Human plant protein intake is on the rise in many EU regions and the market for meat and dairy alternatives is undergoing annual growth rates of 14% and 11% respectively. In order to face the increasing demand for innovative products and comply with the citizens' demands for healthy and environmentally friendly foodstuffs, novel varieties are needed and existing genetic resources in crop breading must be properly exploited. The characterisation and maintenance of food-legume genetic resources, and their exploitation in pre-breeding, form the core development of both more sustainable agriculture and healthier food products. Indeed, in 2019 the IPCC report titled "Climate Change and Land" (https://www.ipcc.ch/report/srccl/) indicated that the transition to novel plant based diets could "present major opportunities for adaptation and mitigation while generating significant co-benefits in terms of human health". However, especially in the field of food legumes, breeding investment and research have been modest, leading to a largely unexplored genetic potential of these important staple food crops.

This is where INCREASE intends to systematically address current shortcomings: Focusing on chickpea, common bean, lentil and lupin, the project will implement a new approach to conserve, manage and characterise genetic resources leading to benefits on different levels. It promises to attract additional private and public investment to boost food legumes breeding. Furthermore, the availability and access to well-described and well-managed collections of genetic resources capturing the full range of species is of crucial importance for reaching a competitive level regarding agronomic performance and sustainability in the EU.

INCREASE will combine cutting edge approaches in plant genetics and genomics, high throughput phenotyping, including molecular phenotyping (e.g. transcriptomics and metabolomics), with most recent advances in Information Technology and Artificial Intelligence to boost the conservation of European crop genetic resources and promote their use and valorisation. "Indeed, utilisation of crop genetic resources is the key for their effective conservation" says Roberto Papa, Full Professor of Plant Genetics at the Marche Polytechnic University in Ancona, Italy, and Scientific Coordinator of the project. "INCREASE will involve many stakeholders including SMEs, research institutions and NGOs through a dedicated Consortium of Stakeholders to facilitate their integration in the project".

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 862862

"Moreover, we will test a completely novel framework by using genetic resources of the four food legume species. In the long term, the new tools and processes could be transferred to other genetic resources thus revolutionising the landscape of conservation sites and safeguarding crop diversity on a global scale." Prof. Papa adds.

[…] *Partners may wish to add additional quotes from their institution's spokespeople or a paragraph about their specific engagement in INCREASE*

To this end, the project aims to:

- improve the management and sharing of food legume genetic resources data through optimised databases and easily accessible tools;
- produce a large amount of high-quality genotypic and phenotypic data;
- develop *Intelligent Collections* for the exploration of crop diversity and design innovative conservation management approaches collaboratively;
- generate new knowledge, such as gene discovery or genomic prediction, made easily available through a web-based searching and visualisation tool to identify appropriate sources of germplasm;
- develop, test and disseminate best practices for dynamic management of genetic resources across European and non-European institutions and initiatives;
- develop decentralised information technology (e.g. block chain) approaches for data sharing and germplasm conservation.

INCREASE is guided by the EC principles "***open science, open innovation and open to the world***" and will take advantage of digital technologies to make science and innovation more collaborative and global. For this purpose, the project will test a decentralised approach to the conservation of genetic resources by setting up a ***Citizen Science experiment***. In early 2021, we will distribute more than 1,000 different common bean landraces to European citizens and farmers to be evaluated in their field, home garden or terraces. Citizens will gain knowledge about legumes biodiversity, will get actively involved in evaluation and conservation activities and in sharing and exchanging seeds in a new legal framework via a specifically developed INCREASE mobile app. This is also a major innovation for the Plant Genetic Resources community for benefit sharing and to promote the correct use of Plant Genetic Resources.

The interdisciplinary INCREASE consortium covers a variety of expertise, including plant genomics, bioinformatics and data analysis, information technology, phenotyping and agronomy, genebanks management, germplasm conservation and sharing and biochemistry.

Project Key Facts

Full Name: INCREASE - Intelligent Collections of Food Legumes Genetic Resources for European Agrofood Systems
Start date: 01 May 2020
Duration: 60 months
Budget: 7 Mio. €
Coordinator: Università Politecnica delle Marche, Ancona, Italy
Website: www.increase-h2020.eu

Project Partners

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 862862

Press Release

International Institutions

FAO - Food and Agriculture Organization of the United Nations FAO, Italy

Universities and Research Institutes

UNLP - Universidad Nacional de La Plata, Argentina

USASK - University of Saskatchewan, Canada

CNRS - Centre National de la Recherche Scientifique, France
INRAE - Institut Nationale de la Recherche Agronomique, l'alimentation et l'environment-INRA*e,* France

IPK - Leibnitz-Institut für Pflanzengenetik und Kulturpflanzenforschung, Germany
MPG - Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Germany

ICRISAT - International Crops Research Institute for the semi-arid Tropics, India

CREA - Consiglio per la Ricerca in Agricoltura e l'Analisi Dell'Economia Agraria, Italy
UNIVPM - Universitá Politecnica delle Marche, Italy
UNIBAS - Universitá Degli Studi Della Basilicata, Italy

ICARDA - International Centre for Agricultural Research in the Dry Areas, Lebanon

IGR-PAN - Instytut Genetyki Roslin Polskiej Akademi Nauk, Poland
IHAR-PIB - Instytut Hodowli I Aklimatyzacji Roslin – Panstwowy Instytut Badawczy, Poland

UCP - Universidade Catolica Portuguesa, Portugal

BRGV-Suceava - Banca de Resurse genetice vegetale Mihai Cristea Suceava, Romania
SDL-BACAU - Statiunea de Cercetare Dezvoltare Pentru Legumicultura Bacau, Romania

VIR - Federal Research Center the N.I. Vavilov All-Russian Institute of Plant Genetic, Russia

KIS - Kmetski Institut Slovenije – Agricultural Institute of Slovenia

SERIDA - Servicio Regional de Investigación y Desarrollo Agroalimentario del Principa, Spain
INIA - Instituto Nacional de Investigación in Tecnología Agraria y Alimentaria OAMP, Spain

NDSU - North Dakota State University, USA
UC Davis – University of California, Davis, USA

SMEs

DCS-Fuerth, Germany
EURICE - European Research and Project Office GmbH, Germany

ISEA SRL, Italy

Associations and Organisations

TERRES INOVIA, France

MASP - Communitá del Mais Spinato di Gandino, Italy

Contact:

Project Coordinator:

Università Politecnica delle Marche, Italy
Prof. Roberto Papa
Phone: +39 0712204984
Mail: r.papa@univpm.it

Project Management:

EURICE GmbH
Dr. Bianca Dibari
Phone: +49 174 19 45 362
Mail: b.dibari@eurice.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 862862