Sushi, Anisakidosis & Allergies: an Emerging Problem for Europe and Turkey ?

Pr Jean Dupouy-Camet

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With the help of Pr Ulgen OK

EATING RAW FISH IS A RISK FACTOR TO ACQUIRE PARASITIC DISEASES

In EUROPE

- Anisakidosis
- Diphyllobothriosis
- Opistorchiasis
- Cryptosporidiosis

A lot of raw fish recipes all over the world

- Sushi, sashimi : Japan, world wide
- Bagoong: Philippines
- Salted or smoked herrings: Netherlands
- Gravlax: Scandinavia
- Lomi-lomi & palu: Hawaii
- Ceviche: South America
- Boquerones en vinagre: Spain
- Carpaccio di pesce: Italy

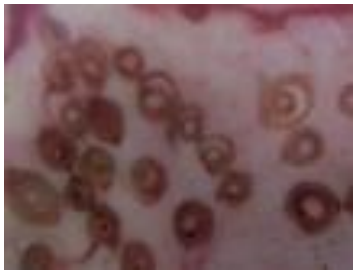
Home made preparations are at risk

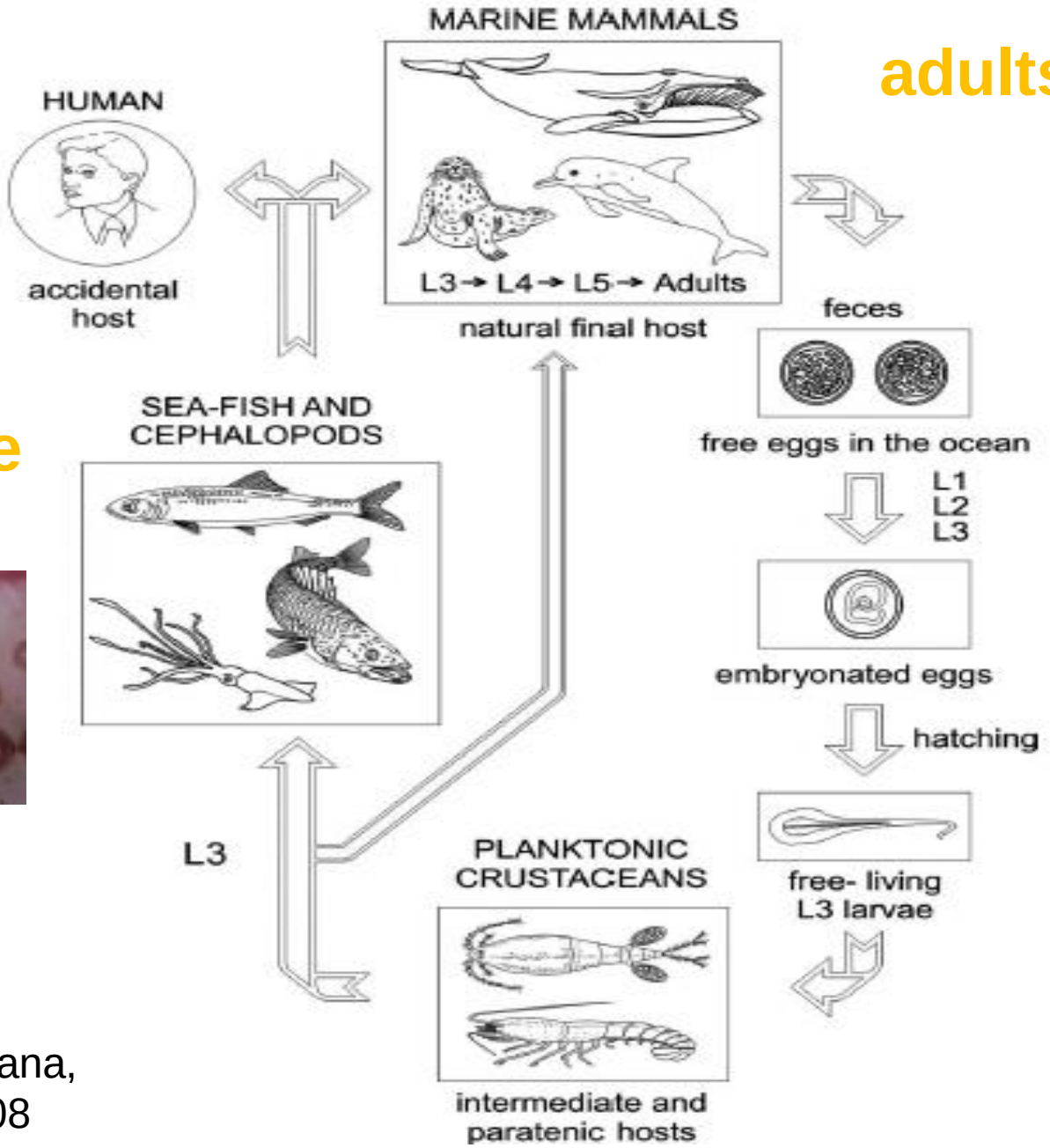
Anisakidosis: infestation by anisakids

Anisakiasis: infestation by *Anisakis*

adults

larvae





Cycle

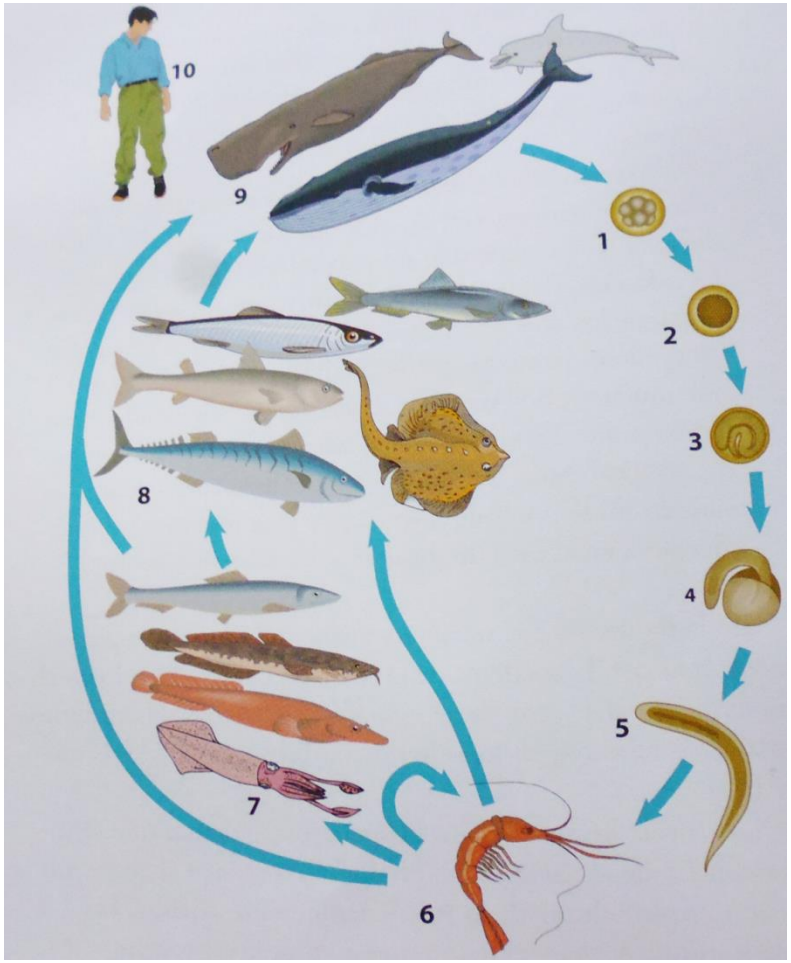
Source M.T.Audicana, M.W Kennedy,2008

MOST FREQUENT SPECIES INVOLVED IN HUMAN INFESTATIONS

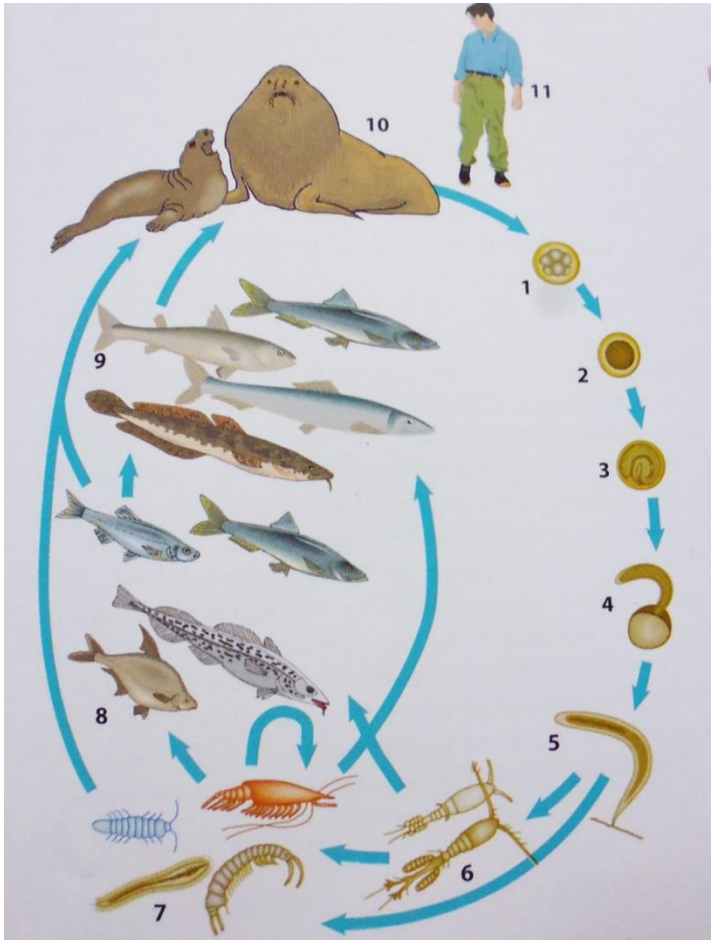
Anisakis sp

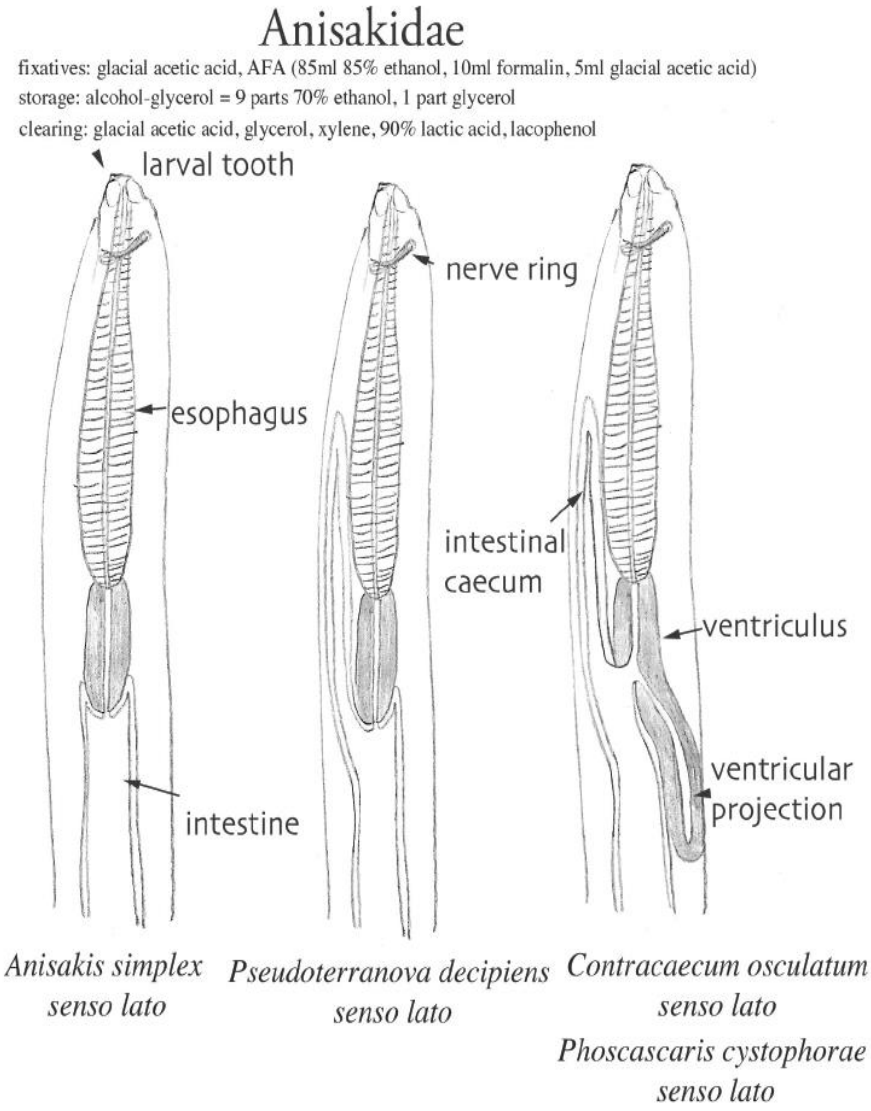
Pseudoterranova sp

Anisakis sp



Pseudoterranova sp





Diagnosis on microscopic criteria… but easier with PCR and sequencing…

