

Ciguatera Poisoning

By

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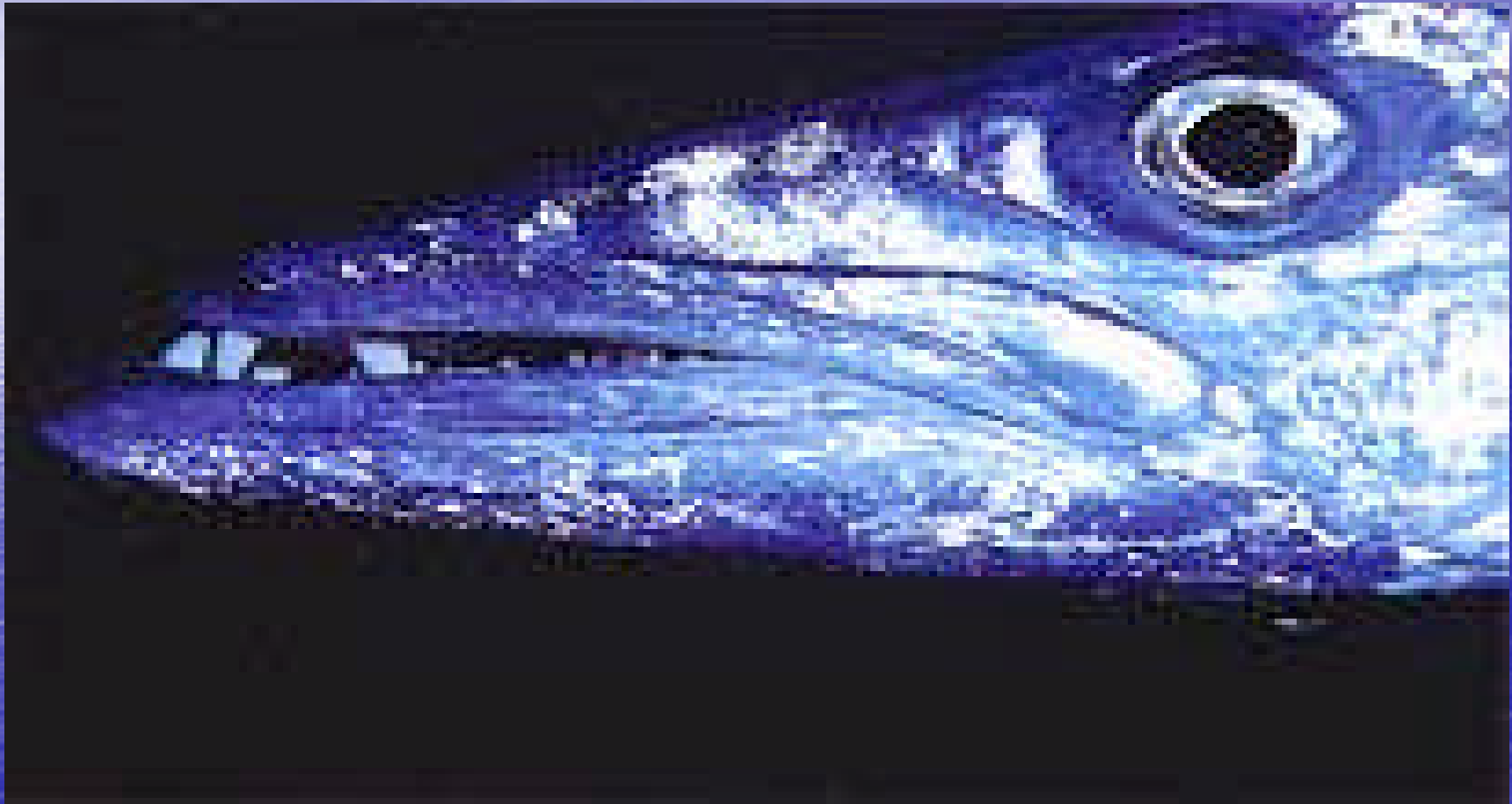
Case History

