



Rubini S*
Ranghieri V*
Malandra R*
Della Puppa T*
Bolognesi E*
Montanari S*
Moretti VM*

1. Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna (IZSLER) Sezione di Ferrara, Cassana (FE) - Italy

2. Mercato Ittico di Milano - Italy

3. Centro Antiveleni Ospedale Niguarda di Milano - Italy

4. Facoltà di Medicina Veterinaria Università degli Studi di Milano - Italy

REFERENCES

- Bavastrelli M, Bertucci P, Midulla M, Giardini O, Sanguigni S (2000) Ciguatera fish poisoning: an emerging syndrome in Italian Travelers. *J Travel Med* 8: 139-142
- Dickey R W, Plakas S M (2010) Ciguatera: A public health perspective. *Toxicol* 56: 123-136
- Lewis R J (2003) Detection of toxins associated with ciguatera fish poisoning. In Hallegraef, G M, Anderson, D M, and Cembella, A D (Eds.), *Manual on Harmful Marine Microalgae*. IOC-UNESCO
- www.fishbase.org

ACKNOWLEDGEMENTS

We would thank Dr Guido Govoni who has been a precious reference for preparation of the report. His willingness on comment on our drafts represented an essential contribution to the present work.

*Dr.ssa Silvia Rubini Sezione IZSLER di Ferrara, Via Modena, 483 Cassana (FE) - Italy
Tel. +390532/730058
Fax +390532/730870
Email: silvia.rubini@izsler.it
Web: http://www.izsler.it

CIGUATERA: AN EMERGING PUBLIC HEALTH ISSUE FOR EUROPEAN CONSUMERS. ARE WE READY?

INTRODUCTION

- Ciguatera poisoning is considered an endemic intoxication of tropical and sub-tropical areas of our planet. However, ciguatera extends beyond subtropical regions and it is a world health problem. The overall tropicalization process, due to climatic changes and the increased importation of fish from endemic areas, plays major role in the expansion of the ciguatera geographical range.
- The globalization process results in expansion of local economy beyond the traditional markets, while the impoverishment of fish stock involves an increasing import of exotic species. Over last years, the presence of tropical fish in markets of European countries has increased in quantity and quality.
- In the Milan fish market every year 10,000 tons of fish are traded and then distributed all over the country. Main suppliers are Oman, India, Thailand, Australia, Maldives (Indian Ocean), Senegal, Morocco, Ecuador, Chile and Argentina.
- Numerous cases of food poison due to fish consumption are reported outside tropical areas. From 2005 to 2010 the Centro Antiveleni (Anti-Poison Centre) of Niguarda (Milan) identified 10 cases of a poison syndrome due to ciguatera. Because of lack of reliable tests, the diagnosis is based on anamnesis, gastrointestinal and neurological symptoms. All patients were on they way back from tropical countries.

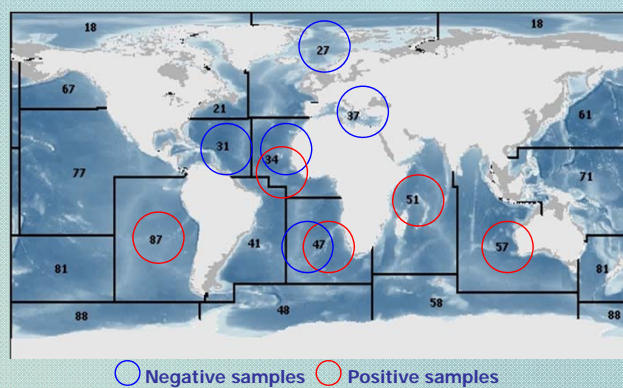
MATERIAL AND METHODS

- The aim of the present work is to carry out an investigation to assess the risk of importing in Italy ciguatoxic species.
- The study is based on the analysis of 25 samples of fish and 2 samples of invertebrates coming from different FAO zones (Figure 1), collected in the Milan fish market (Table 1).
- First stage of the contamination assessment has been carried out through utilisation of the Mouse Bio Assay (MBA) to identify ciguatoxins (CTXs) according to the Lewis and Sellin method (1993). The tissues used were muscles and gonads, if present in the specimens.

