

Bioactive Molecules from Marine Plant Biomasses (C004328)

Due to Covid 19, the education and assessment methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size *(nominal values; actual values may depend on programme)*

Credits 3.0

Study time 75 h

Contact hrs

32.0h

Course offerings in academic year 2021-2022

A (semester 1)

English

Gent

Lecturers in academic year 2021-2022

Siger, Valerie

BREST02 lecturer-in-charge

Hellio, Claire

BREST02 co-lecturer

Poupart, Nathalie

BREST02 co-lecturer

Offered in the following programmes in 2021-2022

[International Master of Science in Marine Biological Resources](#)

crdts

3

offering

A

Teaching languages

English

Keywords

Position of the course

The objective is to make the student ready to develop and propose a comprehensive and integrated approach for enhancing the value of marine plants (macroalgae and halophytes) and their by-products for the development of novel added-value molecules and ingredients, intended for food, agrifood, aquaculture, cosmetics, pharmaceutical and medical sectors, together with the sector of fouling.

Marine biotechnologies are targeting niche markets by offering products with low volumes and high added-values, and also mass markets like bio-sourced polymers.

Contents

Introduction: utilization of marine plants worldwide, chemodiversity and sectors which use marine plants

Chapter 1: Global overview of the marine plants industry in France, Europe and in the world: definitions, types of resources (harvested, cultivated resources together with beaching), markets, value chains, culture versus harvesting following countries with case studies in occidental and oriental countries (for seaweeds).

Chapter 2: The different industrial sectors which use marine plants: general properties, specificities of marine ingredients, classical and innovative uses

Chapter 3: focus on phenolic compounds: extraction, purification, quantification and biological activities, innovative and green processes for their extraction/purification, applications in cosmetic, agrifood and medical industries

Chapter 4: focus on carbohydrates (mono-, di- and polysaccharides): extraction, purification, quantification and biological activities, innovative and green processes for their extraction/purification, applications in cosmetic and medical industries

Chapter 5: focus on marine lipids (terpens, fatty acids,...): extraction, purification, quantification and biological activities, applications in fouling industries and use as natural conservatives.

Chapter 6: innovations in relation with researches on marine plants. Cosmetic Ingredients and formulation: theory and practical way to obtain a cosmetic product.

Initial competences

Basic marine biology, marine biochemistry, botany

Final competences

1 Learning outcomes for students are to obtain a comprehensive vision, in a context of

sustainable and innovative researches:

- of the macroalgal and halophytes industries at different scales (France, Europe and worldwide)
- on the possibilities to valorize marine plants
- on the application of biotechnological processes in the domain of marine sciences
- on biological assays which could be carried out along the research of innovative marine ingredients
- on the formulation of ingredients.

2 Students will also acquire:

- the ability to transpose data/concepts of the scientific literature into R & D approaches integrating scaling-up.
- the capacity to bind extractive and purification processes and their uses, depending on the needs of industrials

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Seminar, Excursion, Lecture

Extra information on the teaching methods

The course will be held in form of lectures, case studies, analysis of scientific papers.
A workshop will be organized during which students will work in small groups under the guidance of the teaching professor.
Review essays will be used to develop critical assessment of the primary literature.
All courses will be available on-line.
A SME visit (cosmetic or aquaculture) will be organized, together with a visit of the Biodimar platform (UBO)

Learning materials and price

References

Stengel et al. (2011) Algal chemodiversity and bioactivity: sources of natural variability and implications for commercial application. *Biotechnology Advances* 29: 483–501
Kornprobst (2005) Substances naturelles d'origine marine : Chimiodiversité, pharmacodiversité, biotechnologies, Tec & Doc
Fleurence & Levine (2016) *Seaweed in Health and Disease Prevention*, 1st Edition. ISBN: 9780128027721
Se-Kwon (2012) *Handbook of Marine Macroalgae: Biotechnology and Applied Phycology*, Wiley-Blackwell. ISBN: 9780470979181
Anonyme (2011) Récolte des algues de rive. Guide de bonnes pratiques. Inter Bio Bretagne (IBB). Accessible en ligne : <http://www.bio-bretagne-ibb.fr/wp-content/uploads/IBB-Guide-recolte-algues-29122013.pdf>

Course content-related study coaching

Assessment moments

continuous assessment

Examination methods in case of periodic assessment during the first examination period

Examination methods in case of periodic assessment during the second examination period

Examination methods in case of permanent assessment

Oral examination, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

Extra information on the examination methods

One edited work (poster or report) will be done on a scientific paper in relation with the use of marine plants in a specific sector. This work will be done in small groups (2 or 3 students)
Each group will deliver an oral presentation on their edited work.