- Male, 37 years old
- Muscle pain, chest tightness, diarrhoea
- Weakness, syncope
- Had eaten fish and rice
- Marked hypotension; no vomiting, paresthesiae, numbness, joint pains
- 2 family members with same symptoms
- Treated at private hospital for GE

Case History

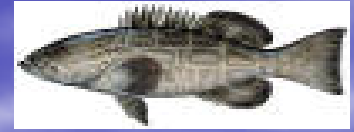
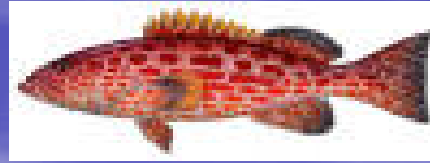
- PMH: diabetes mellitus
- Worsening of his symptoms
- Had 2 beers on day of presentation
- O/E: moist mucous membranes, afebrile, normal chest examination
- BP 90/70mmHg; RBG 12.6mmol/L
- IV fluids- good response
- Discharged with advice

The culprit!

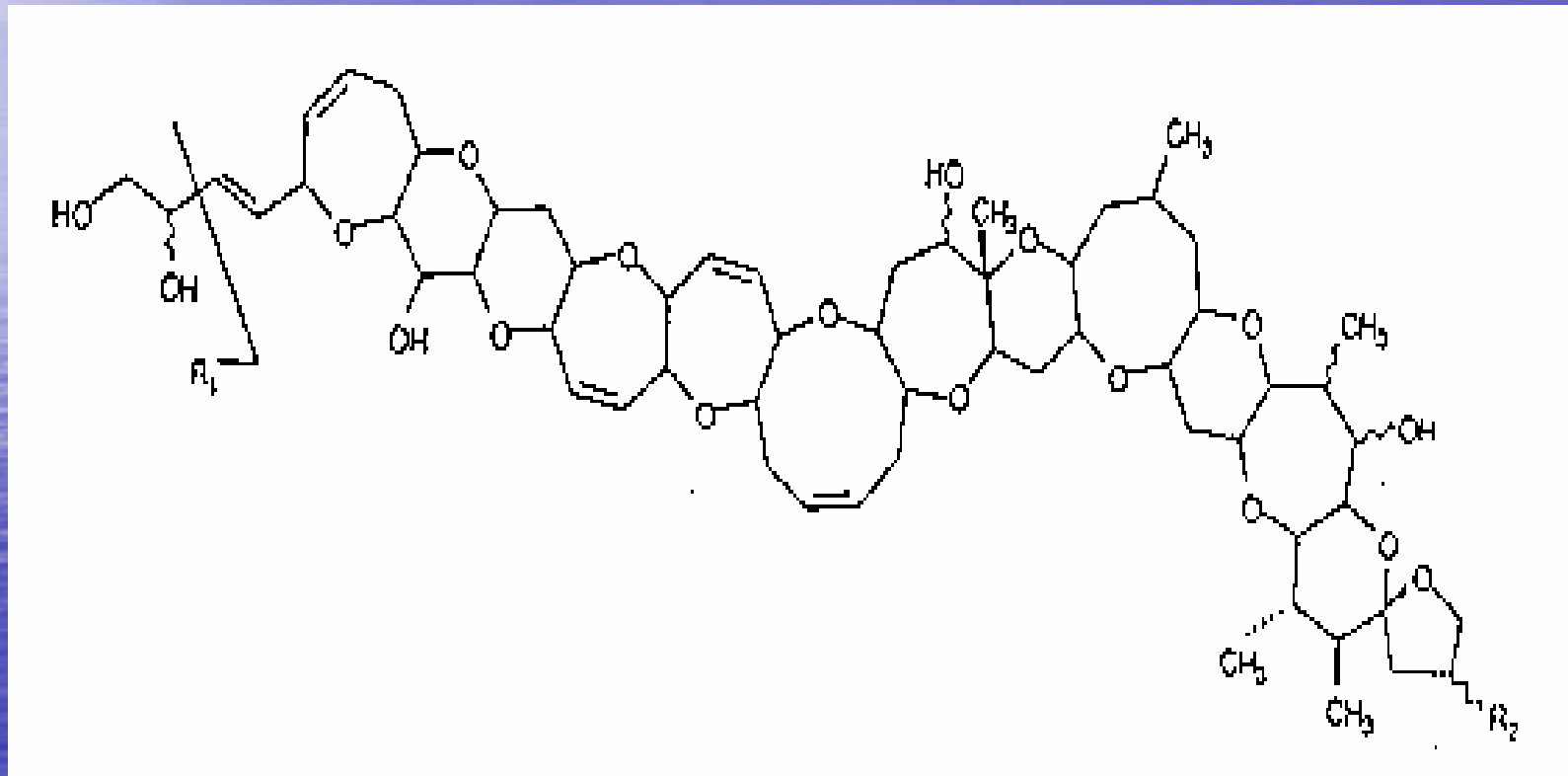


More culprits

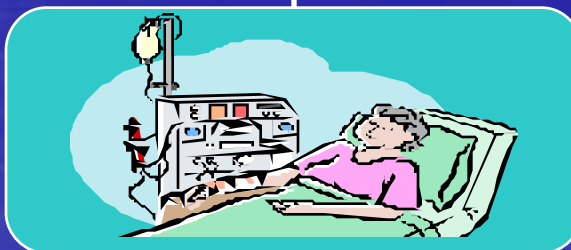
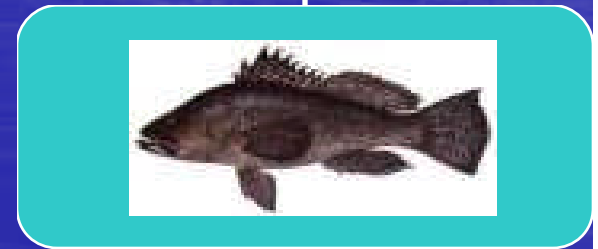
- Groupers
- Amberjacks
- Snapper
- Eel
- Seabass
- Spanish mackerel
 - www.fishbase.org/Topic/List.cfm

