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Nationality: Spanish

Orientation: Sustainable use of marine resources
Specialization Area: Aquaculture
Research Area: 2.12 Upwelling of toxic algae and marine biotoxins

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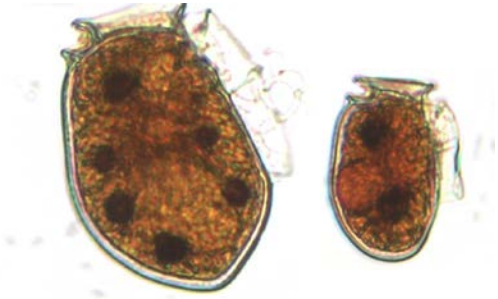
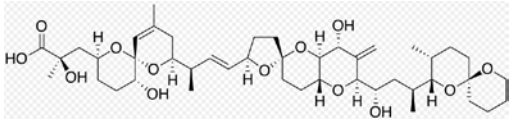
PHD PROGRAM IN MARINE SCIENCE, TECHNOLOGY AND MANAGEMENT





PhD project: **Ecophysiology of mixotrophic harmful dinoflagellates**

Supervisors: Dr. Beatriz Reguera Ramírez (Spanish Oceanographic Institute)
Dr. Francisco Rodríguez Hernández (Spanish Oceanographic Institute)

Summary: Diarrhetic shellfish poisoning (DSP) toxins are produced mainly by dinoflagellate species of *Dinophysis* which also produce pectenotoxins (PTX). Filter feeding molluscs accumulate *Dinophysis* toxins in their soft tissues, and every time toxin concentrations rise above regulatory levels, shellfish harvesting is forbidden by fisheries and health authorities. The first successful culture of *D. acuminata* was established using the ciliate *Mesodinium rubrum* as prey, which in turn feeds on cryptophytes (Park et al. 2006). Chloroplasts and other cell organelles are transferred from cryptophytes to *Mesodinium* and further into *Dinophysis* spp.

In western Iberian coastal waters, the two *Dinophysis* species under study, *D. acuminata* and *D. acuta,* exhibit distinct seasonal patterns. The former has a long (spring-summer) growing season and the latter blooms in late summer when water stratification is maximal. Their vertical distributions in the water column are also characteristic: *D. acuminata* grows in shallow pycnoclines as soon as solar heating leads to spring thermal stratification, whereas *D. acuta* thrives in deeper thermoclines.

The overall objective of this thesis was to study the ecophysiological requirements of *D. acuminata* and *D. acuta* with a comparative approach, to describe their niches and interpret their specific spatio-temporal distributions. This will achieved based on five secondary objectives:

I. Identification of the main nitrogen source (nitrate, ammonia, urea) used in well-fed and starved conditions.
II. Photosynthetic and toxinological characterization and study of the pigments content as response of different light intensities exposure.
III. Metabolomic profiles under different feeding conditions and prey supply.
IV. Micro-scale turbulence response.
V. D*inophysis* optimal and alternative prey identification.