

« Identification of Medicinal/Aromatic
Plants (MAP) properties and improving
quality, nutritive value and storability of
fresh and dry products to support SME
competitiveness»



Opti-AromaQ

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Medicinal and Aromatic Plants (MAP) are well known since the ancient times. The world's oldest perfumes have been found in Cyprus, aged more than 4,000 years old, while Theophrastus (270-285 BC) mentioned that the ancient perfume "Kypros" was one of the most famous fragrances.

In the recent years, consumers in Cyprus and around the world have appreciated the beneficial effects of aromatic plants consumption/use in human health. Therefore, the increased use of fresh and dried herbs, aromatic and medicinal plants has increased the demand for high quality products in a global level.

In Cyprus, there is an increased interest for the cultivation of MAP. This interest is mainly contributed to their promotion in the food and health sector (e.g. organic products shops, drugstores) as highly beneficial products for the human health. However, some farmers abandon their cultivations or do not follow the recent cultivation practices for MAP production, and have little knowledge on the postharvest handling, in a way to achieve the highest quality and the highest income. The Cypriot climatic conditions are highly favorable to cultivate and produce top quality products of MAP, while attracting young farmers' interest for profitable crops to start their profession.

In aromatic and pharmaceutical plants, preharvest factors impact the yield and quality, but these plants, especially when handled fresh, are very vulnerable to accelerated postharvest senescence due to a high rate of metabolism, and possible microbiological problems. The successful marketing of high quality, especially of fresh materials, requires extreme care and attention to postharvest handling conditions, maintaining and/or improving quality attributes i.e. active components, colour, aroma, water loss. While global agriculture is increasingly dominated by large scale industrial production, the producing of most EOs is still dominated by wild collection or small farmer manufacture, and usually not intensive cultivations and as such makes an important contribution to the incomes, and livelihoods of relatively poor rural populations in developing countries. EOs are very interesting natural products, and they possess a series of biological properties.

Opti-AromaQ is tailored to address the requirements of Pillar II of the RESTART PROGRAM "Sustainable RTDI system" and the EXCELLENCE HUBS call, targeting to: 1) Scientific excellence through the implementation of high quality research in MAP sector addressing fundamental problems of SME of MAP (e.g. reduced fertilizer/phytochemicals and water savings through irrigation, eco-innovation, cooperation with research organisations for applied research, production costs reduction, networking with international organizations), 2) strengthen the RTDI system in activities and human resources level in such a way that contributes to the development of the Cypriot economy to face important social and economic challenges (e.g. unemployment, minimal MAP exports to the EU and Russia), 3) recruit young researchers in the RTDI system of Cyprus to execute high quality research on e.g. nutrient value of Cypriot products, production of added value products enriched in minerals and antioxidants, innovative preservation techniques, drying processes, 4) create critical mass of researchers, in cutting edge science, such as determining the appropriate crop nutrient levels avoiding environmental/health related issues, to explore natural products for their antioxidant/antimicrobial properties, to validate added value produce of increased minerals to deliver viable employment positions for young researchers and assist the Cypriot economy.



Main objectives

Opti-AromaQ aims at developing an innovation approach on nutritive value and increased postharvest storage of MAP in Cyprus by employing high tech (hydroponics, biofortification) and safe (natural sanitizers) and quality (added value products, drying conditions) approaches.

The main objectives of the **Opti-AromaQ** project include: 1) the **introduction into cultivation of new MAP** and reduced the uncontrolled wild harvest, 2) the definition of **optimum cultivation management** (for example mineral levels) in order to produce high nutritive value produce for selected MAP species, 3) determination of the **postharvest conditions** (fresh and dry material) for the Cypriot MAP, in order to increase the storage time and maintaining the fresh produce quality, 4) the outline application strategies of **essential oils for food safety and food shelf-life extension**, 5) the establishment of **Biofortification strategies** on MAP in Cyprus, for high added-value products, 6) the establishment for the first time a methodology of **EOs use for fresh produce preservation** in Cyprus, 7) the **demonstration and training/mobility** for early stage researchers and professionals but also Packinghouse owners and herbal/cosmetics owners in MAP sector and essential oil usages, 8) engagement of relevant stakeholders/public to stimulate the **development of a voluntary policy for MAP**, 9) the **transfer of knowledge** (gained from laboratories and packing houses) **to the sector and food-chain operators** through **training activities**.

