



## Current CTX occurrence and official monitoring on the Canary Islands (SPAIN)

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- ✓ **What are the reasons why there are CP in the Canary Islands?**
- ✓ **What means are used to control CP cases in the Canary Islands?**
- ✓ **What is the current prevalence/occurrence of CTX in the Canary archipelago?**



What are the reasons why there are CP in the  
Canary Islands?

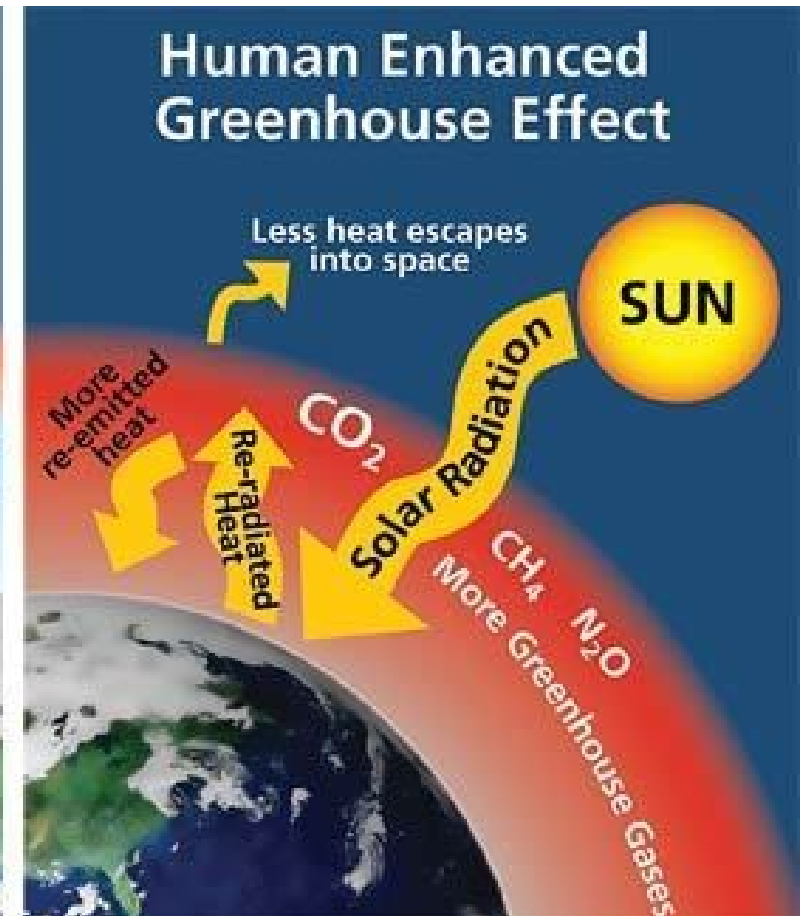
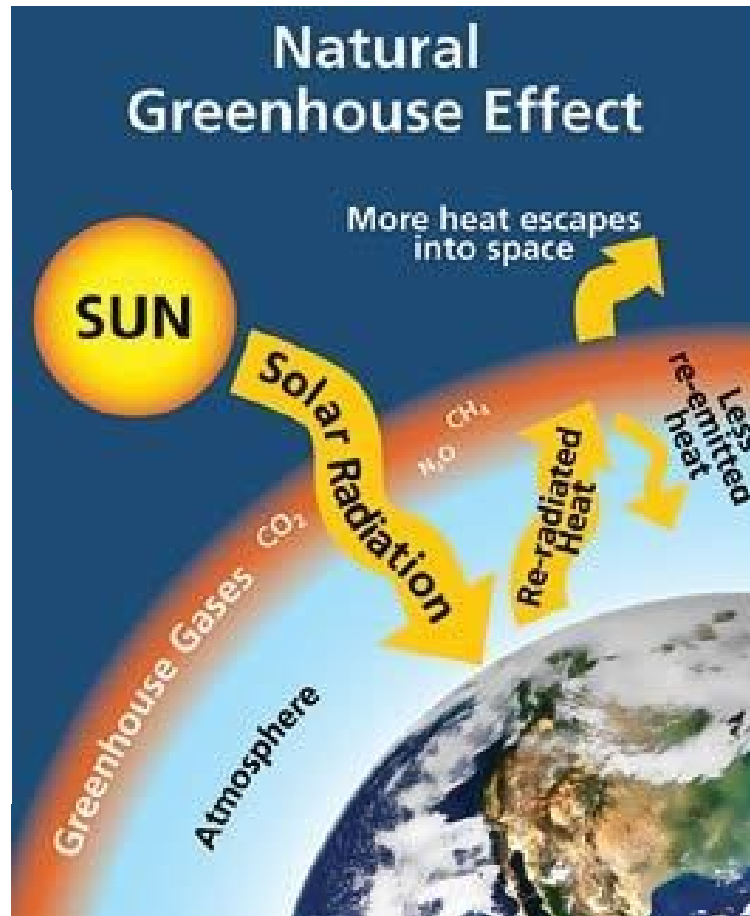
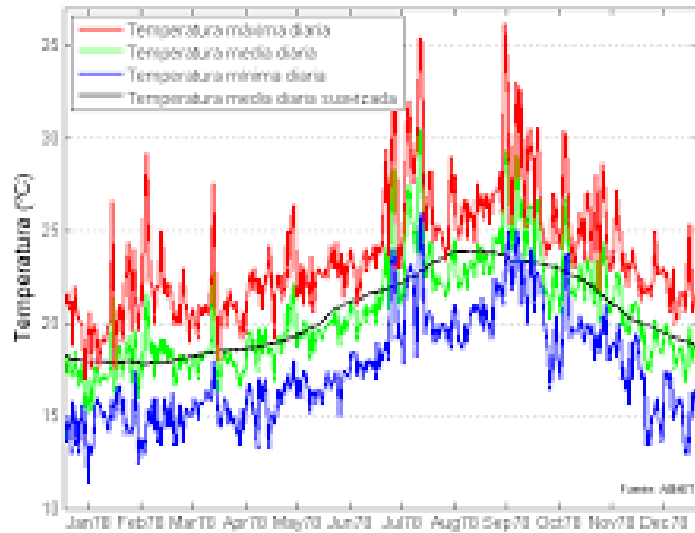


