

DELIVERABLE D1.2

PROGRESS REPORT

CREIAMO Project

CREIAMO Project - Circular economy in olive oil and wine sectors. Valorization of by-products and residues through innovative processes and new business models

December 2020
(18th month of the project)



CREIAMO_Project

Circular Economy in olive oil and wine sectors. Valorization of by-products and residues through innovative processes and new business models

CREIAMO Project - Circular economy in olive oil and wine sectors. Valorization of by-products and residues through innovative processes and new business models

Partners:

University of Brescia (Italy), Department of Civil Engineering, Architecture, Land, Environment and Mathematics.

ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development) – Sustainability Department. Environmental Technologies Technical Unit.

University of Milano – Bicocca (Italy), Department of Earth and Environmental Sciences (DISAT)

Funded by

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1. GENERAL INFORMATION OF THE PROJECT

1.1. Project title

Circular economy in olive oil and wine sectors. Valorisation of by-products and residues through innovative processes and new business models (CREIAMO).

1.2. Duration

30 months: July 2019 (M1) - December 2021 (M30)

1.3. General objective

The general aim of the project is to contribute to the reuse and valorization of residues and wastes from the olive oil and wine production chains.

1.4. Specific objectives

The project has 4 Specific Objectives (SO):

- SO1 Development of a new biological strategy to produce biosurfactants using wastes derived from the oil and wine production (WP2)
- SO2 Definition of the operating procedures to use the biosurfactants for the remediation of contaminated soil (WP3)
- SO3 Assessment of the impact of the processes and products through LCA studies (WP4)
- SO4 Promotion of cross-sectorial synergies among the companies (WP5)

2. TEAM OF RESEARCHERS CREIAMO PROJECT

2.1. Principal Investigators:



MENTORE VACCARI: Ph.D in Sanitary Engineering. Associate Professor of Sanitary and Environmental Engineering at the University of Brescia (Italy), Department of Civil Engineering, Architecture, Land, Environment and Mathematics



SILVIA SBAFFONI: Ph.D in Environmental Engineering. Researcher at the ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development) – Sustainability Department. Environmental Technologies Technical Unit



ANDREA FRANZETTI: Ph.D in Environmental sciences. Associate Professor of Microbiology. Course Applied microbiology and Environmental Sciences at the University of Milano – Bicocca (Italy), Department of Earth and Environmental Sciences (DISAT)

2.2. Postdoctoral Researchers:



TIZIANA BELTRANI: Ph.D in Environmental Sciences. Researcher at the ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development). – Member of the Resource Valorisation Laboratory (RISE)



ALIF CHEBBI: Ph.D in Biological Engineering, is currently a Postdoctoral researcher at the MicroDISAT Research Group of the Department of Earth and Environmental Sciences, University of Milano – Bicocca – Italy



FRANCO HERNÁN GÓMEZ: Chemical Engineer, Master in Renewable Energy, Ph.D in Appropriate methodologies and techniques in international development cooperation. Is currently a Postdoctoral researcher at the Dept. of DICATAM – University of Brescia – Italy



EMANUELA DE MARCO: Urban Planner, graduated in Urban Territorial and Landscape-Environmental Planning at UNINA (2010). Ph.D in Urban Design and Planning (2016). Is currently Research Fellow at the ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development).



LAURA BENASSI: Ph.D in Mechanical and Industrial Engineering in “sustainable inertization of waste material and by-products”, graduated in Land and Environmental Engineering at University of Brescia. Is currently a Research Fellow at the Dept of DICATAM – UniBS.