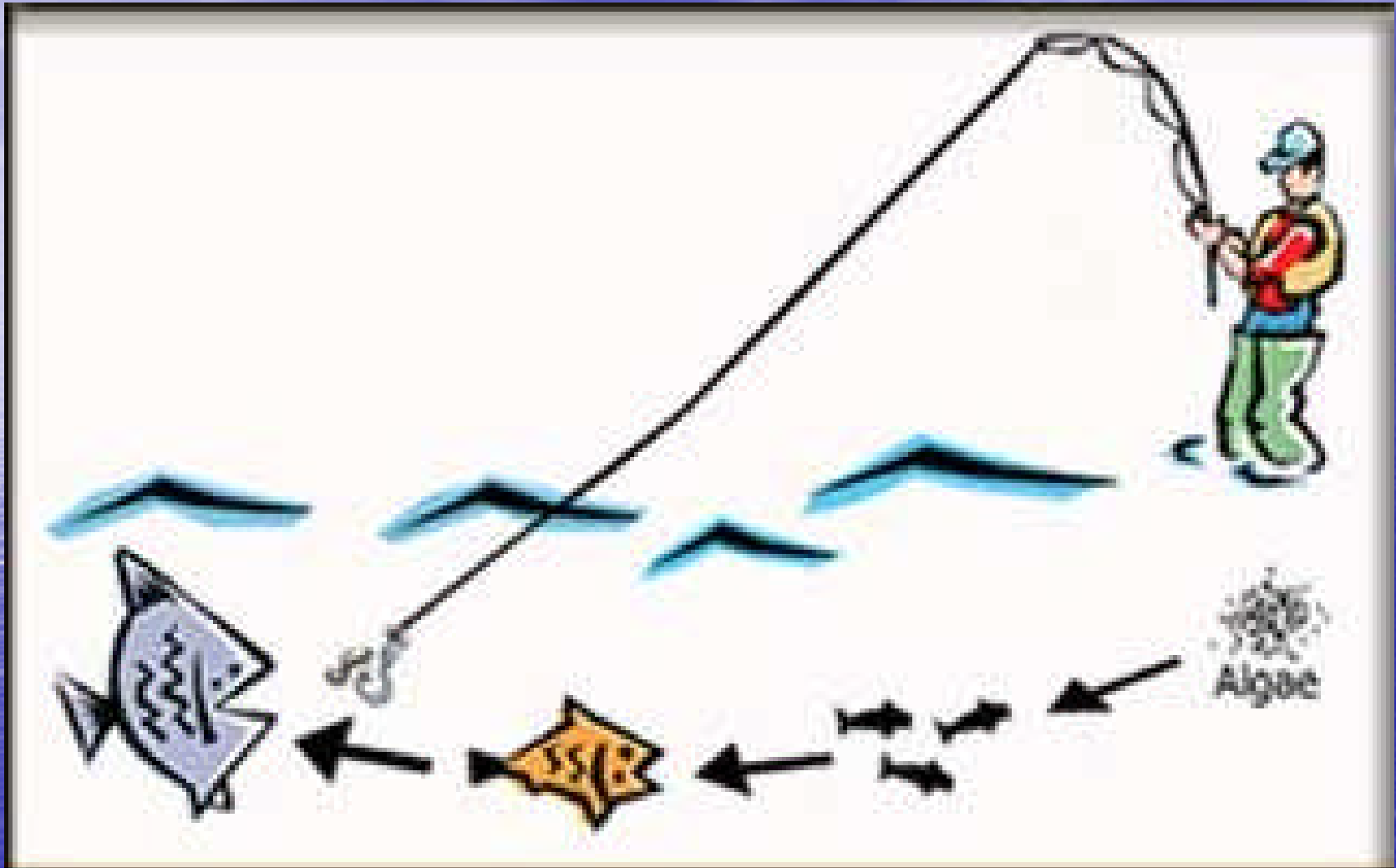


The weapon: ciguatoxin



Grazing
Microphagous fish





Ciguatoxins

- P-CTX-1 (Pacific)
- C-CTX-1 (Caribbean)
- Heat and acid stable
- Odorless and tasteless

Ciguatoxin effects: Na channels

- Opens sodium channels
- Cell membrane excitability and instability
- Prolonged refractoriness
- Decreased conduction
- Oedema of Schwann cells

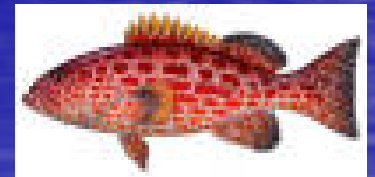
Ciguatoxin effects: Ca channels

- Inhibition of calcium mediated polarising
- Increased intracellular calcium
 - diarrhoea



Ciguatera: clinical features

- Temporally related to ingestion
- Extent and severity dose-dependent
- Varying onset: 15 minutes to 24 hours
- Cardiovascular, GI and neurological systems
- Symptomatology is toxin specific



Ciguatera: GI symptoms

- May last 1-2 days
- Abdominal pain
- Nausea
- Vomiting (91%) and diarrhoea (70%) Arch Intern Med 1982; 142:1090-2



Ciguatera: neurotoxic effects

- Lingual and circumoral paraesthesiae
- Painful paraesthesiae of extremities
- **Paradoxical temperature reversal (1/3)**
- Sensation of loose teeth
- Dental pain,
- Neuropathy
- Ataxia
- Vertigo
- Respiratory paralysis
- Coma
- Arthralgias
- Eye pain



