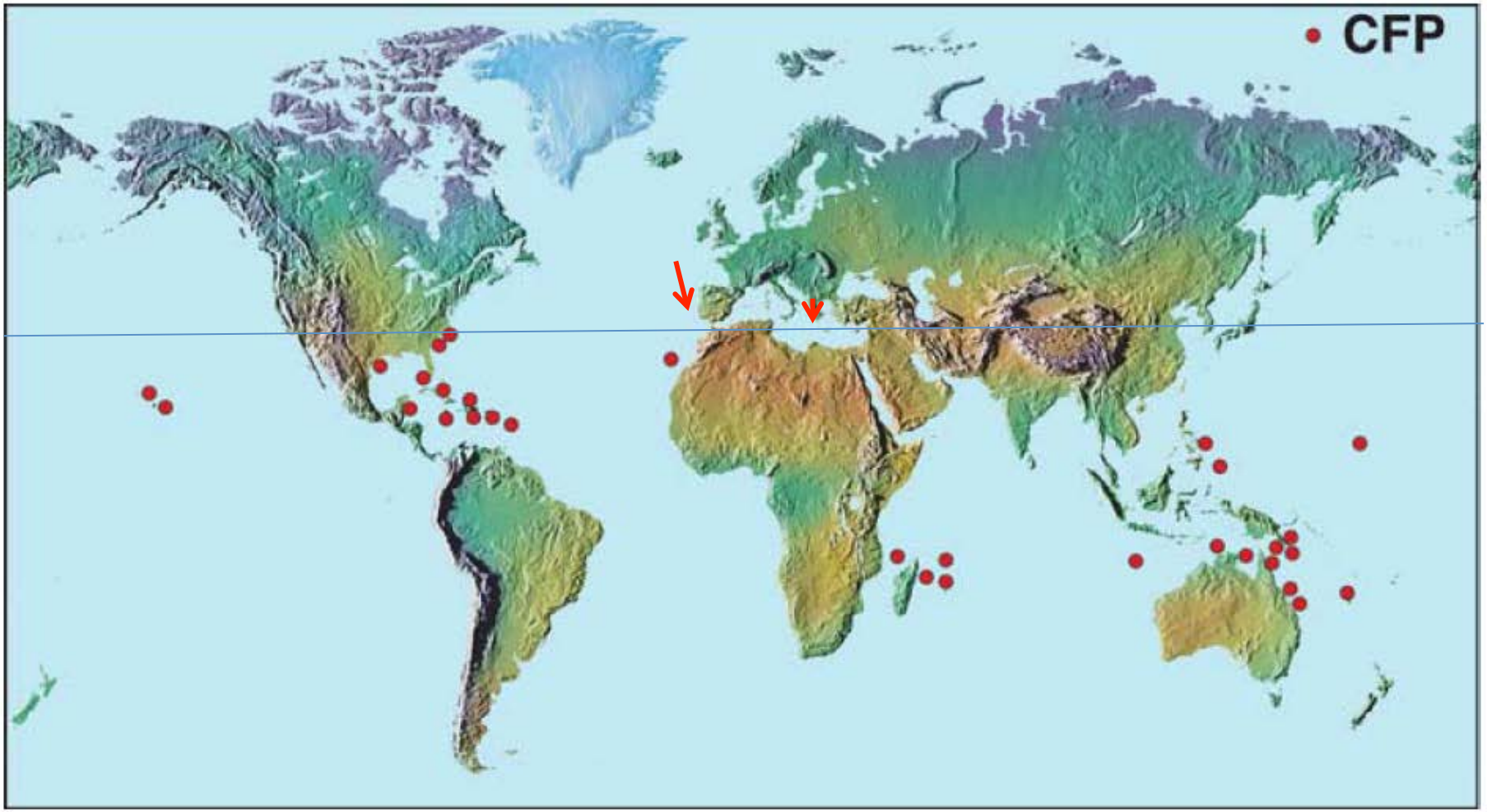
CFP

Gambierdiscus found in Crete

Ciguatera intoxication observed in Canary Islands

Anal. Chem. **2010**, *82*, 6032–6039