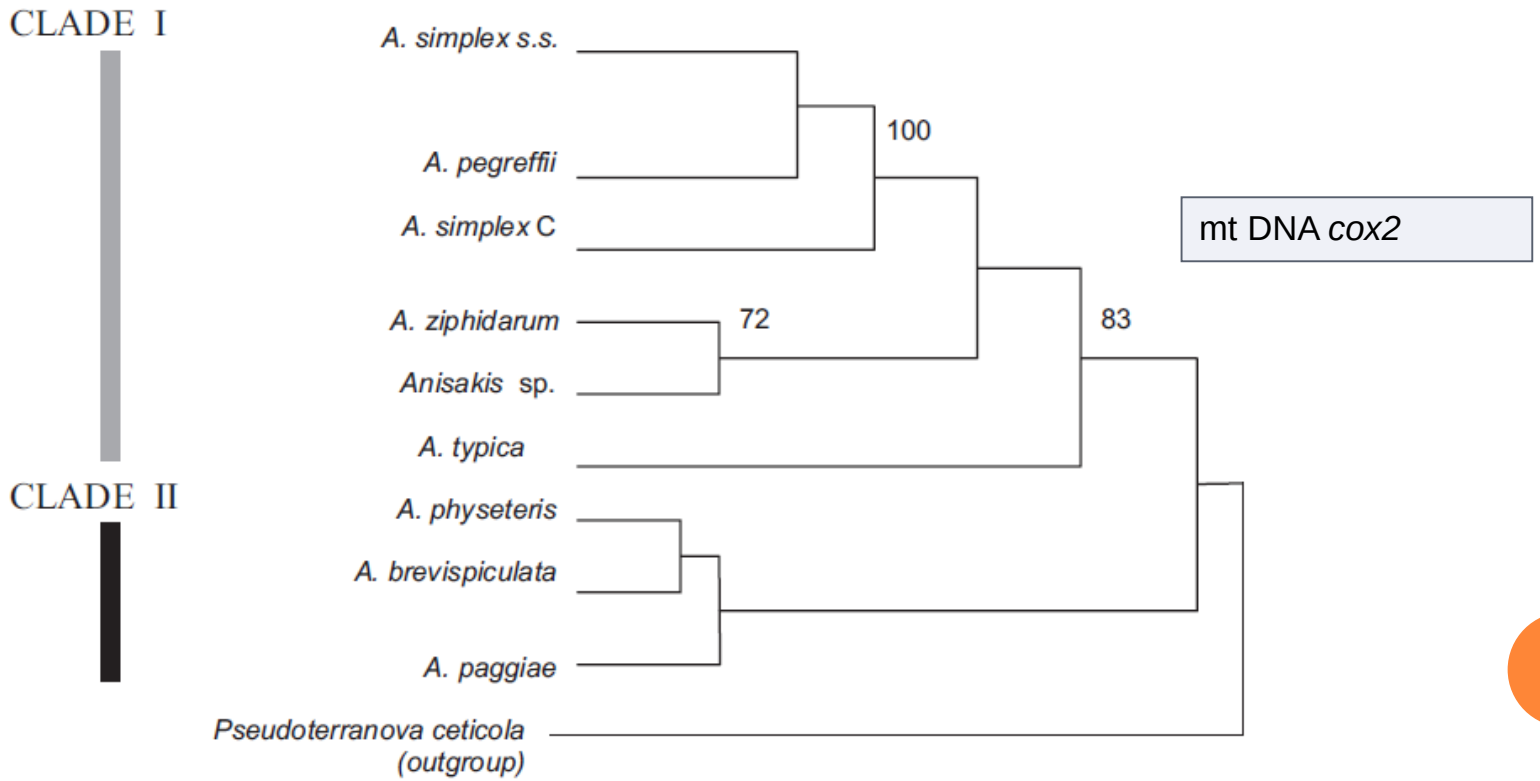
Dixon, 2006

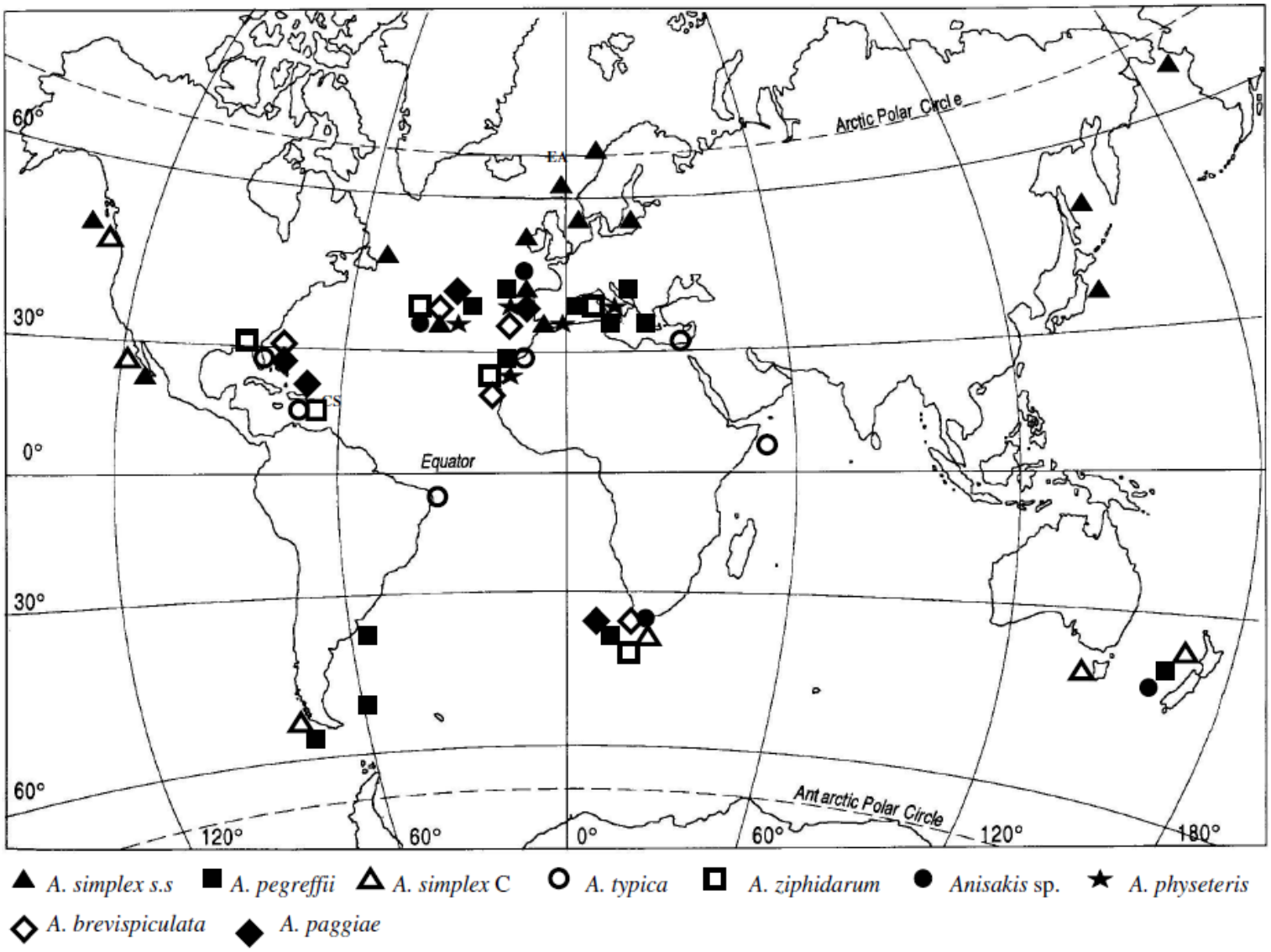
An Italian leading specialist: Simonetta Mattiucci

MOLECULAR SYSTEMATICS, PHYLOGENY AND ECOLOGY OF ANISAKID NEMATODES OF THE GENUS *ANISAKIS* DUJARDIN, 1845: AN UPDATE

MATTIUCCI S.* & NASCETTI G.**

Parasite. 2006;13:99-113.





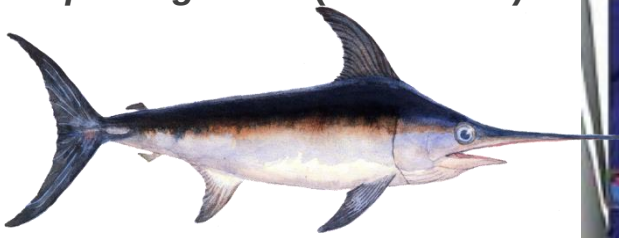
Parasite. 2006;13:99-113.

Different *Anisakis* species according to host and geographical location

A. ***Merluccius merluccius* (hake)**

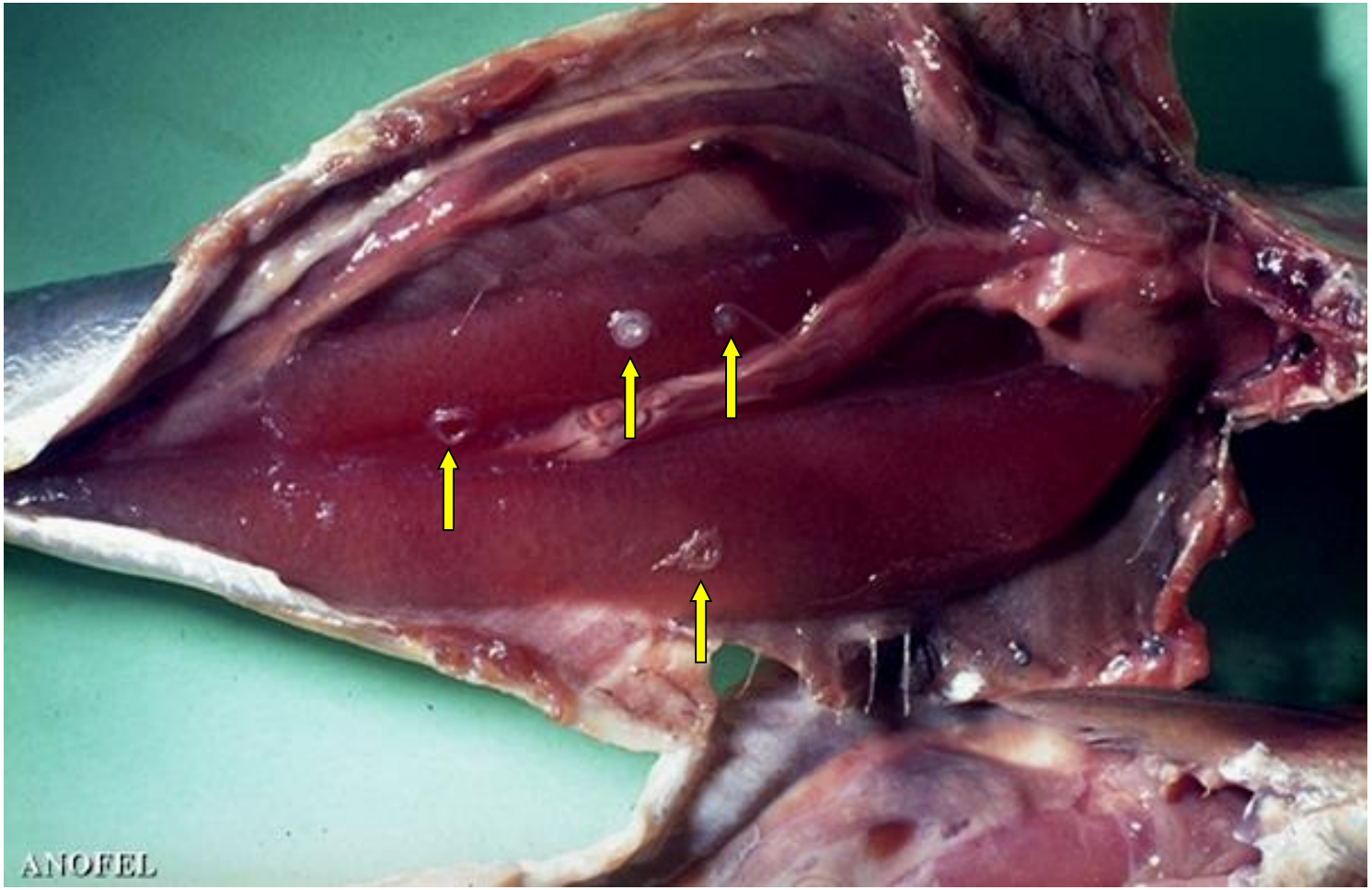
B. ***Trachurus trachurus*** **(Atlantic horse mackerel)**

