



Coordination to Support Fisheries Management in the  
Western and Central Mediterranean. CopeMed Phase II



## **TRAINING COURSE ON ICHTHYOPLANKTON**

**Introduction to ichthyoplankton research and its application  
in ecology and fisheries studies**

by

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Fuengirola (Málaga), Spain  
22-26 February 2016  
Spanish Institute of Oceanography (IEO)



Coordination to Support Fisheries Management in the Western and Central  
Mediterranean. CopeMed Phase II



IEO Fish Larval Ecology Group



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## **What is ichthyoplankton?**

**It is the plankton fraction corresponding to fish eggs and larvae subject to the mercy of currents and drifts of the circulation pattern in a given area**

### **Why research on ichthyoplankton?**

- **Concerns acquiring basic knowledge towards understanding the functioning of a pelagic ecosystem**
- **Essential knowledge in implementing ecosystem based approach to fisheries**
- **Provides important knowledge on fisheries assessment, as:**
  - **Spatial delimitation of the spawning grounds of commercial fish**
  - **Spawning seasonality**
  - **Both necessary for recommending seasonal/spatial closures to fisheries administration**
  - **Ichthyoplankton based methods for estimating pelagic resources**
    - ❖ **Daily Egg Production Method (DEPM) (small pelagics)**
    - ❖ **Larval Index Method (bluefin tuna)**
- **Defining larval fish assemblages and its relationships with hydrographic circulation patterns**

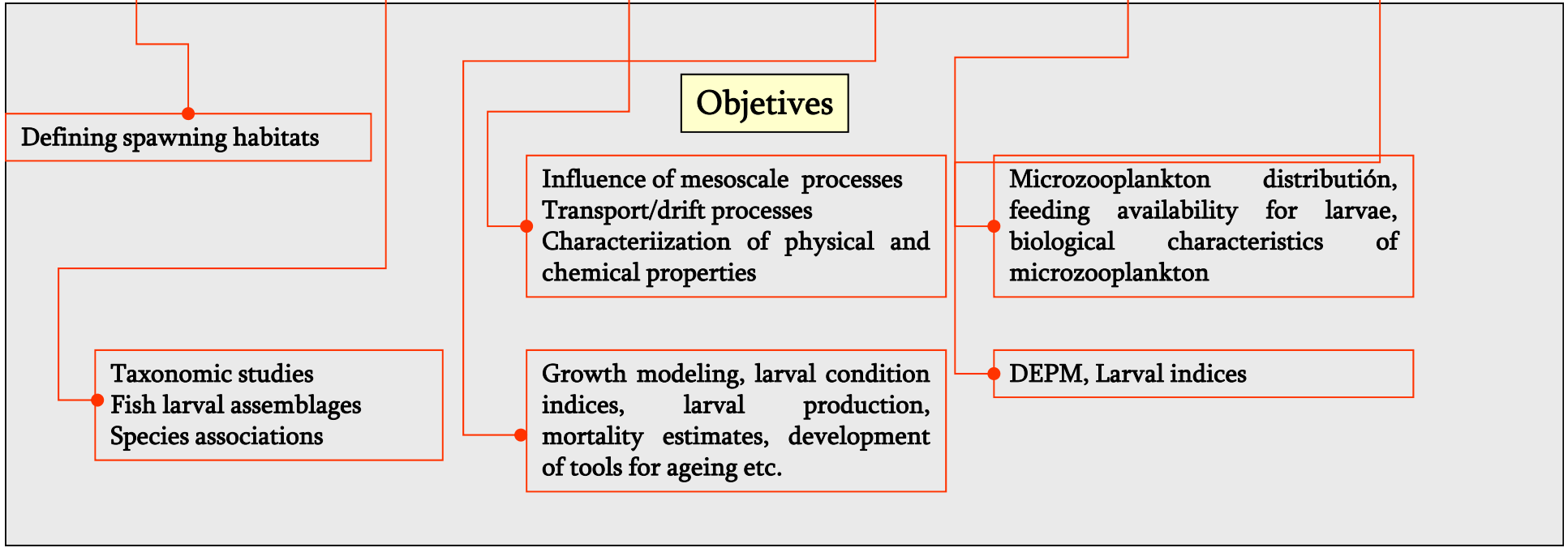
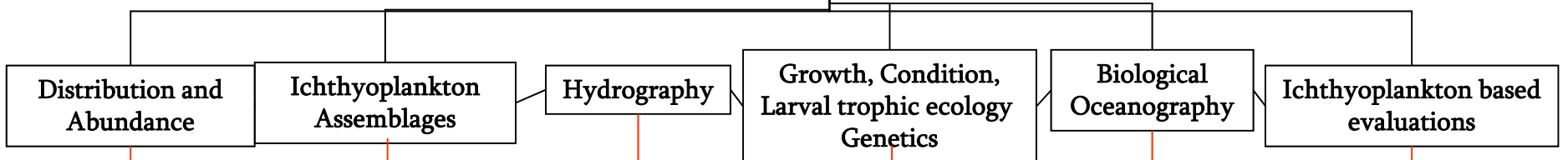
**But above all, ichthyoplankton research implies multidisciplinary approaches.**