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

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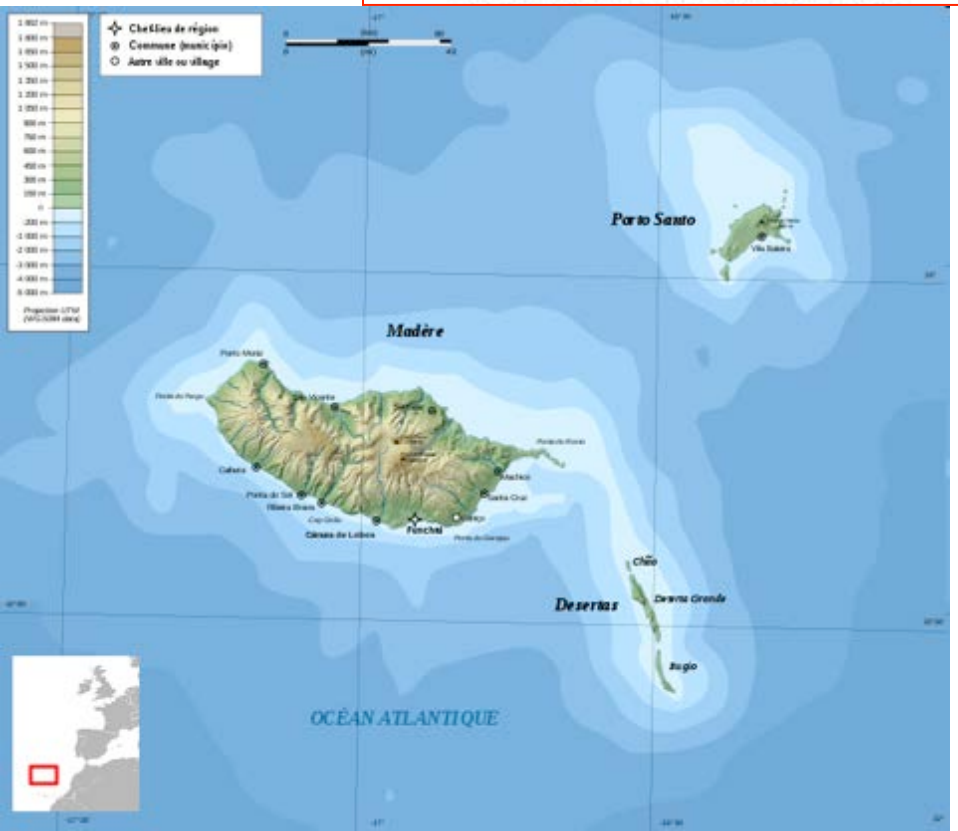
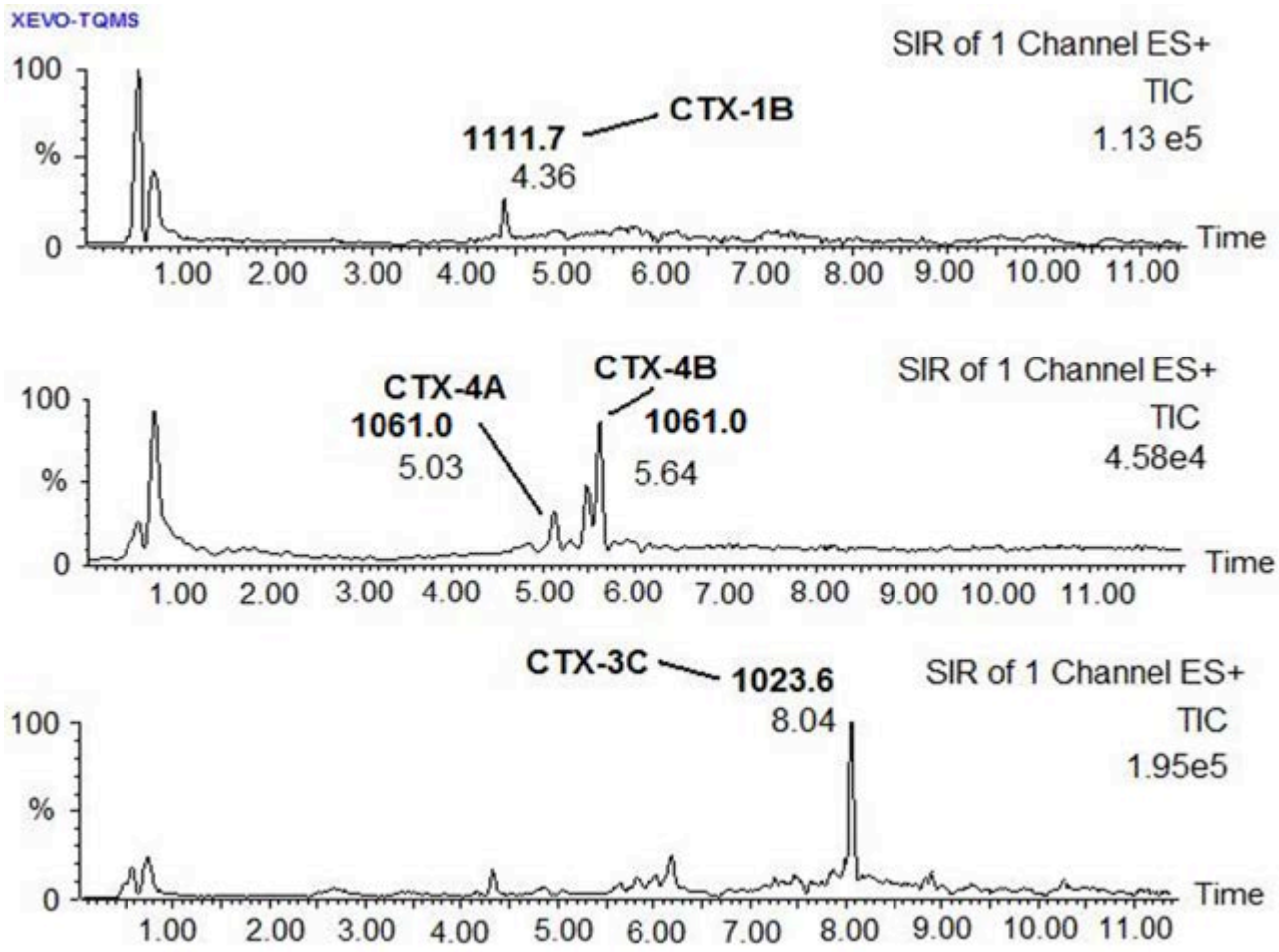


