Interreg

Co-funded by the European Union

IPA ADRION

BFC

BioFarms Cluster – BFC

Interreg VI-B IPA Adriatic Ionian

Priority 1 - Supporting a smarter Adriatic - Ionian region

SO 1.1 - Strengthening innovation capacities in the Adriatic - Ionian region

Activity 1.2 - Knowledge transfer among partners

List of matrices for exploitation

GOEL

Contents

Introduction

This document provides a structured overview of the first round of plant matrices selected for the BioFarms Cluster project, with a dual focus: on the one hand, endemic and typical species of the Mediterranean scrub, and on the other, local by-products of the Calabrian agri-food industry.

Through an integrated analysis of the environmental, economic, and technological benefits associated with biodiversity and the circular economy, the aim was to identify the species of greatest interest for the extraction of high-value compounds (such as polyphenols, flavonoids, terpenes, tannins, and phenolic acids), assessing their potential for industrial applications.

Finally, the objectives and critical issues of the piloting activities are outlined, particularly regarding the cultivation of wild species, the management of integrated supply chains, and potential regulatory barriers.

1. Project context

This analysis is part of the BioFarms Cluster (BFC) project, promoted within the framework of the Interreg VI-B IPA Adriatic Ionian program.

The project aims to strengthen innovation capacities in the Adriatic-Ionian region, with a particular focus on plant biodiversity and the valorization of agri-food by-products, within the framework of an increasingly circular and sustainable economy.

- **Programme:** Interreg VI-B IPA Adriatic Ionian
- **Specific objective:** Strengthening innovation capacities in the Adriatic-Ionian region

- **Activity 1.2:** Knowledge transfer between partners, with evaluation of processes, protocols and know-how
- **Deliverable 1.2.2:** List of matrices for exploitation

2. Objectives of matrix selection

The collection and classification of matrices is based on two key pillars:

- Biodiversity: with the focus on conservation, recovery and valorization of endemic species or species at risk of genetic erosion.
- Circular economy: with the focus on recovering waste and by-products from agri-food supply chains and transforming them into high-value resources.

3. Focus on Biodiversity: wild and typical Mediterranean plants

The parameters for the selection of species as potential candidate for the pilot activities take into account:

- Environmental adaptation: resistant to local climates and soils, with low requirements for external inputs (water, fertilizers).
- Ecological sustainability: greater integration into natural cycles, support for pollinating fauna, ecosystem stability.
- Low risk of invasiveness: unlike exotic species, they do not compromise the natural balance.
- Economic opportunities: applications in sectors such as cosmetics, herbal medicine, food, and crafts.

Among the principal species, our preliminary analysis, showed the following promising on:

- Helichrysum italicum (Helichrysum);
- Myrtus communis (myrtle);
- Pistacia lentiscus (mastic tree);
- Foeniculum vulgare (wild fennel);
- Origanum vulgare (oregano);
- Spartium junceum (broom);
- Thymus vulgaris (thyme).

The main category of phytocomplexes and active principles that can be extracted from the identified species includes:

- Essential oils;
- Flavonoids (quercetin, kaempferol, rutin);
- Phenolic acids (gallic, caffeic, ellagic);
- Terpenes and sesquiterpenes (such as humulene, curcumene);
- Tannins, alkaloids and saponins.

4. Focus on the Circular Economy: local agri-food by-products

The second category of potential matrices for pilots concerns by-products of the agro-industry; our preliminary analysis, showed that the following one are the most suitable ones for an economic valorisation:

- Grapevine (Vitis vinifera): pomace, seeds, leaves;
- Olive tree (Olea europaea): leaves;
- Citrus fruits (orange, bergamot, clementine, mandarin): peel, leaves;
- Tomato and chili pepper: peels and seeds;

Compounds of interest present in these matrices include:

- Polyphenols;
- Flavonoids;
- Terpenes;
- Phenolic acids;
- Carotenoids;
- Fatty acids and alkaloids.

The valorisation of these matrices present both advantage and challenges that can be summarized as follow:

Advantages:

- Waste reduction;
- Resource Optimization;
- Economic potential in new markets.

Challenges:

- Variable quality and seasonality;
- Collection and storage costs;
- Risks of contamination and perishability.

5. Technical objectives of the piloting activities

Based on the results of this preliminary analysis, in order to ensure the success of pilot activities, it is crucial to take into account the following points:

- Selecting the most suitable species for cultivation and propagation to build a local and transnational supply chain;
- Identification of the most effective extraction methods (also with a view to scalability);
- Assessment of the market potential for each extracts and derivatives;
- Identification of local actors relevant to the supply chain;
- Analyze the impact of domestication on the yield of active compounds;
- Study of critical issues related to logistics, legislation, and supply chain integration.

6. Conclusions

This preliminary analysis has identified a broad spectrum of plant matrices and agri-food by-products with potential for an economic and ecological valorization within the BioFarms Cluster project. The dual strategy, based on biodiversity protection and the circular economy, is particularly promising, both for its positive environmental impacts and for the opportunities for local and transnational economic development.

The careful selection of wild species and agri-food waste, along with the evaluation of extractable bioactive compounds and available technologies for the extractions, provides a solid foundation for the design of pilot activities aimed at building integrated supply chains. It is now be crucial to further explore the transformation and scalability phases, addressing the technical and regulatory issues that have emerged, to ensure a sustainable, replicable, and competitive model on the market.

www.interreg-ipa-adrion.eu

PARTNERS

Interreg

Co-funded by the European Union

IPA ADRION

BFC

UMG


PORA
Regionalna razvojna agencija
Koprivničko-križevačke županije


VuK
Veleučilište
u Križevcima
1860
Križevci University
of Applied Sciences


Gospodarska
zbornica
Slovenije
Chamber of Commerce
and Industry of Slovenia
Association of Chemical
Industries of Slovenia


REGIONAL ECONOMIC DEVELOPMENT AGENCY
for Sumadija and Pomoravlje


AGJENCIA PËR ZHVILLIM TË QËNDRUESHËM
AGENCY FOR SUSTAINABLE DEVELOPMENT


INNOVATION PARK
JOIST


fab
sarajevo