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A contribution on the methodics of age determination
in Roundnose Grenadier (*Coryphaenoides rupestris* GUNN.)

by

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Initial intensive studies on the determination of the age of Macrourides were performed by SAVVATIMSKIJ (1971). As a result, he found a method which involves reading the scales using polarised light (polarisation filters at right angles to each other) with transmitted light. Since the application of this method is associated with certain restrictions, further methods of determining the age have been sought. We checked the possibility of determining the age by means of otoliths not for reasons of tradition alone. In the following, we present an "otolith method" which is the main method used in the GDR for determining the age of grenadiers.

Method

The otoliths are obtained in the normal manner and conserved for later evaluation in a formaldehyde solution (ca. 4 %). In practice, the use of soaked paper bags which are stored in plastic bags to prevent them from drying out has been found to be a satisfactory method for this. Immediately before the age is determined, the unbroken otolith is treated with hydrochloric acid (ca. 10 %) in order to remove the thin and wax-like calciferous layer. In order to avoid damage to the otoliths, they remain in the hydrochloric acid only until the initially vigorous development of gas has clearly decreased, this usually being the case after about 30 seconds. After this preparatory treatment, the otoliths are read in indirect transmitted light while they are immersed in water (fig. 1).

In order to be able to use this method also for otoliths which have previously been dried it is necessary to restore the transparency which is lost during the drying process. The transparency will have been for the most part restored if the otoliths have been kept for at least one month in moist paper bags (water or 4 % formalin). The application of 35 % formalin, 96 % ethyl alcohol, glycerine and methyl benzoate as clarifying agents produced no results.

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¹ The author of this paper was inadvertently omitted in the original version which was circulated in 1976.

Although it is not generally necessary to treat the otoliths with acid prior to reading them, the method described above is nevertheless preferable to the subsequent treatment of dry otoliths. Dry otoliths frequently exhibit cracks which may be sources of irritation when determining the age, the central region of the otolith also remaining inadequately transparent in some cases, too.

Results and discussion

Not all otoliths can be read by the otolith method described above. The readability also decreases as the age and size of the fish increase. About 20 - 25 % of the otoliths are unreadable in the case of grenadiers with a total length of up to 40 cm. The readability decreases after this limit so that 65 - 70 % of the otoliths are unreadable in fish with a total length of 70 cm. In these otoliths it is usually impossible to discern any ring structures in the boundary zones, so that this method is scarcely suitable in the case of grenadier stocks comprising mainly large, old individuals. In such cases, better results are obtained by reading the scales using Savvatimskij's method. Scales from smaller fish (with a total length of less than 40 cm), on the other hand, frequently exhibit ring structures which are difficult to interpret. The otolith method is thus advantageous when investigating fish of the lower length range.

It is thus best to consider both scales and otoliths when taking samples. The extent to which the otolith method presented here can be applied to other species must be checked from case to case.

References

- SAVVATIMSKIJ, P.I.: Studies of the age and growth of roundnose grenadier (*C. rupestris* GUNN.) in the North Atlantic, 1967 - 1970
ICNAF Res. Doc. 71/93