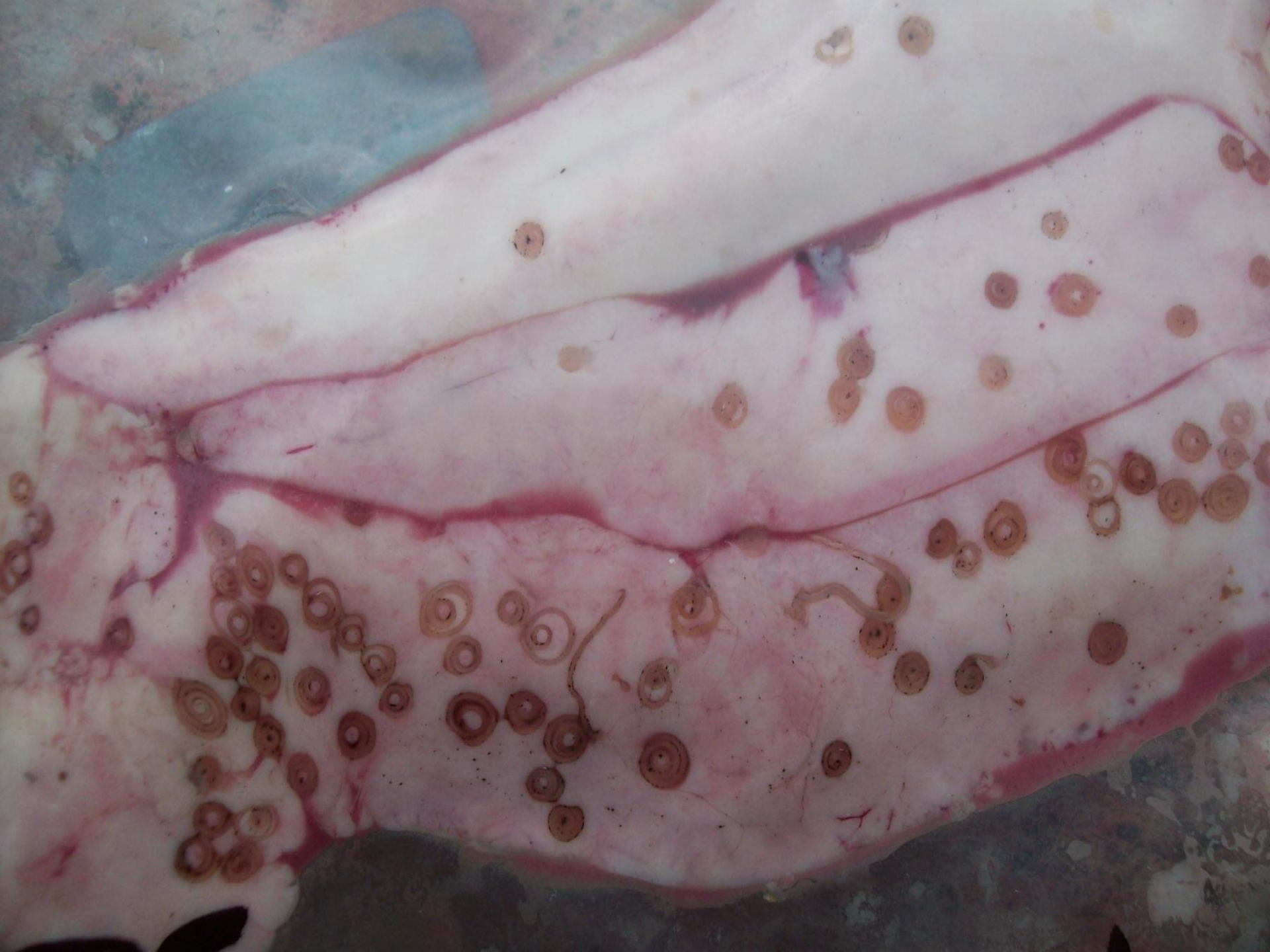
C. ***Xiphias gladius*** **(sword fish)**

