



Deliverable title	D1.8 General Project meeting n.5 Report
Deliverable Lead:	UNIVPM
Related Work Package:	WP1 - Project coordination and overall management
Related Task:	T1.1 Organization of general Project meetings
Author(s)	Lucia Aquilanti
Dissemination level	PU
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Start date of project	30.05.2022
Duration	36 months
Summary of Deliverable D1.8 – General Meeting n.5 Report	The fifth general meeting of SEAFENNEL4MED, was held on December 13th, 2024 at the Université de Bretagne Occidentale in Brest (France). The meeting highlighted substantial achievements across work packages. WP3 reported ongoing progress in the sampling and genetic characterization of sea fennel ecotypes, consolidating a unique Mediterranean germplasm collection. WP4 presented advances in sustainable cultivation, with field trials in several countries yielding practical recommendations on soil preparation, mulching, irrigation, and harvesting. These guidelines demonstrate how organic sea fennel farming can thrive under challenging Mediterranean conditions. Food innovation continues to be a vibrant field under WP5. Pilot-scale prototypes were unveiled, including sea fennel beer in Italy and spiced noodles in Türkiye - products that blend tradition with modern consumer appeal. Complementary work in WP6 showcased the valorization of by-products through extracts, essential oils, and encapsulated ingredients, some already tested in foods such as salami, hamburgers, and edible capsules, as well as in cosmetic formulations. On the socio-economic side, WP7 shared findings from consumer research, showing that awareness of sea fennel is still low but grows quickly when people are introduced to its health, sustainability, and culinary potential. This opens new opportunities for targeted marketing and education. Meanwhile, WP8 presented sustainability assessments, highlighting the environmental impact of packaging and production methods, and proposing eco-design strategies such as biodegradable mulches and lighter packaging to further reduce footprints. Beyond technical progress, the meeting emphasized communication and outreach: newsletters, articles, conference presentations, and social media engagement have kept the project visible and

	attractive to diverse audiences. The importance of involving students and young researchers was also underlined, with numerous theses already produced within the project's framework.
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Versioning and Contribution History

Version	Date	Modified by	Modification reason
V1.0	10/12/2024	Lucia Aquilanti	First version
V2.0	20/12/2024	Lucia Aquilanti	Comments after peer review process

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1 Minutes of the project general meeting n. 5

PRIMA FUNDED PROJECT UNDER THE 2021 CALL

“Innovative sustainable organic sea fennel (*Crithmum maritimum* L.) -based cropping systems to boost agrobiodiversity, profitability, circularity, and resilience to climate changes in Mediterranean small farms”

Acronym SEAFENNEL4MED

13rd DECEMBER 2024

1.1 LOCATION

On **13RD DECEMBER 2024** at 9:30 am the Principal Investigators (PI) and the research Team Members of the Partners of the SEAFENNEL4MED Consortium met at UNIVERSITE DE BRETAGNE OCCIDENTALE (address 6, Avenue Victor Le Gorgeu, Brest, France) for the project general meeting n.5, regularly convened by the Coordinator of the Project, Prof. Lucia Aquilanti, with an email dated 27.11.24.



1.2 PARTICIPANTS

The attendance of researchers from the Consortium Partners is shown in the following tables.

P1- Università Politecnica delle Marche
short name: UNIVPM

	NAME AND SURNAME	EMAIL ADDRESS	ROLE	WP	PRESENCE
1	LUCIA AQUILANTI	l.aquilanti@univpm.it	Coordinator – WP1 Leader Food microbiologist	All	P
2	DEBORAH PACETTI	d.pacetti@univpm.it	Vice-Coordinator – WP2 Leader Food technologist	All	P
3	ANCUTA NARTEA	a.nartea@univpm.it	Project manager Post Doc Researcher	1, 2, 6	P
4	DANIELE DUCA	d.duca@univpm.it	WP8 Leader Agricultural Engineer	1, 2, 8	P
5	ESTER FOPPA-PEDRETTI	e.foppa@univpm.it	Team member - Agricultural Engineer	1, 2, 8	A
6	SIMONA CASAVECCHIA	s.casavecchia@univpm.it	Team member - Botanist	1, 2, 3	P
7	STEFANO ZENOBI	s.zenobi@univpm.it	Team member - Agronomist	1, 2, 4	A
8	ROBERTO ORSINI	r.orsini@univpm.it	Team member - Agronomist	1, 2, 4	A
9	BIAGIO DI TELLA	b.ditella@staff.univpm.it	Team member - Post Doc Researcher	1, 2, 4	P
10	SIMONA NASPETTI	s.naspetti@univpm.it	Team member - Agrifood economist	1, 2, 7	P
11	RAFFAELE ZANOLI	r.zanoli@univpm.it	Team member - Agrifood economist	1, 2, 7	P
12	VESNA MILANIVIC	v.milanovic@univpm.it	Team member – Soil microbiologist	1, 2, 4	A
13	ANDREA MARCELLI	a.marcelli@univpm.it	Team member – Research fellow	1, 2, 4	P
14	ANTONIETTA MAOLONI	a.maoloni@univpm.it	Team member – Post Doc Researcher	1, 2, 5	P
15	MARYEM KROUIA	maryemkr4@gmail.com	Team member – PhD Student	1, 2, 5	P
16	KOFI ARMAH BOAKYE-YIADOM	k.boakye-yiadam@pm.univpm.it	Team member – PhD student	1,2,8	P