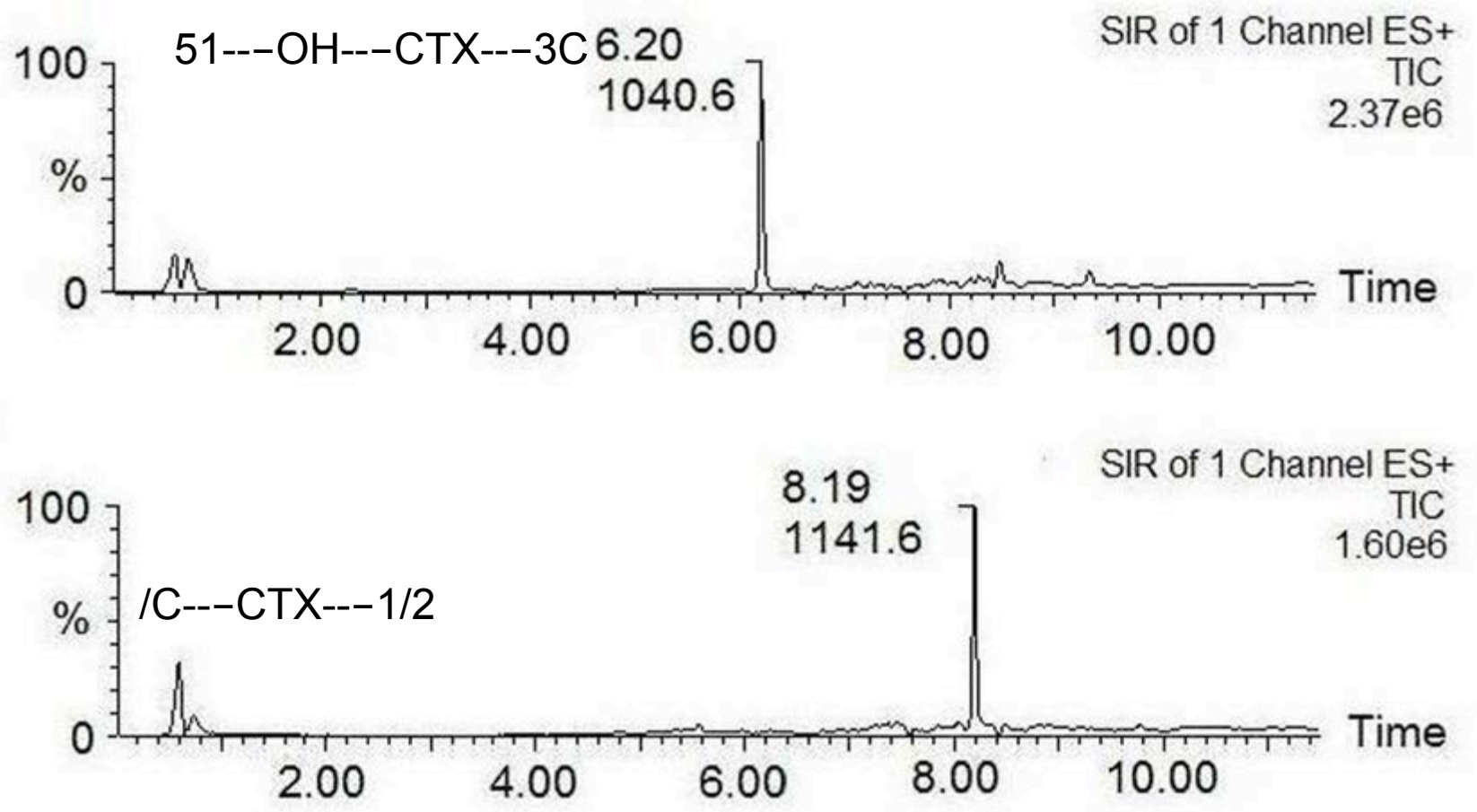
Seriola fasciata
Seriola dumerili

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,*

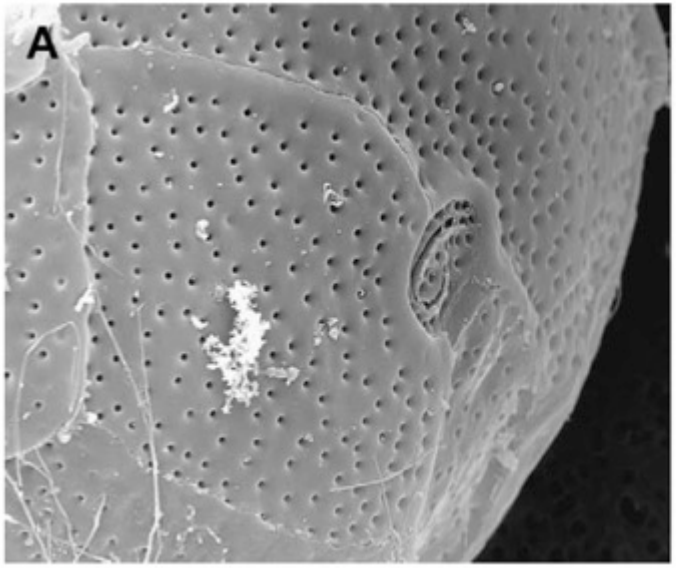


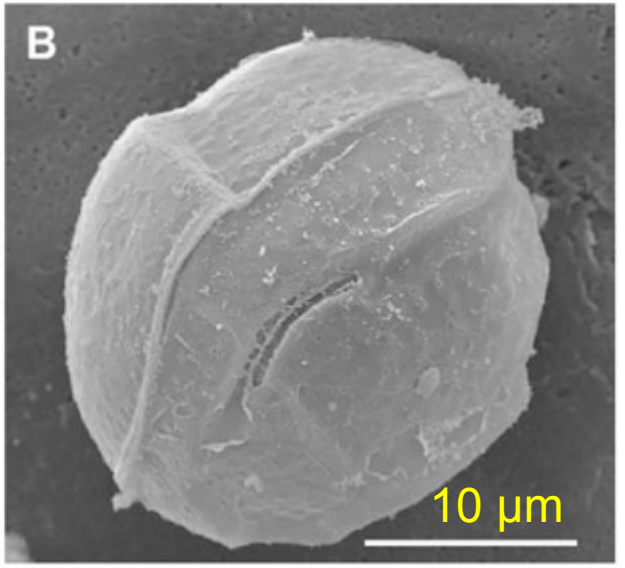
Selected ion recording (SIR) chromatogram from a *Seriola dumerili* on the UPLC

