

I Information and Communication Day INTERREGIONAL and TRANSNATIONAL COOPERATION projects

RETREAT – New technologies based on natuRal matERials for the TREatment
and reuse of wAste water

UNIBAS Matera 03 febbraio 2023



Project identity

Lead partner institution: BASILICATA WASTE AND WATER RESOURCES GOVERNMENT (EGRIB)

Project duration in months: 24 months

Start date: December 2021

Programme Axis: Axis 5 - "Environmental protection and efficient use of resources" (OT6)

Area: 020 - Provision of water for human consumption (abstraction, treatment, storage and distribution infrastructure)

Total budget: Euro 322,500.00

Partnership



EGRIB
(ITALY)



MUNICIPALITY
OF POTENZA
(ITALY)



UNIVERSITY OF
BASILICATA-
SCIENCE
DEPARTMENT
(UB)
(ITALY)



REGION OF
IONIAN
ISLANDS
(GREECE)



UNIVERSITY
OF
NOVI SAD,
FACULTY OF
SCIENCE
(SERBIA)



UNIVERSITY OF
AGRICULTURAL
SCIENCE AND
VETERINARY
MEDICINE OF
CLUJ
(ROMANIA)



MUNICIPALITY
OF
CAPUS MARE
(ROMANIA)

Project Description

Water is an indispensable resource for any productive activity.

The massive use of water resources results in a high production of waste water, which must undergo purification treatment if it is to be returned to the environment.

Urban waste water presents disposal **problems due to the increasing presence of chemical compounds of synthetic origin.**

Waters are unable to receive a quantity of pollutants that exceeds their self-purifying capacity without seeing their water quality and the normal balance of the ecosystem compromised.

The need to purify wastewater through treatment systems that can mimic the biological processes that occur naturally in water bodies is therefore evident.

By exploiting cooperation between local authorities, government bodies in the water resource management sector and academic and scientific institutions, the project aims to test pioneering solutions for wastewater treatment.

Specifically, it will be a **highly innovative third-stage treatment** that will operate after the treatment by sewage treatment plants, with the aim of further purifying the effluent from municipal plants.

The main features of the proposed technology are as follows:

- 1. Use of the soil and its stratification as a purification barrier to improve the quality of filtered water;**
- 2. New natural composite materials, in particular chitosan, derived from insects;**
- 3. Use of bacterial biofilms as natural aids for the degradation of water pollutants.**

This purification technique will be tested on a small scale on the territory of the **Municipality of Potenza**, the project's partner administration.

Specific objective

The project aims to improve the integrated water service for civil use and the prevention of leakage in the aqueduct distribution network.

More specifically, the aims are:

- ➔ Testing, developing and institutionalising pioneering solutions for wastewater treatment
- ➔ Increasing environmental and economic performance in water reuse
- ➔ Creating the pre-conditions for subsequent collaborations between research and specialised companies

Project Output

The project aims to achieve the following outputs:

- > A **thematic survey** on international good practices in wastewater treatment and purification.
- > A **feasibility study** that will define in detail the opportunities and methods for implementing the studied technology in the territories of the respective participating regions.
- > A **prototype wastewater** treatment plant will be implemented in the municipality of Potenza.
- > A **policy paper** of recommendations for water management institutions.

Structure and project activities

WP 1 - FIRST TRANSNATIONAL MEETING

POTENZA - 15 September 2022



Structure and project activities

WP 1 - FIRST PRESS CONFERENCE
POTENZA - 16 September 2022



Structure and project activities

WP 1 - VISIT TO THE PURIFICATION PLANT

POTENZA - 16 September 2022



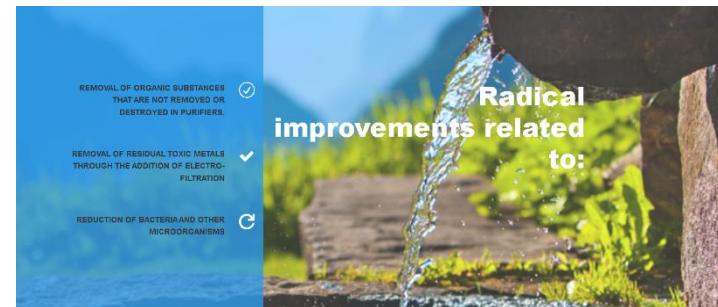
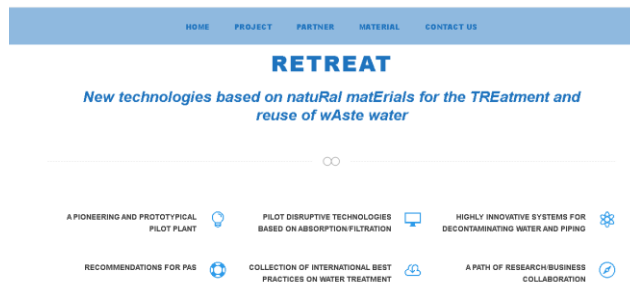
Structure and project activities

