

algae4a-b

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Algae for Aquaculture and Beauty

Newsletter 7 – June 2019

Consortium



Project Coordinator
CNRS, CERMAV
France



Fitoplancton Marino, S.L.
Spain



Agricultural University Of
Athens
Greece



Instituto Andaluz De
Investigacion y Formacion
Agraria Pesquera
Alimentaria
Spain



Apivita SA
Greece



Centro De Ciencias Do Mar
Do Algarve
Portugal



Lifesequencing, SL
Spain

The project

Microalgae were always an exciting target for Aquaculture, Cosmetology and Biotechnology, as they represent a largely untapped reservoir of novel and valuable bioactive compounds.

The ALGAE4A-B (Algae For Aquaculture and Beauty) project seeks to exploit microalgae diversity, as a source for state-of-the-art high-added-value biomolecules in aquaculture and cosmetics.

ALGAE4A-B aspires to foster both European capacity building and the strategic objectives of EU Blue Growth and Marine Biotechnology to harness the untapped potential of European seas and coasts for training and sustainable growth.

Microalgae Biomass Production

The diversification of microalgae biomass production towards two independent applications will give the microalgae industry access to alternative markets in an uncertain, highly competitive and fast changing commercial environment.

Basic and applied research

The project combines both basic and applied multidisciplinary research in the fields of -omics technologies, biochemistry and applied biotechnology in order to:

- Develop and optimize low-input and application-based microalgae culture systems
- Develop “-omic” resources for both microalgae and fishes
- Develop downstream processing of high added value products from microalgae, with an emphasis on polysaccharides, proteins, enzymes and antioxidants
- Develop, formulate and evaluate in vitro a new range of cosmetic and nutraceutical products for aquaculture

Key figures

972 000 € EC funding
7 partners
4 years (2016-2019)

More information on www.algae4ab.eu

Workshop 4: “Exploring biodiversity for novel bio-activities”

Agricultural University Athens & APIVITA – 9-11th April 2019 - Athens, Greece

TUESDAY 9th APRIL		Agricultural University of Athens - AUA Library lecture room	
Day 1	Opening and topic introduction		
	09:00-09:30	Student registration	
	Morning session		
	09:30-10:00	Welcome introduction	Pr. Emmanouil Flemetakis - Agricultural University of Athens
	10:00-10:30	High throughput functional genomic platforms for probing bioactivity of natural products	Dr. Dimitrios Skliros - Agricultural University of Athens
	10:30-11:00	Studying oxidative stress responses in microalgae: The role of SBP	Ms Aikaterini Kolleti - Agricultural University of Athens
	11:00-11:30	Coffee break	
	11:30-12:00	Biosensors in toxicological research	Pr. Georgia Moschopoulou - Agricultural University of Athens
	12:00-12:30	Natural preservatives for perishable food products	Dr. Theofania Tsironi - National Technical University of Athens
	12:30-14:00	Lunch break	
Afternoon session			
14:00-17:30	Laboratory course: Metabolomic analysis of complex natural extracts	Agricultural University of Athens	
WEDNESDAY 10th APRIL		APIVITA Experience store - Solonos 6, Athens	
Day 2	Morning session		
	10:00-10:30	Welcome Speech & registration	Dr. Konstantinos Gardikis - R&D Director - APIVITA
	10:30-11:00	Mycosporine-Like Amino Acids (MAAs) The natural sunscreen in marine micro and macro algae	Dr. Amalia Venetsanopoulou - Scientific associate of HCMR - Institute of Oceanography Dr. Anthi Karnaouri Postdoctoral Researcher - National Technical University of Athens, Greece & Associated Researcher - Lulea University of Technology, Sweden
	11:00-11:30	The Laurencia paradox: An endless source of chemodiversity	Pr. Vassileios Roussis - University of Athens - Faculty of Pharmacy Dpt. of Pharmacognosy and Natural Product Chemistry
	11:30-12:00	Coffee Break	
	12:00-12:30	Reverse Chemical Ecology: An emerging approach towards identification of novel plant insect repellents	Dr. Spyros E. Zographos - Ph.D. Research Director - Structural Biology and Chemistry Institute of Biology, Medicinal Chemistry & Biotechnology - National Hellenic Research Foundation
	12:30-13:00	Innovation on the final product and communication	Christina Papitsa - MSc. Global Product Manager - APIVITA
	13:00-14:00	Lunch Break	
	Afternoon session		
	14:00-15:40	Algae4A&B General assembly & Executive Committee meeting WP1-WP5	Algae4A-B partners only
15:40-16:00	Coffee break		
16:00-17:30	Algae4A&B General assembly & Executive Committee meeting WP6-WP10	Algae4A-B partners only	
THURSDAY 11th APRIL		APIVITA Experience store - Solonos 6, Athens	
Day 3	Morning session		
	10:00-11:00	Algae4A&B General assembly & Executive Committee meeting Round table discussion & workplan	Algae4A-B partners only
	11:00-11:30	Coffee break	
	11:30-12:30	Algae4A&B General assembly & Executive Committee meeting Round table discussion & workplan	Algae4A-B partners only
	12:30-13:00	Closing remarks	Algae4A-B partners only
13:00-14:00	Lunch break		

Talks are available on www.algae4ab.eu



Workshop organization:
Dr. Konstantinos Gardikis
APIVITA
Pr. Emmanouil Flemetakis
AUA

Workshop venues:
Agricultural University of
Athens - AUA Library lecture
room
APIVITA Experience store

More information on www.algae4ab.eu

Algae4A-B Implemented secondments

Research and Innovation Staff Exchange (RISE) projects fund short-term exchanges (“secondments”) for staff to develop careers combining scientific excellence with exposure to other countries and sectors. RISE enables more interaction between academia and non-academic organisations within Europe and worldwide.