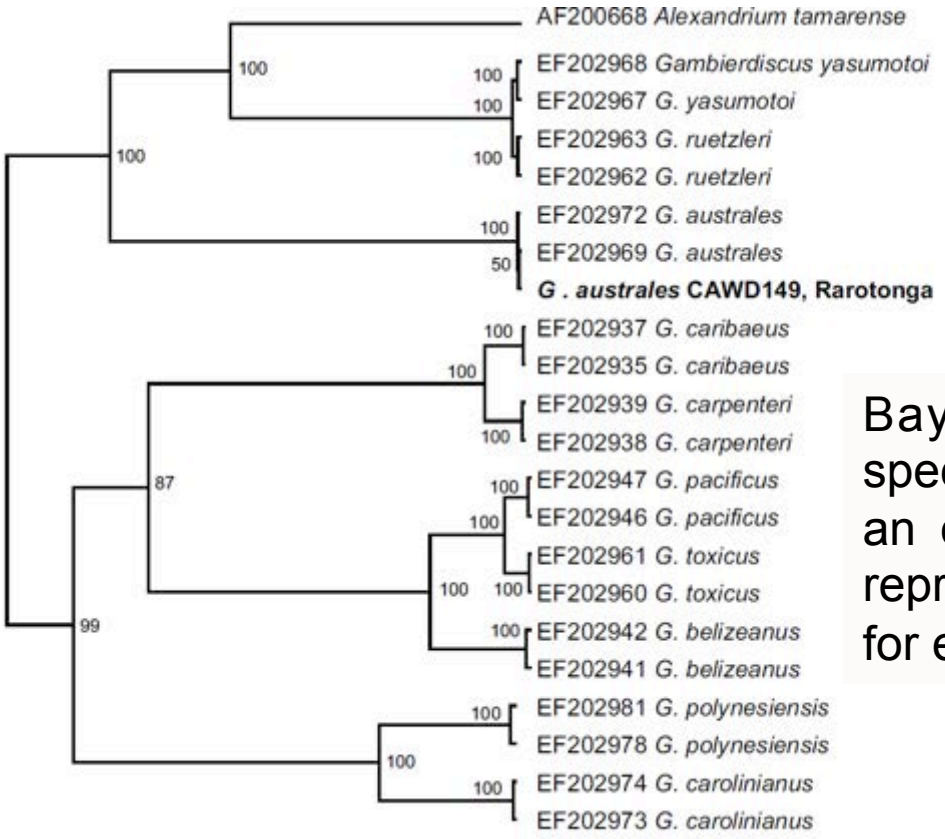


Lack of standards is a major issue

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

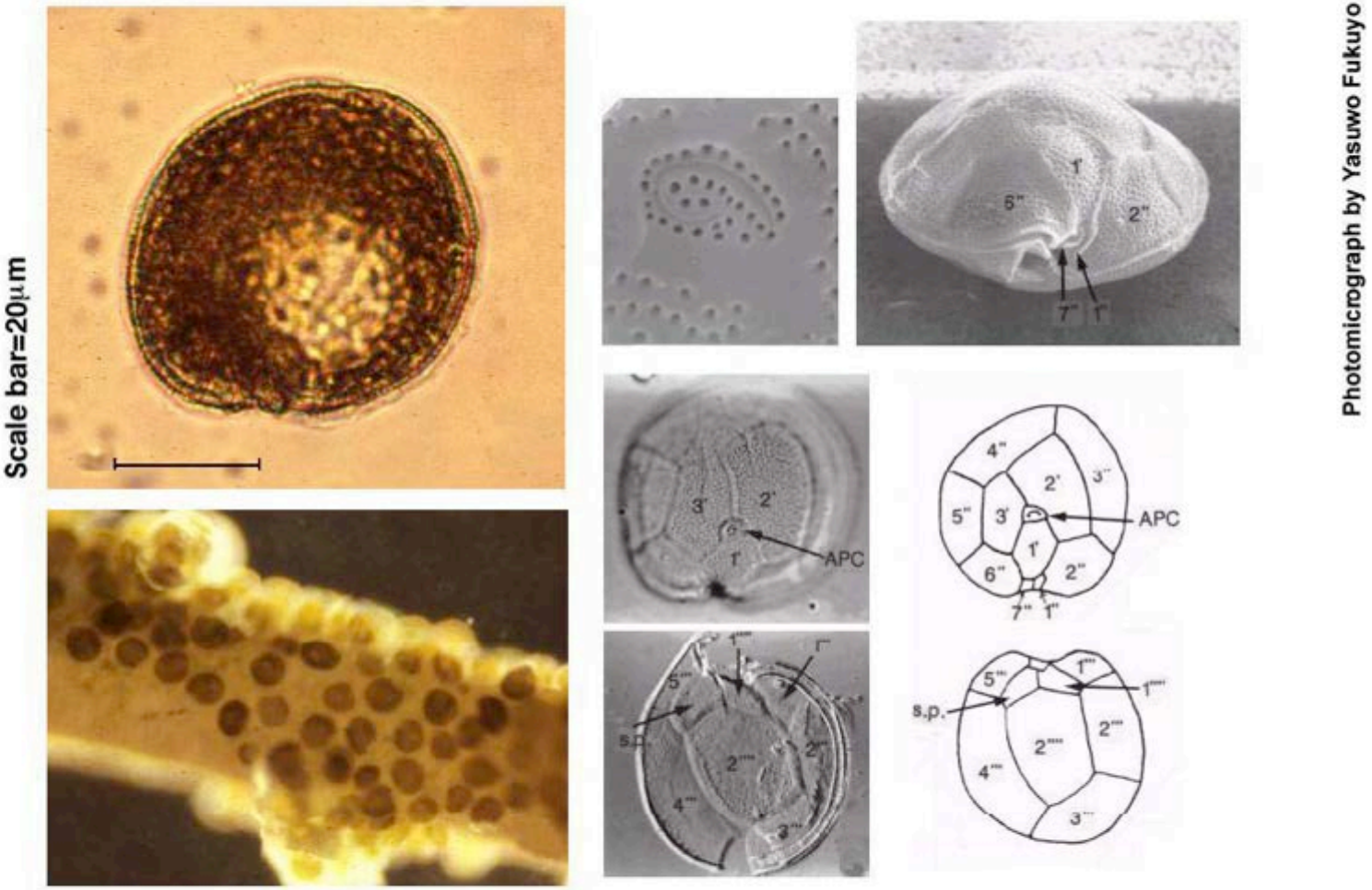






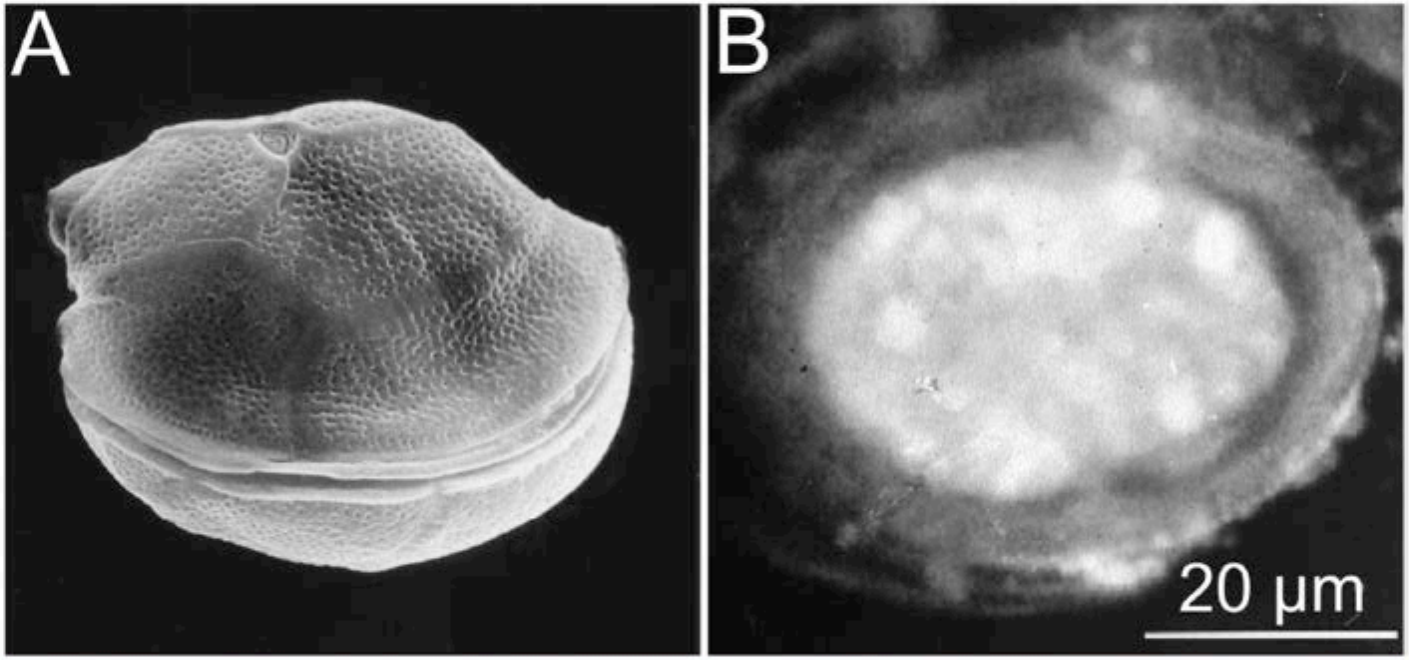
Bayesian analysis of Gambierdiscus species with Alexandrium tamarense as an outgroup. Numbers at branch points represent Bayesian posterior probabilities for each cluster.

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

Le dinoflagellé *Gambierdiscus toxicus*

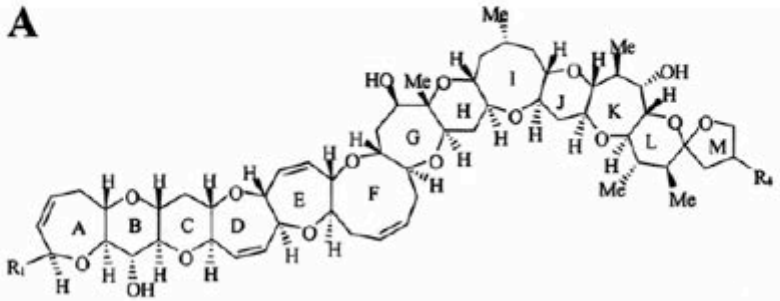


- Dinoflagellé fortement endémique dans le Pacifique sud, l'océan Indien et la mer des Caraïbes
