Section 2. Call: Multi-topic 2019

Topic 2.3.1 Extending shelf-life of perishable Mediterranean food products by sustainable technologies and logistics and by optimized pest and microbial control

Type of action: RIA

Bio-protective cultures and bioactive extracts as sustainable combined strategies to improve the shelf-life of perishable Mediterranean food

Document Information

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Members of the partnership/consortium:

P1 (COORDINATOR) – Cukurova University – CUNI

P2 – Alma Mater Studiorum Università di Bologna – UNIBO

P3 – Universita' Cattolica del Sacro Cuore – UCSC

P4 – C.L.A.I. ScA – CLAI

P5 – University of Split – UNIST

P6 – Croatian Veterinary Institute, Regional Veterinary Institute Split – CROVET

P7 – Centaurus d.o.o. – CROSME

P8 – DOMCA SAU – DOMCA

P9 – University of Ljubljana – UNILJUB

P10 – University of Maribor (Faculty of Mechanical Engineering) – UNIMB

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1. Introduction

The project's Coordination and management plan (CMP) gives an overview of the project timeline at the task level, management units and tools with a description of detailed decision-making processes and risk management.

The CMP will ensure that the project follows its budget, time schedule and that the outputs meet the high-quality standards required by all partners. The CMP will guarantee efficient management and sustainability of the project with defined milestones and the achievement of work programme objectives.

Project management, overall coordination, monitoring and evaluation are the responsibilities of the coordinator, with project partners involved in developing the principles of operation. This includes the timely and high-quality completion of project objectives across the entire project lifetime: initiation, planning, executing, controlling, and concluding.

2. Decision-making process

The project foresees the use of the following management units and tools:

1. General Assembly (GA)
2. Project Management Team (PMT)
3. Coordination and management plan (CMP)

based on good management practices developed in each participating organisation and confirmed by long term experience in EU funded projects and Project Cycle Management guidelines promoted by the European Commission.

2.1. General Assembly (GA)

GA is the management body of the project, created by, and comprised of, project partners' representatives:

GA Representatives	Partner	Country	E-mail	Mobile
Fatih Ozogul	CUNI	Turkey	fozogul@cu.edu.tr	+90 533 454 9787
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The General Assembly (GA) is the highest decision-making body of the consortium, and will be in charge of taking all measures, in addition to the contractual provisions already stipulated, necessary for the development of the present collaboration and the implementation of the project.

The GA is responsible for the political and strategic orientation of the work. It makes sure that the strategy adopted for the project is preserved. The GA acts by decisions or advices. The partners will abide by all decisions of GA.

The role of the GA is:

- to monitor and assess the overall progress and output of the project according to the objectives, timetable, deliverables and milestones and to recommend solutions for any shortcomings, in accordance with the project application

- to promote the sharing of good practice in research and dissemination activities, to inform the partners about dissemination opportunities, and to enhance collaboration with research, entrepreneurial, advocacy and policymaking activities outside the consortium.

In particular, the decision power of the GA concerns:

- the political and strategic orientation of the work,

- the publication and dissemination policy,

- the arbitration, in case of a deadlock situation within a Work Package, upon consultation of the corresponding Work Package Leader;

GA will meet at least once a year to review progress, identify and resolve problems, share information and resources. A written summary of each meeting's main points and conclusions will be prepared and sent to partners.

Any Participant that is a member of GA:

-should be present or represented at any meeting;

-may appoint a substitute or a proxy to attend and vote at any meeting;

-shall participate in a cooperative manner in the meetings.

Meetings of the GA may also be held by teleconference or other telecommunication means due to special circumstances (MS Teams, Zoom).

2.2. Project Management Team (PMT)

The daily management of the project is in the hands of the PMT, consisting of the Project Coordinator, and his management support team.

The management support team consists of following scientific staff members:

- Prof. Fatih Özogul – CUNI; (**Coordinator**)
- Prof. Vida Šimat – UNIST; (**Co-coordinator**)
- Prof. Fausto Gardini – UNIBO.