**Advances in research is product of TEAM WORK..., by creating network of researchers interested in acquiring a BROADER standpoint in defining and understanding the habitat of spawning ecosystems**

**And hopefully, by creating ichthyoplankton experts network**

Proyectos on Small and Large Pelagic species

RESEARCH GROUP  
LARVAL FISH ECOLOGY



MODELING

## Ichthyoplankton related fields of research:

### Larval growth

➤ Most species comply with the growth-mortality hypothesis (Anderson, 1998) that relates larval survival with fast growth by 3 mechanistic ways

- ✓ Stage-duration during larval ontogeny
- ✓ Bigger is better
- ✓ Growth rates

✓ Therefore, if fast growth relates to survival, it further relates to RECRUITMENT, and thereby, useful for fisheries advice

### Larval trophic ecology

➤ Larval survival is also intimately related to feeding availability in the larval habitat

**THESE FIELDS OF RESEARCH CAN HELP UNDERSTANDING RECRUITMENT SUCCESS/FAILURES**

**ENVIRONMENTAL DRIVERS**

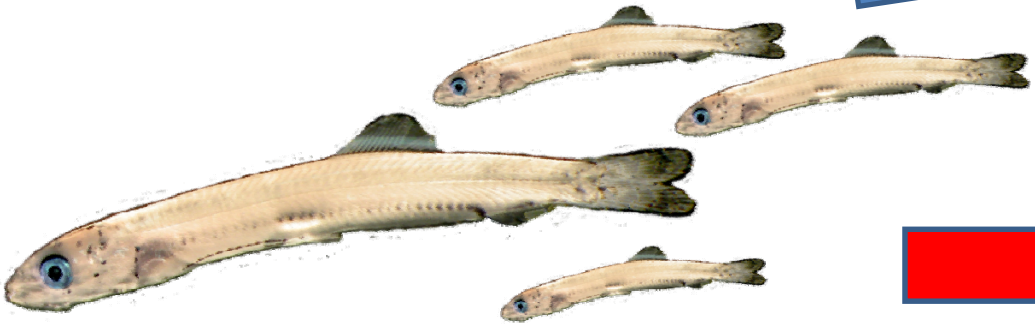
**MATERNAL EFFECTS**

**TEMPERATURE**

**FOOD AVAILABILITY**

**GROWTH**

**RECRUITMENT**



**TOOLS NEEDED FOR ASSESSING GROWTH AND TROPHIC CONDITION**

10 day old larval bluefin



Showing growth large differences by weight and size  
that can cause important consequences on  
recruitment

