

You gonna eat that fish?

What you should know about Ciguatera

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May, 2016 in the Marquesas

"The majority of tropical cruising grounds are rife with opportunity to poison oneself from eating fish." (1) Ciguatera is the most common fish poisoning.

We love to eat fish and Chuck is an avid fisherman. So what's a cruiser to do?

Our favorite fishing book, Cruiser's Handbook of Fishing by Scott and Wendy Bannerot (2000) says "Following a few basic guidelines, sharpening fish identification skills, and religious adherence to local knowledge should completely shield you from these problems."(1). No, not "completely" is our response. You may be able to significantly reduce the risk but there is no foolproof method of avoiding ciguatera if you decide to eat reef fish.

As for us, we have made our decision: We eat *only* offshore (pelagic), open water species like tuna, wahoo, and mahi mahi; we have decided to avoid any risk of getting ciguatera and so *do not eat any* reef fish, no matter who says it's safe. We have seen too many friends - some of whom are locals - struggle with it in both the short term and long term and do not want to be a member of that club. We do not play Russian roulette with our health. And ciguatera is thought to stay with you forever. So why take the chance?

You may feel differently, especially if you like to spearfish or think you know what fish are safe to eat or have a trustworthy local to listen to. If you have decided that eating reef fish is ok for you, at least educate yourself and be aware of the facts below to hopefully reduce your potential hazard of getting ciguatera. Read on.

Ciguatera - What is it?

Ciguatera (CFP) is a fish poisoning caused by eating tropical and subtropical reef fish that have consumed a toxin-producing microscopic algae (dinoflagellate) that grows on coral reefs. Eating ciguatera-contaminated tropical or subtropical fish poisons the person who eats it. (3); it has no effect on the contaminated fish. Ciguatoxin is one of the most potent natural substances known. (11, 13)

Where is Ciguatera found?

It is found worldwide in the "tropics" - the band of water on either side of the equator between the Tropic of Cancer and the Tropic of Capricorn (between latitudes of 35 degrees south and 35 degrees north); it also extends into coral reefs in some subtropical climates. This includes the Caribbean, Hawaii, coastal Central America, the South Pacific, and Indian Ocean. (3) For decades it was thought all the fish in the Gulf of Mexico were safe; now they are finding ciguatera toxic fish on the coral reefs south of the Texas Louisiana border (8) and along the U.S. Southeast Atlantic coast (12).

The algae culprits (dinoflagellates) are area-specific, found in normal reef environments, and their presence is relatively stable.....that is, they do not appear as seasonal "blooms" like other algae species. It is thought that some may colonize reefs that have experienced disturbances like dredging, earthquakes, and hurricanes. This can lead to increased numbers and species of ciguatoxic fishes in specific locations.

How Prevalent is Ciguatera?

Under-diagnosis and under-reporting (especially in endemic areas such as the Caribbean) make it difficult to know the true worldwide incidence of the Marine Toxin Diseases(11). The CDC believes only 2-10% of cases are ever reported in the U.S.

There are at least 50,000 sufferers worldwide each year (11). Another source says it affects 500,000 people globally per year (7)

Percentage of the population affected each year is estimated to be: US Virgin Islands 3%, French West Indies 3%, St. Thomas 4.4%, and Puerto Rico 7% (11). In Australia there were 1400 cases between 1965 and 2010 (45 years), including 2 fatalities. (7)

In several Pacific Island nations such as New Caledonia, the Cook Islands, and French Polynesia, the incidence is significant. Studies in New Caledonia have estimated that 35% to 70% of the population contract CFP in their lifetime. (7)

CFP occurrence worldwide appears to be increasing, with reports of a 60% increase in the Pacific Islands over the last decade.(7) It is thought that coral bleaching, higher water temperatures and the replacement of coral habitat with macroalgae might be to blame for the rise. (7)

The risk is highest in the Caribbean Sea and the Pacific and Indian Oceans, where as many as three percent of travelers are sickened by ciguatera. (10)

What are the symptoms?

