Summary of age-reading activities at the Marine Biology Research Centre, Tajura, Libyan Arab Jamahiriya

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The activities of the Marine Biology Research Centre (MBRC) included the collection of samples to study the main biological features of fisheries target species including age and growth. For these studies samples were collected during catch-assessment surveys (within-frame surveys). During these surveys fish from trawling hauls were sorted by species, and the individual body length and weight of the important commercial species in the catch were recorded.

Regarding age determination, the species currently being examined in the MBRC, and the corresponding hard parts, are:

1. Hake *(Merluccius merluccius*, L.), using the otolith.
2. Pandora *(Pagellus erythrinus*, L.), using the otolith.
3. Round sardinella (*Sardinella aurita,* Val.), using scales.
4. Bluefin tuna *(Thunnus thynnus,* L*.),* using first dorsal spine

In the present paper, only the work on hake is considered.

Hake

Random samples were collected using Italian-type bottom trawl nets, with a cod-end mesh size of 18 mm, in three depth ranges along the Libyan coast: from 50 to 100, from 100 to 200, and from 200 to 300 metres depth

Biological parameters were analysed, such as, individual length and weight, sex, stage of maturity. The *sagittae* (one of the three main types of fish otolith) were collected, measured and weighed. They were washed in running water, dried and stored in small envelopes and identified by relevant information (species, length and weight of specimen, sex, date of collection, etc). Additional details of the fish specimen were recorded on collection sheets. The length-class was based on a 1-cm scale.

Otolith preparation:

1. The number of the *sagittae* collected was 420–600 per year (four seasons), monthly and seasonally.
2. The *sagittae* collected were immediately cleaned with running water and rubbed (by the operator's fingers) to eliminate any adhering membrane, then dried and stored in small envelopes labelled with all the information related to the fish specimen.
3. The otoliths were slightly burned (over a small flame for 10–15 minutes each), to avoid damage that might impede correct reading; the burning makes the annuli stand out as yellow to light-brown rings.
4. The *sagittae* of the young fish specimens, up to 17 cm in length, were read through a stereo-microscope at low magnification, with reflected light against a black background,

and with the distal (concave) side of the *sagittae* upwards. The sample was coated with vegetable oil in a small dish during the examination. The same otolith was analysed by three readers; opaque zones on the otolith appear white and translucent zones appear dark. Otoliths of specimens longer than 17 cm were embedded and then ground carefully on both sides, polished and then examined. The rings became clearer after polishing. However, some information was lost due to the grinding.

5. Annual increments were determined, but no work was done on the daily increment.

In conclusion, it is clear that training in the methodology of age determination in fishes is needed to enable concerned researchers and laboratory technicians to better validate, and discuss, the procedure to be developed by MedSudMed.