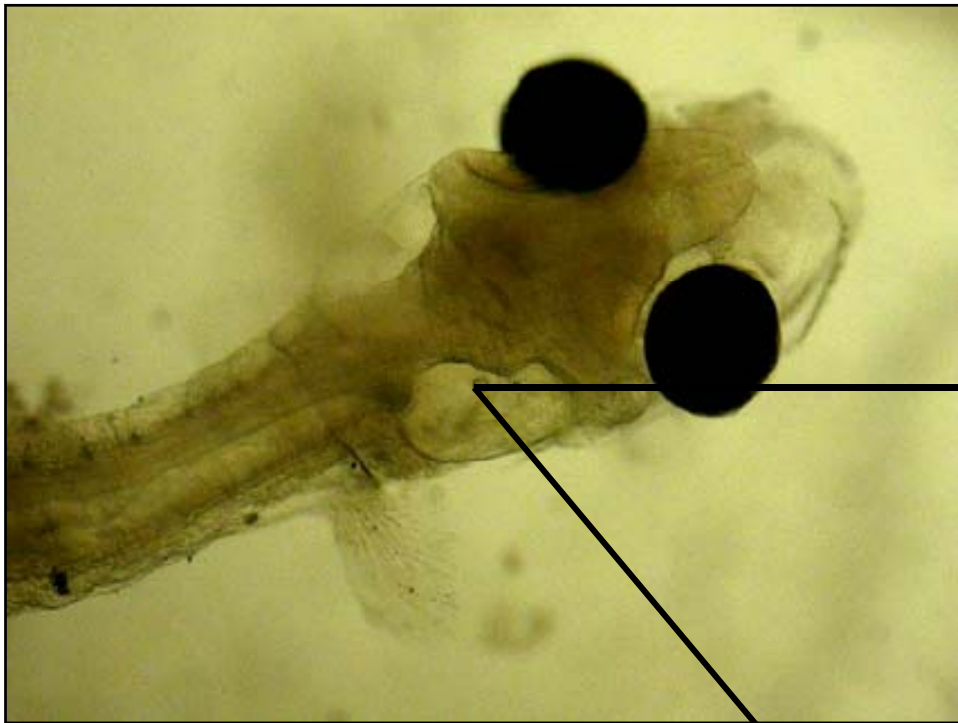


# Otolith

## ➤ Larval otoliths

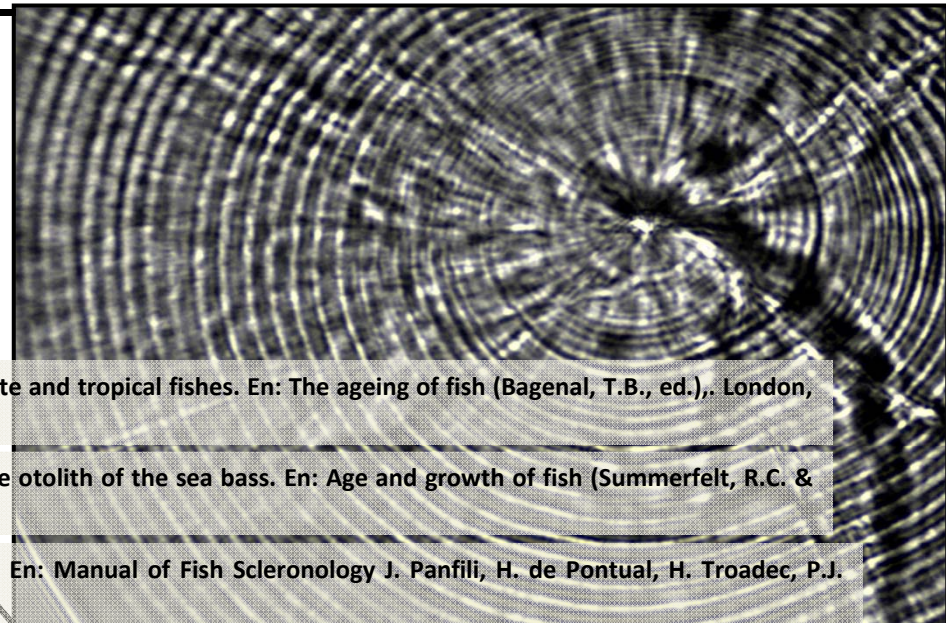
❑ Subject to continuous processes of growth

❑ Growth is expressed as the daily deposition of rings or increments (Pannella (1971). In sardines and anchovies, increments are accreted daily.



