

Introduction

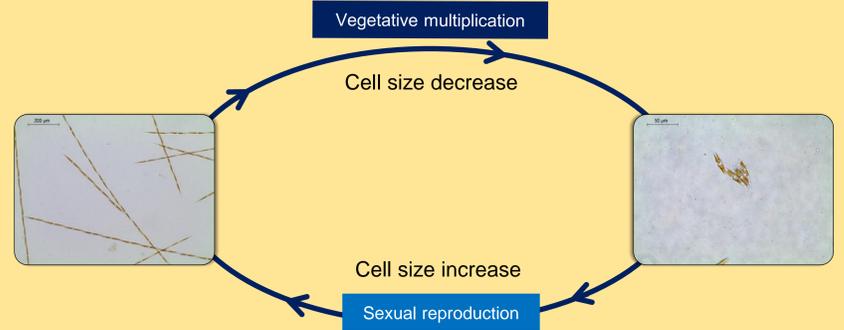
- Pseudo-nitzschia* species are cosmopolitan marine diatoms. They are part of the phytoplankton community off the French coast every year.



- Currently, 47 species are described about half of which produces a neurotoxin, domoic acid.
- This toxin is responsible for ASP (Amnesic Shellfish Poisoning) in humans. ASP events are responsible for severe sanitary and socio-economic troubles in shellfish or fishing industries.

Life cycle

Pseudo-nitzschia, as a diatom, has a peculiar life cycle characterized by a decrease in cell size during vegetative multiplication, and a restoration of large cell size via sexual reproduction.



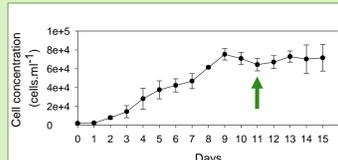
The objective of this project was to study the diversity of toxicity among different *Pseudo-nitzschia* species.

Methods

For each strain of each species:

Batch experiments were conducted under silicate and phosphate limitation since these limitations induce the production of domoic acid in *Pseudo-nitzschia*.

- Every day: cell count
- On the second day of the stationary phase: Cellular domoic acid measurement by ASP ELISA kit (Biosense).

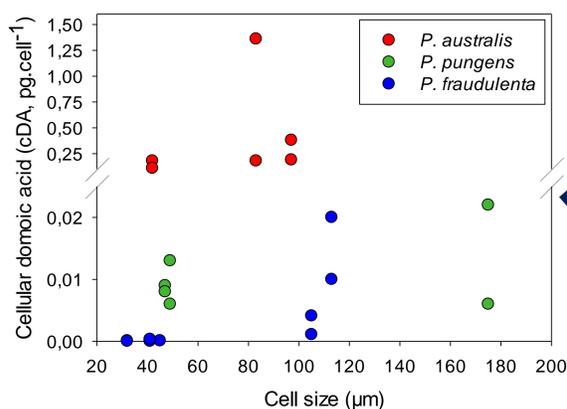


The experiments were performed with several strains of three species. Parental strains (small cells) were isolated from natural population. F1 strains (large cells) come from sexual reproduction made with the parental strains.

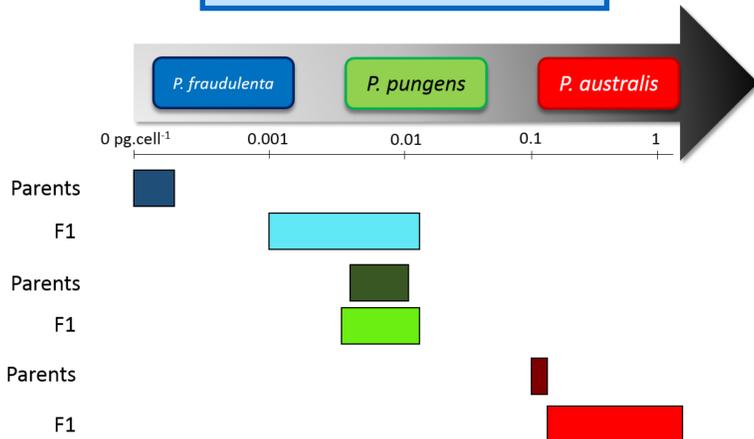
Species	Parents (size)	F1 (size)
<i>P. australis</i>	PN aus P6B3 (42 µm)	PN aus F1-1A (83 µm) PN aus F1-5 (97 µm)
<i>P. pungens</i>	PN pun 66 (47 µm) PN pun 89 (49 µm)	PN pun F1-7A (175 µm)
<i>P. fraudulenta</i>	PN fra 10 (45 µm) PN fra 30 (41 µm) PN fra 31 (32 µm)	PN fra F1-8D (105 µm) PN fra F1-9B (113 µm)

Results

High variability in cellular domoic acid between species and between strains.

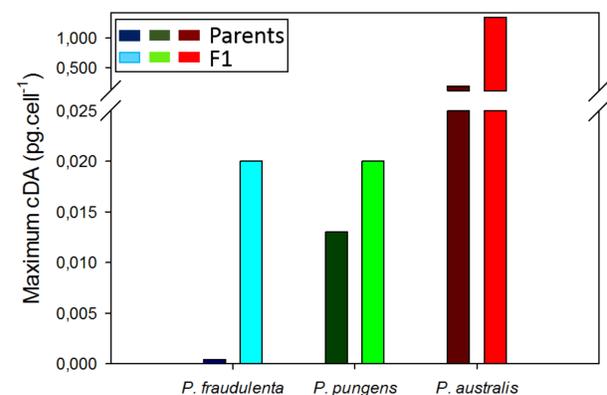


Interspecific variability

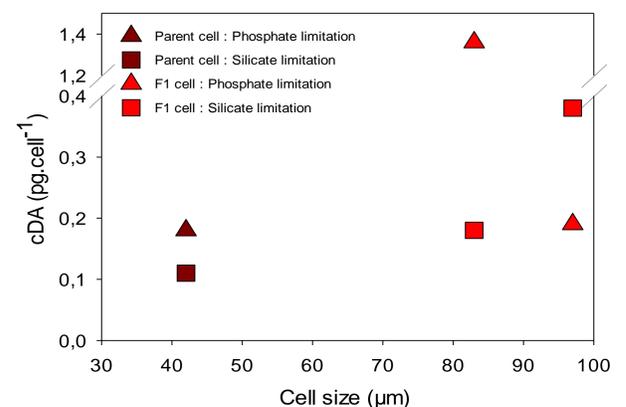


P. australis strains is always more toxic than *P. pungens* and *P. fraudulenta* strains.

Intraspecific variability



For each species, the most toxic cells are always F1 cells produced by sexual reproduction.



Preliminary results suggest that, for *P. australis*, the influence of phosphate and silicate limitations on cellular domoic acid content may depend on the strain considered.

Conclusions

These first results show the importance of interspecific and intraspecific diversity, through genetic variability and life cycle for cellular toxicity in *Pseudo-nitzschia* spp.

Further studies will thus be conducted to better assess the ecophysiological diversity in *Pseudo-nitzschia* spp especially regarding other physiological indices as growth and nutrient uptake.