Aquatic Toxins Symposium  
10-11 June 2024, Berlin



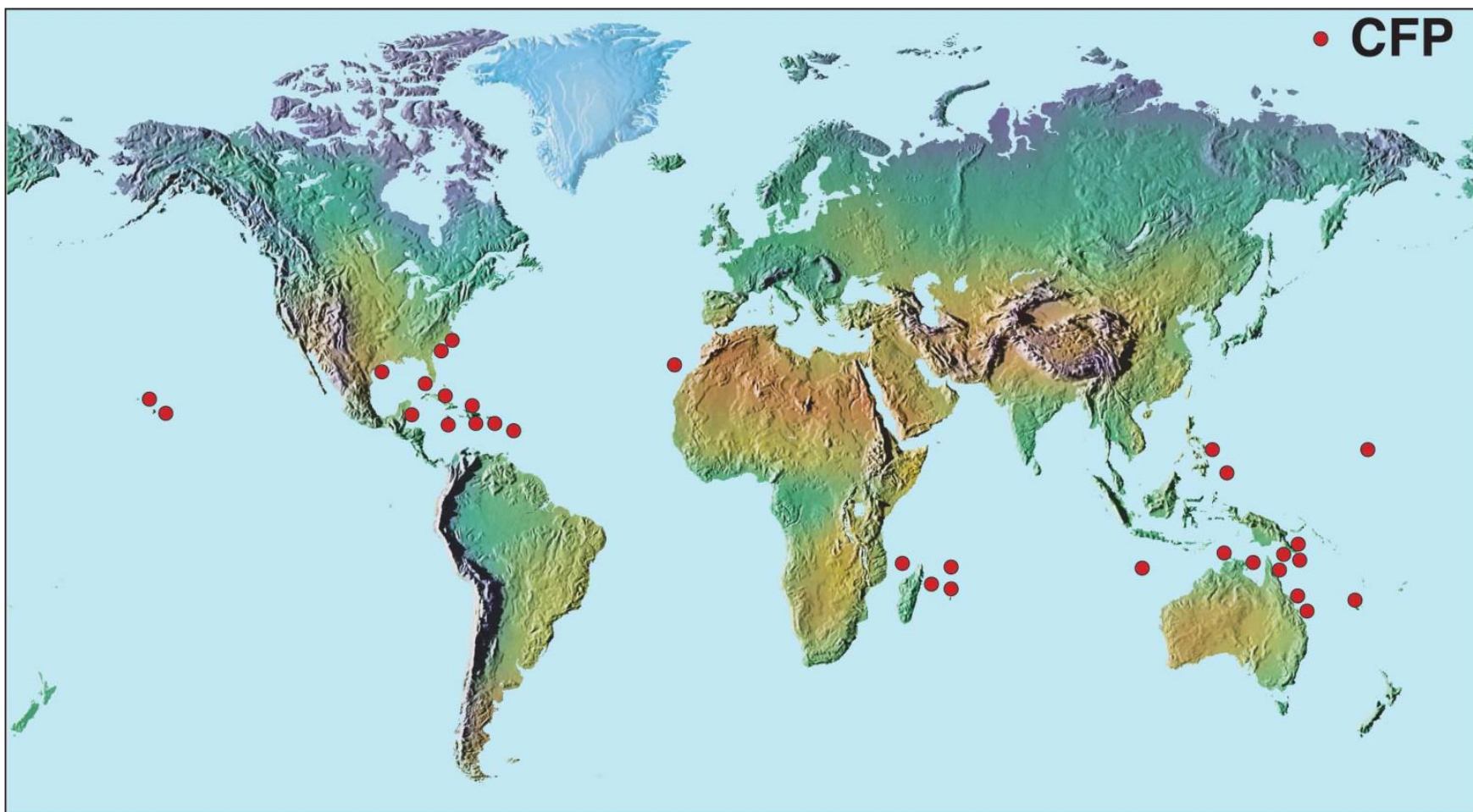








## World distribution of Ciguatera:







What means are used to control CP cases in the  
Canary Islands?



## PRECEDING CP CASES

- **Canary Islands: Year 2004 – 26 kg  
Amberjack (*Seriola rivoliana*)  
9 people affected (First record)**
- **Salvages Islands: June 2008 – 30 kg  
Amberjack (*Seriola spp*)**

Perez-Arellano, J. L. et al. (2005). Ciguatera fish poisoning, Canary Islands. *Emerg Infect Dis*, 11(12), 1981–1982.  
doi:<https://doi.org/10.3201/eid1112.050393>





## RECORD OF CIGUATERA OUTBREAKS IN THE CANARY ISLANDS

### Epidemiological Surveillance System for Ciguatera Poisoning in the Canary Islands (SVEICC)

Date	Island	Number persons affected	Fish	Kg	Fish Origin	Laboratory Confirmation
Nov/2008	Tenerife	25	Amberjack ( <i>Seriola</i> spp.)	37	Local Market	YES
Jan/2009	Tenerife	4	Amberjack ( <i>Seriola</i> spp.)	67	Sport fishing	YES
March/2009	Gran Canaria	3	Amberjack ( <i>Seriola</i> spp.)	Unknown	Unknown	
Nov/2009	Tenerife	2	Amberjack ( <i>Seriola</i> spp.)	Unknown	Sport fishing	
April/2010	Tenerife	6	Amberjack ( <i>Seriola</i> spp.)	80	Unknown	
June/2011	Gran Canaria	5	Amberjack ( <i>Seriola</i> spp.)	24	Sport fishing	YES
Jan/2012	Lanzarote	10	Amberjack ( <i>Seriola</i> spp.)	15	Sport fishing	
April/2012	Lanzarote	9	Amberjack ( <i>Seriola</i> spp.)	26	Sport fishing	
May/2012	Tenerife	4	Amberjack ( <i>Seriola</i> spp.)	Unknown	Local Market	
Dec/2012	Tenerife	12	Dusky grouper ( <i>Epinephelus</i> spp.)	18	Sport fishing	YES
Dec/2013	Lanzarote	16	Dusky grouper ( <i>Epinephelus</i> spp.)	Unknown	Local Market	YES
Feb/2015	Tenerife	3	Island grouper ( <i>Mycteroperca fusca</i> )	4	Local Market	