- Différentes souches: une même morphologie générale mais une grande diversité génétique
- Seules certaines souches sont génétiquement capables de produire des ciguatoxines

- 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

A

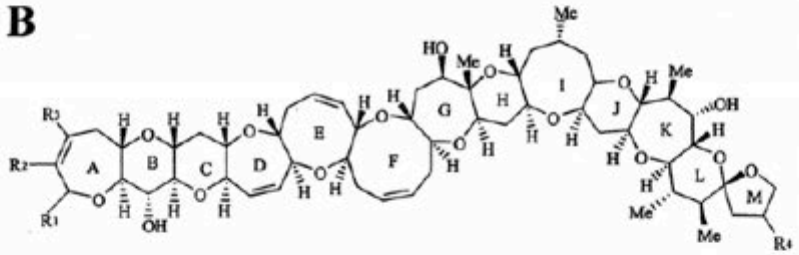


Toxins, $[M+H]^+$	Origin	R_1	R_4
P-CTX-1B, 1111	moray-eel	-CH=CH-CHOH-CH_2OH	OH
P-CTX-2A2, 1095	moray-eel	-CH=CH-CHOH-CH_2OH	H
P-CTX-2B2, 1095	moray-eel	-CH=CH-CHOH-CH_2OH	H
P-CTX-4A, 1061	parrot fish *G. toxicus*	-CH=CH-CH=CH_2	H
P-CTX-4B, 1061	*G. toxicus*	-CH=CH-CH=CH_2	H

