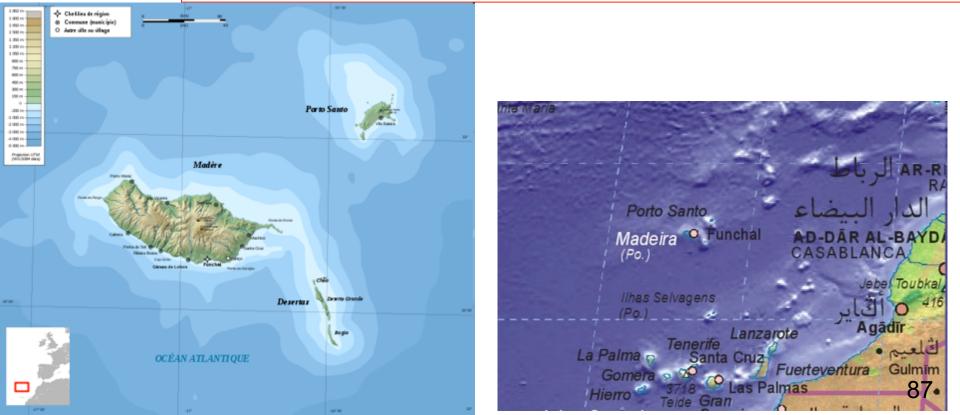


Anal. Chem. 2010, 82, 6032-6039

First Toxin Profile of Ciguateric Fish in Madeira Arquipelago (Europe)

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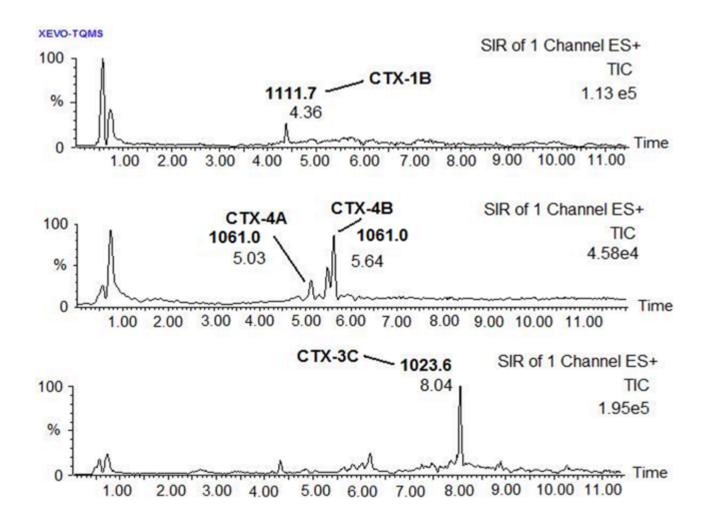


Seriola fasciata Seriola dumerili

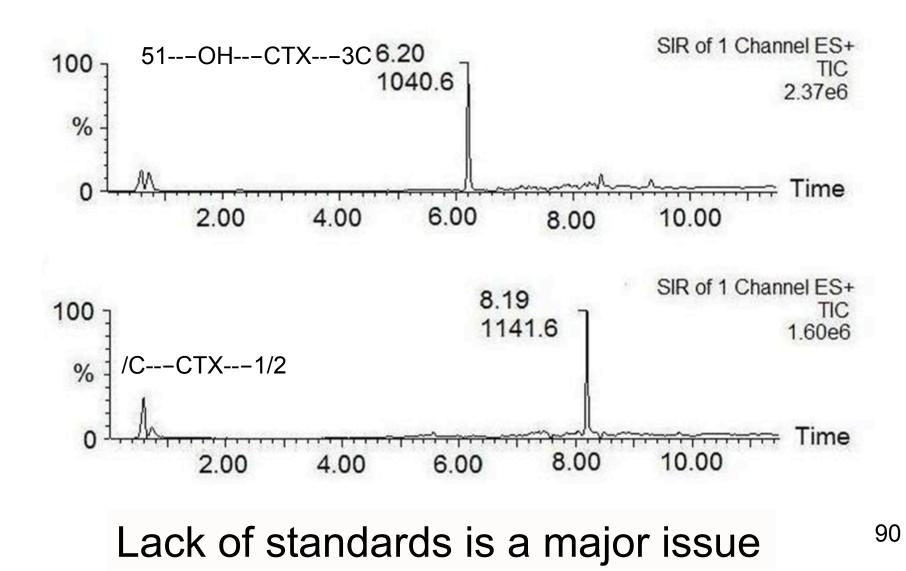


July 2008: Severe intoxication in Madeira reported by Portuguese authorities (11 fisherman)

