

VARIATIONS IN OTOLITH MICROSTRUCTURE OF SEA-BASS (*DICENTRARCHUS LABRAX* L.) LARVAE UNDER DIFFERENT FOOD REGIMES

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Abstract

After validating daily deposition for sea-bass larval otoliths, we found that different feeding regimes did not affect increment deposition periodicity, although they affected their width. We calculated different condition indices based on otolith microstructure and noticed that, for the food deprivation experienced by the larvae, all otoliths recovered their size in days.

Keywords: condition index, daily growth, *Dicentrarchus labrax*, larvae, otolith

Sea-bass (*Dicentrarchus labrax* L.) larvae were reared for the first month of life under different food regimes [fed, 1 to 3 days of (late) food deprivation, starved and delayed feeding] to set a condition index for this species based on the otolith microstructure. Previously, a marking experiment with alizarine, following the protocol of Blom et al. (1) was carried out to validate increment deposition.

We observed daily increment deposition beginning the second day after hatching (Fig. 1). The different food regimes applied did not affect increment deposition periodicity, but they did affect increment width (ANOVA, $p < 0.05$). Thus increment width was used for estimating a condition index (2), which is independent of body size (3).

Starved larvae showed significantly (ANOVA, $p < 0.05$) smaller otoliths than fed larvae, but no variation in the number of increments was observed.

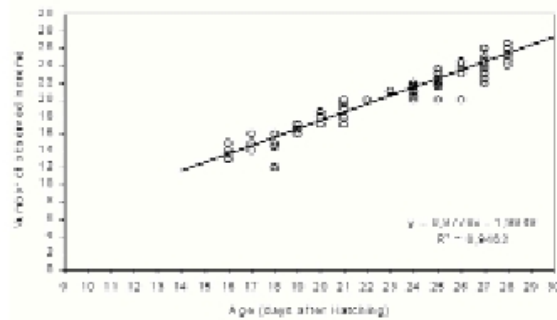


Fig. 1. Relationship between larval age and number of otolith increments in fed larvae. Plotted data are the average counts of both sagittae ($n = 155$).

When food was supplied to the delayed feeding larvae (i.e., not fed until the second week of life), a progressive increase of increment width was observed and after one week of feeding they attained similar values to those for fed larvae (Fig. 2).

A late food deprivation experiment (i.e., 1 to 3 days with no food) was conducted on the third week of larval life. We noticed a delay from the day in which larvae were not fed until it was reflected on their otoliths. They formed narrower increments the second day after

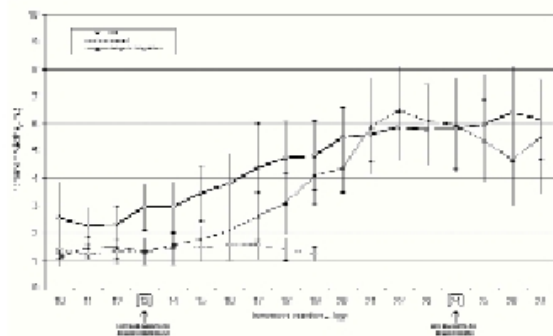


Fig. 2. Absolute increment width of the starved and delayed feeding larvae versus fed larvae.

the initiation of food deprivation, but they recovered their normal width the day after they were fed again (Fig. 2).

We calculated a condition index based on the width of the last three complete growth increments: Recent Otolith Growth Index (4). This index is based on the residuals between the logarithm of the three outermost increments sum and the logarithm of the radii, as a measure of how much an individual separates from the normal condition (Fig. 3).

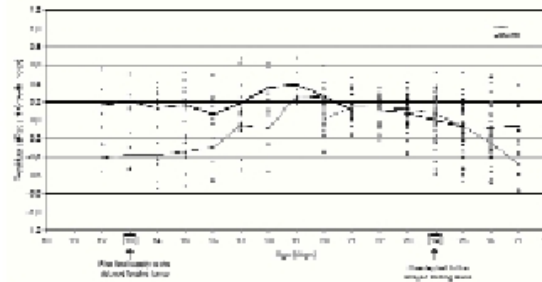


Fig. 3. Plotted residuals (Recent Otolith Growth Index) of the fed versus delayed treatments.

References

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