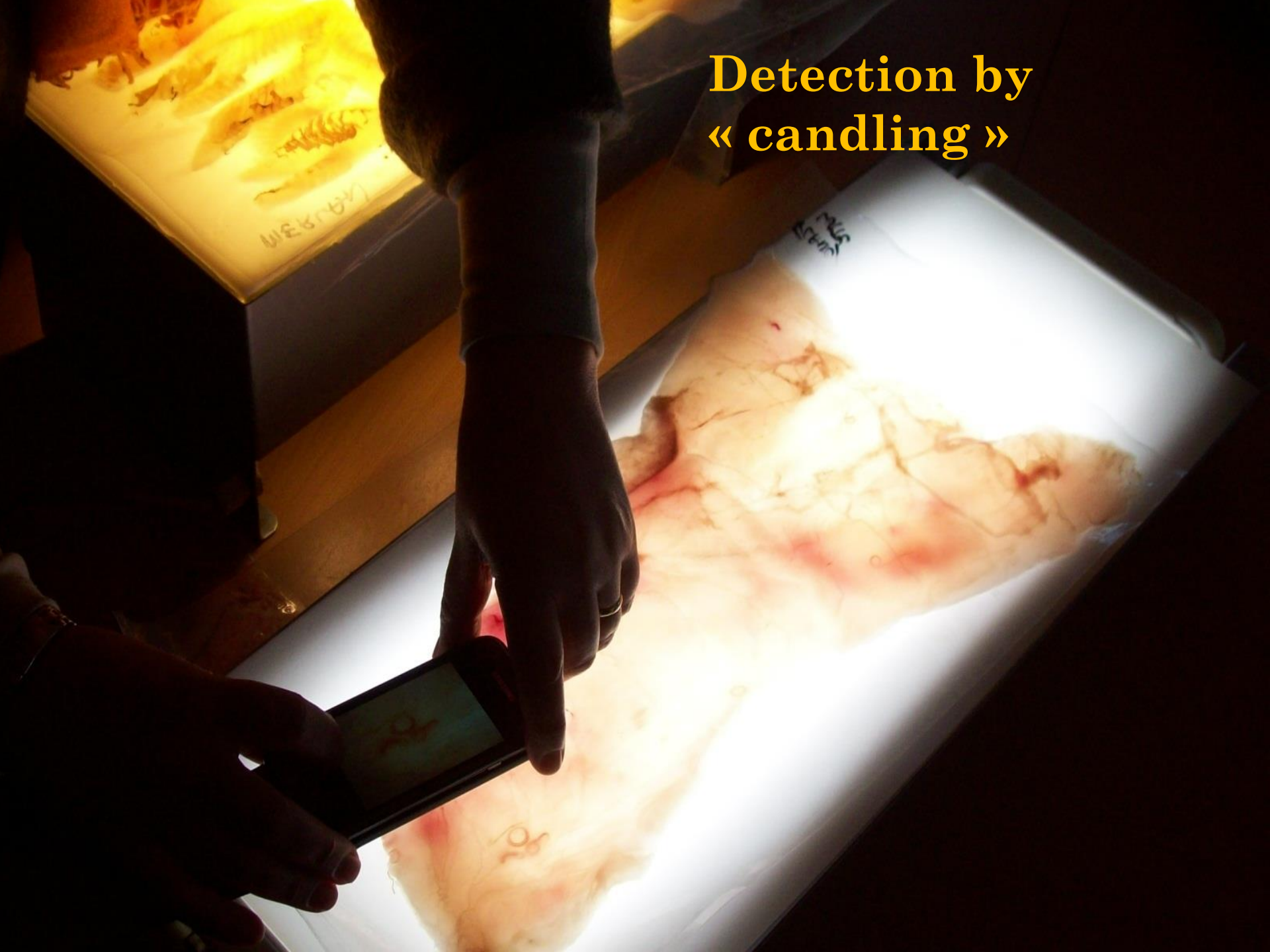


In:S.Mattiucci, G.Nascetti, Advances in Parasitology, 66.2008

Some examples of larvae in fish



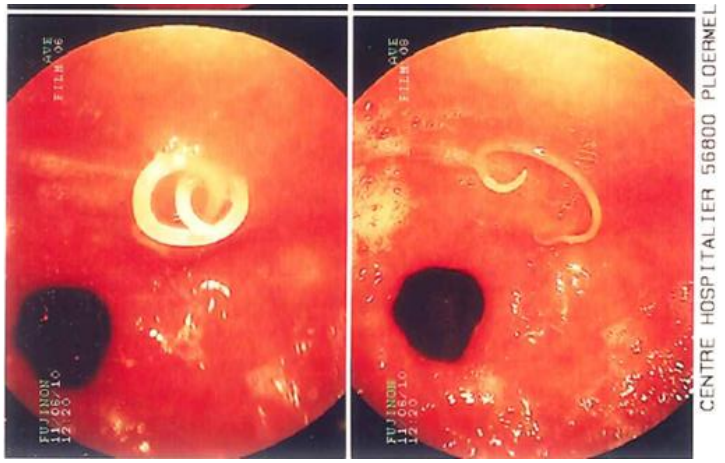



Detection by
« candling »

Anisakidosis : Acute symptoms

- Vomiting and worm expulsion

- Gastric ulcer-like symptoms



- Allergies
  - Urticaria,
  - Quincke oedema
  - Asthma
  - Intestinal oedema leading to obstruction

Thermoresistant allergens

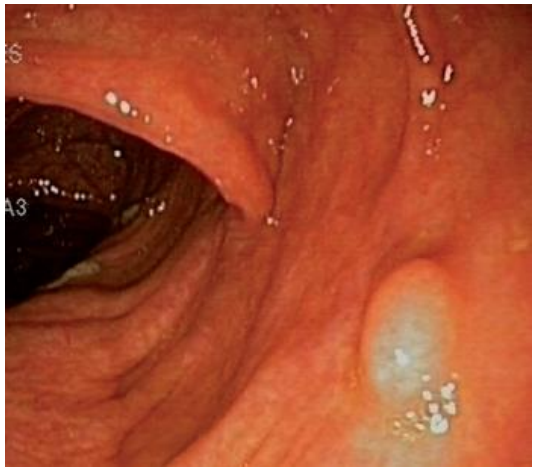
Figure 2. Results of patch testing with the *Anisakis* series in a positive patient: live (+++), frozen (++), cooked (-).

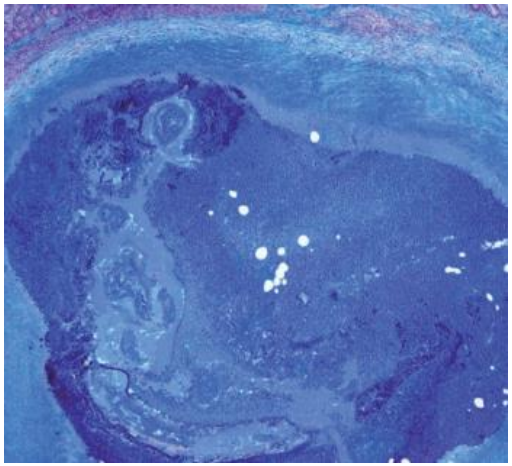
Ventura et al. *J Investig Allergol Clin Immunol* 2008; Vol. 18(4): 253-259

CHRONIC ANISAKIDOSIS

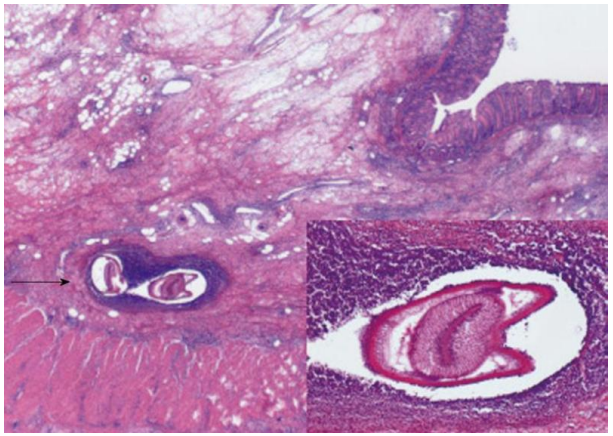
- **«intestinal tumor»**
  - Colon polyps
  - Intestinal obstruction

histology**: eosinophilic granuloma**





Herranz-Bachiller et al, 2012



Miura et al, 2010

A Co-Factor for digestive carcinomas ?

Anisakis simplex, a co-factor of gastric cancer?

SIR,—Dr Davis and colleagues (Aug 25, p 474) note that mortality from stomach cancer is still falling in nearly all the countries studied "although the oldest groups in Italy and Japan show some continuing increases". Japan has the highest national mortality rate from gastric cancer (52·3 per 100 000 in men in 1977), though the rate has been falling.[1] Gastric anisakiasis is also very common in Japan, with 11 232 cases in 1988.[2] A limited relation has been found between gastric cancer mortality[3] and the consumption of salted fish that could be the origin of contamination by *Anisakis simplex*. Desowitz,[4] in work on anisakiasis, found a low molecular weight fraction of extract with "tumour-promoter-like activity".

By serological diagnostic methods[5] we have detected ten subacute

These epidemiological, experimental, and histopathological data suggest that *A simplex* may be a co-factor for certain forms of gastric cancer—a hypothesis that can be tested by longitudinal studies, which take into account the long incubation period of cancers.

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95500 Gonesse, France,
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Aulnay-sous-Bois

J. C. PETITHORY
B. PAUGAM
P. BUYET-ROUSSET
A. PAUGAM

1. Nagayo T. Histogenesis and precursors of human gastric cancer. Berlin: Springer-Verlag, 1986
2. Asaishi K, Nishino C, Hayasaka H. Geographical distribution and epidemiology. In. [illegible]

Medicine®

OBSERVATIONAL STUDY

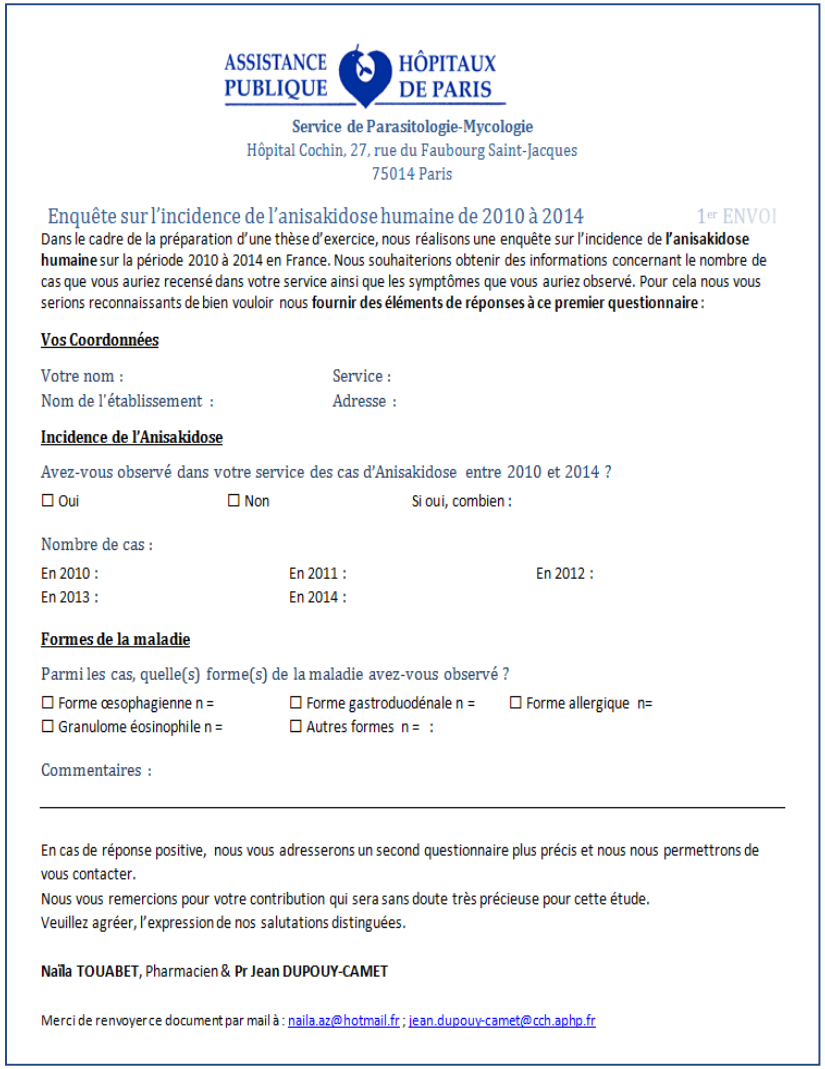
OPEN

Previous Exposure to the Fish Parasite *Anisakis* as a Potential Risk Factor for Gastric or Colon Adenocarcinoma