Severity of poisoning varies widely and is a function of fish toxicity, amount consumed, individual sensitivity/susceptibility or past exposure to toxins. (7) Ciguatera Fish Poisoning can look like anything from a heart attack to severe food poisoning.

Mild Symptoms: nausea, vomiting, diarrhea, muscle pain, numbness in the extremities, tingling (paresthesias), abdominal pain and cramps, dizziness, vertigo.

Severe more debilitating symptoms: profound exhaustion, muscle and joint pain, feelings of loose or painful teeth, visual disturbances (blurred vision), slow reflexes, tearing of the eyes, loss of hair and nails, chills, skin rash, itching, shortness of breath, drooling, muscular paralysis, and the reversal of hot and cold sensations. This last symptom is a characteristic sign although not everyone experiences it. (11, 13)

Chronic ciguatera can also present as a psychiatric disorder of general malaise, anxiety, depression, headaches, memory loss, hallucinations, ataxia (incoordination and loss of equilibrium) for several weeks. (11, 13)

Death due to heart or respiratory failure occurs in rare cases.(3, 7)

Children have more severe symptoms.(14)

In Polynesia, ciguatera is dominated and initiated by neurologic symptoms (paresthesias and dysesthesia), while in the Caribbean ciguatera initially presents acutely as a gastroenteritis often with

associated cardiovascular symptoms, with the gradual onset and dominance of neurologic symptoms over the first 24 hours. (11)

How long does ciguatera poisoning last?

It is important to distinguish between the timespan of symptoms and the timespan of poisoning.

Poisoning: Ciguatera disease does not leave your body but stays with you; it does not disappear with the disappearance of symptoms. Once you get it, it is theorized that the toxins are stored in a person's adipose tissues and can be re-released into the blood stream (13). Thus neurologic symptoms can be triggered to appear again (13) and they often worsen in subsequent episodes. We have a friend who to this day - many years later - cannot drink alcohol because it activates the symptoms.

"Toxins are difficult to eliminate from the body because of their structure - they are very lipid soluble - they bind very strongly to fat (adipose tissue) and it's very difficult for our bodies to actually excrete them. So people who suffer from ciguatera often have periods of remission where they don't have any symptoms and then something will trigger off a release of the toxin (that's the theory) and they start to succumb again to neurological symptoms" (Nicholson, 9).

Symptoms: generally appear 3-24 hours after eating a reportedly good-tasting reef fish and largely resolve spontaneously within 1-4 days.(13) Feelings of weakness generally last a few days to several weeks (13). In severe or chronic cases, recovery can take weeks or months with some symptoms continuing for years.(2)

Is there Treatment for Ciguatera?

No antidote or cure exists. At the present time, there is not even a diagnostic method for detecting ciguatoxins in humans. (13) Doctors just use the horrible combination of neurological symptoms to clinically predict you have it and eliminate the other possibilities. (8, 13)

People who have ciguatera CAN be treated for their symptoms:

Eliminate as much toxin as possible by vomiting and drinking lots of water.(1) Keep the person rested and sedated if necessary.

NSAID's and acetaminophen (Tylenol and others) may reduce pain and headaches. (8,13)

Amitriptyline (Elavil, Endep) and gabapentin (Neurontin, Gralise, Horizant) may help reduce neural pain symptoms (8)

Cool showers may relieve itching. Diphenhydramine (Benadryl) and hydroxyzine (Atarax, Vistaril) may also help relieve itching.(8)

It is recommend that opiates and barbiturates be avoided (11,13).

Severe cases may require medical attention and intravenous glucose in saline solution. Osmotic diuretics (intravenous mannitol) have been used with some success to decrease acute symptoms within 48-72 hours of ingestion (8, 11).

People who are recuperating from ciguatera fish poisoning should avoid all fish of any type, fish sauces, shellfish, alcoholic beverages, caffeine, and nuts and nut oils for 3-6 months following illness because these foods may provoke recurrent symptoms.(4, 11) Any dehydration, physical over-exertion or even some very small amounts of other toxins can bring on severe relapse.(8, 13)

Local remedies from native plants may work somewhat. Polynesians treat it with a tonic of crushed noni fruits (Indian mulberry)(1). There are over 64 different herbal remedies including medicinal teas used in both the Indo-Pacific and West Indies regions. Octopus bush is rumored to be effective in Australia. None of these treatments have been scientifically evaluated so their true efficacy has not been determined. (11, 13)

How can you tell if a reef fish is safe to eat?