P2- Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria
short name: CREA-AN

	NAME AND SURNAME	EMAIL ADDRESS	ROLE	WP	PRESENCE
1	Antonio Raffo	antonio.raffo@crea.gov.it	Principal Investigator – Food chemist	1, 2, 3, 4, 5, 6	P
2	Fiorella Sinesio	fiorella.sinesio@crea.gov.it	Team member – Senior researcher in sensory and consumer science	4,5,6	P
3	Elisabetta Moneta	elisabetta.moneta@crea.gov.it	Team member - Technical Collaborator for Research	4,5,6	P
4	Marina Peparaio	marina.peparaio@crea.gov.it	Team member - Technical Collaborator for Research	4,5,6	P
5	Eleonora Saggia Civitelli	eleonora.saggiacivitelli@crea.gov.it	Team member - Technical Collaborator for Research	4,5,6	P
6	Irene Baiamonte	irene.baiamonte@crea.gov.it	Team member - Researcher	3,4,5,6	P

7	Nicoletta Nardo	nicoletta.nardo@crea.gov.it	Team member - Technical Collaborator for Research	3,4,5	P
8	Valentina Melini	valentina.melini@crea.gov.it	WP5 Leader - Researcher	1,2,3,4,5,6	P

P3- RINCI

short name: RINCI

	NAME AND SURNAME	EMAIL ADDRESS	ROLE	WP	PRESENCE
1	LUCA GALEAZZI	l.galeazzi@rinci.it	Principal Investigator – Food technologist	1, 2, 4, 5, 6, 7, 8	A
2	CLAUDIA GONNELLI	c.gonnelli@rinci.it	Team member – expert in sales and marketing	1, 2	A
3	ETTORE DRENAGGI	etdrenaggi@gmail.com	External consultant – Agronomist	3	A

P4- University of SPLIT

short name: UNIST

	NAME AND SURNAME	EMAIL ADDRESS	ROLE	WP	PRESENCE
1	IVANA GENERALIĆ MEKINIĆ	gene@ktf-split.hr	Principal Investigator - Food Technologist	1, 2, 3, 5, 6	P
2	OLIVERA POLITEO	olivera@ktf-split.hr	Team member – Biochemist	1, 2, 3, 5, 6	P
3	VIDA ŠIMAT	vida@unist.hr	Team member – Food Technologist	1, 2, 3, 5, 6	A
4	DANIJELA SKROZA	danci@ktf-split.hr	Team member - Food Technologist	1, 2, 3, 5, 6	P
5	IVICA LJUBENKOV	ivica.ljubenkova4@gmail.com	Team member – Analytical chemist	1, 2, 3, 5, 6	A
6	LINDA BAZINA	linda.bazina@pmfst.hr	Team member – PhD Student	1, 2, 3, 5, 6	A
7	SANJA RADMAN	sanja.radman@ktf-split.hr	Team member - Biotechnologist	1, 2, 3, 5, 6	A

P5- INSTITUTE FOR ADRIATIC CROPS AND KARST RECLAMATION

short name: IACKR

	NAME AND SURNAME	EMAIL ADDRESS	ROLE	WP	PRESENCE
1	Branimir Urlić	branimir.urlic@krs.hr	Principal Investigator - WP4 Leader Agronomist	1, 2, 3, 4, 6, 7	P
2	Maja Versic	maja.versic.bratincevic@krs.hr	Team member – Analytical chemist	3, 4, 6	P
3	Marijana Popovic	marijana.popovic@krs.hr	Team member – Analytical chemist	3, 4, 6	P

4	Tonka Nincevic	tonka.nincevic@krs.hr	Team member – Agronomist	3, 4, 6, 7	A
5	Gvozden Dumcic	gvozden.dumcic@krs.hr	Team member – Agronomist	3, 4	A
6	Marko Runjic	marko.runjic@krs.hr	Team member – Post Doc Researcher	3, 4, 7	A

P6- UNIVERSITÉ DE BRETAGNE OCCIDENTALE

short name: **UNIBRE**

	NAME AND SURNAME	EMAIL ADDRESS	ROLE	WP	PRESENCE
1	Christian Magné	christian.magne@univ-brest.fr	Principal Investigator – WP6 Leader Plant Physiologist and Biochemist	1, 2, 3, 4, 6, 7	P
2	Xavier Dauvergne	xavier.dauvergne@univ-brest.fr	Team member – Plant ecophysiologicalist, natural substances	3, 6	A
3	Killian Auzende	killian.auzende@univ-brest.fr	Team member – Design Engineer	3, 6	A
4	Monique Arzur	monique.arzur@univ-brest.fr	Team member - Technician	3, 6	A
5	Manon Inizan	manon.inizan@univ-brest.fr	Team member - Technician	3, 6	A
6	Valerie Roussel	valerie.roussel@univ-brest.fr	Team member - botanist	3, 6	A

P7- INSTITUT NATIONAL DE RECHERCHE EN GÉNIE RURAL, EAUX ET FORÊTS

short name: **INGREF**

	NAME AND SURNAME	EMAIL ADDRESS	ROLE	WP	PRESENCE
1	Abdelhamid Khaldi	khalditn@yahoo.fr	Principal Investigator - Senior Researcher in Forestry	1, 2, 3, 4, 5, 6, 7	A
2	Faten Mezni	faten-mez@hotmail.com	Team member - Post Doc researcher - Valorization of forest resources	1, 2, 3, 4, 5, 6, 7	A
3	Ammar Hadj	ammar_hadj@yahoo.fr	Team member - Technician	2,3,4,5,6,7,8	A
4	Awatef Slama	slamaawatef@yahoo.fr	Team member - Post Doc Researcher	2,3,4,5,6,7,8	A
5	Kaouther Ben Yahia	adam.kaouther@yahoo.fr	Team member - Associate professor in Forest Ecology	2,3,6,7,8	A
6	Lilia Naui	lilyabouden@gmail.com	Team member – Agri-food engineer	1, 2, 3, 4, 5, 6, 7	A
7	Boutheina Stiti	stitibou@gmail.com	Team member – Researcher in Forest Ecology	2,4,5,6,8	A
8	Mohamed Tahar El Ayeb	med.elaieb@gmail.com	Team member – Associate professor in Forest Ecology	2,6,8	A
9	Sondes Fkiri	sondesfkiri@gmail.com	Team member – Associate professor in Forest resources	4,5,6,8	A
10	Ezzedine Saadaoui	saad_ezz@yahoo.fr	Team member – Associate professor in Forest resources	2,3,4,6,7,8	A
11	Ali El Khorchani	ali_el_khorchani@yahoo.fr	Team member – Assistant professor in Forest Ecology	2,3,4,5,6,7,8	A

