

Introduction

Aromatic and medicinal plants represent a significant source of valuable natural biomolecules. Essential oils, phenolic compounds, terpenes, sterols, and natural pigments possess interesting biological properties for the pharmaceutical, food, cosmetic, and nutraceutical sectors. Our laboratory uses integrated methods that combine extraction, chromatographic separation, chemical analysis, and biological evaluation to enhance the value of local plant resources.

Objectives:

- Extraction of metabolites of interest from medicinal and aromatic plants (MAPs)
- Optimization of extraction processes
- Chemical characterization of extracts
- Separation and identification of bioactive molecules
- Evaluation of biological activities
- Valorization of plant derivatives

Méthodology

Sampling → drying → Broyage → Stockage → Treatment → Analyzes

Application fields

Cosmetics field

- Dermocosmetic formulations
- Bioactive plant oils
- Natural anti-aging products

Agrifood sector

- Natural preservatives
- Functional oils
- Natural additives
- Natural colorants

Pharmaceutical and nutraceutical field

- Biomolecules with biological activity
- Dietary supplements
- Natural substances of therapeutic interest

Sustainable development

- Utilization of plant by-products
- Circular economy approach
- Development of high value-added products

Conclusion

The laboratory's work contributes to the scientific and technological development of local aromatic and medicinal plants through the extraction, characterization, and biological evaluation of natural biomolecules with high industrial potential. The species studied, notably *Pistacia lentiscus*, *Opuntia ficus-indica*, and *Rosmarinus officinalis*, represent promising resources for the development of innovative natural products in the agri-food, cosmetic, and pharmaceutical sectors.

Prospection, sampling & Treatment (step 1)

Sample treatment (step 2)

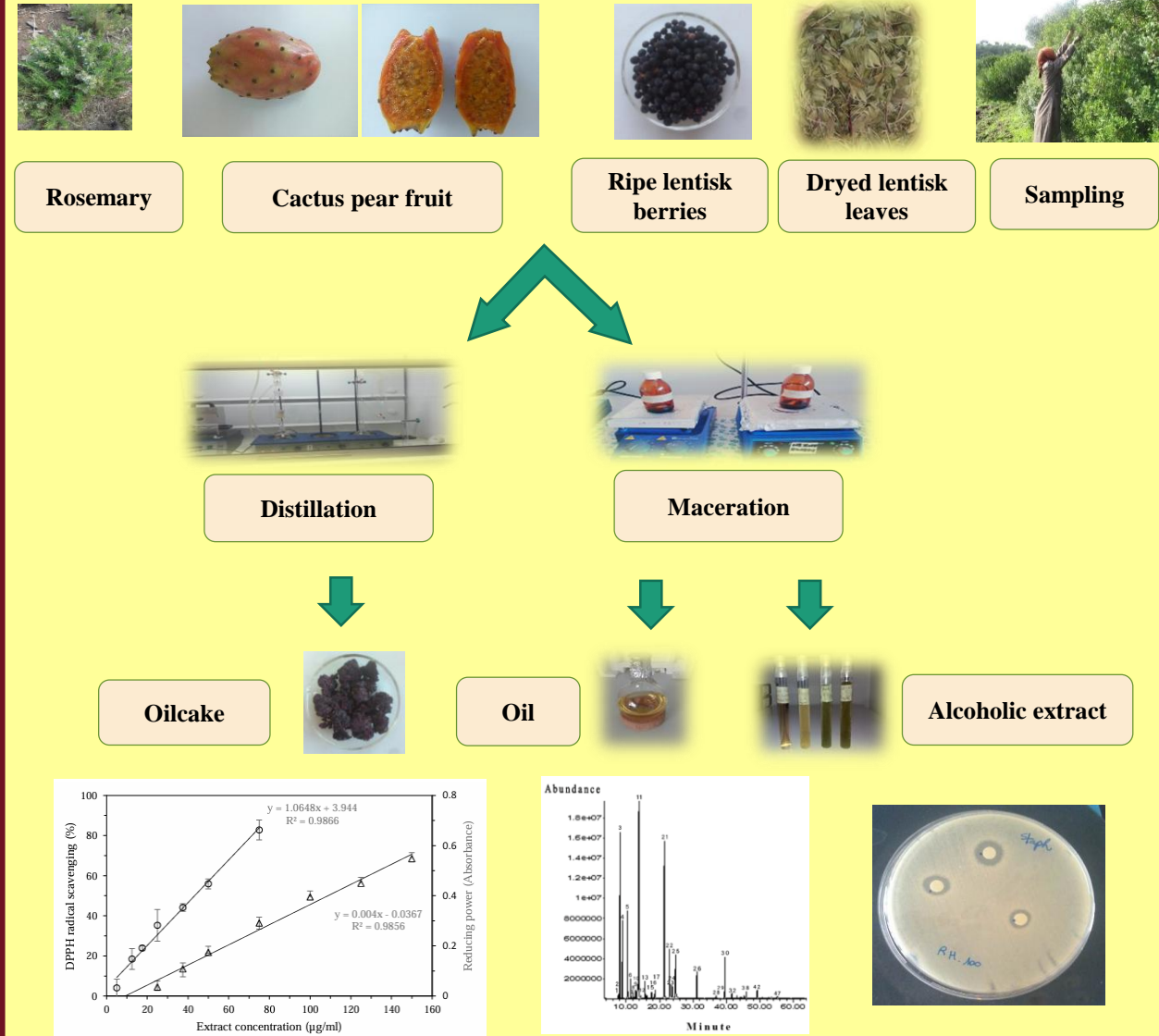
Extraction Techniques

- ✓ Hydrodistillation
- ✓ Soxhlet Distillation
- ✓ Maceration
- ✓ Ultrasound
- ✓ Microwave-Assisted Extraction
- ✓ Mechanical Oil Pressing

Analysis and Results

Analytical Techniques

- Chromatography (GC-MS, HPLC, TLC/CCM, LC-MS)
- Phytochemical dosages (Total Polyphenols, Flavonoids, Carotenoids, Phytosterols, ...etc.)
- Biological activity (Antioxidant activity, Antimicrobial activity, Anti-inflammatory activity, Cytotoxic activity, Nutraceutical potential, Natural preservative effect, ...etc.)



Figures. The two figures on the left represent the antioxidant activity and chromatographic profile of rosemary essential oil according to Mazari et al., 2025 Journal of The Ann. Univ. Dunarea de Jos Galati Fasc. VI Food Technol., 49(1), 27-42.