Type I: 60 atomes de carbone

- liposolubles
- thermostables

B

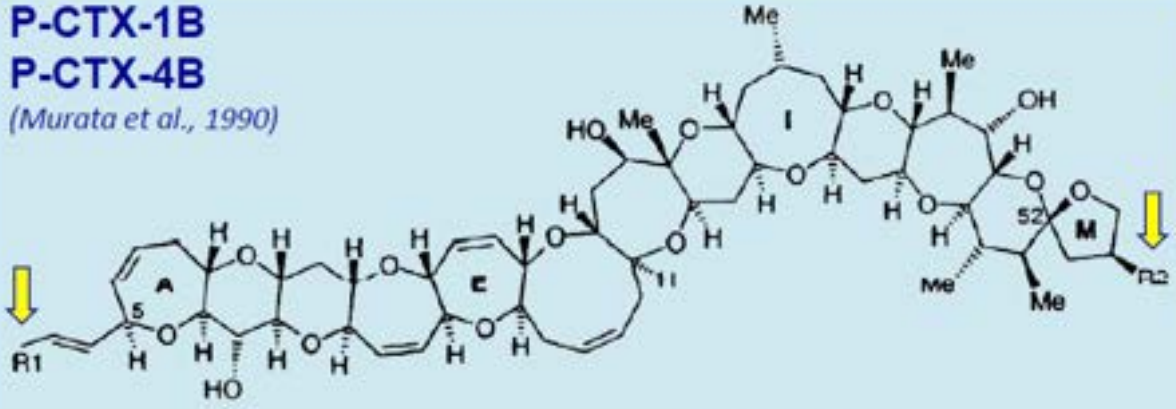


Toxins, $[M+H]^+$	Origin	R_1	R_2	R_3	R_4
P-CTX-2A1, 1057	moray-eel parrot fish	H	OH	OH	H
P-CTX-3B, 1023	parrot fish	H	H	H	H
P-CTX-3C, 1023	moray-eel parrot fish *G. toxicus*	H	H	H	H

Type II: 57 atomes de carbone

Ciguatoxines du Pacifique

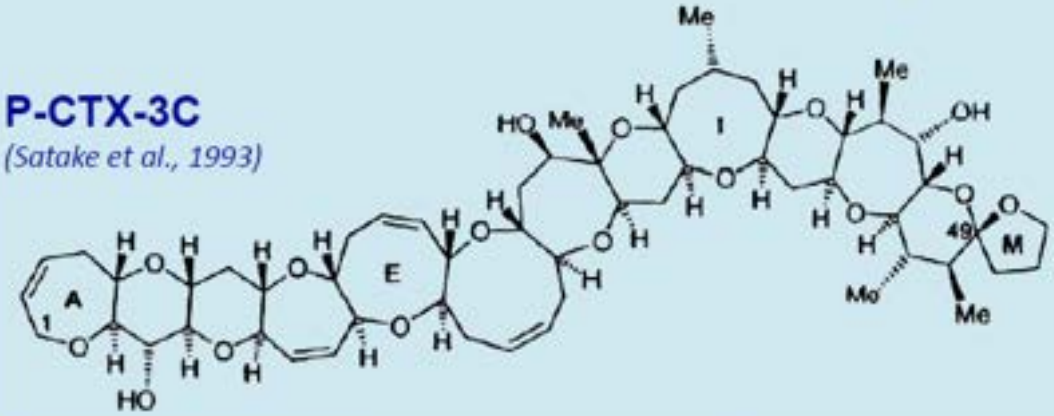
P-CTX-1B
P-CTX-4B
(Murata et al., 1990)



Gymnothorax javanicus

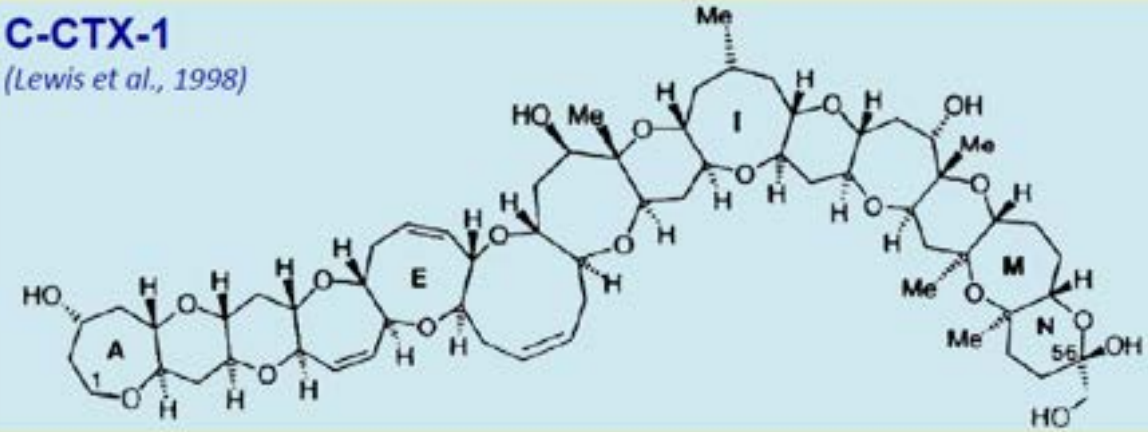
Gambierdiscus toxicus

P-CTX-3C
(Satake et al., 1993)