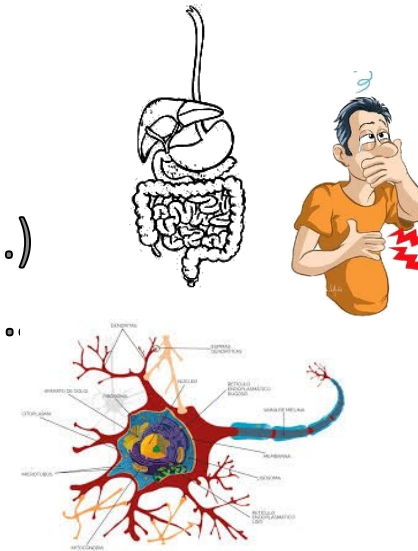
**Total outbreaks: 24**  
**No. people affected: 134**



## SIGNS OF CP

No mortality

Symptoms: 10 min – 24 h after consuming  
Gastrointestinal, (nausea, vomiting,...)  
Circulatory (tachycardia, hipotension..)  
Neurologic (tingling fingers or toes)



Go away: days or months



## DIFFICULTIES:

- Misdiagnosis (symptoms)
- Insufficient sample for diagnosis



Specificity //  
regularity





## TOOLS TO CONTROL CIGUATERA IN THE CANARY ISLANDS:

- Draft Order amending Annexes of Decree 165/1998 that creates the Canaries' Epidemiological Surveillance Network, to be included as a notifiable disease: **Ciguatera poisoning (since 2015)**
- Epidemiological Surveillance System for Ciguatera Poisoning in the Canary Islands (SVEICC)
- Official control protocol in the extractive fishery products at first sales points

GENERAL DIRECTORATE  
OF FISHERIES

**1<sup>st</sup> implemented in 2011**





CONTROL OF CTXs IN SAMPLES OF CERTAIN WEIGHTS OF SOME FISH SPECIES, CONSIDERED A POSSIBLE RISK IN THE CANARY ISLANDS FOR TRANSMITTING THE TOXIN TO CONSUMERS



Island-grouper, 7 kg



Amberjack, 12 kg



Dusky-grouper, 12 kg



Bluefish, 9 kg



Wahoo, 35 kg



## TO UPDATE THE WEIGHT OF THE SPECIMENS

- Comission to update the protocol:
  - GD Fisheries of the Canary Government
    - Official Control Protocol of CTX**
  - GD of Public Health of the Canary Government
    - Epidemiological Surveillance System for Ciguatera Poisoning in the Canary Islands (SVEICC)**
  - U. Institute of Animal Health and Food Safety (IUSA-ULPGC)
    - Analysis to detect CTX in commercial fish**





**UPDATED LIMIT WEIGHT (Kg):**

COMMON NAME	SCIENTIFIC NAME	2017	2023
Island-grouper	<i>Mycteroperca fusca</i>	12	7
Amberjack	<i>Seriola spp</i>	14	12
Dusky grouper	<i>Epinephelus marginatus</i>	17	12
Bluefish	<i>Pomatomus saltatrix</i>	9	9
Wahoo	<i>Acanthocybium solandri</i>	35	35





**SPORT FISHING**



**IUSA LABORATORY**



RESULTS ARE PLACED ON A PLATFORM, WHICH  
AUTOMATICALLY INFORMS THE FIRST SALES POINTS

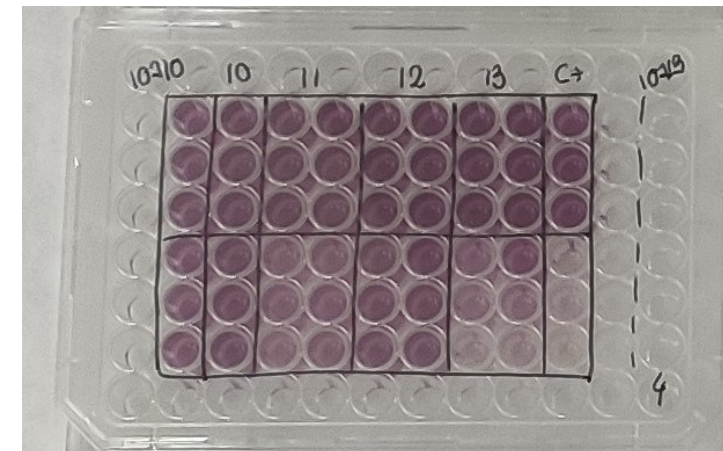
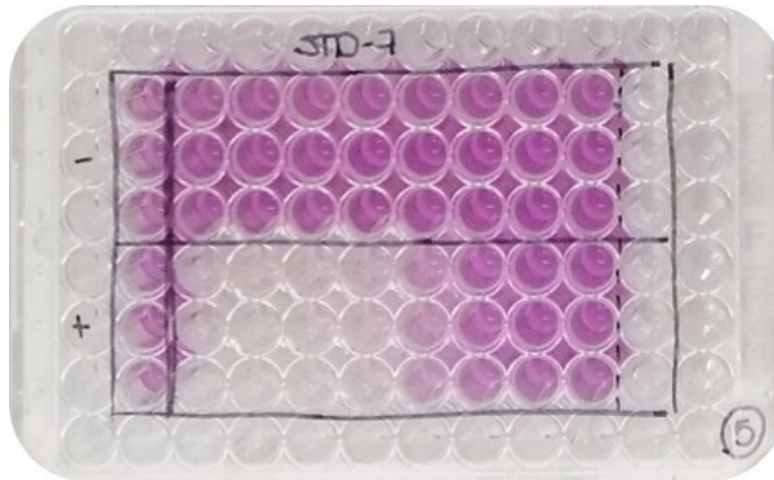


## METHOD

- 1) EXTRACTION OF CTX ([Lewis, 2003](#))
- 2) CELL-BASED ASSAY (CBA) WITH NEUROBLASTOMA (NEURO-2A) ([Caillaud et al., 2012](#))



- Absorbances are read at 570 nm by a multiwell spectrophotometer
- Less than 20% cell mortality is considered as a non-toxic effect