2.3. Young Researchers:



FRANCINE DUARTE: Chemical Engineer. Master degree in Chemical Engineering, is currently a PhD student in Environmental Engineering at the University of Brescia. Member of the Laboratory of sanitary and environmental engineering at the University of Brescia



DANIELE FIORINO: Graduated in Environmental and Territory Engineering at the University of Palermo, Research Fellow for ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development)

2.4. College students involved / thesis

MASSIMILIANO TAZZARI: Department of Earth and Environmental Sciences, University of Milano – Bicocca

MARTINA GRETA CAFFI: Department of Civil Engineering, Architecture, Land, Environment and Mathematics, University of Brescia

RICCARDO BOTTICINI: Department of Civil Engineering, Architecture, Land, Environment and Mathematics, University of Brescia

SERGIO SCATTOLINI: Department of Civil Engineering, Architecture, Land, Environment and Mathematics, University of Brescia

3. EXPERIMENTAL PLAN

METHODS AND ACTIONS PLANNED - ROLE OF PARTNERS

WPs and TASKS	UniBS	UniMiB	ENEA
WP1 - PROJECT COORDINATION	Leader UniBS		
T1.1 - Start-up of the consortium/Kick-off meeting	X	x	x
T1.2 - Coordination and monitoring of activities	X	x	x
T1.3: Budget management and reporting activities	X	x	x
WP2 - PRODUCTION OF BIO-SURFACTANTS FROM RESIDUES OF OLIVE OIL AND WINE SECTORS	Leader UniMiB		
Task 2.1 - Background and case study definition	X	x	
Task 2.2 - Isolation of bio-surfactants producers from residues of olive oil and winery residues	x	X	
Task 2.3 - Production Optimization and chemical characterization of bio-surfactants from residues of olive oil and winery residues	x	X	
Task 2.4 - Ecotoxicity Assessment of the biosurfactant produced before and after purification	x	X	
WP3 - TREATMENT OF CONTAMINATED SOIL BY USING BIO-SURFACTANTS PRODUCED FROM RESIDUES OF OLIVE OIL AND WINE SECTORS	Leader UniBS		
Task 3.1 - Bio-surfactant assisted washing of soil contaminated with hydrocarbons	X	x	
Task 3.2 - Bio-surfactant assisted bioremediation of soil contaminated with hydrocarbons	X	x	
WP4 - ENVIRONMENTAL ASSESSMENT THROUGH LIFE CYCLE ASSESSMENT	Leader UniBS		
Task 4.1 - Definition of scenarios and identification of system boundaries	x		X
Task 4.2 - Life Cycle Assessment (LCA) studies and environmental Life Cycle Costing (LCC) studies	X	x	x
WP5 - INDUSTRIAL SYMBIOSIS FOR THE CROSS-SECTORIAL VALORISATION OF THE RESIDUES OF OLIVE OIL AND WINE SECTORS	Leader ENEA		
Task 5.1 - Companies involvement campaign	X		x
Task 5.2 - Industrial symbiosis events (matchmaking) with companies	x		X
Task 5.3 - Analysis and elaboration of data on possible synergies. Preparation of operative manuals	x		X
WP6 - COMMUNICATION AND DISSEMINATION	Leader UniBS		
Task 6.1 - Project website and logo	X	x	x
Task 6.2 - Management of appropriate social platforms, e-newsletter	X	x	x
Task 6.3 - Promotional materials and publications	X	x	x

4. TIMETABLE UNTIL MONTH 18 OF THE PROJECT

WPs and TASKS	2019						2020												2021											
	J	A	S	O	N	D	G	F	M	A	M	J	J	A	S	O	N	D	G	F	M	A	M	J	J	A	S	O	N	D
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24	M25	M26	M27	M28	M29	M30
WP1																														
T1.1																														
T1.2																														
T1.3																														
WP2																														
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Task 5.3																														
WP6																														
Task 6.1																														
Task 6.2																														
Task 6.3																														

---- December 2020 - 18th month of the project

5. MONITORING AND EVALUATION PLAN (M&E) UNTIL MONTH 18 OF THE PROJECT

The monitoring and evaluation plan (M&E) will be developed during and at the end of the project, using a scheme that includes the following elements, defined by the project partners, as exemplified in the following figure:

- WPs and tasks
- Role of partners
- Activities
- Time schedule initially planned and month of completion
- Targets / result to current date (month 18 of the project)
- Tasks completion to current month (%)

