



# Workshop on Age Reading Of Chub Mackerel (*Scomber colias*) [WKARCM]

ICES

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## Summary of the different techniques of chub mackerel otoliths preparation by laboratory

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# Institutions participants



Murcia

Canaria Islands

Santander

Area

Central Southern Tyrrhenian Sea, Southern Adriatic Sea

Western Mediterranean

Portugal

Ligurian and north Tyrrhenian sea

Mauritanian Waters

Galician Waters / Bay of Biscay

FAO/ICES Area

GSA 10, GSA 18, GSA 19

GSA6

IXaN, IXaS

GFCM - GSA9

CECAF Mauritania

IXaN, VIIIc, VIIIb and VIIIa

## Diapositiva 2

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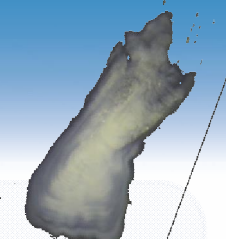
**CN1** We have to add the information about IEO-Murcia and COISPA-Italy.

IEO-Murcia: Western Mediterranean, GSA6

COISPA-Italy: Central Southern Tyrrhenian Sea (GSA 10), Southern Adriatic Sea (GSA 18) and West Ionian Sea (GSA 19)

Charo Navarro, 28/10/2015

# Calcified structures



## Preparation



Murcia

Canaria  
Islands

Santander

Mounted

Whole otoliths immersed in sea water

Whole otoliths mounted in clear resin in black plastic slides

Whole otoliths mounted in Entellan® resin in black plastic plates

Whole otoliths immersed in sea water

Whole otoliths mounted in Resin in black plastic plates

Whole otoliths mounted in Eukitt® resin in black plastic plates

Stored

Dried and stored in a plastic box

Plastic bags

Black plates with cover, inside a cardboard box

Dried and stored in a plastic phial

Black plates with cover, inside a cardboard box

Black plates with cover, inside a cardboard box

# Image Analysis



Murcia

Canaria  
Islands

Santander

Software

Image J

Irfan view  
(analysis);  
Las ez as  
(capture)

Visiolog  
6.3/TNPC 4

Image Pro  
Premiere 9

Nis-  
Element  
and Image  
Pro

Nis-  
Elements  
Viewer 4.0

Camera

BELL  
DV1300  
CMOS  
Camera

Digital  
camera

Sony digital  
camera  
DFY-SX910;  
1,45  
Mpixels

Digital  
camera:  
color CCD,  
resolution  
1295 x 960  
pixel

Nikon  
Digital  
Sight Ds-U2

Color  
Digital  
Camera.  
Nikon  
Sight. DS-  
5Mpixels

# Images Analysis



Murcia

Canaria Islands

Santander

Usage

Exchanges, validation studies and formation a reference collection

Exchanges

Exchanges, Thesis

Routine, exchanges, validation studies, thesis

Exchanges, annual periodicity, validation for ring deposition, backcalculation

Exchanges, validation studies, publications, thesis, an age determination procedures manual elaboration, resolution of doubt and an otolith image bank

Measures

Otolith total length, radius and ring radius

Distance between nucleus and first and second ring.