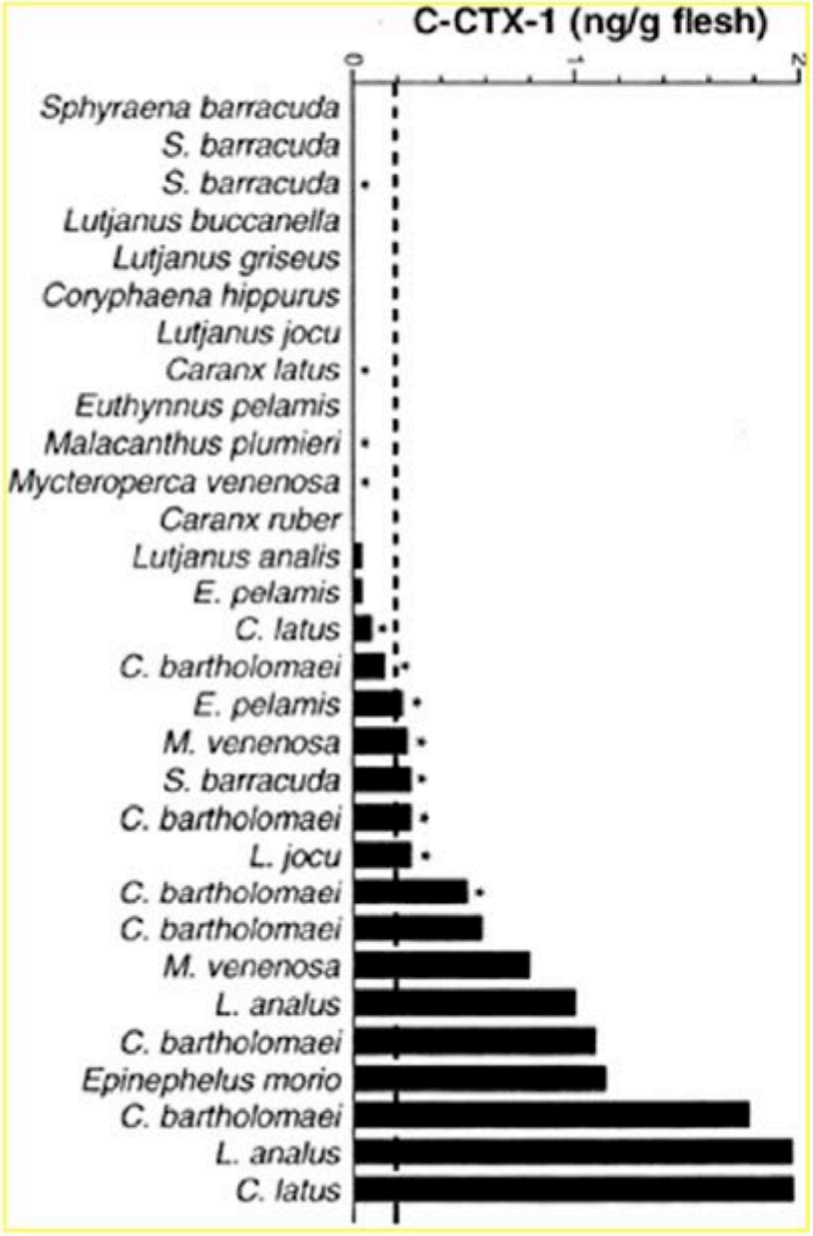
Ciguatoxines des Caraïbes

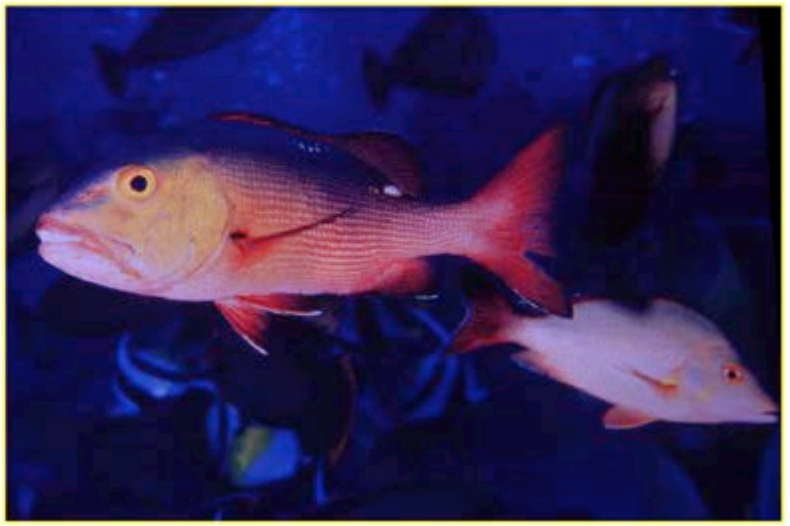
C-CTX-1
(Lewis et al., 1998)