FITMAR - AUA

Carlos Unamunzaga – 2 months

The objective of the secondment has been the development and evaluation of a purification method for protease activity from *Nannochloropsis gaditana* extracts based on aqueous-two phase system (ATPS). Stopped spectrophotometric measurements were used for protease activity determination in microalgae extracts using as substrate azo-gelatine and azo-casein. The method could be used in future studies for the purification of other novel proteases from other microalgae species.

FITMAR – CNRS

Claudia Maya – Sonia Torres – 2 months

The main objective of this secondment was the analysis of up to 18 different exopolysaccharide (EPS)-enriched fractions obtained from cyanobacterial strains belonging to FITMAR's collection. These fractions were previously prepared at FITMAR facilities from cell cultures under stress conditions, mainly nutrient deprivation (old cultures in the plateau phase). Two different analysis were performed: i) osidic composition by gas chromatography, and ii) protein content determination using the Bradford assay. Results obtained during this secondment period represent a valuable analytical contribution to be considered for the optimization of protocols for EPS purification from cyanobacteria cultures.

IFAPA – APIVITA

Manuel Aparicio – 2 months

The objective of this secondment was the biochemical characterization of new hatching liquids from sole and seabream. A full study to investigate the catalytic activity, protein amounts, protein profile and purification using affinity chromatography was carried out. During the period, an intensive training in a wide range of lab techniques was carried out including protease assays, SDS analysis, chromatography, dialysis, cloning and in vitro purification assays. Overall, all this work contributed to complete the results of WP4 and fulfil the objectives to get new biotechnological products from fish.

CCMAR - APIVITA

Ana Patricia Mateus – 1 month

The purpose of the secondment was to evaluate the effect of fish CRTAC1 peptide and β -Estradiol on human primary dermal cell proliferation and skin recovery after cell damage. This secondment was complimentary to the work of Rita Costa and was aimed at completing molecular analysis with a view to preparing a scientific article.

CCMAR - LIFESEQ

Patricia Pinto – 1 month

The objectives of this secondment were: i) the bioinformatics analysis and validation of the microbiome from skin and gut of pigmented or albino sole (*Solea senegalensis*); ii) the bioinformatics analysis and validation of transcriptomics analysis from skin and gut of pigmented and albino sole and iii) the preparation of microbiome libraries of gut DNA from Solea treated with glucans (pilot experiment).

CCMAR - APIVITA

Rute Felix – 2 months

This secondment aimed to test if a primary fish fibroblast cell line (SJD.1) could be used as a model for human skin cosmetology assays with the view of product formulation. SJD.1 was used to evaluate the effect of vertebrate CRTAC1, a highly conserved protein, in wound recovery after cell damage. This work was complimentary to the work of Dr Sofia Letsiou an APIVITA RDI expert and the secondment of Dr Rita Costa.

IFAPA – APIVITA

Ana Manuela Crespo – 2 months

The main objective of this secondment was the completion of transcriptomic analysis in cells treated with microalgal extracts and evaluate the cytotoxicity of hatching liquid extracts. A set of 10 genes were studied and expression quantified in human dermal normal fibroblast (HDNF) exposed to crude microalgal extracts, yeast β -glucans using two types of encapsulates (CD and HRF). Exposure trials under standard conditions or previous treated with LPS, an inflammatory inducing agent, were processed. The main effects on cell protection and anti-inflammatory capacities were determined. Moreover, cytotoxicity tests were performed demonstrating the potential of choriolysins to be used in cosmetics.

CCMAR – APIVITA

Rita Costa – 2 weeks

The purpose of the secondment was to evaluate the effect of piscine CRTAC1a and CRTAC1b peptides and β -Estradiol on human primary dermal cell proliferation and skin recovery after damage. This is part of a process towards formulation of a product (WP6).

APIVITA – CNRS

Konstantinos Gardikis – 2 months

The objectives of the secondment were 1) to produce polysaccharides degrading enzymes, 2) digest polysaccharides from algae and microalgae having original structures, and 3) isolate oligosaccharide fractions for biological assays that will be conducted by the project partners.

IFAPA – APIVITA

Manuel Machado – 2 months

The main objective of this secondment was to complete the work previously initiated in secondments between IFAPA and APIVITA within the WP2 and WP4. I carried out the supervision of experimental design, did data analysis and discussed the main results achieved. In WP2, transcriptomic analysis of human dermal normal fibroblast treated with microalgal extracts were processed. The anti-inflammatory capacity of these extracts was evaluated. Moreover, cytotoxicity tests using hatching liquid were analysed. In WP4, data for protease activity and protein profiles of hatching liquid were studied and analysed. Moreover, some activities related to data compilation for writing two manuscripts about the hatching enzymes and immune stimulation in fish using microalgal extracts were carried out. Manuscript and deliverables were prepared to disseminate the project activities.

More information on www.algae4ab.eu

Algae4A-B project results dissemination

Events:

Aquaculture Europe 2019 Berlin, Germany – October 7-10, 2019

Publications:

Cartilage acidic protein 1 promotes in vitro wound healing in primary human dermal fibroblasts

Sophia Letsiou, Rute C Félix, João CR Cardoso, Liliana Anjos, Asgarifar Sanaz, Gomes HL, Deborah M Power– *Journal of Dermatological Science* – Submitted

*Yeast β -glucans and microalgal extracts modulate the immune response and gut microbiome in Senegalese sole (*Solea senegalensis*)*

Carlos Carballo, Patricia I.S. Pinto, Ana Patricia Mateus, Concha Berbel, Cláudia C. Guerreiro, Juan F. Martinez-Blanch, F. Codoñer, L. Mantecon, Deborah M Power* and Manuel Machado – *in press*

More information on www.algae4ab.eu



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