Annual ring radius and diameter, otolith radius and diameter

Radios, lenght, distance between rings, annual ring radius

Distance between rings, otolith radius and annual ring radius

Otolith diameter/radius, annual ring radius, AMD, RMD



# Images Analysis



Murcia

Canaria Islands

Santander

N. Images /year

30

Not routinely

Not routinely

±500 images

Not routinely

±300 images

Calibration/Format

Calibrated,  
JPEG

Calibrated,  
TIFF or JPEG

Calibrated,  
TIFF or JPEG

Not calibrated,  
JPEG

Calibrated,  
TIFF or JPEG

Calibrated,  
LIM; JPEG;  
TIFF; PSP

# Summary

| Country  | Institute | Laboratory   | Calcified pieces | Preparation  | Stored before treatment   | Stored after treatment   |
|----------|-----------|--|------------------|--|---|--|
| Spain    | IEO       | Instituto Español de Oceanografía – Canarias               | Whole otoliths   | Otoliths mounted in clear resin in black plastic plates  | Cleaned and dried, in labelled plastic containers                                 | Labelled in black plastic plates   |
| Italy    | CIBM      | Centro Interuniversitario Biologia Marina “G.Bacci”        | Whole otoliths   | Otoliths immersed in sea water   |   | Dried and stored in a pvc phial.   |
| Portugal | IPMA      | Instituto Português do Mar e Atmosfera                     | Whole otoliths   | Otoliths mounted in resin (Entellan <sup>®</sup> , Merck, ref. HX807787) in black plastic plates | Cleaned and dried in epandorffs   | Labelled in black plastic plates   |
| Spain    | IEO       | Instituto Español de Oceanografía – Santander              | Whole otoliths   | Otoliths mounted in resin (Eukitt <sup>®</sup> ) in black plastic plates with cover              | Loose and dry inside labelled plastic plates with cover, in a horizontal position | Fixed in resin in black plastic plates with cover; stored in cardboard boxes in the laboratory |
| Italy    | COISPA    | Stazione Sperimentale per lo studio delle risorse del mare | Whole otoliths   | Otolith immersed in the clarification medium (sea water)   | Dried in the plastic box  | After the age analysis the otolith are dried again and stored in the same box                  |
| Spain    | IEO       | Murcia   | whole otoliths   | otoliths mounted in clear resin on custom plastic slides   | They are directly mounted in clear resin on custom plastic slides.                | In plastic bags.   |



# Summary

| Country  | Institute             | Image capture software                     | Type of camera   | Images uses  |
|----------|-----------------------|--|--|--|
| Spain    | IEO – Canaria Islands | NIS - Elements and Image Pro.              | Nikon Digital Sight DS-U2.   | Exchanges, annual periodicity validation for one ring deposition, backcalculation.   |
| Italy    | CIBM                  | Image pro premiere 9.1                     | Digital camera: color CCD sensor 1/3", resolution 1295 x 960 pixel with 8/12 bit color (mod. C125) | Routine, exchanges, validation studies, thesis   |
| Portugal | IPMA                  | Visilog 6.3/ TNPC 4                        | Sony digital camera DFY-SX910  | Exchanges, thesis  |
| Spain    | IEO – Santander       | NIS-Elements Viewer 4.0                    | Color Digital Camera. NIKON Digital Sighth. DS-5M  | Exchanges, validation studies, publications, thesis, age determination procedures manual, resolution of doubts, otolith image bank |
| Italy    | COISPA                | ImageJ                                     | BELL DV1300 CMOS Camera  | Exchanges, validation studies and formation a reference collection   |
| Spain    | IEO - Murcia          | Irfan view (analysis); Las ez as (capture) | digital camera   | Exchanges  |

# Summary

| Country  | Institute              | Image measurements type  | Number images per year | Calibrated images | Image format               |
|----------|------------------------|--|------------------------|-------------------|----------------------------|
| Spain    | IEO – Canarias Islends | Distance between rings, otolith radius and annual ring radius.   | Not routinely          | Yes.              | TIFF or JPEG.              |
| Italy    | CIBM                   | Radius, length, distance between rings, annual ring radius   | About 500              | No                | JPEG                       |
| Portugal | IPMA                   | Annual ring radius, otolith radius   | Not routinely          | Yes.              | TIFF                       |
| Spain    | IEO - Santander        | Otolith diameter, otolith radius, annual ring radius, absolute marginal distance, relative marginal distance | 200-300                | Yes.              | LIM images, JPEG, TIF, psp |
| Italy    | COISPA                 | Otolith total length, radius and ring radius   | 30                     | yes.              | JPEG                       |
| Spain    | IEO - Murcia           | Distance between nucleus and first and second ring.  | Not routinely          | yes               | JPEG                       |