The role of the PMT is helping the coordinator in all duties according to Consortium Agreement. In addition Dr. Giulia Tabanelli has been delegated as **Scientific Manager** for the project.

3. Transnational project meetings

Five project meetings will be held with all partners:

Meeting n°	Time	Place	Reason
1.	M2	Bologna, Italy	Kick-off meeting
2.	M12	Split, Croatia	GA meeting
3.	M24	Granada, Spain	GA meeting
4.	M28	Ljubljana, Slovenia	Operative meeting
5.	M36	Adana, Turkey	Final project meeting and dissemination event

Reports from project meetings with record of activities related to dissemination and exploitation (M2, M12, M24, M36)

4. Financial management

Each partner will be funded directly by its own National funding body; therefore, a grant agreement is concluded between each beneficiary and its national funding body. The rules applying for this agreement are the national rules set in the national regulations. In accordance with its own usual accounting and management principles and practices, each partner shall be solely responsible towards its own National funding authority for the justification of costs. Neither the coordinator nor any of the other partners shall in any way be liable or responsible for such justification of costs of a partner towards its own National funding body. The budgetary issues, including potential restrictions for funding, should be carried out and checked based on the national regulations of and by contacting their own National funding Body.

Each partner should notify the coordinator in advance of any allowed proposal of modification of the budget, to be agreed by such partner with its own National funding Body.

No transfer of a partners's fund towards another partner is expected. Any financial arrangements among one or several partners must be made in separate agreements, where allowed by the National funding bodies.

If necessary, the partners shall individually provide the additional funding required in order to carry-out their share of the work.

5. Risk management and mitigation

Special attention will focus on MESA (Monitoring, Evaluation, Steering, Action), which is an essential part of the whole project enabling smooth ongoing of activities, their troubleshooting, risk amortisation and results implementation. It will consist of internal and external (PRIMA and National boards) monitoring and 5 progress meetings in 3 years. This approach will enable taking actions in time thus minimising the Critical risks for implementation.

Critical risks for implementation**:**

Description of risk (indicate level of likelihood: Low/Medium/High)	**Work package(s) involved**	**Proposed risk-mitigation measures**
Breakdown of large equipment (GC-MS, HPLC, HPLC MS/MS etc.), (likelihood: Low/Medium)	WP2-WP5	All apparatus has been regularly maintained and serviced. Assistance of other departments having the same instruments will be required.
Contamination of LAB strains, (likelihood: Low)	WP3, WP5	All research will be conducted in sterile environment with sterile materials to avoid contamination. The strains will be stored in two different buildings in order to limit these risks and have a backup copy of all the genetic resources.
Changes in national or EU regulations (likelihood: Low)	All	The risk is low, since the introduction of the new legislation happens very slowly. The project WPs will be reorganised accordingly if necessary without causing delay or affecting objectives of the project.
Difficulty with obtaining purified bioactive components from the extracts (likelihood: Low)	WP2	Pure compounds will be purchased from commercially available source.
Delays in implementation of some tasks which may cause a delay or change the timeline of the project, (likelihood:	All	Communication and open dialogue will enhance team management capacities and directly positively influence project implementation. WPs will be reorganised

Medium)		according the new dates and actions taken to make up for the delay.
Absence of some consortium members (likelihood: Medium)	All	Members of the consortium have been cooperating before, so other teams can assist in the absence of a member, or additional compatible staff member can be employed
Disputes within the consortium (likelihood: Low/Medium)	All	Consortium agreement will be signed before the beginning of the Project defining how disputes will be handled. MESA coordination model minimises this risk.
Failure of new concept	WP5	Review of scientific research and updating
Poor visibility of the impacts and benefits of the project (likelihood: Low)	All	Pro-active, timely and planned communication actions throughout the duration of the project

The course of the project is elaborated in a clear way with previously agreed division of tasks between all partners. To avoid misunderstandings and potential conflicts, tasks are divided in accordance with the experiences and background of each partner.