❑ Increments are deposited daily (otholin) and calcium carbonate (Morales-Nin, 1987).

❑ these act as auditive organs, perceiving noises and have the function of equilibrium (Wright y col., 2002)



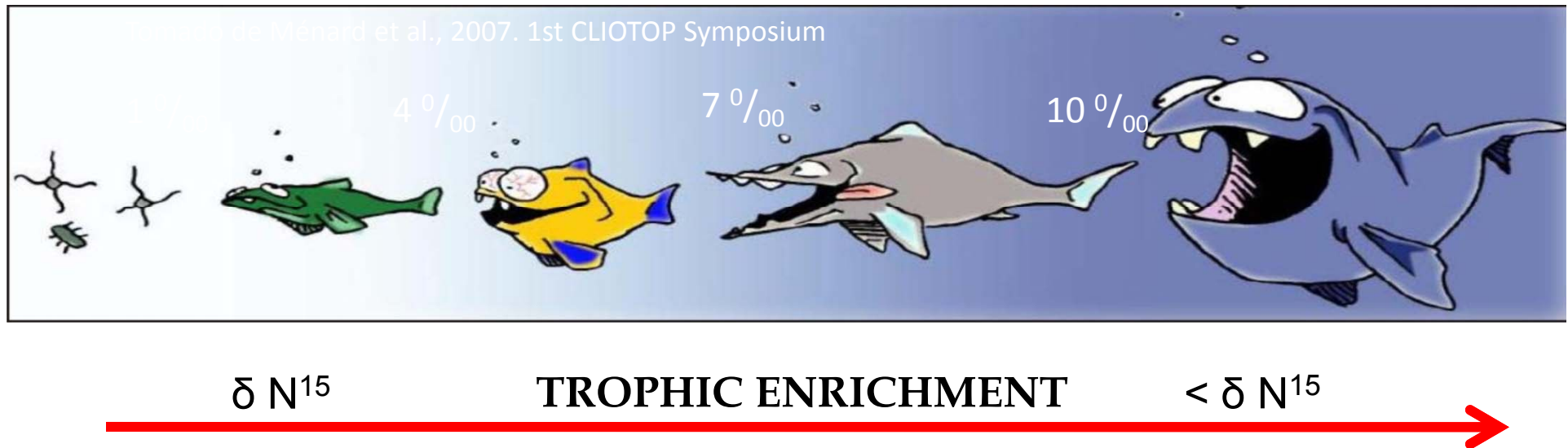
Pannella, G. (1974). Otoliths growth patterns: an aid in age determination in temperate and tropical fishes. En: *The ageing of fish* (Bagenal, T.B., ed.), London, UK: Unwin Brothers Ltd. pp. 28-39

Morales-Nin, B. (1987). Ultrastructure of the organic and inorganic constituents of the otolith of the sea bass. En: *Age and growth of fish* (Summerfelt, R.C. & Hall, G.E., ed.), pp. 331-343. Ames, Iowa, USA: Iowa State University Press. pp. 28-39