**CTX-like toxicity**

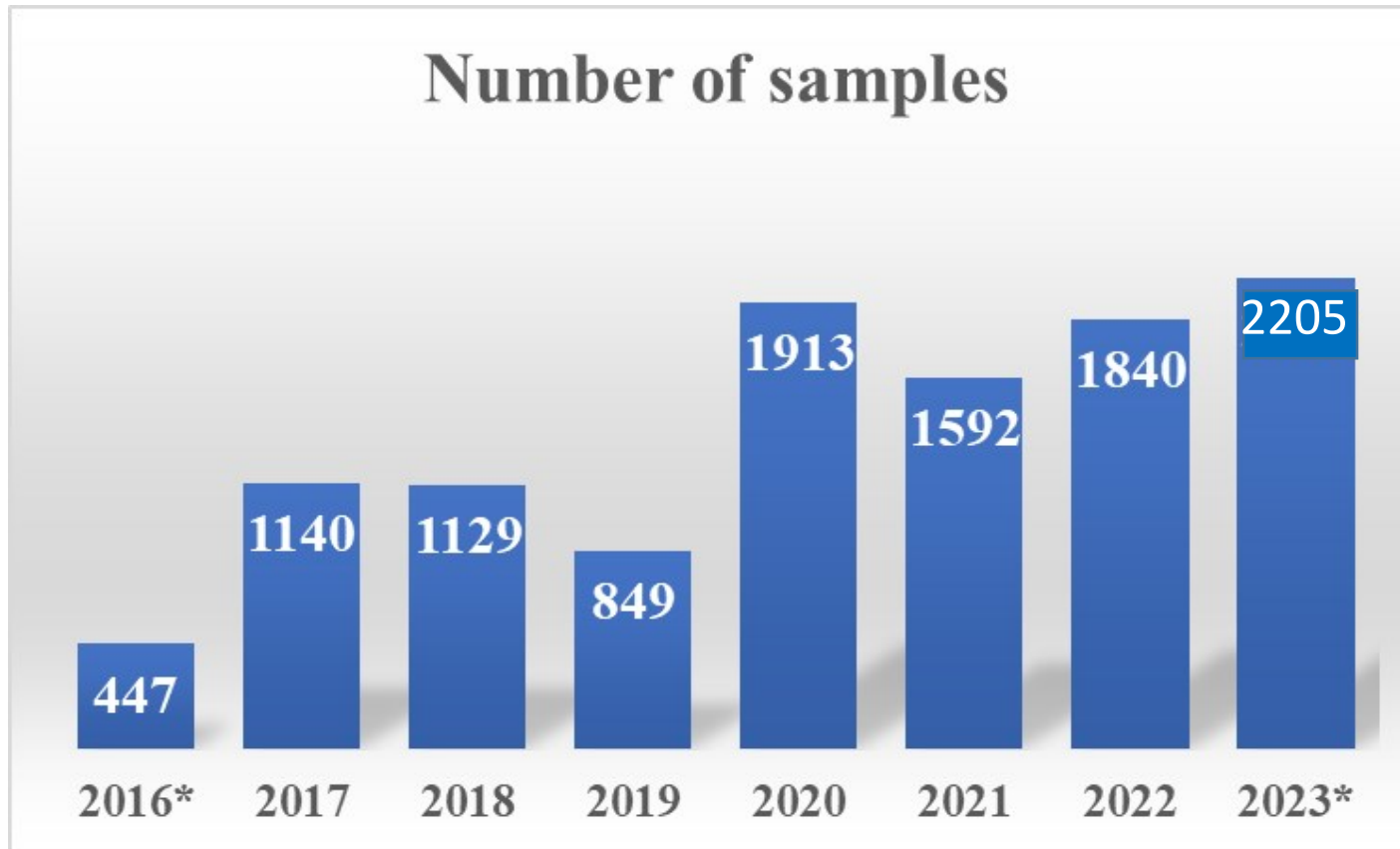


**No CTX-like toxicity**





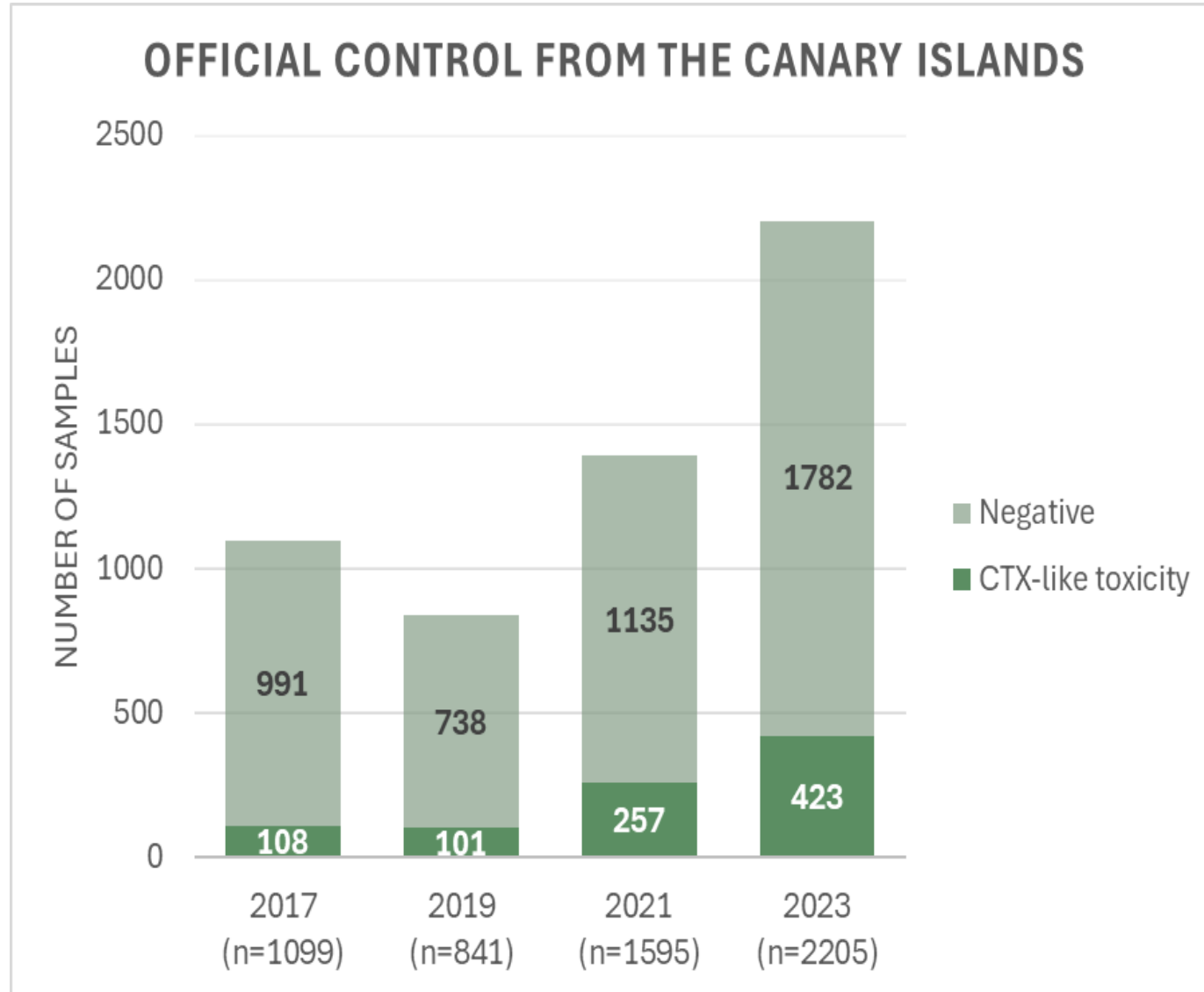
What is the current prevalence/occurrence of CTX  
in the Canary Islands?