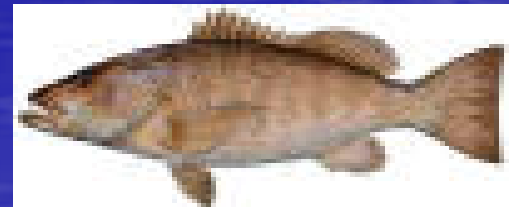
Ciguatera: other effects

Cardiovascular effects

- Bradycardia
- Hypotension

Miscellaneous

- Chills, neck stiffness, headache
- Sweating, salivation, taste disturbance
- Dyspnoea
- Pruritus



Ciguatera: treatment

- Supportive: IV fluids
- Antihistamines, amitriptyline
- Antiemetics,
- Atropine
- Pressors
- Mannitol



Ciguatera: mannitol

- 1988: Palafox et al JAMA 259(18):2740-2 Marshall Islands
- 1990: Pearn et al Med J Aust 153 (5): 306 Australia
- 1991: Stewart MP Trop Doct 21(2):54-5 Anguilla
- 1992: Bagnis et al Med Trop 52(1):67-73 French Polynesia
- 1992: Blythe et al Bull Soc Pathol Exot (85): 425 Miami
- 2002: Schnorf et al Neurology 58(6)873-880



Ciguatera: mannitol

- Schnorf et al: Cook Islands
 - Prospective, randomised, double-blind
 - Between August 1998 and October 1999
 - 50 patients, over 24 hours



Inclusion criteria:

- consumption of local reef fish
- gastrointestinal symptoms
- neuropathic symptoms (one of the following: acral or perioral paraesthesia, dysesthesia, numbness, reversal of cold/warm sensation),
- written informed consent to participate in the study by the patient
- absence of any exclusion criteria

Exclusion criteria

- Any one of the following:
 - age below 16 years
 - pmregnancy
 - body temperature above 38°C
 - decompensated heart failure or evidence for acute myocardial ischemia.

- Patients received:
 - 500ml 20% Mannitol OR
 - 500ml 0.9% normal saline
- 5 point severity scale : 0, 1, 3, and 24 hours (0 = absent, 1 = mild, 2 = moderate, 3 = severe 4 = unbearable)
- Additional medication given as needed

Primary endpoints

- The evolution of subjective symptoms using the 5-point symptom severity scale
- The evolution of the neurologic status at baseline and at 24 hours

Clinical features

- diarrhea (n = 27)
- abdominal cramping/abdominal pain (n = 23)
- asthenia and hypersensitivity to cold (n = 21 each)
- paresthesia (n = 17)
- nausea (n = 16)
- dizziness (n = 15)
- numbness (n = 14), myalgia and headache (n = 12 each), arthralgia and pruritus (n = 11 each), and dysuria (n = 3)
- metallic taste in the mouth (n=1)

Neurologic findings

- Achilles tendon areflexia 3 (12)
- Patellar tendon areflexia 2 (8)
- Triceps tendon areflexia 1 (4)
- Biceps tendon areflexia 1 (4)
- Light touch sensation 7 (28)
- Vibration sensation 13 (52)
- Position sensation 1 (4)
- Pinprick sensation 13 (52)
- Temperature sensation 19 (76)
- Cerebellar signs 0

Results

- Treatment satisfaction

	Mannitol	Normal saline
– Excellent	14 (56)	17 (68)
– Good	6 (24)	5 (20)
– Moderate or bad	2 (8)	3 (12)
– Not rated	3(12)	0

Study conclusions

- “Mannitol was not superior to normal saline in relieving symptoms and signs of CP at 24 hours in this study population but had more side effects”.
- “These results do not support single-dose mannitol as standard treatment for CP”.