Expected results

The expected results of **Opti-AromaQ** are summarized in the following:

1. Determine the nutritional properties of MAP in Cyprus
2. MAP biocidal (antioxidant, antimicrobial, insecticidal, cytotoxicity and anticancer) activities
3. Determine the optimum mineral levels for selected MAP in Cyprus
4. Hydroponic and Biofortification for added value products in greenhouse and field MAP crops

5. Determine the postharvest and drying storage conditions for MAP produce under common and innovative preservation techniques
6. High project dissemination with website (> 1100 visits), social media. Newspaper articles (> 100,000 readers in total), newsletters (> 200 different persons), leaflets (> 1000 individuals).

National and international impact of the project

The implementation of the MAP cultivation under intensive systems-hydroponics- considering the appropriate/balanced nutrient solution for the different species as well as the exploitation of biofortification with micronutrients in order to enhance nutritive value of the product will establish the innovation on MAP sector and added value products at national level and will contribute to the research knowledge at international level. The application of natural sanitizers (plant extracts and EO) will also establish the innovative tools for the postharvest preservation of MAP and fresh produce in general. Studying MAP species from Cyprus is expected to expand the MAP sector by the increased needs for the MAP production and uses for added value products and/or as natural sanitizers. Through Opti-AromaQ project, the methodology, reports, and publications will be available in English and will be easy to be used for the worldwide MAP sector.

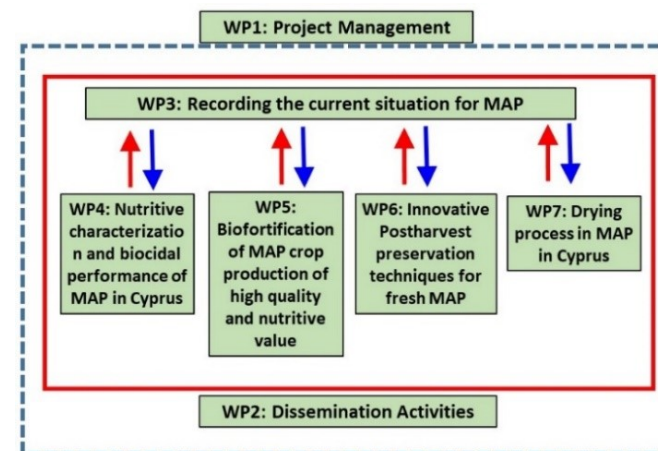
Opti-AromaQ will perform applied research using cutting edge methodology that has been achieved at this particular time, targeting the eco-innovation of the Cypriot MAP and packaging sector. This methodology will be used for creating new knowledge and for the acquisition of new knowledge and skills by the project members (e.g. young researchers, SMEs) for supporting the eco-innovation of the MAP sector and contributing to the creation of sustainable economic environment in the island.

Work packages

Opti-AromaQ consists of 7 working packages (WP):

- WP1. Project Management
- WP2. Dissemination Activities
- WP3. Recording the current situation for MAP

- WP4. Nutritive characterization and biocidal performance of MAP in Cyprus
- WP5. Biofortification of MAP crop production of high quality and nutritive value
- WP6. Innovative Postharvest preservation techniques for fresh MAP
- WP7. Drying process in MAP in Cyprus



Participants:

- Cyprus University of Technology (CUT), **Cyprus**
- E.U.C. Research Centre Ltd (EUC), **Cyprus**
- M.CH.GARDENS LTD (GARDENS), **Cyprus**
- Development Agency of Limassol LTD (ANELEM LTD), **Cyprus**
- Foreign Research Organization:
 - University of Athens (UA), **Greece**
 - University of Belgrade (UB), **Serbia**
 - NCSR «DEMOKRITOS» (NCSR), **Greece**

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 opti-aromaq.cut.ac.cy  [Opti-AromaQ](#)