



MaCuMBA

Marine Microorganisms: Cultivation Methods for Improving their
Biotechnological Applications

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**NIOZ Summer school on improved culture efficiencies of
marine micro-organisms**

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Dissemination Level	
PU Public	X
PP Restricted to other programme participants (including the Commission Services)	
RE Restricted to a group specified by the consortium (including the Commission Services)	
CO Confidential, only for members of the consortium (including the Commission Services)	

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List of reviewers

Issue	Date	Implemented by
v.1	29/07/2015	NIOZ

Indicate any document related to this deliverable (report, website, ppt etc) and give file name

- *The flyer, programme and students evaluation report of the MaCuMBA Summer School are available for download from basecamp (MaCuMBA – WP9 >> Files: <https://basecamp.com/2022234/projects/1379508-macumba-wp9/attachments>).*

Summary

Objective(s):

The objective of the MaCuMBA Summer School was to give participants (young scientists, technicians, and PhD students) from in- and outside the MaCuMBA consortium the opportunity to interact with experts in the field and obtain first-hand experience of isolation and cultivation design along with various other techniques.

Rationale:

MaCuMBA is a project that aims at improving the rate of isolation of marine microorganisms and improve their cultivation efficiencies with the aim to use them for biotechnological applications. In this time of OMICs there is a decreasing effort in the training of students for the cultivation of microorganisms. The MaCuMBA consortium found it therefore important to offer a course in which the various techniques for enrichment, isolation, and cultivation are presented by experts using a combination of lectures and theoretical and practical exercises.

Results:

The 2-week Summer School took place in the premises of NIOZ on the island of Texel (The Netherlands) from 12-24 July 2015. With 20 students the Summer School was fully booked. About 40 students from all over the world showed interest. The 20 accepted participants came from 13 countries and also represented 13 nationalities (see table). Fifteen participants were female and five were male. Only 7 students came from MaCuMBA partners. The participants and lecturers were accommodated in Hotel 'De Pelikaan' on Texel and transported to NIOZ by a daily bus shuttle.

Country	Resident	Nationality
Belgium		1
Cyprus	1	1
Denmark	1	
Ecuador	1	1
Finland	2	2
France		1
Germany	4	5
Greece	1	1
Italy	1	2
Jordan		1
Morocco	1	1
Netherlands	3	1
Norway	2	2
Spain	1	1
Sweden	1	
United Kingdom	1	
Total	13/20	13/20

The Summer School was organized and led by prof. dr. Corina Brussaard and prof. dr. Klaas Timmermans (who due to illness could not be present) of NIOZ-Texel and dr. Henk Bolhuis, dr. Silvia Crețoiu, and prof. dr. Lucas Stal of NIOZ-Yerseke, who were present during the whole Summer School and acted as mentor and teacher for the participants in addition to presenting various lectures and assisting with the practical. The program of the Summer School is provided in the attached document. The success of the Summer School was in the first place thanks to the contributions of the expert lecturers of which many were from our MaCuMBA consortium, which helped tremendously to keep the fee for the students as low as possible. The lectures in the morning were mostly given in the auditorium of NIOZ and the workshops in various other rooms. The practical in the afternoon took place in several laboratories of NIOZ with the help of Josje Snoek and other lab technicians. Part of the evenings were reserved for short presentations by the participants and the link with the MaCuMBA Summer School, a workshop on microscopy and for making a 'Future-of-cultivation' assignment.

During the weekend half-way the School, a trip to Amsterdam was organized on Saturday with a visit to 'Micropia' (www.micropia.nl), the unique microbe 'zoo', the open-air museum 'Zaanse Schans' (www.dezaanseschans.nl), with Dutch windmills, cheese making and other typical Dutch sights, and ended with a nice dinner in a local restaurant and the last ferry to the island. On Sunday we visited the Seaweed Centre of NIOZ and learned how to sample water from the NIOZ Jetty in the Marsdiep and subsequently how to use these samples for isolation using the Survival Box. This was followed by a sightseeing tour to see the island of Texel, combined with a visit to the 'Slufter', a dynamic coastal area that developed after a storm in 1858 destroyed the dunes, and sampling of intertidal sediments and microbial mats in 'De Cocksdorp' in the northern-most end of the island. Sediments were frozen *in situ* using the so-called 'cryo-lander' and liquid nitrogen. The day ended with a wonderful dinner in the beach restaurant 'Paal 17'.

We acknowledge the fantastic help of Frida Kraanen concerning the logistics of the Summer School and who helped each and every student and guest lecturers with all their questions. We are thankful for the inspired contributions of dr. Gaëtan Burgaud, mrs. Catarina Cuccio, dr. Colin Ingham, prof. dr. Mohamed Jebbar, dr. Gwenaëlle LeBlay, dr. Cendrella Lepieux, dr. Ada Librada Canedo, dr. Dominique Marie, prof. dr. Jörg Overmann, dr. Lynn Paterson, dr. Jörg Peplies, dr. Jerry Reen, prof. dr. Francisco Rodriguez Valera, prof. dr. Dave Scanlan, mr. Hans Slagter, dr. Ulrich Tillich, and dr. Thomas Vanagt. We were also lucky to have some excellent lecturers from outside MaCuMBA who volunteered to cover important areas that are unavailable within MaCuMBA. We acknowledge with gratitude the contribution of prof. dr. Gijs Kuenen for opening the School with an important lecture and practical on fundamentals in microbiology. Dr. John Day discussed and exercised the preservation of cultures and prof. dr. Helena Vieira made the students aware of the fact that they all could become entrepreneurs. The great diversity of lecturers allowed a large variety of aspects to be discussed and demonstrated in the laboratory and as workshops. These included topics ranging from medium design and thermodynamics, to metabolic pathways and biochemistry, to isolation and culturing of bacteria, fungi and phytoplankton, to culture collections and preservation, and finally, topics most of the students were unaware of such as the consequences of the Nagoya Protocol and the European legislation in relation to that, and how to start your own business.

eCOAST recorded movies during the Summer School as part of the planned MaCuMBA movies.

The reactions of the students and the lecturers was overwhelmingly positive (see attached outcome of the evaluation) and this led to the idea that in this time of OMICS-dominated microbiology there might be a real need for an undergraduate/graduate course on sampling, isolation and cultivation of (marine) microorganisms. The organizers will evaluate this Summer School and discuss the potential to make this a recurrent course / MaCuMBA legacy.

Partner(s) involved in Deliverable production:

NIOZ (P1) with the aid of AquaTT (P9), with feedback and input from all partners.