12	Issam Touhami	issam_touhami@yahoo.fr	Team member – Researcher -Forest Ecology	3,4,8	A
13	Samir Dhahri	dhahrisamir72@gmail.com	Team member – Assistant professor in Forest entomology	2,3,4,5,6,7,8	A

P8- EGE UNIVERSITY

short name: **UNIEGE**

	NAME AND SURNAME	EMAIL ADDRESS	ROLE	WP	PRESENCE
1	ÖZLEM KARAHAN UYSAL	Uysal4@gmail.com	Principal Investigator - Economist	1, 2, 3, 4, 5, 6, 7	P
2	SEBNEM TAVMAN	sebnemtavman@gmail.com	Team member – Food Engineer	1, 2, 5, 6	A
3	SERDAR GÖKHAN ŞENOL	sgsenol@yahoo.com	Team member – Ecologist Botanist Phytochemist	1, 2, 3	P
4	ÖZGÜR TATAR	tatar.ozgur@gmail.com	Team member – Chemical Engineer	1, 2, 3, 4	P
5	ZERRIN KENANOĞLU	zerrinbektas@hotmail.com	Team member – Agricultural Economist	1, 2, 7	A
6	DUYGU TOSUN	duygutosun@gmail.com	Team member – Agricultural Economist	1, 2, 7	A
7	CIGDEM SONMEZ	cigdemsnmz@gmail.com	Team member – Agronomist	1, 2, 3, 4	A
8	SEHER KUMCUOGLU	seherkumcuoglu@gmail.com	Team member – Food Engineer	1, 2, 5, 6	P
9	OGUZ BAYRAKTAR	oguzbayraktar70@gmail.com	Team member – Agronomist	1, 2, 5, 6	A

Legend: P Present, A Absent

1.3 MEETING MINUTES AND CONCLUSIONS

• Welcome and opening of the meeting, communications from the Coordinator

The Project Coordinator opens the meeting at 9.30 a.m (Rome time) and welcomes the participants.

The Coordinator kindly reminds to PIs to regularly check in the shared folders up-loaded in SHAREPOINT at <https://univpm.sharepoint.com/sites/SEAFENNEL4MED-sharedplatform> for the drafting of deliverables and sharing of procedures/protocols.

The Coordinator shares with Consortium Partners the following information:

- ✓ The Project coordinator and the Vice-Coordinator will be interviewed by an external expert and the Prima project officer, for the MIDTERM AUDIT (18 months since the start of the project) on 18th December 2024. Such an interview will allow the Coordinator to illustrate the multiple activities carried out during the reporting period. In view of this event, **the Coordinator strongly recommends that WP leaders finalize that drafting of deliverables whose delivery date falls within the first project half (months 1 – 30!)**.
- ✓ The Coordinator remind to PIs, WP Leaders, and team members to use the SEAFENNEL4MED WhatsApp group for the sharing of pictures and videos; this also represents a tool for fast communication among PIs and WP leaders. Pictures are of crucial importance for the drafting of Newsletters, reports, and leaflets.
- ✓ The social media manager reminds how to manage collaborative posts of PIs, WP Leaders and team members and how to invite the page SEAFENNEL4MED_PRIMA as a collaborator to a post PIs, WP Leaders and team members are creating: before publishing the post, tap Tag people; tap Invite collaborator; search for the account SEAFENNEL4MED_PRIMA to add as a collaborator, then tap the account; tap Done. The social media are available at the following links:
https://www.instagram.com/seafennel4med_prima/
https://www.facebook.com/people/SeaFennel4Med_Prima/100094057515351/
- ✓ The Coordinator reminds the need that WP leaders convey regularly specific meetings within their own WP to monitor the progresses of the activities and, **most of all, the drafting of deliverables, where methods and main results from all the partners involved should be added.**
- ✓ The Coordinator reminds that all shared protocols/procedures (included the new procedure for the genetic characterization of wild sea fennel populations) can be downloaded from https://drive.google.com/drive/folders/1zz194wTVswDVWx_5hF9mk-TJ01hxYBJx whereas the editable *.doc files of deliverables are available at <https://univpm.sharepoint.com/sites/SEAFENNEL4MED-sharedplatform>.

• WP1

As Leader of WP1, Prof. Lucia Aquilanti shows a brief presentation (Annex I) illustrating the activities to date carried out within WP1, as well as the list of deliverables (either in progress or delivered) for this WP. Both are shown as follows:

TASKS AND STATUS IN THE REPORTING PERIOD

Task 1.1. Organization of general Project meetings **ON-GOING**

Task 1.2. Project coordination, management, supervision, and quality control **ON-GOING**

Task 1.3. Communication with PRIMA call secretariat and the funding Agencies **ON-GOING**

Task 1.4 Preparation of mid-term and final reports **ON-GOING**

DELIVERABLES DELIVERED IN THE REPORTING PERIOD

D1.1 General Project meeting n.1 (Kick off meeting) Report (month 2) **DELIVERED ON 17.06. 2022**

D1.2 Quality Assurance Plan (month 3). **DELIVERED ON 16.06.2022**

D1.3 General Project meeting n.2 Report. **DELIVERED ON 30.05.2023**

D1.4 1st year (progress) Report **DELIVERED ON 30.05.2023**

D1.5 General Project meeting n.3 Report (month 19); **DELIVERED ON 30.11.2023**

D1.6 General Project meeting n.4 Report (month 25); **DELAYED - DELIVERED**

D1.7 2nd year (progress) Report (month 25); **DELAYED**

D1.8 General Project meeting n.5 Report (month 31);

D1.9 General Project meeting n.6 (Final workshop) (month 36);

D1.10 3rd year (final) Report (month 36)

Briefly, one deliverable (D1.5) has been delivered in the reporting period (month 12 - 18); three further deliverables (D1.6, D1.7 and D1.8) will be delivered soon.