You can't 100% know for sure. Plain and simple. Contaminated fish don't look, smell, or taste any different; cooking does not affect toxicity.

There are no tests outside of complex laboratory examinations to identify ciguatoxins in a fish. A field test called Cigua-Check was developed in Hawaii in 1997 and publicly sold but it has since been deemed unreliable and has been withdrawn from the market (8)

Natives or locals often claim they can tell a fish is contaminated by methods which include the behavior of flies near the meat, visual appearance of the meat, color changes of coins placed on the meat, the appearance of the liver or other organs, rubbing the meat on your lips to see if they tingle, offering it to a cat. "Using a household pet or even elderly relative for a simple test was and may still be practiced in many island communities"(11).

There's no indication that any of the local methods of checking for ciguatera really work.(8)

Another source suggests: "Feed it to an expendable mammal first; eat a very small amount yourself the first day and see if you experience any mild symptoms."(1)

What are the factors that will affect your risk of getting ciguatera and reduce the potential hazard of eating reef fish?

1. Type of fish - Fundamental rules: Do not eat moray eels, coral scrapers and algae scrapers (herbivores) such as parrotfish and surgeonfish, and fish eating predators like barracudas, jacks, trevallies, snappers, hogfish, sea bass, king and spanish mackerel and groupers. Some wrasses and mullet can be highly ciguatoxic in some locations. Stick to fish species with invertebrate diets.
2. Size does matter - since toxin accumulates in flesh with age, larger, older fish belonging to highly predatory species pose the greatest risk. (1) Toxin concentrates as it goes up the food chain; the toxin is transferred through the food web as the algae is consumed by small herbivorous fish, which are consumed by larger carnivorous fish and reach particularly high concentrations in large predatory tropical reef fish, which are in turn consumed by humans (4,13).

One source says avoid fish greater than 6 lbs., another says over 3 lbs.(4, 13,14) Avoid all medium to large piscivorous reef fish, coral scrapers and algae feeders (herbivores). Stick to smaller individuals.

It has also been suggested that eating small portions (i.e. <50 grams or < 0.11 pounds) of different fish is safer than eating larger portions of any individual fish that might be associated with CFP (13)

3. Avoid certain fish parts - Avoid consuming *all* reef-fish viscera and fish heads since this is the most toxic part of the fish (1, 11)

4. Depth of your catch - Ciguatoxic reef fish usually forage in the food chain in depths of less than 325 feet (100 meters).

For example, the ubiquitous tropical Indo-Pacific red snapper is notoriously ciguatoxic in most areas, yet in the Marquesas individuals captured outside a specific depth are usually safe, while virtually all individuals of this species are non-toxic in Tonga's Vava'u group (1)

5. Location - The occurrence of toxic fish is sporadic, and not all fish of a given species or from a given locality will be toxic (4). Some reef areas are known to be very ciguatoxic like Anaho Bay in Nuku Hiva (Marquesas) where it is recommended that no local fish be eaten.

6. Local Knowledge - Cruiser's Handbook of Fishing says "always seek the detailed knowledge of local residents before you decide to keep and consume any fish caught on or near a reef.....Locals often know the safe maximum eating size of different species and the horizontal and vertical boundaries for safe individuals of each resident species." (1)

While affirmation of safety by locals may be more foolproof, be aware that many locals contract ciguatera too.

Shark Poisoning

Tropical sharks are risky to eat. Don't eat large individuals of tropical species, especially those caught near reefs. Don't eat: grey reef sharks or blacktip reef sharks.