WP 2 - COMMUNICATION STRATEGIES

→ PROJECT LOGO



→ WEB SITE



Structure and project activities

WP 3 - MAPPING THE STATE OF THE ART IN PARTNER COUNTRIES AND IDENTIFICATION OF GOOD PRACTICES



STUDY VISIT IN:

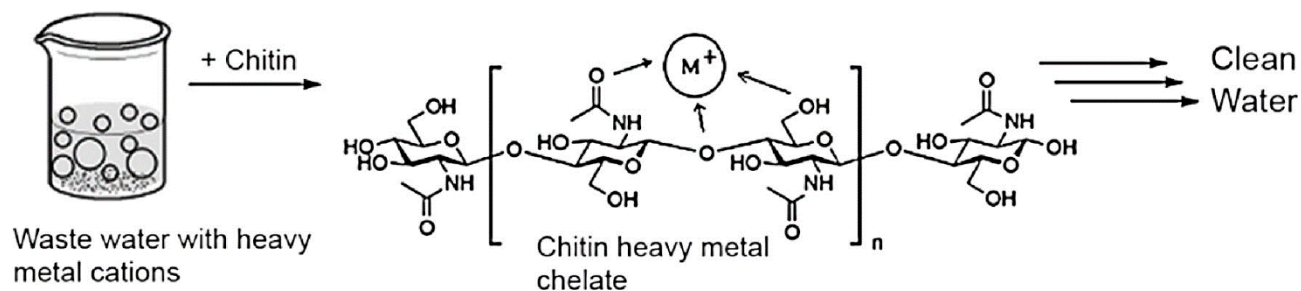
- Romania
- Grecia



Structure and project activities

WP 4 – RESEARCH INTO NEW BIOMATERIALS FOR ADSORPTION/ FILTRATION

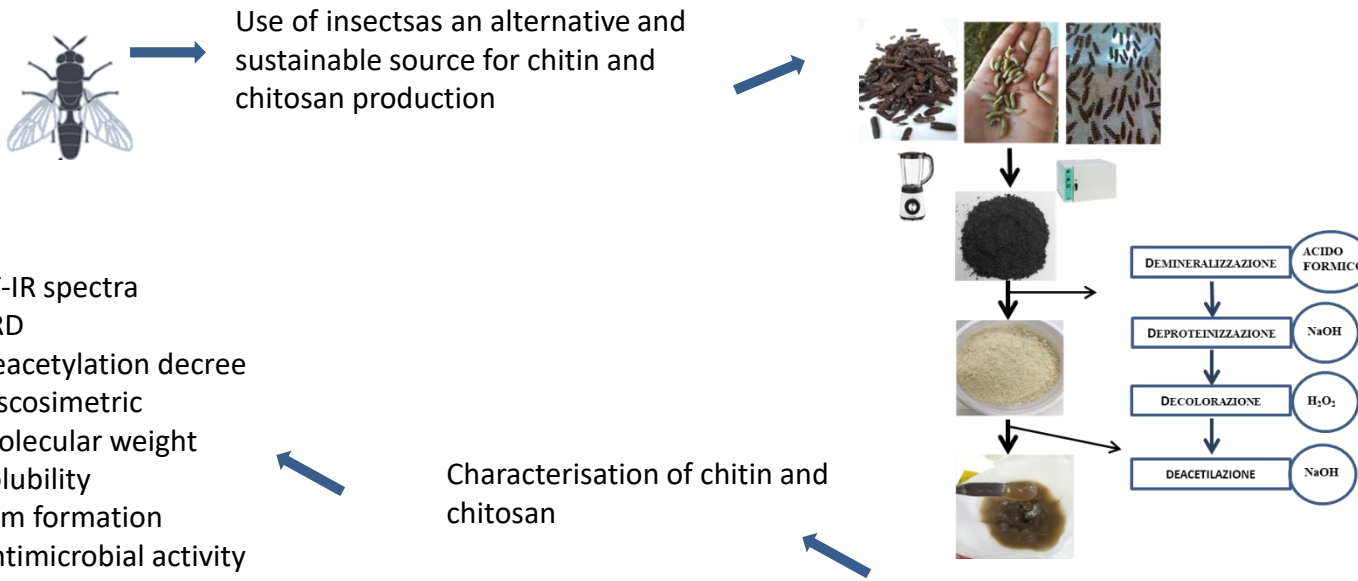
TASK 4.3 - NEW ABSORBENTS BASED ON CHITOSAN EXTRACTED FROM INSECTS



Structure and project activities

WP 4 – RESEARCH INTO NEW BIOMATERIALS FOR ADSORPTION/ FILTRATION

EXTRACTION OF CHITIN AND CHITOSAN FROM INSECTS

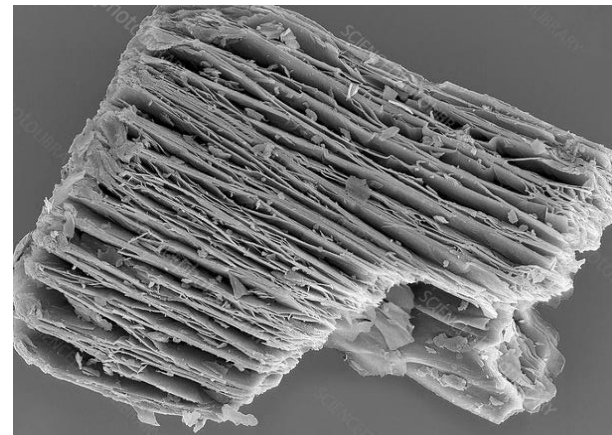
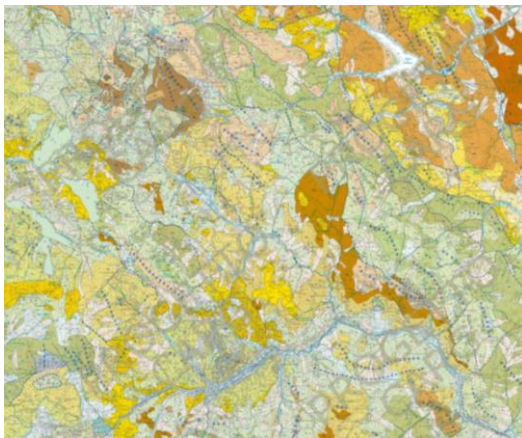


Structure and project activities

WP 5 – DEVELOPMENT OF PILOT TECHNOLOGIES BASED ON ADSORPTION

TASK 5.1 - CHARACTERIZATION OF THE AREA OF THE MUNICIPALITY OF POTENZA FROM A GEOLOGICAL AND HYDROGEOLOGICAL POINT OF VIEW

