A systematic review on *Eustrongylides* spp. in fish species: preliminary results

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INTRODUCTION

- Consumption of **raw fish dishes** may favour **fish-borne zoonoses**
- ***Eustrongylides* spp. (Dioctophymatidae) nematodes** have an **indirect life cycle** in freshwater environments (Fig. 1), with several **fish species** as **second intermediate or paratenic hosts**, and a wide geographical distribution [1]
- A **few human cases** were described, in the USA and South Sudan [2]

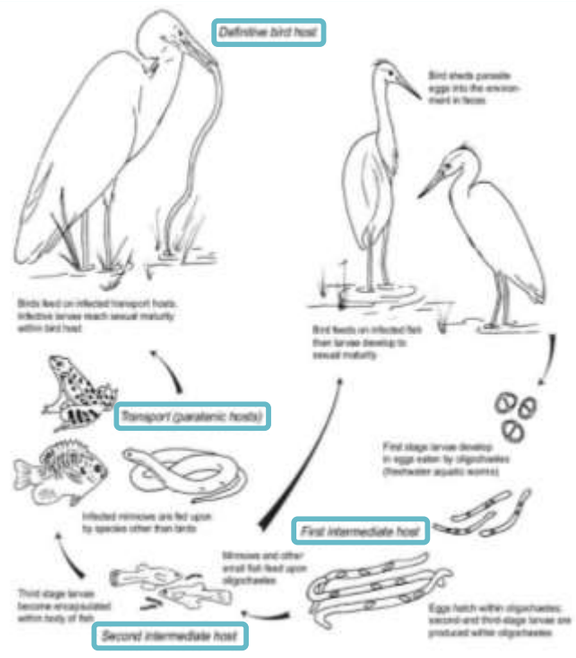

Fig. 1 *Eustrongylides* sp. life cycle

AIM

To perform a systematic review on the **epidemiology of *Eustrongylides* spp. in freshwater fish species globally**

MATERIALS AND METHODS

- **Bibliographic search** on 3 scientific databases
- Keywords "Eustrongylides AND fish", 2015-2020 as timeframe
- **Inclusion criteria** registered in an Excel file:
  - investigated fish species/genus
  - sampling site (at least country)
  - number of examined specimens
  - number of positive specimens/prevalence (P)
- **Additional recorded data**: parasite detection and identification method; mean intensity; larval location (viscera or muscle)

RESULTS

- 686 scientific papers (SPs) initially retrieved, **61 SPs reviewed**
- Most of the studies conducted in Brazil, followed by Iran and USA, Italy, Turkey, Nigeria, Ethiopia and Eastern EU countries (Fig. 2)
- 101 fish species and 6 genera investigated
- **67 different species and one genus positive for *Eustrongylides* sp.**
- **Prevalence values (P)** ranged from **0.13% to 100%**
- Visceral location predominant, but **larvae in the muscle reported by ~30% of the SPs**
- **Molecular tools used only in 4 SPs (6.6%)**
- **Ten most investigated species** (each targeted in ≥3 SPs): *Atherina boyeri, Cyprinus carpio, Esox lucius, Hoplias malabaricus, Micropterus salmoides, Oreochromis niloticus, Perca fluviatilis, Rutilus rutilus, Sander lucioperca* and *Silurus glanis.*
- **Predator species showed very high P** (85-100%), while lower P rates were reported for non-predators
- *C. carpio* always negative
- **Reports** also occurred in several commercial freshwater species in **Central and Northern Italy**

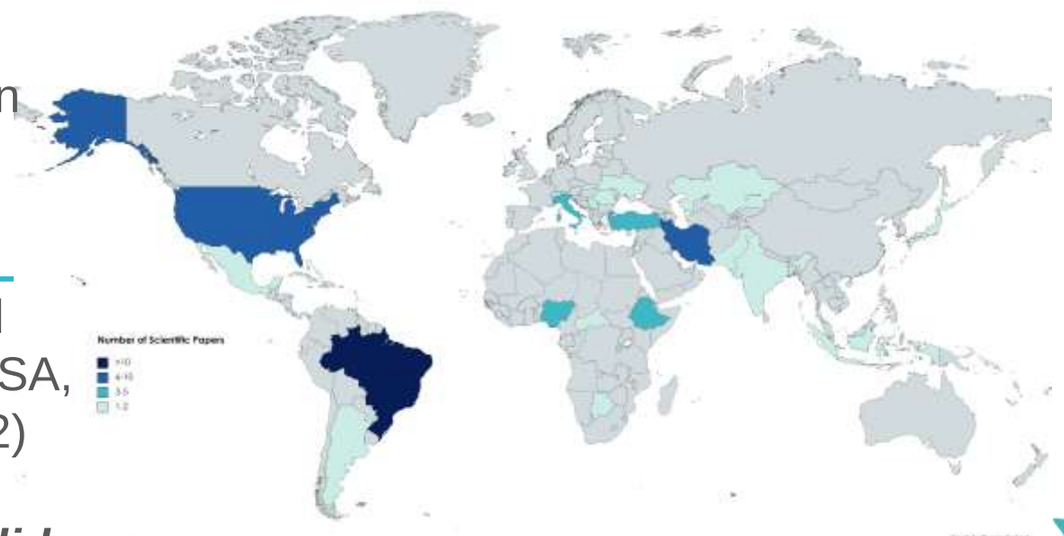

Fig. 2 Geographical distribution of the SPs

CONCLUSIONS

- **Rising prevalence rates** in some areas (Danube basin and the Caspian Sea), possibly due to **climate and anthropogenic changes** [3,4]
- Current **poor molecular characterization** of the genus
- Need to better understand **consumers' health risks** and **impact on seafood quality**, also considering the macroscopic aspect (Fig. 3)

Fig. 3 Macroscopic aspect of *Eustrongylides* sp.

REFERENCES
[1] Xiong et al., 2009 J. Parasitol. 99: 137–144; [2] Heberard & Ruiz-Tiben, 2014 Am. J. Trop. Med. Hyg. 90: 315–317; [3] Urdes et al., 2015 Agric. Agri. Sci. Procedia 6: 277-280; [4] Fallah et al., 2015 J. Parasitic Dis., 39: 245-248

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