Since 2011 > 15,000 samples submitted for CTX detection

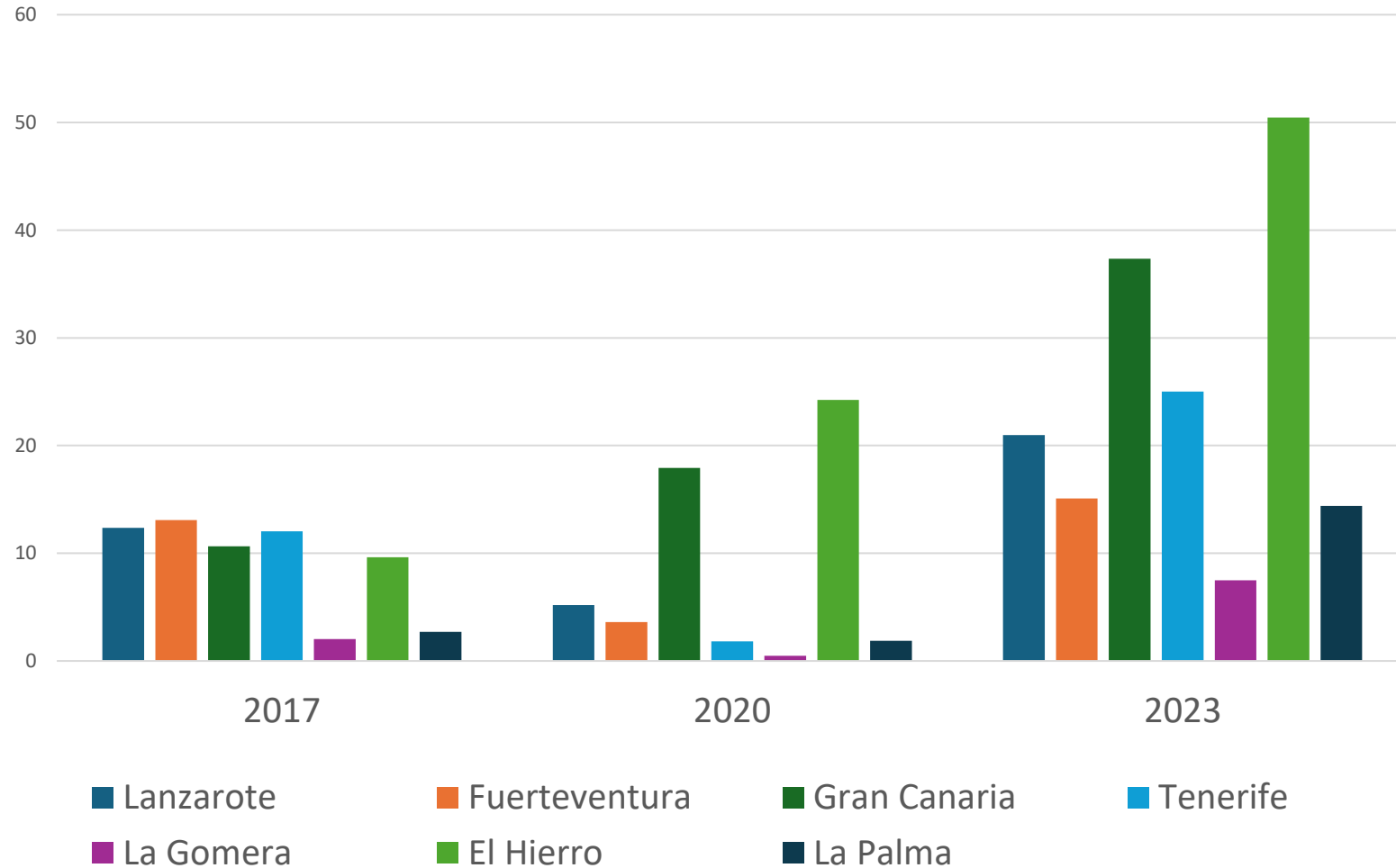
No case of CP detected in all the fish with a negative result and released for consumption.