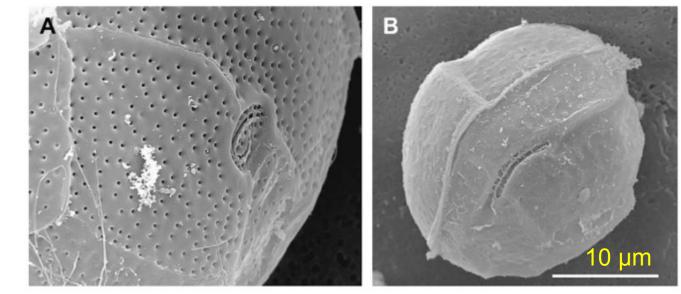
Chromatograms, using selected ion recording (SIR) UPLC mode of A fish sample of *Seriola dumerili*,



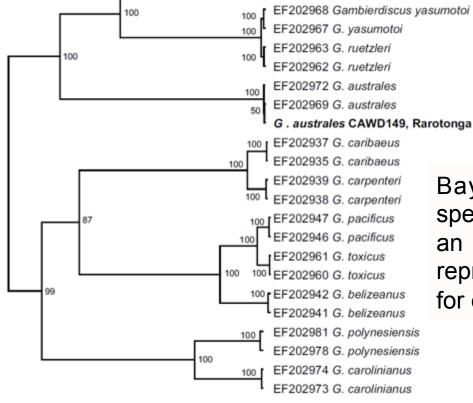
Selected ion recording (SIR) chromatogram from a *Seriola dumerili* on the UPLC



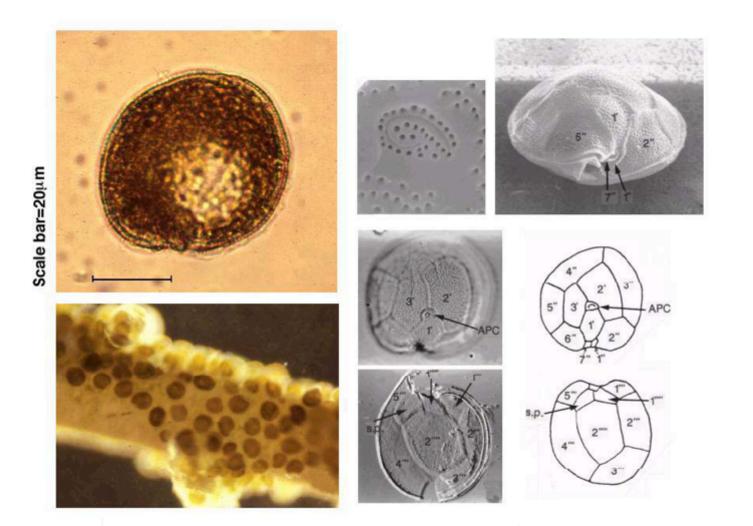
Scanning electron micrographs of Gambierdiscus australes and Ostreospsis sp. respectively, from Rarotonga, Cook Islands.



AF200668 Alexandrium tamarense

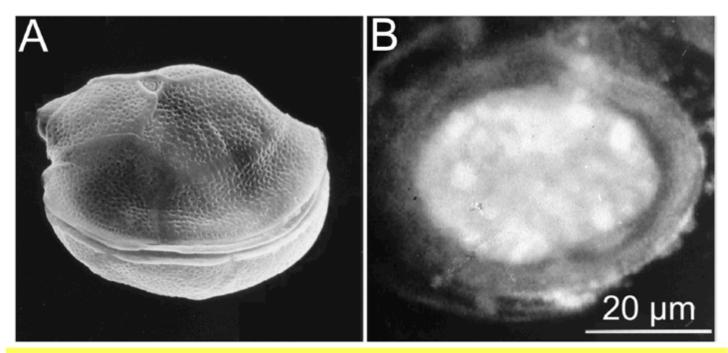


Bayesian analysis of Gambierdiscus species with Alexandrium tamarense as an outgroup. Numbers at branch points represent Bayesian posterior probabilities for each cluster. Le principal agent étiologique de la ciguatéra: Le dinoflagellé *Gambierdiscus toxicus*