Regarding D1.9 Ivana Generalich (UNIST) and Branimir Urlich (IACKR) confirm the candidature of Croatia for hosting the **6th general meeting**, which is definitely scheduled for **9-11 April 2025**.

During the reporting period the following activities have been carried out.

- **The Coordinator organized and scheduled the General project meeting N5; it was** held in presence (but with connection to TEAMS platform for those who could not attend) on 13nd NOVEMBER 2024 at UNIVERSITE DE BRETAGNE OCCIDENTALE – Brest, FRANCE with the participation of all the partners. All the details about the meeting are reported in the Deliverable 1.6.
- The Coordinator reviewed the **periodic reports** prepared by the WP leaders to verify their consistency with the project tasks, in view of their assembling and transmitting to PRIMA-IS and the funding agencies on behalf of the Consortium.

• WP2

The Project Coordinator leaves the floor to Prof. Deborah Pacetti (UNIVPM), leader of the WP2, who briefly presents the on-going activities and deliverables (either in progress or delivered) related to communication and technology transfer. In her presentation (Annex II), Prof Deborah Pacetti shows the status of tasks and deliverables, which is reported as follows.

Tasks:

Task 2.1 Start-up activities **DONE**

Task 2.2 Establishment of a stakeholder-platform and knowledge exchange network **DONE**

Task 2.3 Installation and continuous up-date of SEAFENNEL4MED website **DONE**

Task 2.4 Production of dissemination materials **ON-GOING**

Task 2.5 Documentation of scientific results **ON-GOING**

Task 2.6 Demonstration activities **ON-GOING**

Deliverables:

D2.1 Project logo and communication templates (month 1); **DELIVERED IN DUE TIME ON 30.06.2022**

- D2.2** Public SEAFENNEL4MED website (month 2); **DELIVERED IN DUE TIME ON 30.07.2022**
- D2.3** SEAFENNEL4MED intranet (month 2); **DELIVERED IN DUE TIME ON 30.06.2022**
- D2.4** Press release at Project launch for the wide public (month 3); **DELIVERED IN DUE TIME ON 30.08.2022**
- D2.5** Establishment of a stakeholder platform for knowledge exchange network (month 6); **DELIVERED IN DUE TIME ON 30.11.2022**
- D2.6** SEAFENNEL4MED Data Management Plan (month 6); **DELIVERED IN DUE TIME ON 30.11.2022**
- D2.7** Demonstration activity 1: sea fennel harvesting campaign involving students (month 20) **DELIVERED IN DUE TIME ON 30.10.2023**
- D2.8** Demonstration activity 2: presentation of sea fennel-based recipe book (month 34) **TO BE DELIVERED BY 31st MARCH 2025**
- D2.9** Collection of 12 newsletters (month 36)
- D2.10** At least 2 articles in journals/magazines destined to professionals in the field of crop and/or food production (months 36)
- D2.11** At least 4 open access papers published in international peer-reviewed journals (months 36)
- D2.12** At least 4 conference proceedings (months 36)
- D2.13** At least 1 downloadable Project leaflet (month 36)
- D2.14** At least 1 video on new sustainable organic sea fennel cropping systems and applications of the new crops for production of food/food ingredients/nutraceuticals (month 36)
- D2.15** Press release at Final Workshop (month 36)
- D2.16** Attendance at almost 1 event/exhibition aimed at promoting Mediterranean agri-food products where the supply and demand can encounter each other and the researchers (month 36)

Regarding **D2.8**, Prof. Deborah Pacetti recommend to PIs to start with the collection of national/local recipes involving sea fennel as an ingredient, possibly with images/pictures and anecdotes regarding local customs/traditions regarding the diffusion/collection/consumption of sea fennel. All the collected materials (recipes+images+notes) will be shared in SHAREPOINT using a dedicated folder and/or the seafennel4med WhatsApp chat (SEAFENNEL4MED Consortium).

Regarding **D2.9**, Prof Deborah Pacetti reminds that, to date, 9 newsletters have already been sent to the SEAFENNEL4MED Stakeholder platform (one every 3 months, as planned; 1 newsletter in the reporting period).

Regarding **D2.10**, Prof Deborah Pacetti reminds that to date, 8 articles have been published in journals/magazines destined to professionals in the field of crop and/or food production and/or to the open public (see the following lists of articles, grouped by Consortium partner).

UNIVPM - 6

UNIST - 1

IACKR – 1

Regarding **D2.11** Prof Deborah Pacetti shows the lists of the open access papers (grouped by Consortium partner) to date published in international peer-reviewed journals with key data collected throughout the project SEAFENNEL4MED.

UNIVPM - 6

UNIST & IACKR – 10

Regarding **D2.12** Prof Deborah Pacetti shows the list (reported below) of abstracts for posters and oral presentations referred to the attendance at national/international conferences.

UNIVPM - 6

CREA-AN - 2

UNIST&IACKR - 7

UNIEGE - 3

Finally, regarding **D2.16** Prof Deborah Pacetti shows the list of participations at event/exhibition aimed at promoting Mediterranean agri-food products where the supply and demand can encounter each other and the researchers

UNIST & IACKR

• WP3

The Project Coordinator leaves the floor to Dr Faten Mezni (Delegate of the WP3 Leader Prof. Abdelhamid Khaldi), who briefly presents the on-going activities and deliverables related to characterization of Mediterranean sea fennel ecotypes (with the up-dated list of drafted/delivered deliverables).

