

Day 1 – Toxic Microalgae in Coastal Environments

Coastal environments are amongst the ecosystems most affected by increasing human activities and climate change. These pressures on the ecosystem will result in more and more change in substrate and environmental conditions and will thus affect the phytoplankton community structure. Toxic microalgae are a natural constituent of phytoplankton communities. However, their occurrence has been difficult to predict, mostly due to the multifactorial influences on their development. Some microalgae are also difficult to monitor due to their low abundance, both in pelagic niches (e.g. *Dinophysis spp.*) or in epiphytic/benthic niches (*Gambierdiscus*, *Vulcanodinium*). While much impetus has been given to pelagic species toxic to man, knowledge greatly lacks on both ichthyotoxic and on benthic species. This day will be dedicated to reviewing the taxonomy, culture, ecology and chemical importance of such ichthyotoxic and benthic microalgae as well as the uptake of their metabolites into fish and shellfish. Sampling techniques will be described both for the analysis of phytoplankton and for the toxins they produce. Particular attention will be given to recently-developed sampling techniques including phytoplankton and chemical passive samplers.

Morning session:

Nicolas Chomérat (30 min): Taxonomy of benthic & ichthyotoxic dinoflagellates (comprehensive)

Véronique Séchet (30 min): Culture of benthic & pelagic dinoflagellates (focus: bioreactors)

Santiago Fraga (45 min): Recently discovered benthic species (focus *Gambierdiscus*)

Pat Tester (45 min): Recent sampling techniques for benthic dinoflagellates

Philipp Hess (30 min): Passive sampling techniques and transfer of algal toxins to fish and shellfish

Afternoon session:

This session will allow four groups of 5-8 people to take turns in the following practicals (30 min each):

1) Véronique Séchet: tour of the Phycotoxin Lab at Ifremer (focus algal culture techniques)

2) Nicolas Chomérat / Santiago Fraga: Microscopic analysis of benthic & ichthyotoxic genera (focus *Ostreopsis*, *Gambierdiscus*, *Prorocentrum*, *Kareniaceae*)

3) Pat Tester: demonstration of passive sampling for benthic micro-algae (from lab cultures)

4) Philipp Hess: Lab visit with demonstration of passive sampling and uptake studies

These sessions will be followed by a discussion session with time for questions and answers (1h)