WPs and TASKS	UniBS	UniMIB	ENEA	ACTIVITIES	Monitoring and Evaluation (M&E) Plan			
					Month of completion	Current Month	Targets / Result to current date	Tasks completion to current month (%)
WP1 – PROJECT COORDINATION		Leader UniBS						
T1.1 - Start-up of the consortium/Kick-off meeting	X	x	x	All the partners will contribute as required to the project management in minimising risks, reporting impacts and progress for the project meetings and events; to deliver efficient and effective management of the project technically, financially and administratively; to manage and maintain clear communications among partners; to manage IPR eventually generated.	1	18	14 meetings with partners ENEA/BICOCCA/UNIBS	100%
T1.2 - Coordination and monitoring of activities	X	x	x		30			
T1.3: Budget management and reporting activities	X	x	x		30			
WP2 – PRODUCTION OF BIO-SURFACTANTS FROM RESIDUES OF OLIVE OIL AND WINE SECTORS		Leader UniMIB						
Task 2.1 – Background and case study definition	X	x		Identify and characterize residues from olive oil and wine sectors suitable for the biosurfactant production by the selected bacteria strains.	4	18	3-4 bacterial strains will be able to produce BSs (Rhamnolipids) on winery wastes and olive oil mill 2 Screening BS producers on those agriculture wastes 1 Perform the first biodiversity study (Domain bacteria) and identification of microbial consortia and bacteria, able to reduce surface tension Improve the standard media using low costs carbon sources (or conditions) for growing the selected BS-producing bacteria. (1 g /l) Production yield	100%
Task 2.2 – Isolation of bio-surfactants producers from residues of olive oil and winery residues	x	X		Isolate efficient biosurfactant (BS) producers using several microbial enrichments, incubated under different conditions.	15			100%
				Identify potential BS producers to the existing bacterial collection in DISAT-UniMib. The BS production capacities of the isolated strain will be compared				
Task 2.3 – Production Optimization and chemical characterization of bio-surfactants from residues of olive oil and winery residues	x	X		Study of the biodiversity and identification of selected consortia and bacteria.	15			
				Improve the standard media using low costs carbon sources for growing the selected BS-producing bacteria.				
				The optimization of these microbial surface-active agents will be achieved using experimental design methods				
Task 2.4 – Ecotoxicity Assessment of the biosurfactant produced before and after purification	x	X		The yields of BS production and the critical micelle concentration (CMC), and partial chemical characterization of the BS will be also determined.	21	100%		
				Evaluation of the activity of both purified and semi-purified will be performed.				
				Based on the previous results, we will produce the BS in a large scale in order to reach high BS-yield of production for the targeted application foreseen in WP3.				
				1 The yields of production, 1 the critical micelle concentration (CMC), 1 partial chemical characterization 1 BS tested and approved				
				1 Large-scale production of the BS				
				1 Confirm the ecotoxicity assessment of the produced BS			80%	
WP3 – TREATMENT OF CONTAMINATED SOIL BY USING BIO-SURFACTANTS PRODUCED FROM RESIDUES OF OLIVE OIL AND WINE SECTORS		Leader UniBS						
Task 3.1 – Bio-surfactant assisted washing of soil contaminated with hydrocarbons	X	x		Lab-scale washing tests will be performed to compare traditional surfactants and biosurfactants developed in WP2. The contaminated soils will be characterized to define their grain size distribution and chemical-physical characteristics, as well as the TPHs and PAHs concentrations. Germination tests will be carried out to evaluate the potential agricultural reuse of the treated soil. Lab-scale test will be carried out to treat the wastewater originated by soil washing.	25	18	Soil washing tests, 3g of contaminated soil and 15 ml of washing solution, using for the latter the two concentrations C1 = 1CMC and C2 = 2CMC and C0 (deionized water) for the contact times of 0,5, 2 and 6 hours, repeating each test 2 times thus obtaining a total of 18 tests	10%
Task 3.2 – Bio-surfactant assisted bioremediation of soil contaminated with hydrocarbons	X	x		Lab-scale bioremediation tests will be performed with and without the bio-surfactants produced in WP2. The same contaminated soils used in the Task 3.1 tests will be used here, too. Before the tests, the contaminated soils will be characterized to define their grain size distribution and chemical-physical characteristics, as well as the TPHs and PAHs concentrations. UniMIB will perform microbiological analyses of soil before and after treatment. Residual concentrations of hydrocarbons will be quantified at the end of the tests; moreover, germination tests will be carried out to evaluate the potential agricultural reuse of the treated soil.	25			5%