In her presentation (Annex III) Dr Faten Mezni shows the status of tasks and deliverables, which is reported as follows.

Tasks:

Task 3.1 (RES). Sampling and morphological characterization of spontaneously growing sea fennel populations **ON-GOING**

Task 3.2 (RES) Chemical analysis of dried sea fennel aerial parts/seeds **ON-GOING**

Task 3.3 (RES). Molecular analysis of sea fennel aerial parts **ON-GOING**

Task 3.4 (RES) Elaboration of morphological, chemical, and genetic data for potential identification of different ecotypes **ON-GOING**

Deliverables:

D3.1 Dried sea fennel biomass (leaves, stems, flowers) from at least 5 Mediterranean spontaneous sea fennel populations (month 6) **DELIVERED IN DUE TIME ON 30TH NOVEMBER 2022**

D3.2 Catalogued and stored seeds (≥ 2500) from at least 5 Mediterranean sea fennel populations (month 8 → 30.01.2023) **DELIVERED IN DUE TIME ON 30TH JANUARY 2023**

D3.3 Selected Mediterranean sea fennel germplasm (at least 1 ecotype) for cultivation (month 10 → 30.03.2023) **DELIVERED IN DUE TIME ON 30TH MARCH 2023**

D3.4 Report with elaborated data overall collected within WP3 (month 10 → 30.03.2023) **DELAYED**

• WP4

The Project Coordinator leaves the floor to the WP4 leader Dr Branimir Urlic from IACKR who briefly presents the on-going activities and deliverables related to production of sea fennel organic crop (with the up-to-dated list of drafted/delivered deliverables) (Annex IV). The status of the tasks and deliverables is reported below.

Tasks:

Task 4.1 (R). Sustainable production of sea fennel crop in demo field (month 6 – 24). **ON-GOING**

Task 4.2 (D). Sustainable production of sea fennel crop in open field (month 12 – 35). **ON-GOING**

Task 4.3. (D) Analysis of the new sea fennel crops (month 6 – 35). **ON-GOING**

Task 4.4. (D) Statistical analysis (month 18 – 35). **ON-GOING**

Deliverables:

D4.1 Experimental plan design of cultivation trials (month 6); **DELIVERED IN DUE TIME ON 30TH NOVEMBER 2022.**

D4.2 Fresh biomass (edible aerial parts) from the new organic sea fennel crops (month 12); **DELAYED - DELIVERED IN DUE TIME ON 30TH NOVEMBER 2022.**

D4.3 By-products (old leaves and fibrous stems) from the new organic sea fennel crops (month 12) **DELAYED - DELIVERED IN DUE TIME ON 20TH NOVEMBER 2024.**

D4.4 Recommendations and guidelines on sustainable production of new organic sea fennel crops in the Mediterranean basin (Month 24). **DELAYED - DELIVERED IN DUE TIME ON 20TH NOVEMBER 2024.**

D4.5 Report with the elaborated data overall collected within WP4 (month 35)

After the presentation of tasks and deliverables by Dr Branimir Urlich, representatives of each Research partner involved in WP4 show the on-going activities and main results achieved in the reporting period. A summary of these presentations is reported below.

Briefly,

to optimize sea fennel cultivation in organic farms, the following guidelines are recommended:

- **Soil Preparation:** Traditional ploughing (40 cm) or two-layer tillage (20 cm) followed by harrowing to prepare a suitable seedbed for transplanting.
- **Mulching:** Use of biodegradable mulch to retain soil moisture and suppress weeds.
- **Seedling & Transplanting:** Seeds are sown in greenhouses at 20°C in biodegradable pots with a topsoil-peat mix (50:50). Seedlings are transplanted in February-March at 0.45m x 0.45m spacing.
- **Weed Control:** Manual weeding ensures environmental sustainability without chemical inputs.
- **Fertilization:** Application of biostimulants and biofertilizers, aligned with organic farming regulations, enhances root growth, biomass production, and chlorophyll levels.
- **Irrigation:** Though drought-tolerant, emergency irrigation is essential in prolonged dry spells.
- **Harvesting:** Edible biomass should be harvested before flower buds open for optimal quality.

With these sustainable practices, organic sea fennel cultivation can thrive, supporting both environmental and economic sustainability in the Mediterranean region.

• **WP5**

The Project Coordinator leaves the floor to the WP5 leader Dr Valentina Melini from CREA-AN who briefly presents the on-going activities and deliverables related to exploitation of sea fennel for manufacturing of innovative sea fennel-based foods (with the up-to-dated list of drafted/delivered deliverables) (Annex V). The status of the tasks and deliverables is reported below.

Tasks:

Task 5.1 (R) Laboratory scale manufacturing of fermented shelf-stable sea-fennel preserves at laboratory scale (month 1 – 20). - **DONE**

Task 5.2 (R) Laboratory-scale manufacturing of unfermented shelf-stable preserves (month 1 – 20). **DONE**

Task 5.3 Pilot-scale manufacturing of fermented and unfermented shelf-stable sea-fennel preserves (D) (month 20 – 35). **ON-GOING**

Deliverables:

D5.1 At least 2 pilot scale prototypes of sea fennel-based fermented shelf stable preserves (month 24);

D5.2 At least 2 pilot scale prototypes of sea fennel-based unfermented shelf stable preserves (month 24);

D5.3 Recommendations and guidelines for manufacturing of new sea fennel-based fermented shelf-stable preserves at pilot scale (month 35);

D5.4 Recommendations and guidelines for manufacturing of new sea fennel-based unfermented shelf-stable preserves at pilot scale (month 35);

D5.5 Report with elaborated data overall collected within WP5 (month 35)

After the presentation of tasks and deliverables by Dr Valentina Melini, representatives of the research partners involved in the WP5 show the on-going activities and main results achieved in the reporting period. A summary of these presentations is reported below.