Juan Carlos Garcia-Perez, MD, PhD, Rosa Rodríguez-Perez, PhD, Araceli Ballestero, MD, Jaime Zuloaga, MD, PhD, Belen Fernandez-Puntero, PhD, Javier Arias-Díaz, MD, PhD, and María Luisa Caballero, PhD

SURVEY OF ANISAKIDOSIS IN FRANCE

- Retrospective survey over the years 2010 -2014
  - by collecting cases (questionnaire) among all Parasitology-Mycology laboratories of University hospitals of metropolitan France (ANOFEL network)
  - by analyzing data from the French hospital medical information database (PMSI).
  - ,
  - .



ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

Service de Parasitologie-Mycologie
Hôpital Cochin, 27, rue du Faubourg Saint-Jacques
75014 Paris

Enquête sur l'incidence de l'anisakidose humaine de 2010 à 2014 1er ENVOI

Dans le cadre de la préparation d'une thèse d'exercice, nous réalisons une enquête sur l'incidence de **l'anisakidose humaine** sur la période 2010 à 2014 en France. Nous souhaiterions obtenir des informations concernant le nombre de cas que vous auriez recensé dans votre service ainsi que les symptômes que vous auriez observé. Pour cela nous vous serions reconnaissants de bien vouloir nous **fournir des éléments de réponses à ce premier questionnaire** :

Vos Coordonnées

Votre nom : Service :
Nom de l'établissement : Adresse :

Incidence de l'Anisakidose

Avez-vous observé dans votre service des cas d'Anisakidose entre 2010 et 2014 ?

☐ Oui ☐ Non Si oui, combien :

Nombre de cas :

En 2010 : En 2011 : En 2012 :
En 2013 : En 2014 :

Formes de la maladie

Parmi les cas, quelle(s) forme(s) de la maladie avez-vous observé ?

☐ Forme œsophagienne n = ☐ Forme gastroduodénale n = ☐ Forme allergique n=
☐ Granulome éosinophile n = ☐ Autres formes n = :

Commentaires :

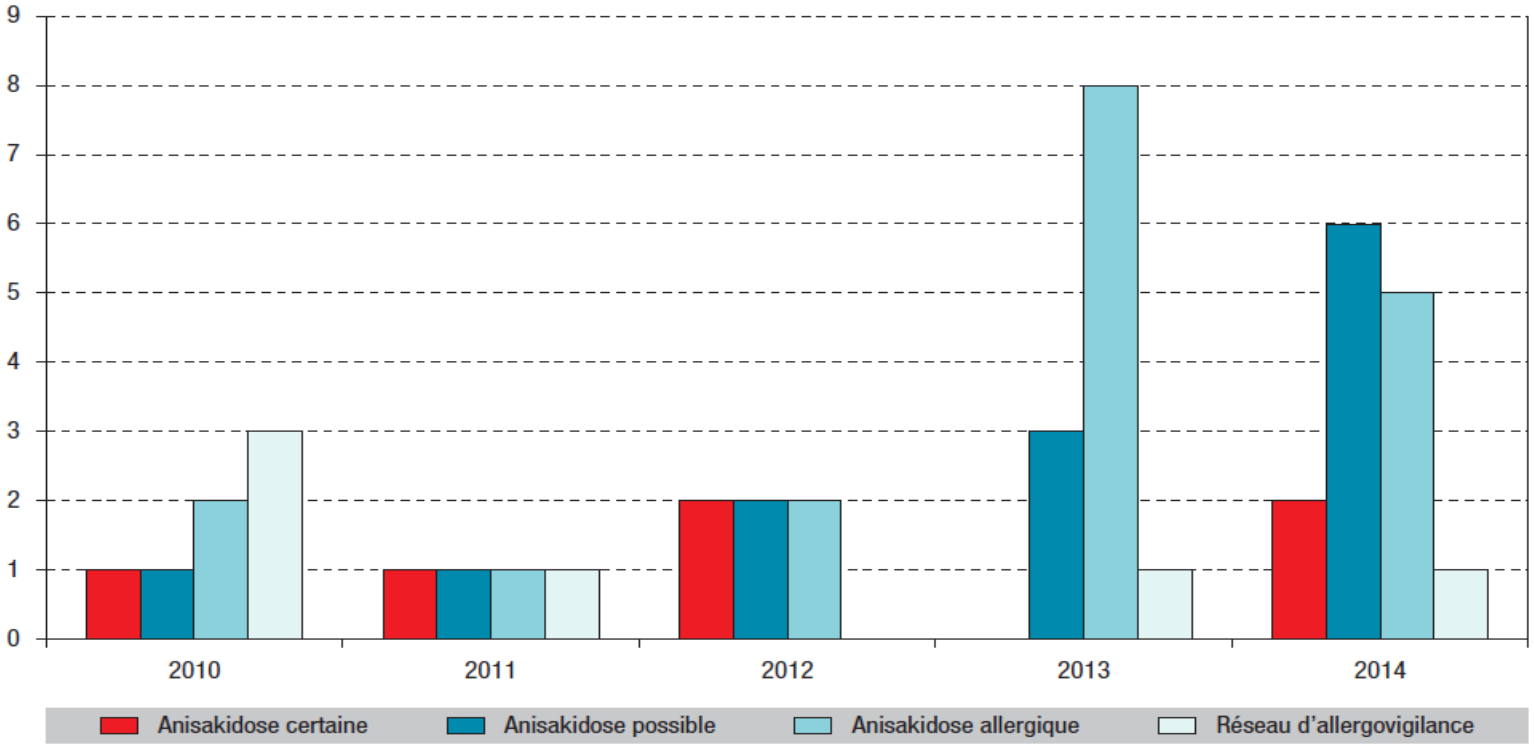
En cas de réponse positive, nous vous adresserons un second questionnaire plus précis et nous nous permettrons de vous contacter.
Nous vous remercions pour votre contribution qui sera sans doute très précieuse pour cette étude.
Veuillez agréer, l'expression de nos salutations distinguées.

Naïla TOUABET, Pharmacien & **Pr Jean DUPOUY-CAMET**

Merci de renvoyer ce document par mail à : naila.az@hotmail.fr ; jean.dupouy-camet@cch.aphp.fr

- 37 cases notified by all French Departments of Parasitology:
  - Age range: 11-69 years
  - Females predominance (25/12, 67 %)