Geological field activity for the sampling of clay sediments and water to be used for the treatment.



Structure and project activities

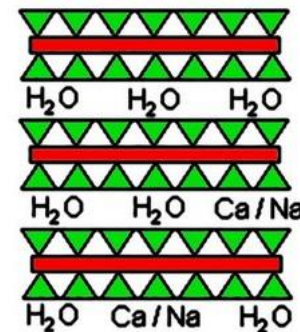
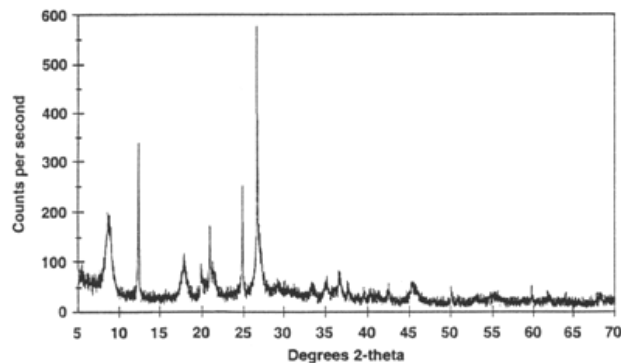
WP 5 – DEVELOPMENT OF PILOT TECHNOLOGIES BASED ON ADSORPTION

TASK 5.2 - REALIZZAZIONE DI COLONNE FILTRANTI PER IL TRATTAMENTO DELLE ACQUE INQUINATE

Compositional analyses on solid matrices (sediments) and on aqueous matrices collected in the Potenza area.

Specifically will be performed:

- laboratory analysis of the mineralogical characteristics of the solid matrix (X-ray diffractometry);
- laboratory and field analysis of the physicochemical characteristics of the aqueous matrix (ion chromatography, multiparameter probe).



Structure and project activities

WP 6 – USE OF BIOFILMS FOR WATER PURIFICATION

WP 7 – CAPITALISATION AND TRANSFER

WORKSHOPS WITH COMPANIES FOR SPIN-OFFS AND INDUSTRIAL SCALE-UP

THANKS FOR YOUR ATTENTION

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