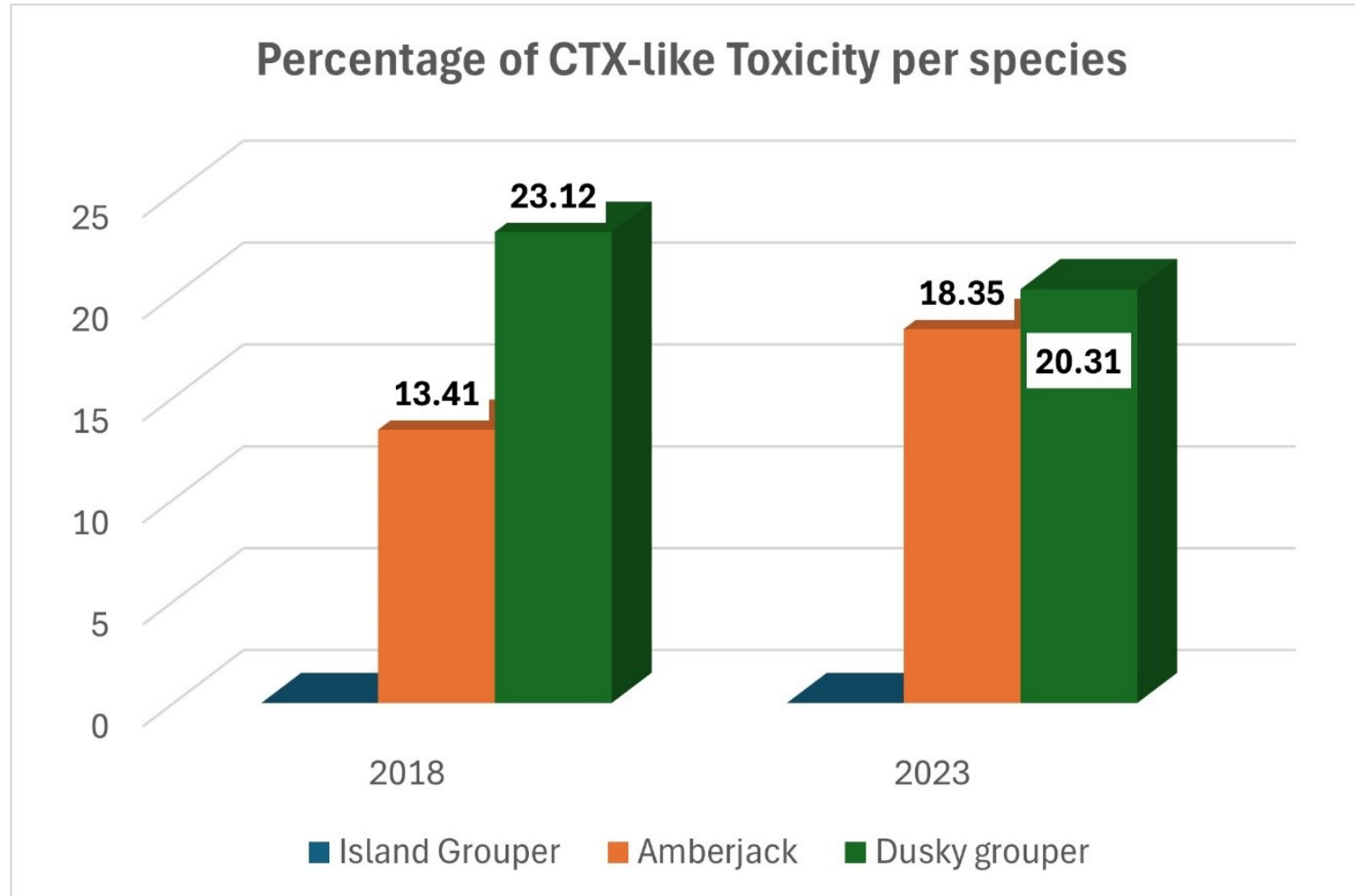






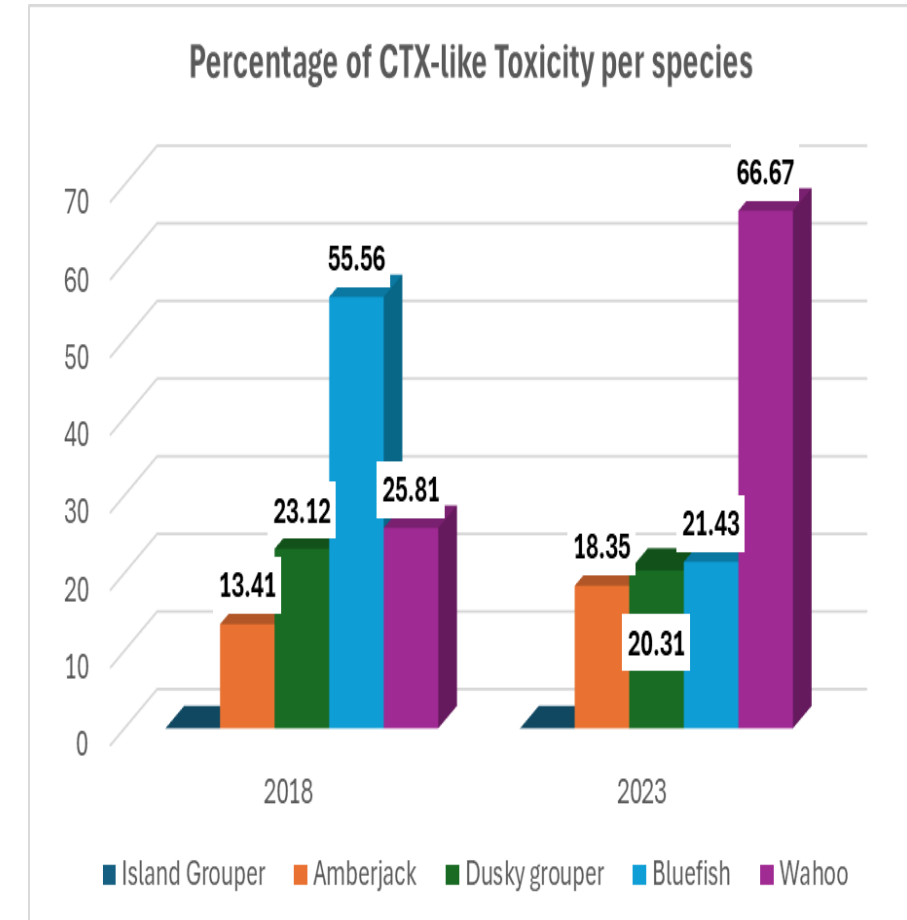
% of CTX-like toxicity





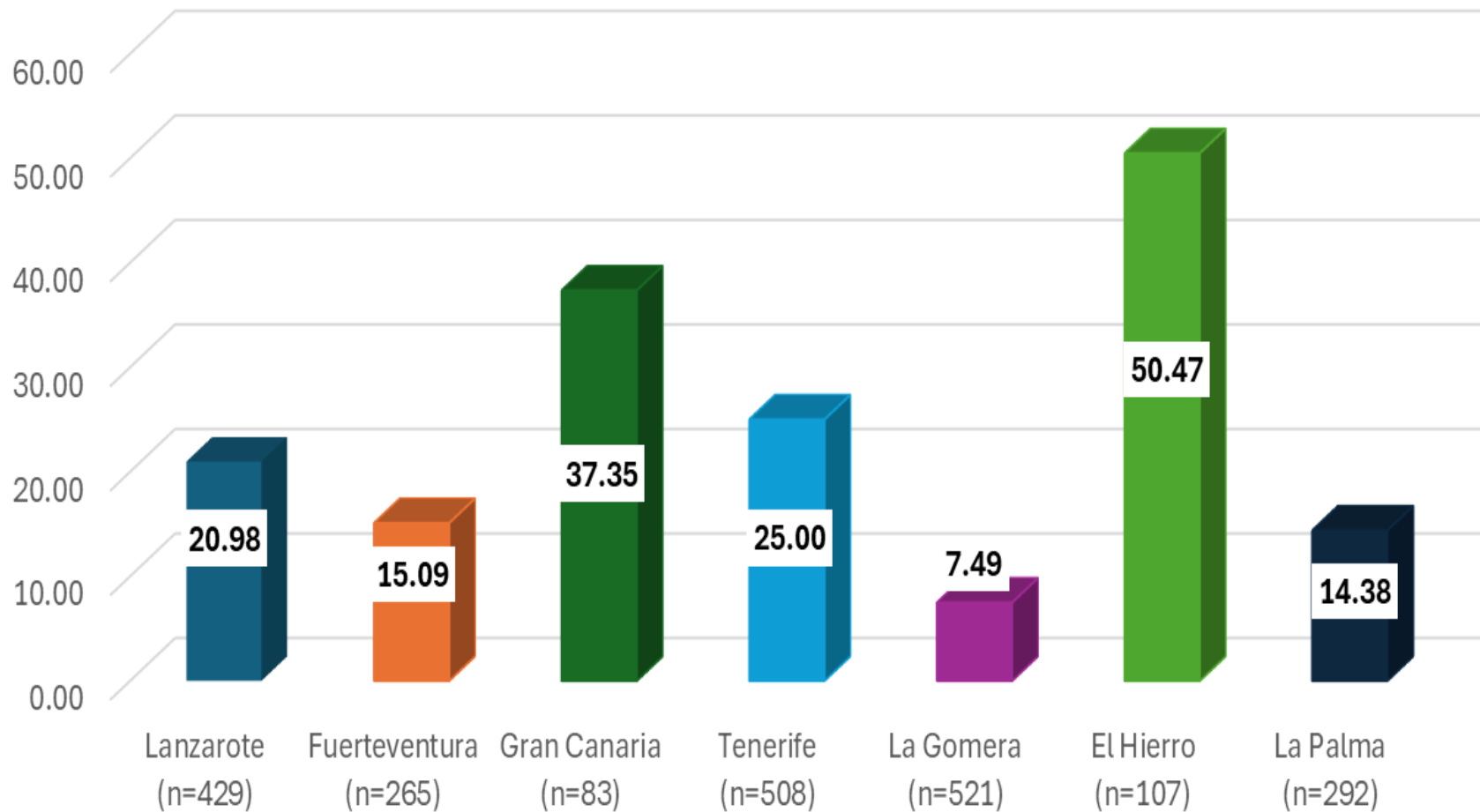


Year	Species	Total number of simples	Number of positive	Number of negatives	% Toxicity
2018 →	Amberjack	753	101	652	13.41
	Bluefish	9	5	4	55.56
	Dusky grouper	199	46	153	23.12
	Wahoo	31	8	23	25.81
2023 →	Amberjack	1591	292	1299	18.35
	Bluefish	14	3	11	21.43
	Dusky grouper	581	118	463	20.31
	Island grouper	4	0	4	0.00
	Wahoo	15	10	5	66.67