Scope of ciguatera poisoning



- Ciguatera fish poisoning—Florida, 1991. *MMWR* June 4, 1993;42(21):417-8
- Ciguatera fish poisoning—Texas, 1997. *MMWR* August 28, 1998;47(33):692-4
- Epidemiologic notes and reports ciguatera fish poisoning—Bahamas, Miami. *MMWR* July 23, 1982;31(28):391-2
- Epidemiologic notes and reports ciguatera fish poisoning—Vermont. *MMWR* April 25, 1986;35(16):263-4

Scope of ciguatera poisoning



- **FISH POISONING ON INCREASE ON RAROTONGA**
By Matariki Wilson
- **COOK ISLANDS: Experts Warn On Increasing Fish Poisoning Incidents**
Wednesday: June 15, 2005

Scope of ciguatera poisoning



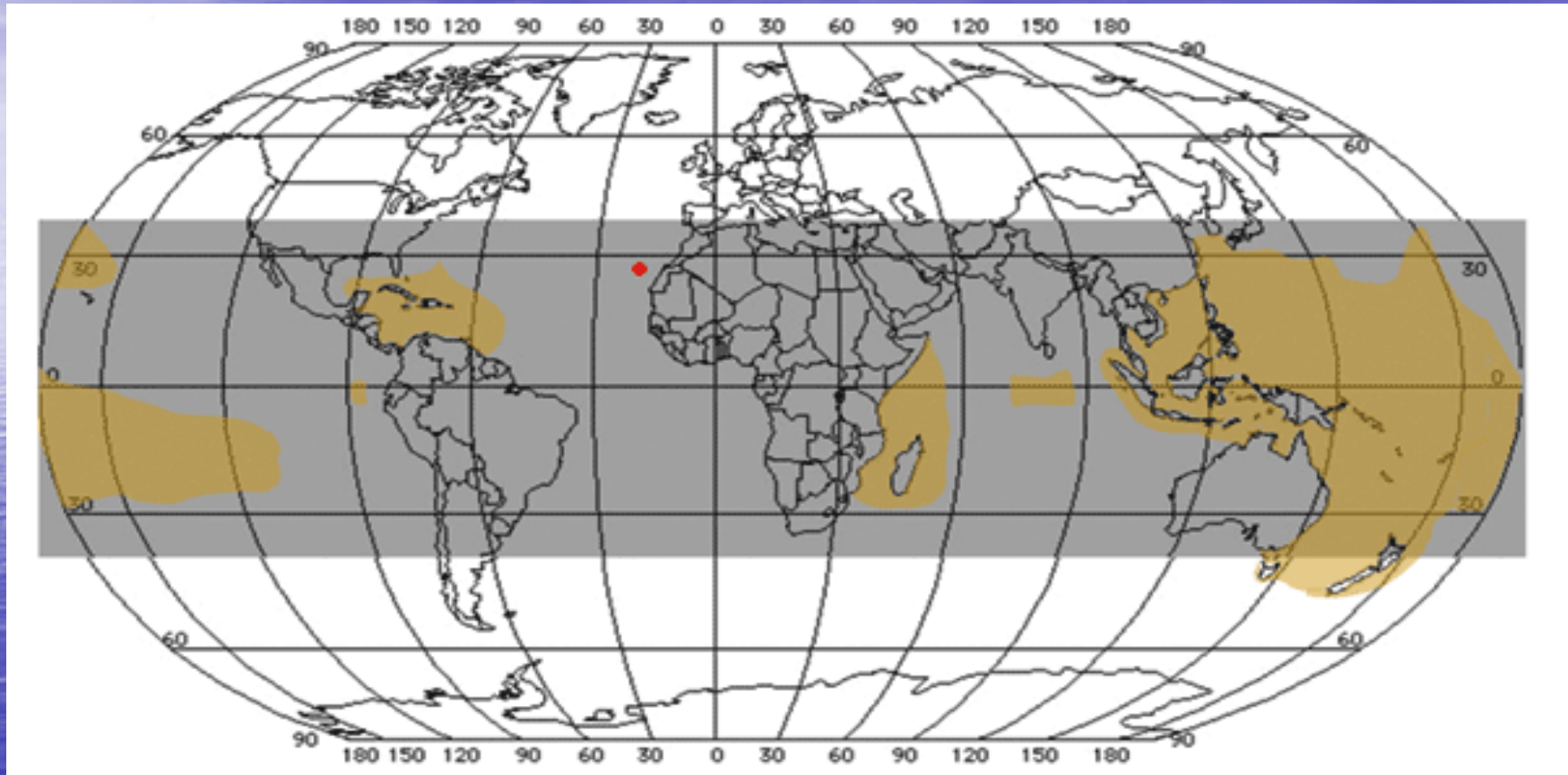
- Coleman AME. Ciguatoxin-induced food poisoning in a community. *West Indian Med J* 1990; 39: 233-38.
- Maharaj SR, Desai P, Kulkarni P, Pinnock MA. Ciguatera food poisoning in a Jamaican family. *West Indian Med J* 1986; 35: 321-23.
- Grell GAC. Ciguatera fish poisoning. *West Indian Med J* 1983; 32: 63-5.

