South Pacific Regional Fisheries Management Organisation

11th Meeting of the Science Working Group

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SWG-11-JM-05

Working Plan Chilean Jack Mackerel Age Estimation

BACKGROUND

The main recommendations of the "Chilean jack mackerel otolith interpretation and ageing Workshop" were: continue the work of comparison and discussion of ageing estimation criteria because improving current level of readings is still required, especially due to the rather poor experience in reading otoliths of Chilean jack mackerel. For this purpose, otolith images have proven to be useful and eliminate the practical difficulties of a sample circulating through countries. Furthermore, they can be examined simultaneously by all participants. A second recommendation was that validation studies should be continued by the WS participants intersessionally.

Considering the above mentioned recommendations and the conclusions of the WS, fully agreeing with juvenile fish age estimations, but disagreeing with the adult fish estimations, which show differences in the interpretation of the first and second annuli, it can be concluded that there is a deficient level of consensus in Chilean jack mackerel age estimation. Therefore Chile suggests this working plan, which considers the main recommendations of the WS, with a view to moving forward to the development of a methodology protocol applied by countries that conduct age estimations of this species, and whose results are used in the stock assessment.

OBJECTIVES

1. Validating annual Chilean jack mackerel age determination.
2. Generating a protocol for interpretation of annual growth rings of Chilean jack mackerel (annual age)
3. Developing otolith reference collections in each laboratory, which considers age interpretation criteria indicated in the commonly-agreed Interpretation Protocol.

WORKING AREAS OR SECTIONS

I.- Age validation

Age validation is the estimation of age accuracy, that is, how close is the age determination from the real age. This corresponds to the validation of growth increments considered in the age estimation procedure applied by each laboratory.

Some validation methods can be: verification of the first annulus through counting primary micro-increments; labeling-recapture; radiocarbon dating, among others. Currently, we have age dating for 21 otoliths, through the radiocarbon dating method; this is part of the validation study for common hake and jack mackerel conducted by IFOP in Chile.

Any work developed by laboratories will constitute significant advance to establish the annual annuli interpretation protocol; however, they should be developed concurrently with the age inter-calibration, which will determine interpretation consensus.

Thus, the proposal consists on each laboratory (country) defining the validation study that they can conduct, indicating the time periods for them to complete the work. These works may consider a level of cross-participation of researchers from different laboratories and workshops to discuss the results before they are incorporated as elements in the design of the Age Interpretation Protocol.

II.- Age Interpretation Protocol

Generating a Protocol or Guideline to interpret the annual growth rings, on the basis of the validation information (age accuracy) and/or commonly-agreed criteria for inter-laboratory interpretation (age precision)

This work requires developing age inter-calibration exercises, followed by discussing used identification criteria, to reach consensus that will be a part of the annuli common interpretation and a review through new exercises, independent expert consults and/or the conduction of validation studies to solve differences (bias)

We propose continued realization of new age inter-calibration exercises, distance discussion of results, and joint working meetings (workshops), to make progress in the development of the suggested age interpretation protocol.

III- Reference Collection

A reference collection can be defined as a collection of prepared ageing structures, of known or consensus-derived ages, representative of all factors which might reasonably be expected to influence the appearance or relative size of the growth increments (Campana, 2001).

Reference collections facilitate the monitoring of consistency in age estimation of one reader over time, or among readers.

The otolith selection of each laboratory, used in the age inter-calibration exercises, can be considered in the elaboration of a reference collection, regardless of each laboratory having collections of its own. However, these should be based on the commonly-agreed criteria (inter-laboratory) for jack mackerel age determination

PRIORITIZED ACTIVITIES (PROPOSAL)

Working Area	ACTIVITY	DATES
Subject I "Validation"	Devising a proposal of validation studies, which can be feasibly carried out by each laboratory and including the completion deadline.	January 2013
Subject II "Inter-calibration excersise"	Developing a second exercise of age calibration, including the participation of China, which was in the first exercise. We suggest it to be developed from a set of otolith images that can be selected from otoliths collected in Chile or with the collaboration of all laboratories. We also suggest this exercise to be restricted to experienced readers only. The Growth and Aging Laboratory of IFOP offers its services to conduct the methodological procedure with which the exercise is carried out; results could be analyzed by a Laboratory or an independent researcher.	First semester 2013
	Analyzing data corresponding to the results of the readings so each laboratory collects the differences and coincidences inter-laboratory in the growth ring identification patterns. Results exchange and discussion through e-mail.	Second semester 2013
	Conducting the second "Chilean Jack mackerel otolith interpretation and ageing" workshop, including the following activities: • Third age inter-calibration exercise • Getting acquainted with the preliminary results of validation studies • Starting the elaboration of an Age Interpretation Protocol. • Defining tasks to move forward to agreed interpretation, where there is the highest level of difference.	First semester 2014