Percentage of CTX-like toxicity per islands in 2023



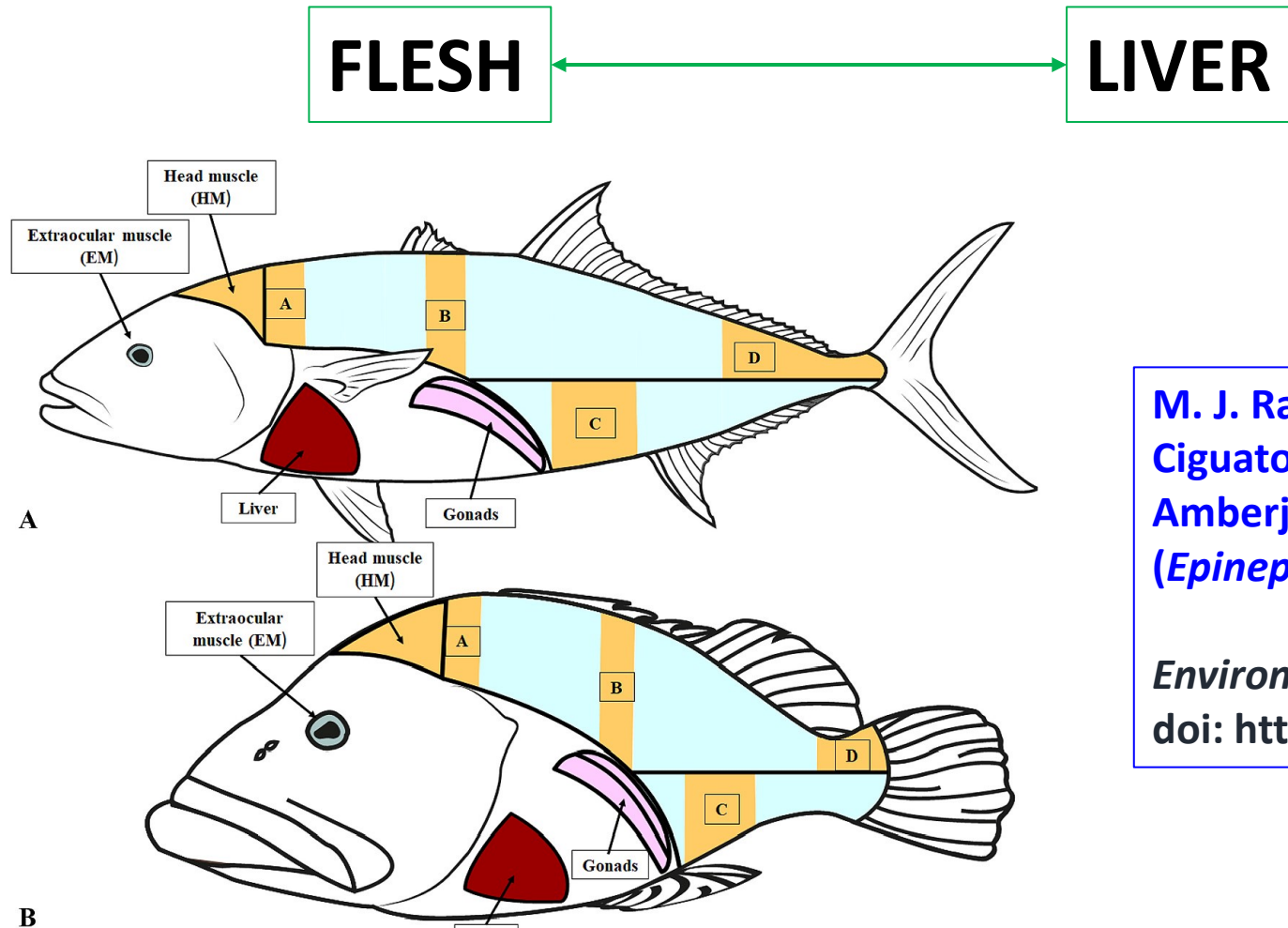


## Some considerations to take into account:

- ✓ **The data do not represent a real prevalence/occurrence.**
- ✓ **Sampling is not done at random.**
- ✓ **Sampling directed at risk species/specimens.**
- ✓ **Confounding variables**



## Some considerations to take into account:

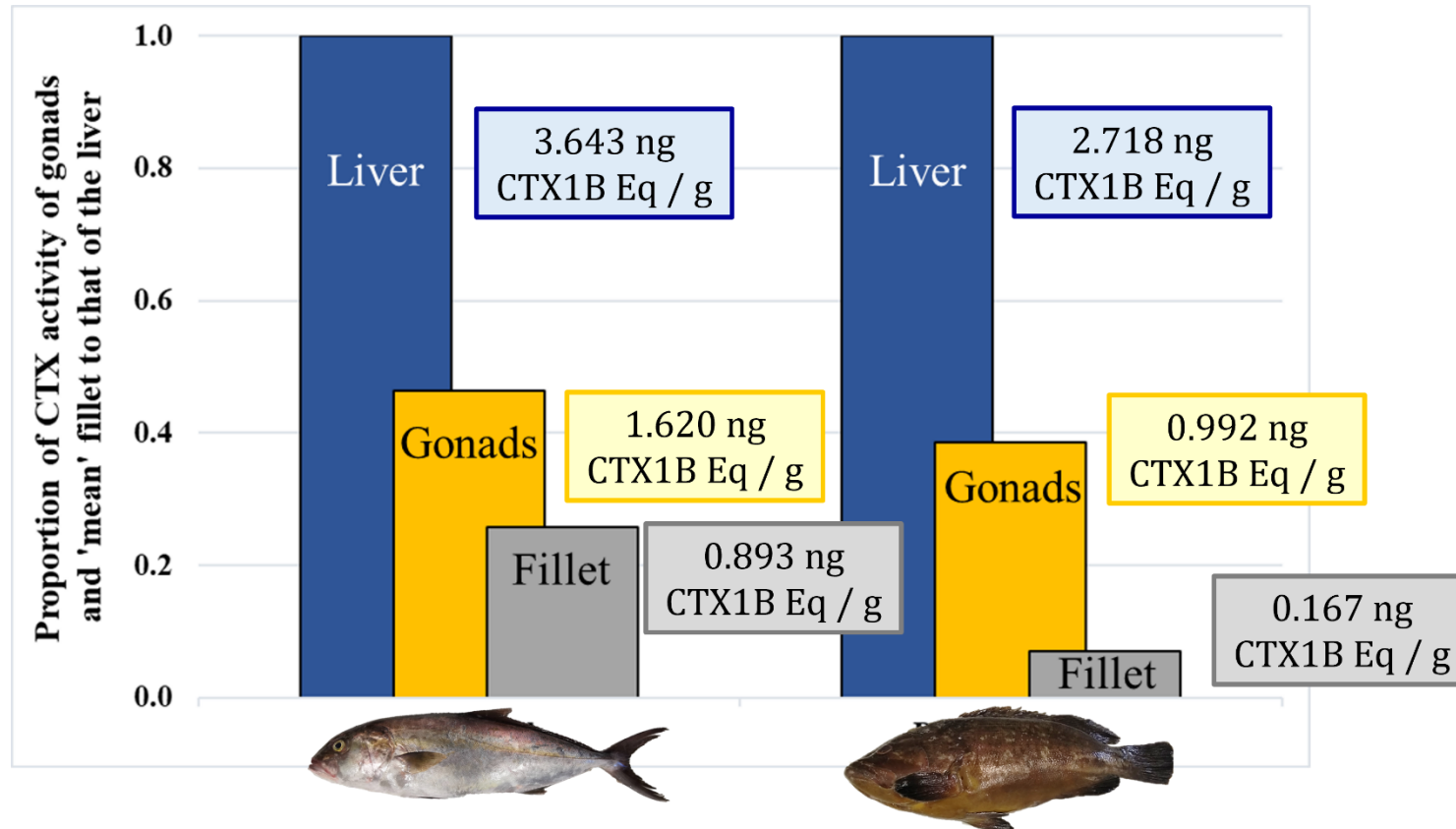


**M. J. Ramos-Sosa, et al. 2023**  
**Ciguatoxin-Like Toxicity Distribution in Flesh of**  
**Amberjack (*Seriola* spp.) and Dusky Grouper**  
**(*Epinephelus marginatus*)**

*Environmental Research*, 228: 115869-115878.  
doi: <https://doi.org/10.1016/j.envres.2023.115869>



## Some considerations to take into account:







**Gobierno de Canarias**  
Consejería de Agricultura,  
Ganadería, Pesca y Aguas  
Dirección General de Pesca



**Servicio  
Canario de Salud**





**THANK YOU  
FOR YOUR  
ATTENTION !!!**