ITALY

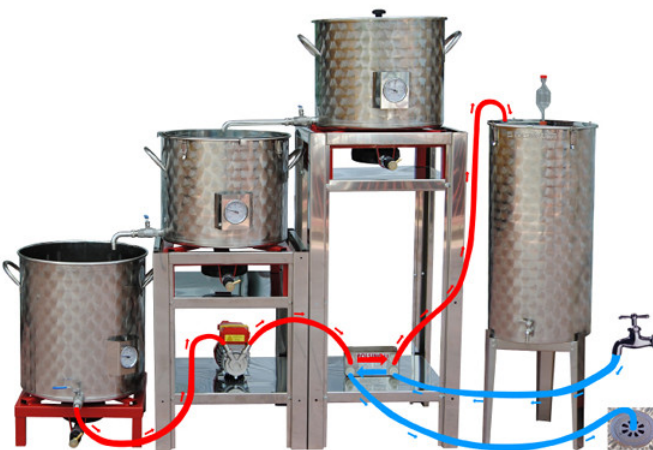
Pilot-scale production of innovative sea fennel-based products has been initiated. The first batches of sea fennel beer and fermented sea fennel sprouts have been successfully produced. Initial physico-chemical and microbiological analyses have been conducted, showing promising results in terms of quality and safety. Further evaluation and sensory testing are ongoing and will be presented at the upcoming project meeting.

TÜRKİYE

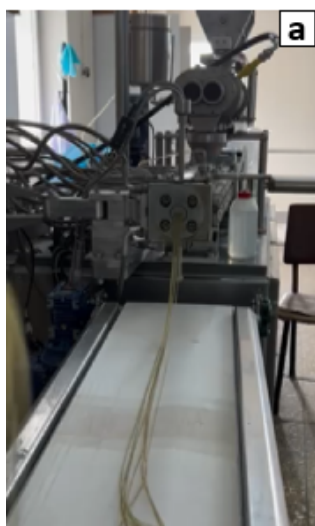
In Türkiye, the pilot-scale production of spiced noodles enriched with sea fennel has been completed. The process was optimized using local culinary preferences and technical constraints. Preliminary outcomes are positive, and the product is undergoing final evaluations. Full results and samples will be ready for presentation during the next project meeting.



a) Sea fennel extract enriched beer samples



b) Pilot brewing plant



Spiced Noodle with Sea Fennel: a), b) exit of the die during extrusion process, extruder, c), extruder, d), e), f), g), and h) picture of noodle substitution of 0, 2, 4, 6 and 8% sea fennel powder, respectively.

- WP6**

The Project Coordinator leaves the floor to the WP6 leader Prof Christian Magné from UNIBRE who briefly presents the on-going activities and deliverables related to valorisation of sea fennel crop by-products for production of functional food ingredients/nutraceuticals/soil amendments (with the up-to-dated list of drafted/delivered deliverables) (Annex VI). The status of the tasks and deliverables is reported below.

Tasks:

Task 6.1 (R&D). Preparation and analysis of extracts from sea fennel crop by-products (month 12 – 18). **ON-GOING**

Task 6.2 (R&D) Exploitation of the extracts as functional food ingredients and nutraceuticals (month 18 – 24). **ON-GOING**

Task 6.3 (R&D) Composting of residual sea fennel biomass (month 24 – 35). **STARTED**

New Task 6.4 (R&D) Production, analysis, and exploitation of essential oils (EOs) from sea fennel as food ingredients with antimicrobial activity/beneficial properties applied to the manufacture of Mediterranean foods (e.g.: cheeses, fermented sausages, ect). (month 24 – 35) **NOT STARTED**

Deliverables:

D6.1 At least 1 crude extract with antioxidant, antimicrobial and/or health-beneficial activity (month 18); **DELIVERED ON DUE TIME ON 30TH NOVEMBER 2023**

D6.2 Recommendations and guidelines for preparation of crude extracts with antioxidant, antimicrobial and/or health-beneficial activity from sea fennel (month 18). **DELIVERED ON DUE TIME ON 30TH NOVEMBER 2023**

D6.3 At least 1 soil amendment produced by composting of sea fennel crop residual biomass (month 35); - **ON GOING**

D6.4 Recommendations and guidelines for preparation of soil amendment by composting of sea fennel residual biomass (month 35);

D6.5 Report with elaborated data overall collected within WP6 (month 35)

After the presentation of tasks and deliverables by Dr Christian Magné, representatives of Research partner involved in WP6 show the on-going activities and main results achieved in the reporting period. A summary of these presentations is reported below.

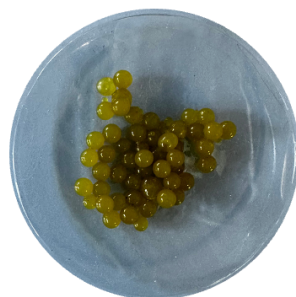
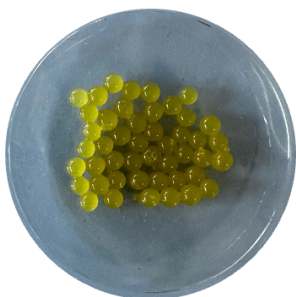
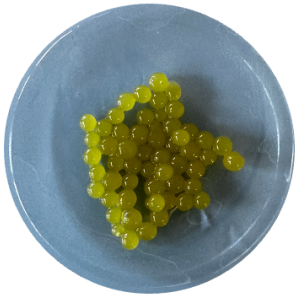
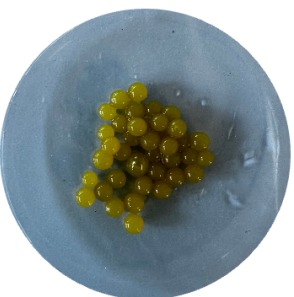
More in detail, regarding the formulation of **NEW FOOD INGREDIENTS**, the activities proposed by each Consortium Partner and those carried out in the reporting period are listed and detailed, respectively.