You can eat mako, silky, and blacktip sharks (1)

A Final Word - Personal experience/anecdotes

This year (2015-6) in the Marquesas, friends on svRhombus and svOlé and two other boats contracted ciguatera. The couple on Rhombus ate a fish they caught; she was a nursing Mom and had to give up breast feeding and they scrambled to find baby formula. Paco and Theda on Olé got it from a fish that a local gave them and were struggling with fatigue weeks later. Luckily 2-year-old Fran did not eat any of the fish. While the majority of cruisers we know who have had ciguatera and cases we have read about seemed to have recovered just fine, a friend of Chuck's cannot drink any alcohol since contracting ciguatera decades ago.

One of the most severe accounts I have read about is Ian Woolf (5) , who presented with Chronic Fatigue Syndrome and aphasia. He was contaminated by eating a local pizza with crust made from Omega-3 enriched flour (omega-3 comes from fish oil). I have no idea how he reached that conclusion but I'm sure it entailed an epic sleuthing effort. He has been sick for 10 years and recently had a vicious relapse that lasted for 12 months. Other ciguatera victims tell their heartbreaking stories in the video called "Reef or Madness" (15).

But here's the thing - many locals come down with ciguatera. Steven, from Hanamoenoa (Tahuata, Marquesas) had a severe case of it when we returned there in May, 2016. Steven often takes cruisers out fishing when they anchor in his bay. The father of my tattoo artist, Moana Sr., was hospitalized - he was living in Anaho (Nuku Hiva) and was running a restaurant which we had dinner at.

Chuck tells the story of a conversation with his local friend Jonah and his wife Lindua in Fiji when he was sailing in the South Pacific in the 1990's. Chuck had asked Jonah if the fish from his bay had ciguatera. "The fish right here in my part of the bay are safe to eat but don't eat any on the other side of the bay" Jonah said as he pointed to the short distance on the other side of the water. "That's not true, Jonah" Lindua intoned "because you have had ciguatera".

One sailor expresses his attitude: “The best way to avoid ciguatera is to avoid eating any reef fish. Fish caught far from the reef are not a problem. There is no practical way for a sailor to tell where the algae is growing this year and no way for the diner to know where his dinner is caught. Many cannot even tell one fish from another whole much less on the plate served at the table. If you wear a helmet when you ride a bike, a PFD when you sail, and a host of other life protecting actions many Americans now take, eating reef fish may not be for you. I still eat snapper. I just do not eat reef fish when I am staying on a boat a long way from home.” (8)

About this information sheet

I compiled this while in French Polynesia because Chuck and I were shocked at how many cruisers we met had either not heard about ciguatera or were misinformed about it. Information contained here comes from our favorite fishing book, experiences of friends and several internet sources:

1. Cruiser’s Handbook of Fishing by Scott and Wendy Bannerot, published 2000.
2. <http://www.cdc.gov/nceh/ciguatera/>
3. http://www.medicinenet.com/ciguatera_poisoning/article.htm
4. CA. Dept. of Public Health: https://www.cdph.ca.gov/HealthInfo/discond/Documents/_Ciguatera.pdf
5. <http://www.hereswhy.tk/ciguatera>
6. <https://en.wikipedia.org/wiki/Ciguatera>
7. <https://theconversation.com/explainer-what-is-ciguatera-fish-poisoning-21835>
8. <http://www.traveltalkonline.com/forums/showflat.php?Cat=0&Number=1498689&page=0&fpart=1&vc=1>
9. <http://ia600302.us.archive.org/27/items/Graham-Nicholson-Ciguatera-HW/graham-nicholson-ciguatera.mp3>
10. yahoo.com - Ciguatera fish poisoning might be more common than thought - June 29, 2015
11. Woods Hole: https://www.whoi.edu/science/B/redtide/illness/ciguatera_fish_poisoning.html
12. NOAA: <http://www.noaanews.noaa.gov/stories2015/120215-ciguatera-fish-poisoning-predicted-to-increase-with-rising-ocean-temperatures.html>
13. Nat. Institute of Health: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2579736/>
14. http://www.emedicinehealth.com/wilderness_ciguatera_toxin/article_em.htm
15. Reef or Madness video: <https://vimeo.com/19045730>