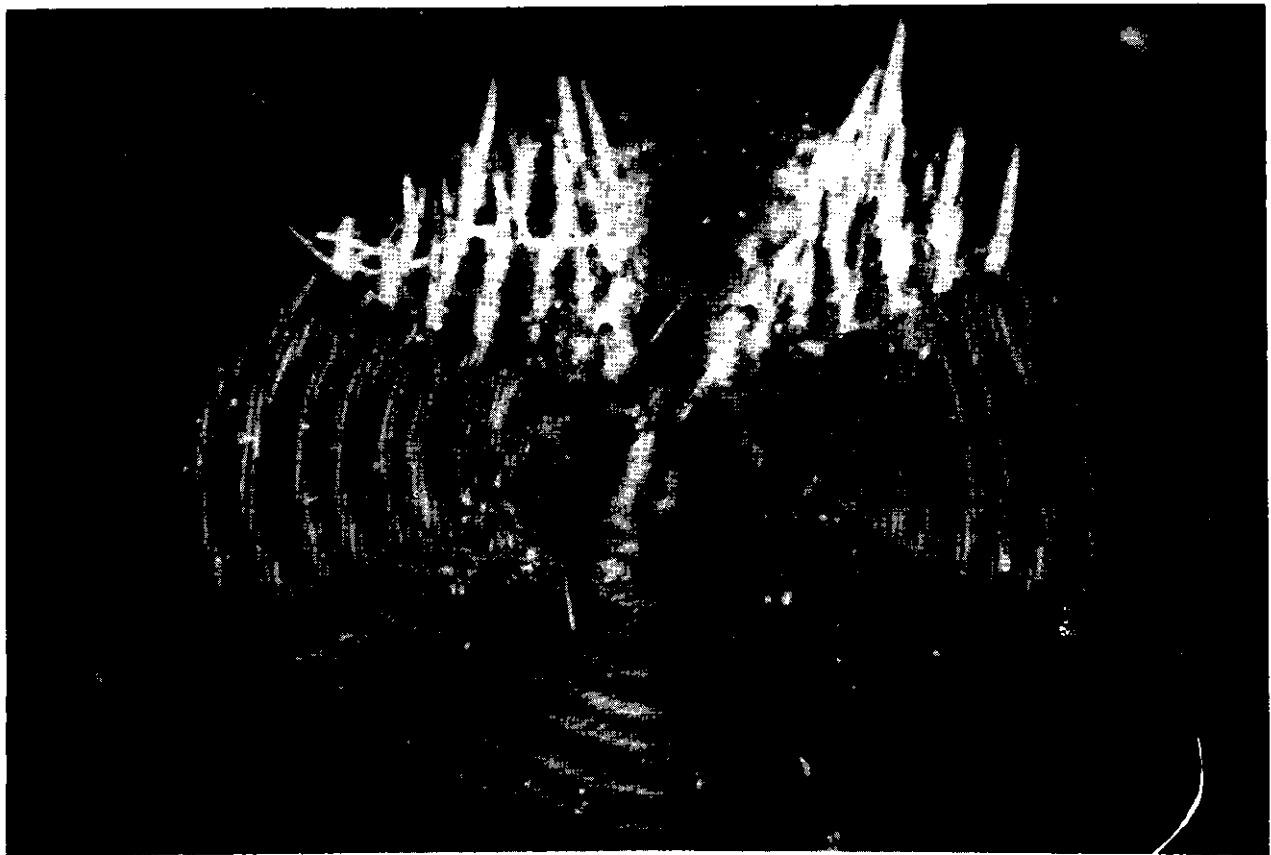
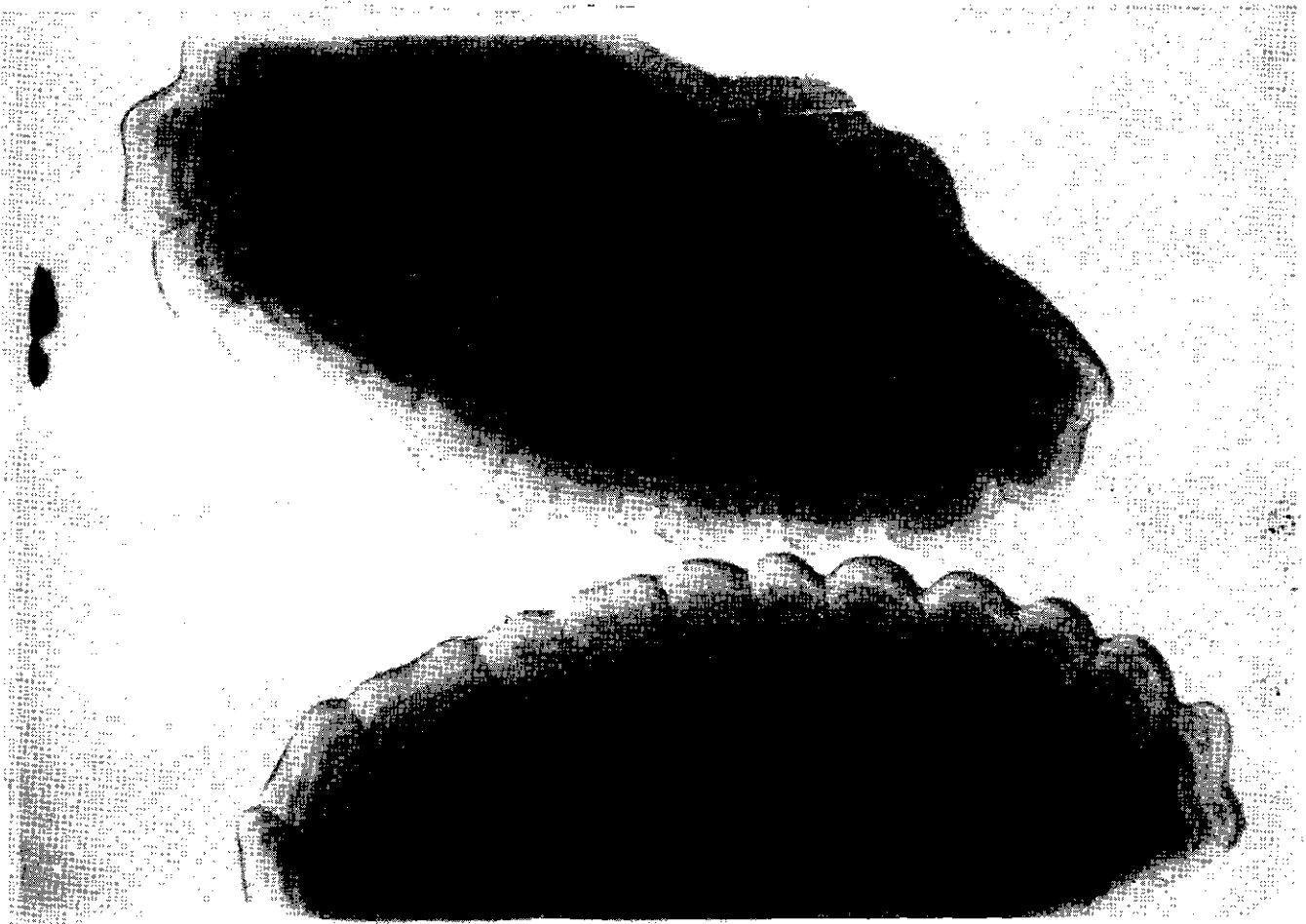


Fig. 1. Grenadier, scale and otoliths, ICNAF Div. 2H, October 1974.
Lt - 52 cm; sex - female; age - 10 years; scale - transmitted
light, polarised; otoliths - treated with HCl, in transmitted light.