Bien que d'autres genres de dinoflagellés potentiellement toxiques aient été également identifiés dans les eaux tropicales et que leur implication dans l'ichtyosarcotoxisme ciguatérique reste à être établi 49

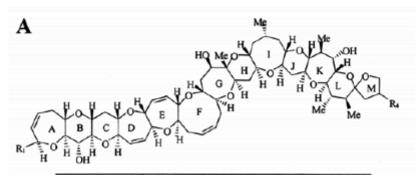
Le dinoflagellé Gambierdiscus toxicus



- Dinoflagellé fortement endémique dans le Pacifique sud, l'océan Indien et la mer des Caraïbes
- •Différentes souches: une même morphologie générale mais une grande diversité génétique
- Seules certaines souches sont génétiquement capables de produire des ciguatoxines

Pourquoi certains dinoflagellés sont-ils toxiques et comment produisent-ils les toxines ?
Quel est le rôle des bactéries dans la production de toxines ?

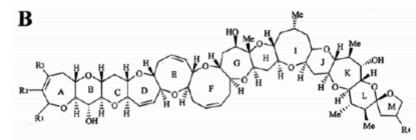
Les ciguatoxines: Une famille d'une vingtaine de polyéthers cycliques



Type I: 60 atomes de carbone

Toxins, [M+H] +	Origin R1		R4
P-CTX-1B, 1111	moray-eel	-CH=CH-CHOH-CH2OH	OH
P-CTX-2A2, 1095	moray-eel	-CH=CH-CHOH-CH2OH	н
P-CTX-2B2, 1095	moray-eel	-CH=CH-CHOH-CH2OH	Н
P-CTX-4A, 1061	parrot fish G. toxicus	-CH-CH-CH-CH2	н
P-CTX-4B, 1061	G. toxicus	-CH=CH-CH=CH ₂	н

liposolublesthermostables

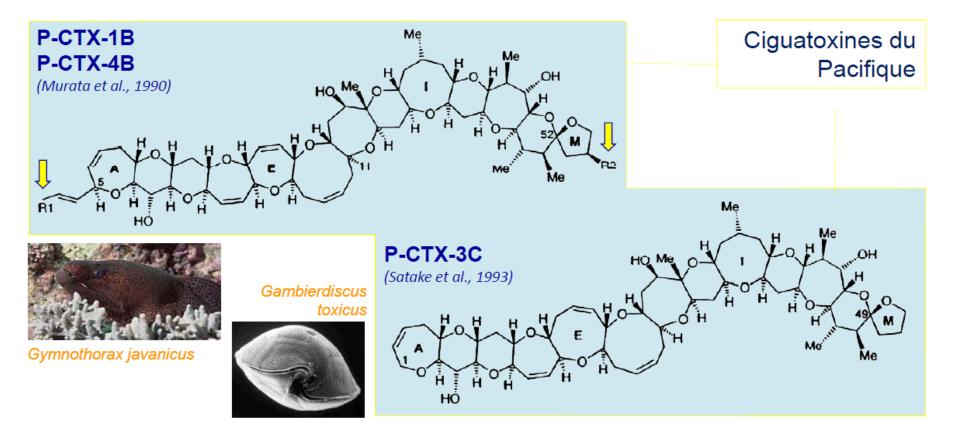


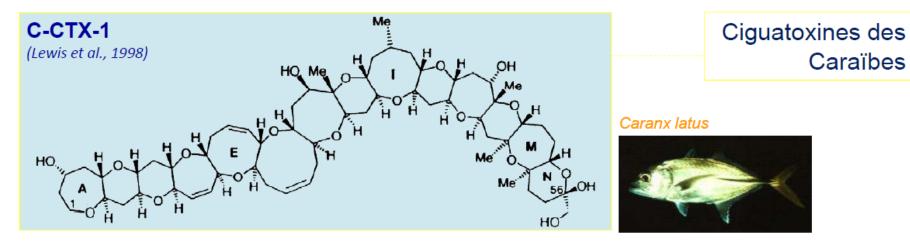
Toxins, [M+H] +	Origin	R ₁	R ₂	R3	R4
P-CTX-2A1, 1057	moray-eel parrot fish	н	он	ОН	н
P-CTX-3B, 1023	parrot fish	Н	н	н	н
P-CTX-3C, 1023	moray-cel parrot fish G. toxicus	н	н	н	н