ITALY (UNIVPM, CREA-AN, RINCI)

- production of extracts with polar bioactive compounds and analysis of their chemical, antioxidant, and antimicrobial activities (the latter towards key foodborne pathogens: *Escherichia coli*, *Staphylococcus aureus*, *Listeria innocua*)
- production and validation of seasoning edible capsules (from the extracts produced in T6.1 or essential oils produced in T6.3) e.g., example balsamic Modena vinegar (spherification process using sodium alginate)
- application of essential oils produced in T6.3 into the production of fermented salami (es. Ciauscolo salami) to improve sensory traits/safety/functional properties.
- application of essential oils produced in T6.3 into the production of meat-based products (e.g., hamburger) to improve sensory traits/safety/functional properties (example 3)

In the reporting period, a procedure to produce water and ethanol extracts from sea fennel by-product was optimized and then applied to crop byproducts purchased by RINCI.

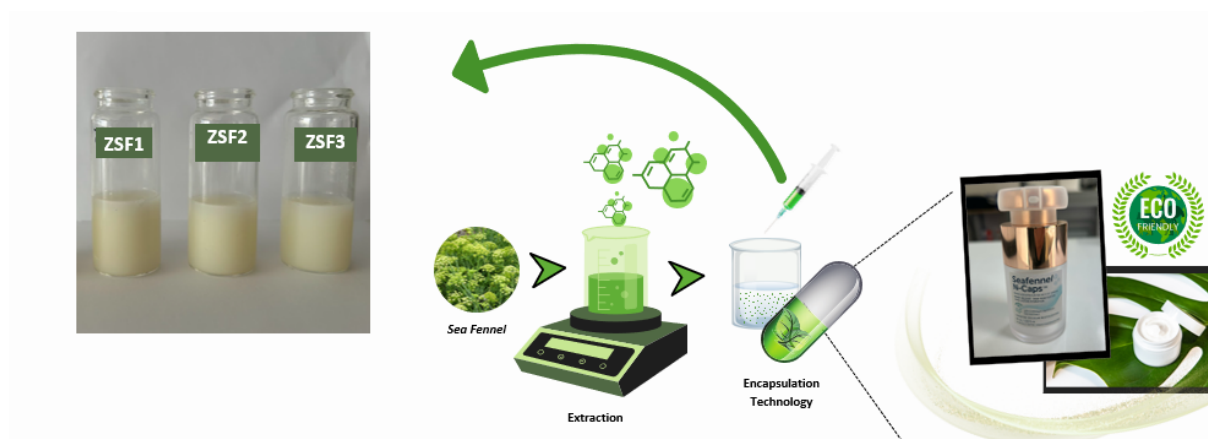
The alginate based encapsulation was optimized using sea fennel by-product hydro-ethanolic extract and related physico-chemical analysis were performed. Preparations for microbiological and accelerated shelf-life analysis are on-going.

W1 1.7% extract 1.5% alginate	W2 1.7% extract 1.5% alginate 2% sugar	N 1.2% extract 0.9% alginate 0.7% pectin	W1C 1.7% extract 1.5% alginate Washing in chitosan solution 0.4%
EE,% 90.03±3.38	EE,% 92.4±2.39	EE,% 69.25±9.27	EE,% 55.49±8.19
			

Different formulations of alginate-based edible capsules

TURKIYE (UNIEGE)

SF extract loaded zein nanoparticles were prepared by a antisolvent precipitation method. The effect of Zein/SF mass ratio, on particle size, polydispersity index, and stability was examined. Cosmetic formulation prototypes were prepared using the selected extract and nanoparticle.



Preparation and application of Sea Fennel (SF) extract-loaded zein nanoparticles via the antisolvent precipitation method.

- **WP7**

The Project Coordinator leaves the floor to the WP7 leader Prof. Ozlem Uysal from UNIEGE who briefly presents the on-going activities and deliverables related to demonstration of socio-economic benefits of the proposed innovations (with the up-to-dated list of drafted/delivered deliverables) (Annex VII). The status of the tasks and deliverables is reported below.

Tasks:

Task 7.1 (D) Identification of drivers and lock-ins for the development of sea-fennel products (month 1– 12). **ON-GOING**

Task 7.2 (D) Assessment of consumer attitudes and acceptance of sea fennel products (month 13–30). **ON-GOING**

Task 7.3 (D) Business model evaluation (month 24 – 35). **NOT STARTED**

Deliverables:

D7.1 Lock-ins and drivers for the development of sea-fennel products (month 12); **DELAYED - DELIVERED**

D7.2 Report on consumer research on the attitudes and acceptance of sea-fennel products (month 30); - **DELIVERED**

D7.3 Report on Business Model Evaluation (month 35)

After the presentation of tasks and deliverables by Prof. Ozlem Karahan UysalUysalUysal, she shows the on-going activities and main results achieved in the reporting period. A summary of this presentation is reported below.

Considering that sea fennel food products are a fairly new concept in the food market, a behavioural model leveraging the Theory of Planned Behaviour (TPB) was developed to measure the attitude and acceptance of consumers regarding sea fennel-based food products. According to the TPB (Ajzen, 1991), people's intentions to perform or not perform a behaviour can be used to predict their behaviour. The intentions are determined by attitudes (positive or negative evaluation of the individual performing the behaviour), subjective norms (the view of others on the individual's choices), and perceived behavioural control (the extent to which the individual perceives that the behaviour is under their control).