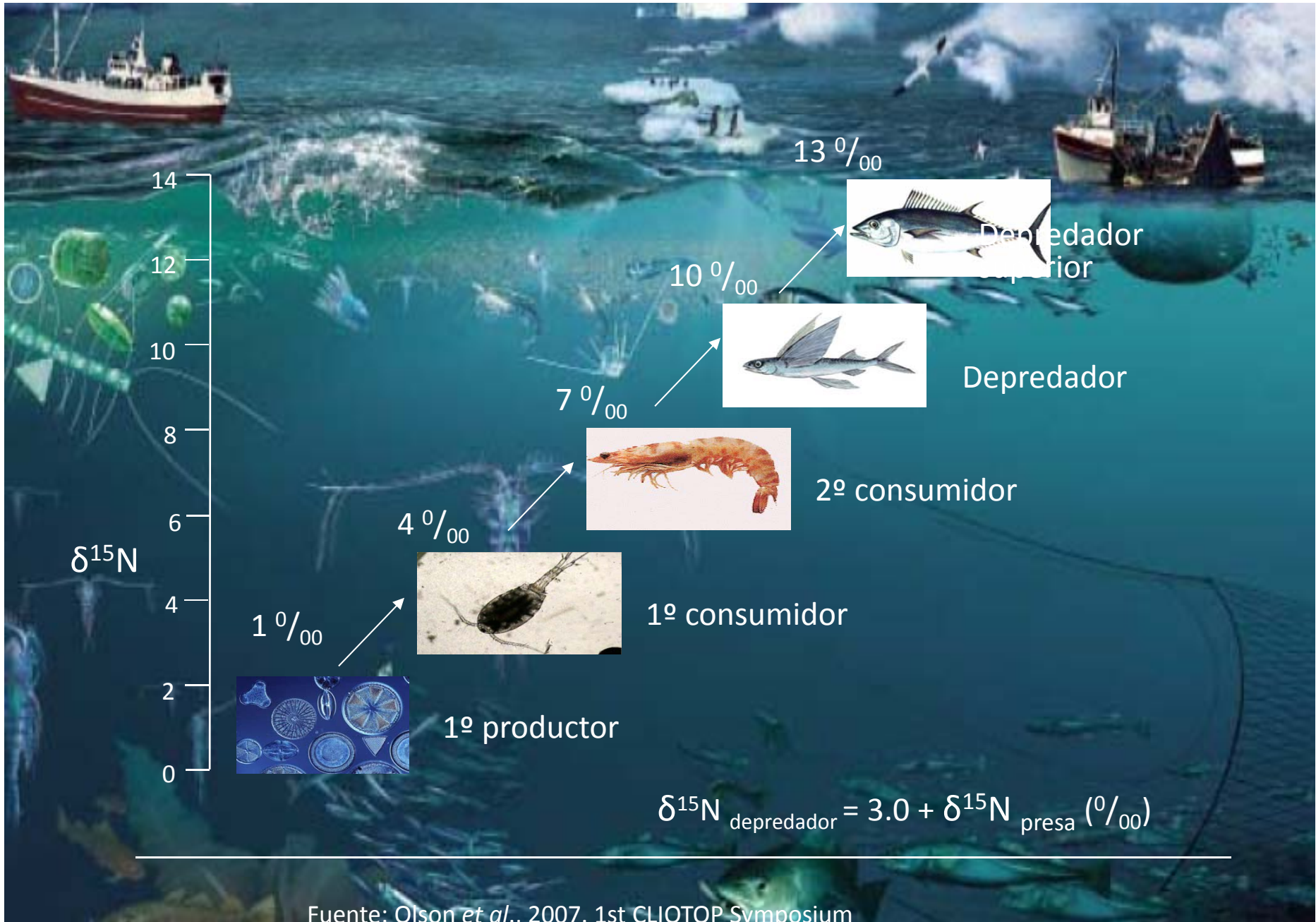
Wright Panfili, B. Morales-Nin y A.J. Geffen 2002. Otoliths: description and function. En: *Manual of Fish Sclerology* J. Panfili, H. de Pontual, H. Troadec, P.J. Wright (eds.). IFREMER

# STABLE ISOTOPE RESEARCH

The heavy isotope of nitrogen  $\delta N^{15}$  of a consumer is greater than its diet and this difference is trophic enrichment



$\delta N^{15}$  is an indicator of the trophic position of a consumer in the trophic web



Fuente: Olson *et al.*, 2007. 1st CLIoTOP Symposium

**THANKS FOR YOUR ATTENTION**