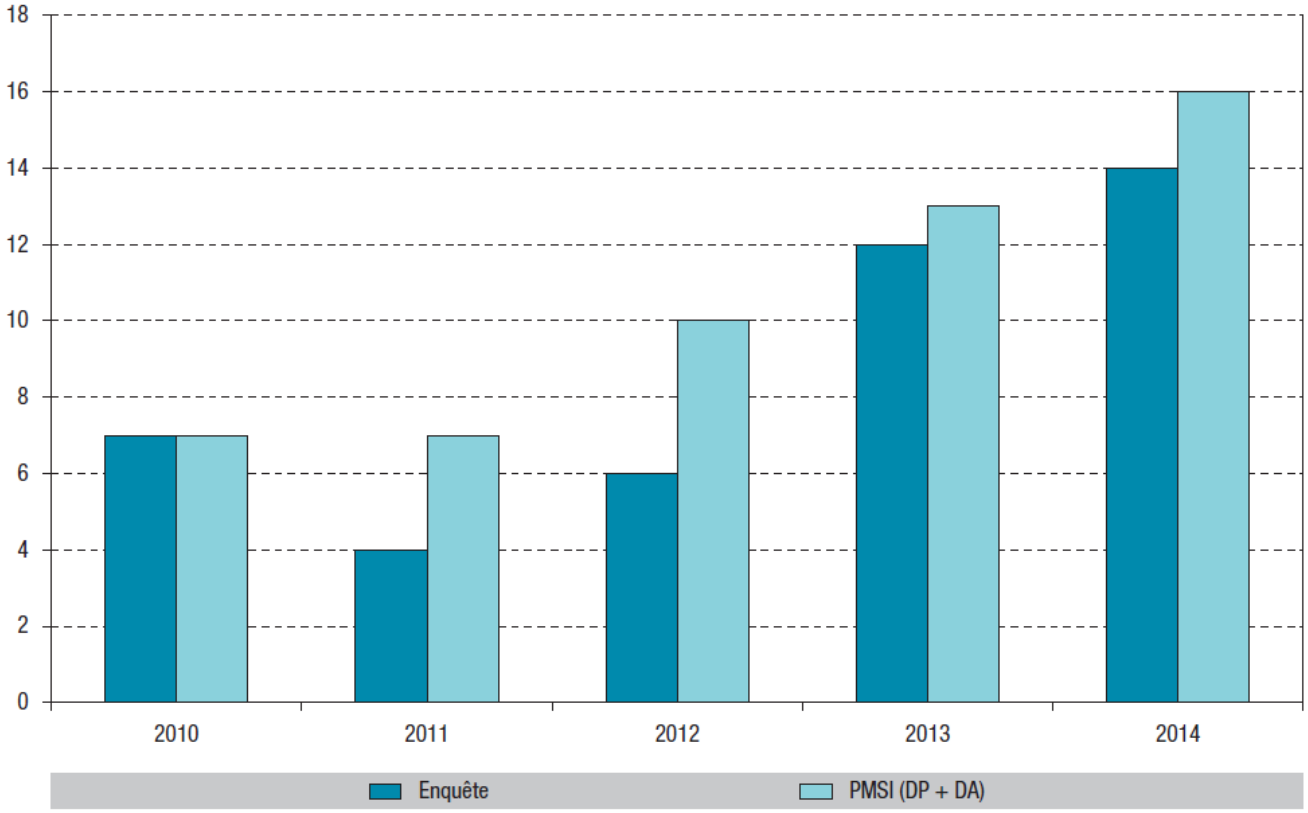
Nombre de cas d'anisakidose (certains, possibles ou allergiques) identifiés dans le réseau Anofel et nombre de cas d'anaphylaxie grave dus aux anisakidés repérés dans le réseau d'allergovigilance (RAV) en France métropolitaine, 2010-2014



- **6 proven cases** with evidence of a worm,
- **13 possible cases** with abdominal pain after consumption of raw fish with detection of anti-*Anisakis* precipitins
- **18 allergic cases** defined as acute manifestations after consumption of fish associated with specific IgE for *Anisakis*

- Analysis of the PMSI database identified 43 hospitalized cases (anisakidosis reported as main or associated diagnosis)
  - Median age: 51 years (8-81)
  - Female predominance (62%)

Nombre total de cas d'anisakidose (réseau Anofel et réseau d'allergovigilance, RAV) identifiés entre 2010 et 2014 en France métropolitaine comparés aux cas identifiés par le PMSI



DP=diagnostic principal ; DA=diagnostic associé.

PMSI data base

Parasitol dpt survey

atih
AGENCE TECHNIQUE DE L'INFORMATION SUR L'HOSPITALISATION

- The female predominance of anisakidosis could be due to a higher preference for sushi.
- This preference was demonstrated in Japanese but not in French women.
- Women could be more implicated in preparing raw fish recipes at home than men.

.

- Compared with a previous survey performed in France 25 years ago (Hubert et al., 1989), this study indicates:

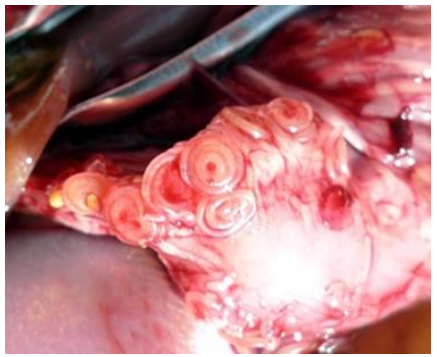
  - a decrease of clinical cases of anisakidosis

0.23 cases/months in 2014 vs 0.63 in 1987

  - the emerging allergic potential of anisakids whose importance for public health in France should be better evaluated.

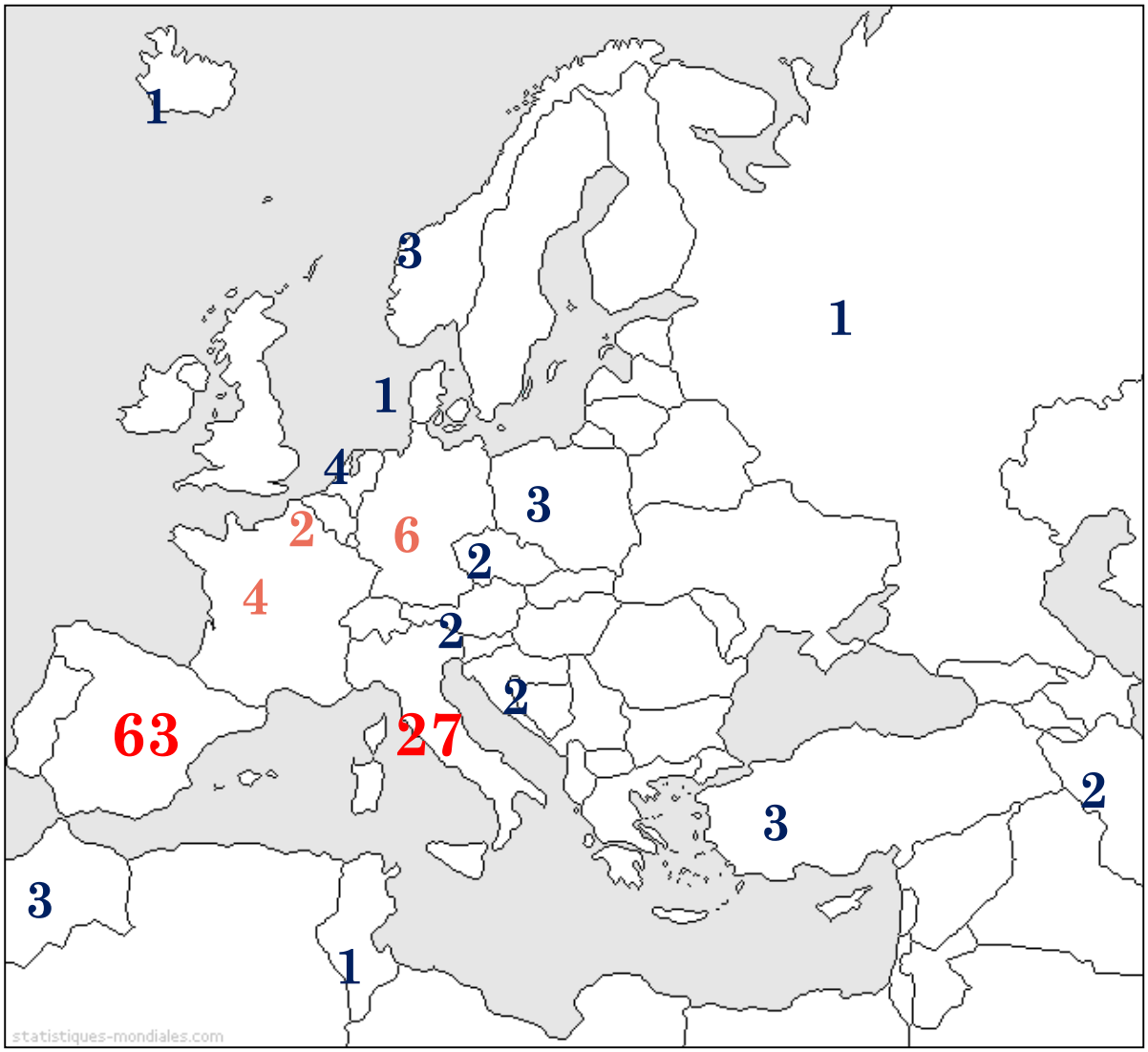
- Data from the French hospital medical information database reliable information about the incidence of anisakidosis

- The unfrequent human cases contrast with the high prevalence of anisakids in fish. This could be explained by :
  - EU regulation advising to cook or deep freeze fish
  - Spontaneous elimination of anisakids by humans
  - Elimination of parasites by professionals when preparing filets



Papers devoted to anisakiasis in Europe

- **Key words Medline**: « country, anisakiasis, human», past 10 years



STUDIES IN TURKEY ?