Conclusion:

Despite its availability in the Mediterranean, consumer awareness of sea fennel remains low, especially outside Tunisia. However, when informed, consumers perceive it positively—associating it with naturalness, health, and sustainability. To unlock its market potential, promotional strategies, product tastings, and new recipes are recommended. Making fresh sea fennel more accessible in markets and expanding its use in food, health, and cosmetics is key. Marketing strategies should consider local demographics and peer influence, which strongly impacts purchase intentions. Raising awareness and improving communication about the product are essential for increasing consumer interest and behavior.

- **WP8**

The Project Coordinator leaves the floor to the WP8 leader Prof. Daniele Duca from UNIVPM who briefly presents the on-going activities and deliverables related to demonstration of environmental benefits of the proposed innovations (with the up-to-dated list of drafted/delivered deliverables) (Annex VIII). The status of the tasks and deliverables is reported below.

Tasks:

Task 8.1 (D) Sustainability assessment of sea fennel open field production (month 1-35). **DONE**

Task 8.2 (D) Sustainability assessment of new sea fennel-based foods/food ingredients (month 1-35). **DONE**

Task 8.3 (D) Sustainability assessment of functional extracts for food ingredients/nutraceuticals (month 1- 35). **ON-GOING**

Deliverables:

D8.1 Report on sustainability assessment of fresh sea fennel carried out by LCA from data collected thanks to WP4 activities (month 35); - **DELIVERED**

D8.2 Report on sustainability assessment of processed sea fennel products carried out by LCA from data collected thanks to WP5 activities (month 35); - **DELIVERED**

D8.3 Report on sustainability assessment of sea fennel residues extracts from data collected thanks to WP6 activities (month 35)

After the presentation of tasks and deliverables by Prof. Daniele Duca, he leaves the floor to Dr Kofi Armah Boakye-Yiadom for the presentation of the on-going activities and main results achieved in the reporting period by UNIVPM for WP8. A summary of his presentation is reported below.

Regarding **Task 8.2** (D Sustainability assessment of new sea fennel-based foods/food ingredients - the study assesses the environmental impacts of sea fennel preserves, highlighting glass packaging as a major contributor due to its weight and energy-intensive production. Alternative scenarios, such as using HDPE bottles or refillable glass with plastic sachets, showed significant impact reductions, with the latter achieving a 44% decrease. Switching to solar energy provided marginal benefits but introduced trade-offs in material resource use. For fermented pickles, pasteurization was more sustainable than brine preservation by eliminating refrigeration needs, though it increased water use. Lid material choices also influenced sustainability, with aluminium outperforming steel. Limitations include reliance on pilot-scale data and some system boundary exclusions. The findings support eco-design strategies to improve packaging, energy use, and overall sustainability in food production.

• OTHER ISSUES TO BE DISCUSSED

Thanks to the input of some PIs, the Coordinator reminds the importance to take note of the master/doctoral thesis works of students involved in the SEAFENNEL4MED PROJECT; the complete list will be reported in the mid-term and final report to valorise this dissemination activity, as well. The list of thesis works to date carried out is reported below, for each Research Institution.

ITALY (UNIVPM)

- Kraouia, M.: "EXPLOITATION OF SEA FENNEL EDIBLE AERIAL PARTS FOR THE MANUFACTURING OF INNOVATIVE SEA FENNEL-BASED FOODS"
- Boakye-Yiadom, K.A.: "Life Cycle Assessment of Bioconversion of Agri-Food Production Residues: Evaluation and Improvement of Energy and Environmental Sustainability"
- Ashim, A.: "Sea fennel (*Crithmum maritimum* L): sustainable source of omega3 fatty acids and functional ingredient for the development of sea fennel-based capsules"
- Ottaviani M.: "Production of an innovative low-alcohol beer using sea fennel (*Crithmum maritimum* L) crop byproducts"
- Leonardo P.: "Biostimulation effect on *Crithmum maritimum* L. cultivated in different growth environments"

CROATIA (UNIST)

- Divić, L.: Impact of extraction solvent on the phenolic composition and antioxidant properties of sea fennel extracts, 2023.
- Ćorić, I.: Tocopherol content in sea fennel (*Crithmum maritimum* L.), 2023.

- Podrug, R.: Chemical composition and biological potential of sea fennel, 2023.
- Prga, I.: Chemical composition and biological potential of sea fennel leaves and flowers, 2023.
- Podrug, R.: Chemical composition and biological potential of sea fennel
- Šantić, I.: Phenolic antioxidants of the Adriatic Sea fennel flowers
- Kovačević, K.: Chemical composition of essential oils isolated from different parts of the *Crithmum maritimum* L.
- Boras, D.: Determination of fatty acids by GC-FID technique.
- Zelić, P.: Qualitative and quantitative determination of ascorbic and dehydroascorbic acids by UHPLC-MS/MS.
- Batinović, P.: Microwave-assisted isolation and GC-MS analysis of sea fennel volatiles from Korčula (*Crithmum maritimum*)
- Bakarić, A.: Comparison of the profiles of volatile compounds in sea fennel essential oils and the volatile compounds in their hydrolates obtained by various extraction methods
- Desnica, N.: Determination of chlorogenic acids using UHPLC-MS/MS
- Koceić, P.: Profiles of volatile compounds of essential oils and hydrolates of rock samphire (*Crithmum maritimum* L.) obtained by different distillation procedures
- Kovačić, R.: Phenolic composition and antioxidant activity of sea fennel (*Crithmum maritimum* L.) extracts obtained by different extraction methods
- Ćorić, I.: Tocopherol content in sea fennel (*Crithmum maritimum* L.)

As there was nothing else to discuss, the project Coordinator declares the session closed at 17.45.

SEAFENNEL4MED Project Coordinator

Prof. Lucia Aquilanti PhD

