AntiFoul

Applying novel biotechnological tools to utilize compounds isolated from the red algae *S. coronopifolius* as eco-friendly antifouling agents

COFASP ERA-net

MarineBiotech

PROJECT FACTSHEET

JOINT CALL COFASP – ERA-MBT

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ABSTRACT

Biofouling is the undesirable growth of living organisms (bacteria, algae, mollusks etc.) on structures submerged in water which causes serious problems for the aquaculture and maritime industries. A number of physical and chemical technologies have been applied in antifouling paints (AF), the most effective of them being the use of tributyltin coatings. However, due to toxicity caused by tributyltin and heavy metals, in September 2008, the International Maritime Organization (IMO) banned the use of self-polishing tributyltin coatings and there is increasing opposition to the use of copper. Preventing the settlement of fouling organisms in a non-toxic manner would be the ideal solution. To this end, there has been a multitude of physical, chemical and biomimetic approaches. Likely, a successful method of AF will need to combine all methods.
Over the past few years several marine metabolites were characterized for their eco-friendly antifouling potential. Among them, a very promising halogenated terpene, bromosphaerol from *S. coronopifolius* isolated by our group. Currently, the major hurdle of the use of marine metabolites is the limited available quantities. To address this limitation, our consortium will approach bromosphaerol biosynthesis in an interdisciplinary manner utilizing all available new tools in biotechnology, genomics, bioinformatics, biochemical and chemical analysis and in-vivo assays. In preliminary work, we have applied Next Generation Sequencing (NGS) to identify several thousands of expressed genes from *S. coronopifolius* including candidate terpenoid biosynthetic genes. In the current project we will expand the NGS approach in additional fresh material, analyze bioinformatically the expressed genes to quantify expression levels, isolate candidate biosynthetic genes, perform enzymatic analysis and metabolic modeling and flux analysis, reconstitute the biosynthetic pathway in heterologous species, refine the chemical analysis tools to identify compounds from tiny amounts of algal material and settlement-inhibition assays of barnacles.

More information can be found on the COFASP website.

Sector:

- Seafood processing

Topic:

- Explore opportunities for the use of biotechnological tools

Total costs*:
€ 512.400

Funding granted*:
€ 276.100

Duration:
3 years (2017-2019)

** Exact amount may change after completion of national contracts*

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