- Data in Fish

- No Data in humans (to my knowledge)

Gökçeada Kıyı Sularındaki Balıkların Parazitik Nematodları

Parasitic Nematodes of Fish in the Coastal Waters of Gökçeada

Ahmet Akmırza

İstanbul Üniversitesi Su Ürünleri Fakültesi, Yetiştiricilik ve Hastalıklar, İstanbul, Türkiye

Turkiye Parazitol Derg
2013; 37: 199-202

Tablo 1. Nematod türleri, bulunduğu konakçılar ve enfeksiyon değerleri

Parazit türü	Konakçı	İBS	PBS	TPS	P %	Ortalama yoğunluk	Min-max
Anisakis simplex	*Merluccius merluccius*	9	7	92	77,78	13,14	4-23
	Alosa fallax	6	2	5	33,3	2,5	2-3
	Serranus hepatus	4	1	5	25	5	5
	Zeus faber	1	1	>100	100	>100	>100
	Scomber japoniscus	71	6		8,45		2- >50
	Uranoscopus scaber	29	4	21	13,79	5,25	2-11
	Sphyraena sphyraena	12	5	14	41,67	2,8	1-6
	Trachurus mediterraneus	28	1	5	3,57	5	5
	Conger conger	26	4	14	15,38	3,5	1-6
	Pomatomus saltator	3	1	2	33,33	2	2
	Mullus surmeletus	46	1	2	2,17	2	2

Veterinary Parasitology 201 (2014) 82–94

Contents lists available at ScienceDirect

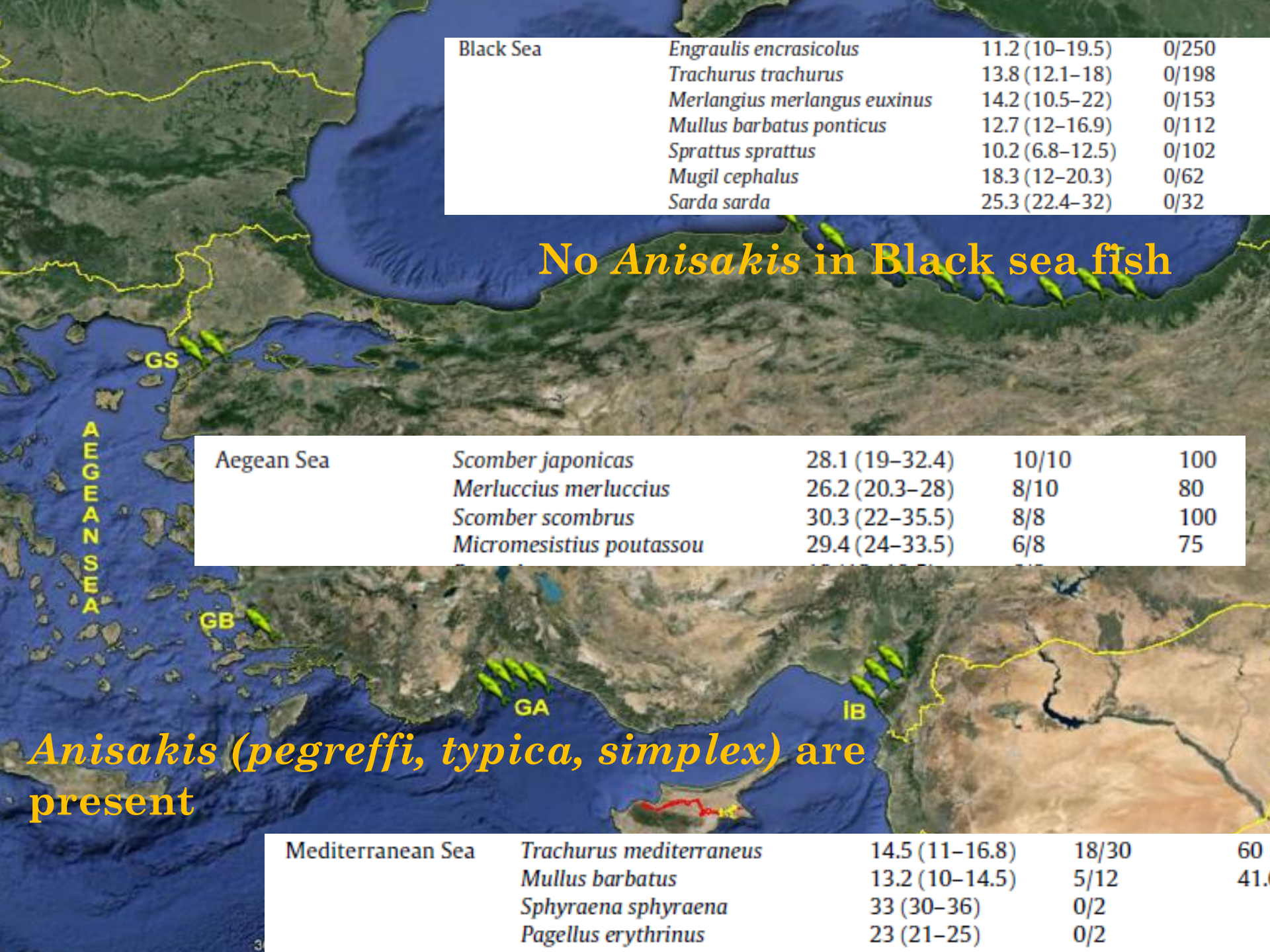
Veterinary Parasitology

journal homepage: www.elsevier.com/locate/vetpar

Molecular identification of Anisakis species (Nematoda: Anisakidae) from marine fishes collected in Turkish waters

Gokmen Zafer Pekmezci[a,*], Ertan Emek Onuk[a], Cenk Soner Bolukbas[b], Banu Yardimci[a], Ali Tumay Gurler[b], Mustafa Acici[b], Sinasi Umur[b]

[a] *Department of Aquatic Animal Diseases, Faculty of Veterinary Medicine, Ondokuz Mayis University, Samsun 55139, Turkey*
[b] *Department of Parasitology, Faculty of Veterinary Medicine, Ondokuz Mayis University, Samsun 55139, Turkey*



Black Sea	*Engraulis encrasicolus*	11.2 (10–19.5)	0/250	
	Trachurus trachurus	13.8 (12.1–18)	0/198	
	Merlangius merlangus euxinus	14.2 (10.5–22)	0/153	
	Mullus barbatus ponticus	12.7 (12–16.9)	0/112	
	Sprattus sprattus	10.2 (6.8–12.5)	0/102	
	Mugil cephalus	18.3 (12–20.3)	0/62	
	Sarda sarda	25.3 (22.4–32)	0/32	

No *Anisakis* in Black sea fish

Aegean Sea	*Scomber japonicas*	28.1 (19–32.4)	10/10	100
	Merluccius merluccius	26.2 (20.3–28)	8/10	80
	Scomber scombrus	30.3 (22–35.5)	8/8	100
	Micromesistius poutassou	29.4 (24–33.5)	6/8	75

***Anisakis (pegreffi, typica, simplex)* are present**

Mediterranean Sea	*Trachurus mediterraneus*	14.5 (11–16.8)	18/30	60
	Mullus barbatus	13.2 (10–14.5)	5/12	41.
	Sphyraena sphyraena	33 (30–36)	0/2	
	Pagellus erythrinus	23 (21–25)	0/2	

CONCLUSIONS

- Emergence of allergy to anisakids reported in numerous international studies
- Anisakidosis is a health problem in Mediterranean countries such as Spain and Italy
- Anisakidosis should be evaluated in Turkey as recent papers have shown the presence of anisakids in fish consumed in this country.


Many thanks !
Pompeï, Naples Museum