Caranx latus

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

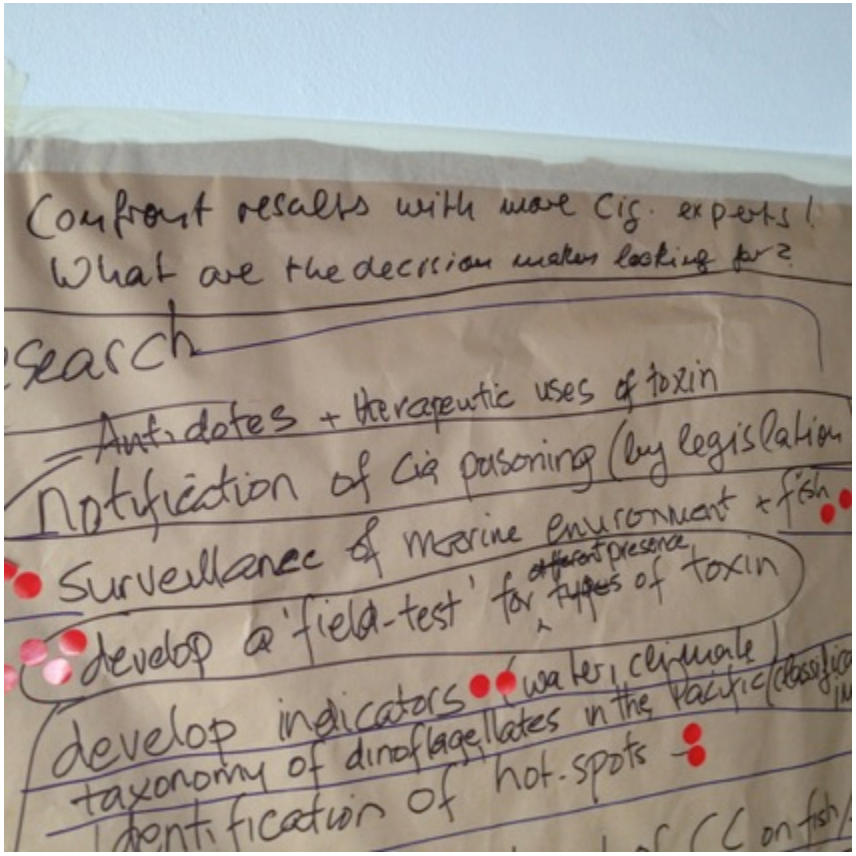
Priorities for research

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

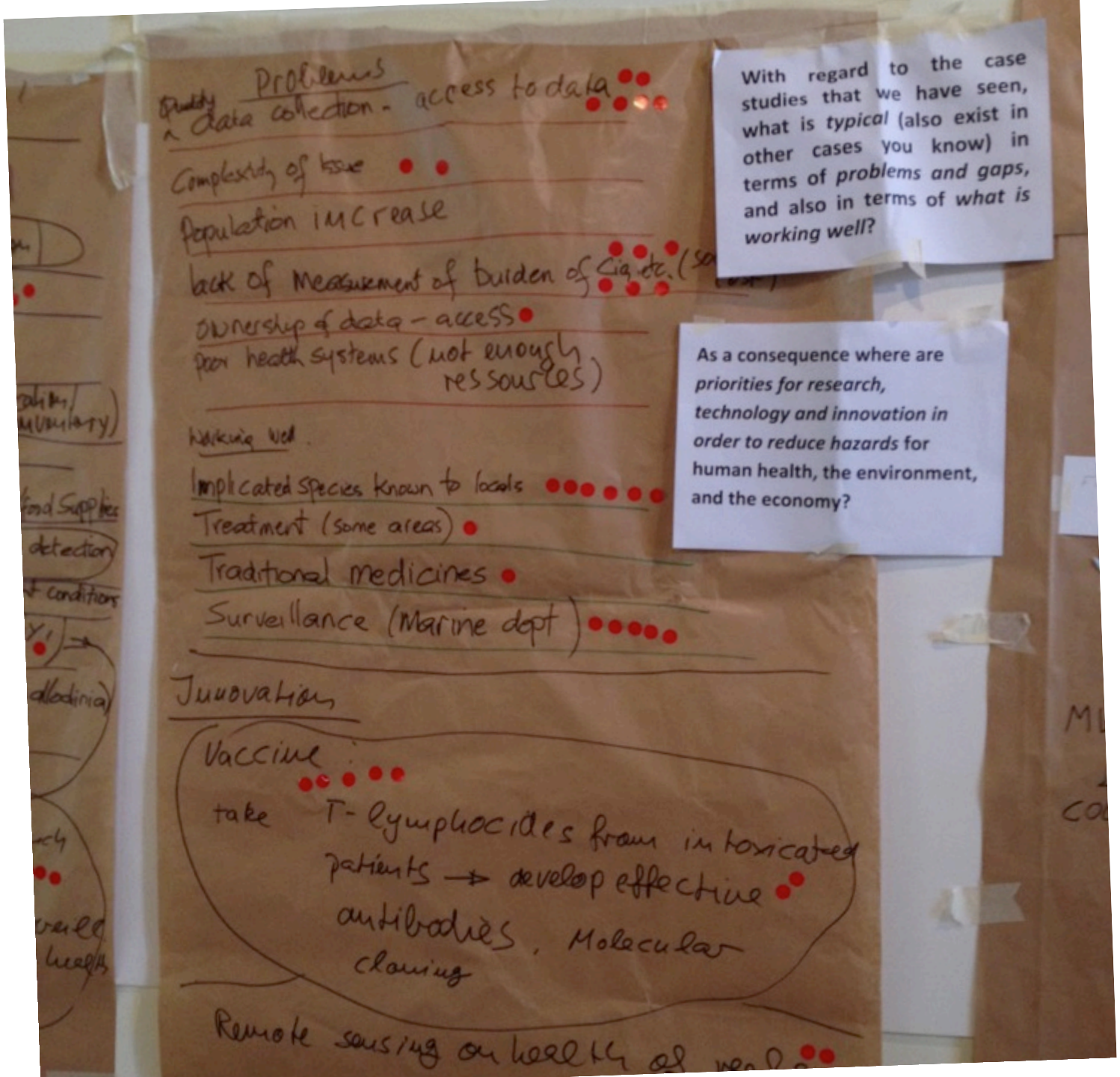
Innovation

- 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 (eg role of TRVPA1 in cold allodynia)

Questions remaining



- Ask other experts for feedback on the ideas
- What are the decision makers after?


Problems
Quality
Data collection - access to data
Complexity of issue
Population increase
lack of Measurement of burden of Cig etc. (so
ownership of data - access
poor health systems (not enough ressources)
Working well
Implicated species known to locals
Treatment (some areas)
Traditional medicines
Surveillance (Marine dept)
Innovation
Vaccine
take T-lymphocides from intoxicated patients → develop effective antibodies. Molecular cloning
Remote sensing on health of
With regard to the case studies that we have seen, what is typical (also exist in other cases you know) in terms of problems and gaps, and also in terms of what is working well?
As a consequence where are priorities for research, technology and innovation in order to reduce hazards for human health, the environment, and the economy?

… 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 %

Poisson perroquet du Pacifique

(% 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%