Scope of ciguatera poisoning



- **BARRACUDA - DANGEROUSLY TASTY**
published: Thursday | April 6, 2006
Shelly-Ann Thompson, Freelance Writer
- *Early last week there were reports of 19 persons from Enfield, St. Mary being poisoned and subsequently hospitalised at the Annotto Bay Hospital in the parish, allegedly from eating barracuda fish.*

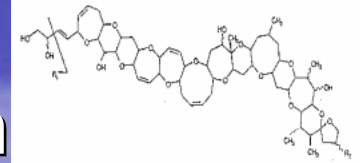
Scope of ciguatera poisoning



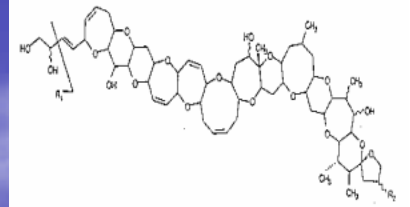
Ciguatera Fish Poisoning, Canary
Islands, Jose-Luis Perez-Arellano
et al Volume 11, Number 12,
December 2005

Diagnosing ciguatera poisoning

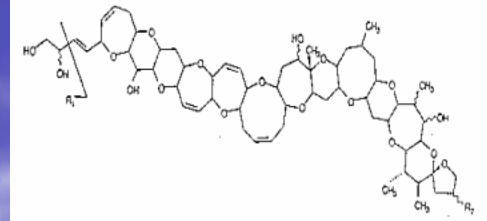
- Based solely on clinical symptoms and signs and in association with the consumption of fish
- Testing is laborious and expensive
- Reserved for confirming outbreaks



- **Test claims to identify deadly toxin ciguatera in fish**
an ABC Action News report 05/05/06
- MADEIRA BEACH - There is a dangerous toxin found in many fish here on the Gulf Coast. It's called ciguatera and it's nearly impossible to detect. **However, a new test claims it can identify contaminated fish and protect you before the fish get to your table.**

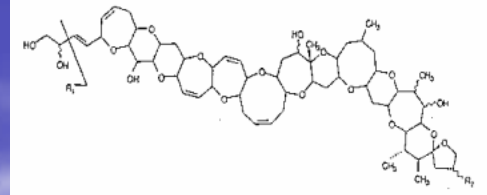


Testing for ciguatoxins



- Oceanit Test Systems, Inc., Hawaii, USA,
- Designed to test only rice-grain sizes of fish flesh
- The product is based on the MIA for P-CTX-1
- Sensitive for the detection of ciguatoxin (equal or greater than 80 pg/g fish (0.08 mg/kg)
- Ciguatoxin is not detected by Cigua-Check at levels of less than 50 pg/g (or 0.05 mg/kg).
- Fish that are considered non-toxic by Cigua-Check may contain ciguatoxin and

Ciguatoxin testing



- “Cigua-Check® Fish Poison Test Kit is the world’s only field based rapid detection test kit for ciguatera toxin”.
- A blue results means ciguatera is present; a clear result means the fish is safe to eat.
 - www.cigua.com

Prevention?

- "If there is no fly or ant attracted to it, then it's poisonous. This is a tactic that has worked for years,"