Table 1. Samples collected at the Fish Market of Milan

N°	Scientific Name	Common Name	Origin	Organ analyzed	MBA for DSP	MBA for CTXs
1	<i>Epinephelus fasciatus</i>	Blacktip grouper	FAO 51	Muscle	N	N
1	<i>Epinephelus fasciatus</i>	Blacktip grouper	FAO 51	Liver	N	N
2	<i>Sparisoma cretense</i>	Parrotfish	FAO 51	Muscle	N	N
2	<i>Sparisoma cretense</i>	Parrotfish	FAO 51	Liver	N	N
3	Fam. Carangidae		FAO 51	Muscle	N	N
4	<i>Lethrinus atlanticus</i>	Atlantic emperor	FAO 34-47	Muscle	N	P
5	<i>Pseudopeneus prayensis</i>	West African goatfish	FAO 27-34	Muscle	N	N
6	Fam. Lutjanidae	snapper	FAO 51	Muscle	N	N
7	<i>Octopus maya</i>	Mexican four-eyed octopus	FAO 31	Muscle	N	N
8	<i>Coryphaena hippurus</i>	Common dolphinfish	FAO 51	Muscle	N	P
9	<i>Argopecten purpuratus</i>	Chilean-Peruvian scallop	FAO 87	Flesh	N	P
10	<i>Lutjanus malabaricus</i>	Malabar blood snapper		Muscle	N	N
11	<i>Brama brama</i>	Atlantic pomfret	FAO 27	Muscle	N	N
11	<i>Brama brama</i>	Atlantic pomfret	FAO 27	Gonads and Liver	NE	N
12	<i>Seriola lalandi</i>	Yellowtail amberjack	FAO 57	Muscle	N	P
13	<i>Epinephelus coloides</i>	Orange-spotted grouper	FAO 51-57	Muscle	N	N
14	<i>Epinephelus</i> spp.	grouper	FAO 51	Muscle	N	N
14	<i>Epinephelus</i> spp.	grouper	FAO 51	Gonads and Liver	NE	N
15	<i>Epinephelus areolatus</i>	grouper	FAO 51-57	Muscle	NE	N
16	<i>Cephalopholis sonnerati</i>	Tomato hind	FAO 51	Muscle	NE	N
17	<i>Parupeneus</i> spp.	goatfish	FAO 51-57	Muscle	N	N
18	<i>Epinephelus marginatus</i>	Dusky grouper	FAO 34-47	Muscle	N	N
19	<i>Epinephelus aeneus</i>	grouper	FAO 34-47	Muscle	N	N
20	<i>Cephalopholis sonnerati</i>	Tomato hind	FAO 51-57	Muscle	N	N
20	<i>Cephalopholis sonnerati</i>	Tomato hind	FAO 51-57	Liver	NE	N
21	Fam. Lethrinidae	Emperor fish	FAO 51-57	Muscle	N	N
22	<i>Scomberoides tol</i>	Needlescaled queenfish	FAO 51-57	Muscle	N	N
23	<i>Chelmerius nufar</i>	Santer seabream	FAO 51	Muscle	N	N
24	Fam. Carangidae		FAO 51	Muscle	N	P
24	Fam. Carangidae		FAO 51	Liver	NE	P
25	<i>Euthynnus alletteratus</i>	Little tunny	FAO 37	Muscle	N	N
25	<i>Euthynnus alletteratus</i>	Little tunny	FAO 37	Liver	NE	N
26	<i>Epinephelus</i> spp.	grouper	FAO 34-47	Muscle	N	N
27	<i>Seriola lalandi</i>	Yellowtail amberjack	FAO 57-71	Muscle	N	N

Figure 1. FAO Fishing Zones



RESULTS

- In five case MBA for CTXs was positive. All samples have been tested also with MBA for identification of liposoluble toxins (according to EU regulation) and resulted negative.
- One of the MBA positive samples was an Emperor fish (*Lethrinus atlanticus*) from the FAO 34-47 zone, where ciguatoxins have never been reported.
- Another positive sample was a breed yellowtail amberjack (*Seriola lalandi*), Pacific Ocean FAO area 57 (Australia) which was farmed.

SPECIES RESULTED POSITIVE WITH MBA

Seriola lalandi



Lethrinus atlanticus



Fam. Carangidae



Coryphaena hippurus



Argopecten purpuratus



CONCLUSIONS

- We are planning to confirm in the future the positive results of the biological assay with chemical methods such as LC-MS, even though the standard references to conduct the test are not easily available.
- In the case all positive samples (18.5%) will be confirmed by more specific chemical tests, we recommend that Public Health Services set as a priority the increase of control methods.
- The concerned Authorities should support the identification of analytical screening methods, which have to be quick, reliable and cheap.