Type II: 57 atomes de carbone

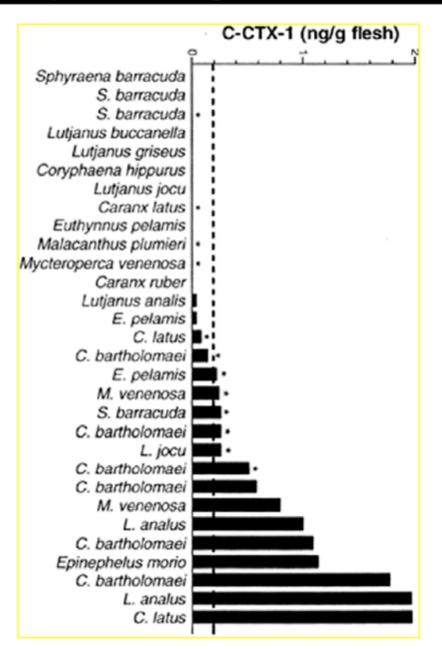
1

†





La quantité de ciguatoxines varie selon l'espèce pisciaire considérée ...







Problems and gaps

- Poor quality and lack of representativeness of data
 - eg. notification of fish poisoning cases depends on many factors, including initial presentation to health services, recognition and recording from local to national and regional levels)
- Consequently the true burden (health, productivity, economic, social) is not well known

What works well?

- Local knowledge is thought to be effective in indentifying toxic species, seasons and locations (but note empirical study suggesting this is not always true)
- Communicable disease surveillance systems are effective in some countries

Priorities for research

- Analyse relationships between physical environment, marine ecosystem parameters, fish toxicity, and health impacts (based on improved surveillance)
- Develop indicators/predictors of risk (hotspots)

Innovation

- Ideas varied in scale from remote sensing of environmental parameters to molecular biology (and several in between)
- Develop a cheap, accurate field test for toxicity
- Systematic data collection for representativeness (long term, standard methods across countries)
- Sample/data bank of T cells from affected people
- Molecular genetics of mechanisms of action (eq role of TRVPA1 in cold allodynia)

Questions remaining

Confront resalts with more Cig. experts l What are the decrision maker looking pre- search Antidates + Herapeutic uses of toxin Antidates + Herapeutic uses of toxin
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- Ask other experts for feedback on the ideas
- What are the decision makers after?

auty problems access to data . With regard to the case studies that we have seen, what is typical (also exist in other cases you know) in Complexity of the . terms of problems and gaps, and also in terms of what is Population IMC rease working well? lack of Measurement of builden of Gig. etc. (? Ownership of data - accesso poor health systems (not enough ressources) As a consequence where are priorities for research, ali ka technology and innovation in AUBURATY Walking Well order to reduce hazards for human health, the environment, Implicated species known to locals nd Spel and the economy? Treatment (some areas) . detection Traditional medicines . Condition Surveillance (Marine dopt) ladinia Junovation M Vaccine take T-lymphocides from intoxicated patients -> develop effective • antibadies, Molecular CO reil 1 clausing heel Remote sousing on health of we

... ainsi que le type de ciguatoxines pour un poisson donné



Murène du Pacifique

(% par poids de chair)				
P-CTX-1B	33 %			
P-CTX-2A	16 %			
P-CTX-2B1		13 %		
P-CTX-2B2		9 %		
P-CTX-3C	10 %			
ND		19 %		



(% par poids de chair)					
P-CTX-4A	17%				
P-CTX-3B	28%				
P-CTX-2C	13%				
P-CTX-2A1		5%			
P-CTX-3C	23%				
ND		14%			

Poisson perroquet du Pacifique