In case of any unforeseeable, exceptional situation caused by force majeure, the GA will be obliged to analyse the case: what are the reasons of unpredictable situation, which partners are involved, what the potential consequences are and how they could influence the entirety of the project. By considering the conclusions of an in-depth and extensive analysis, the GA will choose the possible method of solving the problem as the decision-making body. Every attempt will be made to reach consensus on decisions. When that is not possible, a simple majority vote of GA members will be used.

6. Detailed work plan with timeline

WPs and Tasks (T)	Coordinator and Participants	Months (02/03/2020 – 01/03/2023)																	
		2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
WP1. Project coordination and management (M1-M36)	**Coordinator: CUNI**																		
T1.1: Creating the project organizational structure, including the Project Steering Group and the Project Management Team	UNIST; CROSME, CROVET, DOMCA; UNILJUB, UNIMB																		
T1.2: Administrative and financial project management																			
T1.3: Scientific and data project management																			
WP 2. Extraction, purification and production of bioactive compounds from different macro algae and agro-food by-products (M1-M14)	**Coordinator: UNIST**																		
T2.1: Selection and characterisation of brown macroalgae and food by-products	UNIST; CUNI; CROSME																		
T2.2: Selection of green extraction technologies for the recovery of bioactive compounds from macroalgae and food by-products	UNIST; CUNI; UNIBO; CROSME																		
T2.3: Concentration/purification of antioxidant compounds from extracts at lab scale	CUNI; DOMCA UNIST; UNIBO;																		
T2.4: *In vitro* biological activities of the selected extracts and bioactive components from T2.2 and T2.3	UNIST; UNIBO; CUNI; DOMCA; CROSME; UNILJUB; UCSC																		
WP 3. Isolation and characterisation of autochthonous lactic acid bacteria for improved bio-protective cultures and functional starters (M1-M18)	**Coordinator: UNIBO**																		
T3.1: Spontaneous traditional fermented meat products characterisation	UNIBO; UCSC; CLAI; DOMCA																		
T3.2: Lactic acid bacteria (LAB) isolation, purification, identification and characterisation for their safety and bio-protective features	UCSC; UNIBO; DOMCA																		
T3.3: LAB technological characterisation (aroma production, NaCl resistance and growth/acidification performances) and data modelling	UNIBO; DOMCA																		
T3.4: Study of the synergic/antagonistic effects of functional strains and antimicrobial compounds on food-borne pathogens and aminobiogenic strains in cultural media or meat model systems.	UNIBO; UCSC; CLAI; UNILJUB																		

WP 4. Application of selected extracts and bioactive compounds and their synergy with novel packaging methods on fresh and lightly preserved foods (M15-M26)	**Coordinator: UNILJUB**																		
T4.1: Determination of antioxidant potential of bioactive extracts (individual and mixtures) in food model	UNIST; CROVET; CROSME																		
T4.2: Development of thin films (PP and PE) as well as biodegradable PLA/starch/ antimicrobial/antioxidant nanocomposites.	UNIMB																		
T4.3: Determination of antimicrobial potential of bioactive extracts (individual and mixtures) in food models and their synergy with packaging methods.	UNILJUB; CUNI; DOMCA; UNIST, CROSME, UNIMB; CROVET; UCSC																		
WP5 Application of selected LAB on fresh and lightly preserved foods (vegetables, meat, and seafood) and their synergy with bioactive components/extracts (M19-M36)	**Coordinator: UNIBO**																		
T5.1: Shelf life prolongation by the use of bio-protective strains in 6 different food models.	UNIBO; UCSC; CLAI; UNIST; CROSME; CROVET; DOMCA; CUNI; UNILJUB																		
T5.2: Challenge-test against *Listeria monocytogenes*, *Salmonella* and *Staphylococcus aureus* in meat and fish matrix.	UNIST; UNIBO; UCSC; CLAI; CROVET; CROSME; DOMCA																		
T5.3: Test of the most promising strains as functional starter cultures in traditional pork meat fermented sausages in pilot scale productions.	UCSC; UNIBO; CLAI																		
T5.4: Test of the effects of bio-protective microorganisms and active packaging with bioactive compounds.	UNILJUB; CUNI; UNIMB																		
WP 6. Dissemination and Exploitation (M4-M36)	**Coordination: CUNI**																		
T6.1: Development of the Communication and Dissemination plan (CDP)	UNIBO; UCSC; CLAI; UNIST; CROVET; CROSME; DOMCA; UNILJUB																		
T6.2: Develop communication and dissemination materials and tools																			
T6.3: Organisation of five project meetings																			
T6.4: Organisation of dissemination event (with important stakeholders invited)																			