WPs and TASKS	UniBS	UniMiB	ENEA	ACTIVITIES	Monitoring and Evaluation (M&E) Plan			
					Month of completion	Current Month	Targets / Result to current date	Tasks completion to current month (%)
WP4 – ENVIRONMENTAL ASSESSMENT THROUGH LIFE CYCLE ASSESSMENT	Leader UniBS							
Task 4.1 – Definition of scenarios and identification of system boundaries	x		x	<p>The system boundaries have to be defined by means of support of partners involved in their development within the project WPs.</p> <p>Where information on distribution, utilization and end-of-life of the products are available, a more complete LCA will be performed.</p> <p>For the comparative analyses, literature will be checked to extract the layout of conventional processes.</p>	12		<p>Purchase of laptop and Simapro software.</p> <p>Organization of the training course on Life Cycle Assessment (LCA) and environmental Life Cycle Costing (LCC)</p>	50%
Task 4.2 – Life Cycle Assessment (LCA) studies and environmental Life Cycle Costing (LCC) studies	x	x	x	<p>Data collection formats will be prepared for collecting the primary data – where available - to be used in the LCA and LCC studies.</p> <p>The LCA and LCC studies identify the hot spots of the processes and the improvements on them (recommendations on methods and technological solutions), the potential benefits of innovative solution and scenarios in comparison with the conventional systems.</p> <p>An environmental Life Cycle Costing study will be carried out for evaluating the economic viability and convenience of the introduced innovation, in agreement with the most updated guidelines.</p>	28	18		0%
WP5 – INDUSTRIAL SYMBIOSIS FOR THE CROSS-	Leader ENEA							
Task 5.1 – Companies involvement campaign	x		x	<p>The first step for the implementation of industrial symbiosis pathways is the selection of companies present in a case study area which will be identified in the province of Brescia. The data of a consistent number of companies should be collected.</p> <p>A database containing information on several (hundreds) companies will be developed, collecting data from personal connections (UniBS, organisations which have signed the attached letters of support to the project), regional productive districts, chambers of commerce, universities, industrial associations and companies' web sites.</p> <p>Starting from this DB, an analysis of productive sectors and an evaluation of quantity and dimension of companies will be carried out to identify the most productive areas with a satisfactory sectors diversification: a cross-sectorial companies involvement will be ensured.</p>	17		74 companies in the database	80%
Task 5.2 – Industrial symbiosis events (matchmaking) with companies	x		x	<p>Two operative meetings, for a maximum of 50 delegates each, will be organized in Lombardia Region with the main goal of involving companies in the project, get from them data, and at looking for potential synergies.</p> <p>According to the ENEA industrial symbiosis methodology, already tested in several previous projects, companies will be asked before the matchmaking events to fill in input-output tables with data on resources intended to be shared within the project.</p> <p>Information shared by companies will be included in the input-output database, checked and loaded on the ENEA industrial symbiosis platform, in order to search for synergies using the “origin-destination” strings, in addition to those found during the meetings.</p>	19	18	3 industrial symbiosis events 74 companies involved	30%

