



**GENERAL FISHERIES COMMISSION
FOR THE MEDITERRANEAN
COMMISSION GÉNÉRALE DES PÊCHES
POUR LA MÉDITERRANÉE**



SCIENTIFIC ADVISORY COMMITTEE (SAC)

Fifteenth Session

FAO Headquarters, Rome, Italy, 8-11 April 2013

**Report of the Workshop on age determination of elasmobranchs
in the GFCM Area
8-12 October 2012, Antalya (Turkey)**

OPENING AND ARRANGEMENT OF THE MEETING

1. The Workshop on age determination of elasmobranchs in the GFCM area was held at the Mediterranean Fisheries Research Production and Training Institute premises in Antalya (Turkey), from 8 to 12 October 2012. It was a hands-on workshop with an important training component. It was attended by 19 participants from 9 member countries and Ukraine as well as by the GFCM Secretariat (List of participants is in Appendix B). A manual of the techniques used is being published separately and made available on the GFCM web site.
2. Mr Haydar Fersoy Vice-chairperson of GFCM and Fisheries Officer at the FAO Subregional office for Central Asia welcomed the participants and thanked them for attending this meeting. He commented on the process of modernization that the Commission is passing through, stressing the importance of more accurate data for the purpose of stock assessment and management of fisheries in a more sustainable way.
3. Pilar Hernández, from the GFCM Secretariat welcomed the participants and thanked the local organizers for their kindness in hosting and arranging the meeting. She also acknowledged the important support of the Turkish Ministry of Food, Agriculture and Livestock in acquiring the material and equipment needed for the good development of the course. She stressed the importance to correctly assess the age of fishes in any process that involves stock assessment.
4. She also framed the workshop in the context of the Medium-term Research Programme on Elasmobranchs currently undertaken by GFCM and outlined the main activities carried out so far, reminding that the implementation of the last phase of this programme had been possible thanks to the financial support of the EU. She also thanked the FAO Regional projects AdriaMed, CopeMed II, EastMed and MedSudMed for covering the attendance of ten of the participants.
5. Mr Steven Campana, the instructor, highlighted the main objectives of the workshop stressing that it was a hands-on workshop in which participants would learn the methods required to prepare and age the spines and/or vertebrae of Mediterranean elasmobranchs, as well as the statistical methods required for assessing accuracy and precision. The agenda is attached in Appendix A

BRIEF DESCRIPTION OF THE SESSIONS

Day 1 began with a round of introductions in which it was noted that the age determination experience of the participants varied widely. A brief presentation by the instructor included an introduction to age determination in elasmobranchs, as well as a general overview of the methods to be used during the workshop. The remainder of the day was spent in the laboratory, where the participants started by embedding vertebrae of numerous elasmobranch species in epoxy and then setting them aside to dry. The participants then imaged and interpreted the spines of *Squalus acanthias*, and learned the statistical method for adjusting for worn sections of the spine.

The workshop participants had brought many vertebrae for preparation, and some had sent samples to Mr Campana beforehand for embedding, so there was no shortage of ageing materials.

Day 2 began with an opening lecture on the interpretation of elasmobranch vertebrae, with examples from several species. The remainder of the day was spent learning how to use the sectioning saw, in the ageing of previously-prepared vertebral sections, and in learning how to use the image analysis system.

Day 3 began with an opening lecture on age validation methods for ensuring ageing accuracy. The participants spent the remainder of the day practising their skills in embedding, sectioning and ageing vertebrae, as well as in learning key skills in using Photoshop to enhance vertebral images. Participants spent much of the afternoon ageing 100 *Leucoraja* vertebral images, after which their interpretation skills had improved markedly.

Day 4 began with an opening presentation on statistical methods for ensuring ageing accuracy and precision, using the participants' own age data from Day 3 as a test. Participants spent the remainder of the day continuing with the sectioning and ageing of their vertebral samples, practising their Photoshop skills, and repeating the statistical tests.

Day 5 began with a presentation showing many of the participants' own vertebral section images, enhanced and annotated to show the growth bands. The participants used the remainder of the day (which went only to noon) to practise their Photoshop and statistical skills with age data.

6. During the course of the workshop, each of the participants managed to age about 30 *Squalus* spines, to embed, section and image 10-30 vertebrae, and to age more than 100 vertebral images. Participants prepared and aged a wide range of species, , almost all of which were GFCM species provided by the participants. Some of the species examined included *Squalus acanthias*, *S. blainvillei*, *Raja clavata*, *R. asterias*, *R. miraletus*, *Rhinoptera marginata*, *Leucoraja ocellata*, *Lamna nasus*, *Prionace glauca*, *Isurus oxyrinchus*, *Dasyatis pastinaca*, and *Mustelus mustelus*.
7. Despite some initial technical limitations associated with setting up some of the equipment, the workshop went very well, and all participants left with greatly improved skills for ageing elasmobranchs. Some difficulties were also noted on the language barrier; English was not the first language of any of the participants, and although Mr Campana conducted some of the training in French (for the benefit of the French-speaking participants), many other languages were present at the workshop.
8. A usual outcome of this type of workshop is that the participants return home eager to practice their new-found skills, and then improve their skills to the point where the basics are now mastered. They then realize that the more advanced methods presented at the workshop (and which they were not able to follow at the time) would be very useful to their age determination projects. There may be some benefit to holding another elasmobranch ageing workshop in 1-2 years.

CLOSING SESSION

9. Ms Hernández conducted the closing session, in which she thanked and complimented the excellent work of Mr Campana by keeping the interest of all the participants and making the sessions actual hands-on sessions, with practical work in the laboratory from the beginning to the end. She also thanked the participants for their efforts and encouraged them to continue this line of work in their institutions and to transmit the knowledge to other colleagues in their countries so as to contribute to a better fishery science in all the Mediterranean and Black Sea. She then thanked the Director of the Mediterranean Fishery, Research, Production and Training Institute, Mr Yilmaz Emre for his continuous support and hospitality. Then she gave certificates of attendance to all participants.

Appendix A**Agenda**Monday 8 October

- Opening lecture
- Vertebra and spine extraction
- Epoxy embedding
- Interpretation and measurement of spines

Tuesday 9 October

- Opening lecture
- Sectioning of vertebrae (instructor's samples) with Isomet saw
- Initial interpretation of sections
- Use of image analysis system
- Spine interpretation and calculation of eroded annuli

Wednesday 10 October

- Opening lecture
- Sectioning of vertebrae (provided by participants) with Isomet saw
- Interpretation of sections
- Using Photoshop for image enhancement
- Production ageing of 100 vertebral sections each

Thursday 11 October

- Opening lecture
- Sectioning of vertebrae with Isomet saw
- Interpretation of sections
- Data analysis: strategy for data entry
- Age frequency histograms; age comparison using scatterplots, then age bias plots; preparation of growth curves; testing for sexual dimorphism; measuring precision; modal analysis

Friday 12 October

- Complete sectioning and interpretation
- Data analysis review

Appendix B

List Of Participants

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