7. List of Deliverables

Deliverable (number)	Deliverable name	Work package number	Lead participant	Delivery date (in months)
D1.1	Coordination and management plan	**WP1**	**CUNI**	4
D1.2	Midterm progress report on research activities	**WP1**	**CUNI**	10
D1.3	Final report on research activities	**WP1**	**CUNI**	36
D2.1	Report of bioactive component composition in brown algae and agro-food by-products	**WP2**	**UNIST**	11
D2.2	Report on *in vitro* biological activities of algae and agro-food by-products and their correlation with bioactive component composition	**WP2**	**UNIST**	14
D2.3	Prepared extracts for application in novel packaging and food models	**WP2**	**UNIST**	14
D3.1	Report of artisanal spontaneously fermented product characterisation	**WP3**	**UNIBO**	8
D3.2	Report on *in vitro* antimicrobial activities of lactic acid bacteria biotypes and the presence of bacteriocin-encoding genes	**WP3**	**UNIBO**	14
D3.3	Report on *in vitro* technological features of lactic acid bacteria biotypes	**WP3**	**UNIBO**	14
D3.4	Report on potential synergic /antagonistic activities of selected strains and bioactive compounds	**WP3**	**UNIBO**	18
D4.1	Report on antimicrobial effect of selected extracts and bioactive compounds	**WP4**	**UNILJUB**	26
D4.2	Developed PP and PE films	**WP4**	**UNILJUB**	26
D4.3	Report on effects of developed films and absorbent food pad with bioactive compounds on selected foods	**WP4**	**UNILJUB**	26
D5.1	Report on the proof of concept (TRL 4 and 5) of possible shelf life prolongation of sustainable innovative food production using results obtained in WP2 and WP3.	**WP5**	**UNIBO**	35
D6.1	Communication and Dissemination plan (CDP)	**WP6**	**CUNI**	4
D6.2	Visual identity (logo, web page, press material)	**WP6**	**CUNI**	9
D6.3	Reports from project meetings with record of activities related to dissemination and exploitation	**WP6**	**CUNI**	1, 12, 24, 36

8. List of milestones

M No.	Milestone name	Related WP	Due date (in month)	Means of verification
1.1	Kick off meeting	WP1	2	Meeting agenda
2.1	Consortium decision on which extracts/components will be used for bioactivity testing	WP2	12	Database/Report
2.1	Consortium decision on which extracts/components will be used further application in novel packaging and food models	WP2	12	Database/Report
3.1	Consortium decision on which spontaneous fermented products will be characterized and will be used as a source of wild lactic acid bacteria isolates	WP3	2	Database/Report
3.2	Consortium decision on which strains will be chosen to be studied	WP3	12	Database/Report
3.3	Consortium decision on which strains will be used for further applications as bio-protective cultures and functional starters	WP3	18	Database/Report
4.1	Decision on selection of optimal treatments and storage condition	WP4	20	Database/Report
5.1	Decision on selection of optimal treatments and storage condition	WP5	26	Database/Report
6.1	Validation of results	WP6	12	Report
6.2	Decision on selection of communication and dissemination channels	WP6	6	Report