WPs and TASKS	UniBS	UniMiB	ENEA	ACTIVITIES	Monitoring and Evaluation (M&E) Plan			
					Month of completion	Current Month	Targets / Result to current date	Tasks completion to current month (%)
WP6 – COMMUNICATION AND DISSEMINATION	Leader UniBS							
Task 6.1 - Project website and logo	X	x	x	<p>The project logo and graphic profile will be reviewed with all partners to be used for all project related activities. Based on this coordinate project image, the website will be created.</p> <p>The website will be user friendly so that all type of visitors can easily find the data and information they are looking for. The project website will be created in Italian and in English.</p> <p>The website will be regularly updated by UniBS throughout the whole duration of the project.</p>	6		Link web site and logo	100%
Task 6.2 - Management of appropriate social platforms, e-newsletter	X	x	x	<p>This task plans to create the project Newsletters with the main outputs and progress of the project. The Newsletters will be created in Italian and English to send them to a wide audience and different target groups.</p> <p>A press and media strategy (included in the “Dissemination Plan”) will be created to be able to handle press and media in a unified way among the partners.</p>		18	Link: email contact, social network: facebook, twitter, linkedin YouTube channel Creiamo project	
Task 6.3 - Promotional materials and publications	X	x	x	<p>Within the project a leaflet will be designed, printed, and distributed to all project partners. The leaflet will be created in Italian and in English. A roll-up and a poster will be prepared.</p> <p>Partners will host local and regional seminars and workshops.</p> <p>At the end of the project, a final event will be scheduled in order to launch the project results to the community and to stimulate the curiosity and interest of researchers, end-users, public institutions, industrial associations and other stakeholders on project innovation.</p> <p>In addition to the overall workshops, the project will be presented in parallel and specific workshops and seminars of different nature, as well as to national and international open access journals in order to ensure the maximum dissemination of the project results.</p>	29		Newsletter 1, 2, 3 Last News, posters, seminars and workshops Project Information Session No. 1: Training	100%

6. DELIVERABLES UNTIL MONTH 18 OF THE PROJECT

N.	Deliverable name	Type*	Accessibility	Month of completion	Access
D1.1	Project management plan	R	Public	2	Link
D1.2	Progress Report	R	Public	18	Link
D2.1	Report on biosurfactant produced from wine sector residues	R	Confidential	15	
D2.2	Report on biosurfactant produced from olive sector residues	R	Confidential	15	
D5.1	Report on the industrial symbiosis activities	R	Public	18	Link
D6.1	Stakeholder mapping	R	Public	6	Link
D6.2	Project logo and visual identity	DEC	Confidential	4	
D6.3	Communication tools development	DEC	Confidential	4	
D6.4	Project website	DEC	Public	4	Link
D6.5	Dissemination Plan	R	Confidential	3	
D6.6	Social media	R	Confidential	4 7 11 16	
D6.7	Newsletter	DEC	Public	7 11 16	Link
D6.8	Publications	R	Public	15	Link
D6.9	Project Information Sessions and Final Conference	DEC	Public	6 12	Link

*R: document, report (excluding the project periodic or final reports), DEM: demonstrator, pilot, prototype, plan designs; DEC: websites, patents filing, press & media actions, videos, etc. and OTHER: software, technical diagram, etc.

7. MILESTONES UNTIL MONTH 18 OF THE PROJECT

N.	name	Month of achievement	Responsible	WORK DONE
M1.1	Kick-off meeting organized in Brescia	M1	UniBS	OK
M1.2	Projects review meetings via Telcos or Meetings	M6, M12, M18	UniBS	OK
M2.1	Case study defined	M4	UniBS	OK
M2.2	Isolation of bio-surfactants producers from residues of olive oil and winery residues	M15	UniMiB	OK
M2.3	Production Optimization and chemical characterization of bio-surfactants from residues of olive oil and winery residues	M15	UniMiB	OK
M2.4	Contract for consultancy	M15	UniMiB	OK
M3.1	External chemical analyses	M18	UniBS	OK
M3.2	Contract for consultancy (agronomist)	M6	UniBS	OK
M5.1	Stakeholder and companies involved in industrial symbiosis working tables	M17	ENEA	OK
M6.1	Project web site	M4	UniBS	OK