

The transition of the experienced environment of jack mackerel in the East China Sea

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Jack mackerel *Trachurus japonicus* is distributed on the continental shelf waters along the subtropical Kuroshio Current and the Tsushima Warm Current in the western North Pacific. The East China Sea (ECS) is one of major spawning and nursery grounds for jack mackerel and understanding the recruitment processes of jack mackerel into the fishing grounds in the ECS is important. However, information of how jack mackerel respond to decadal temperature change is limited. Aim of this study is to know the transition of experienced environment of jack mackerel in the ECS from 1960s to 2000s. To estimate the experienced environment, oxygen ($\delta^{18}\text{O}$) and carbon ($\delta^{13}\text{C}$) stable isotope of jack mackerel otolith were analyzed. Fish samples were taken at ECS in 1960-70s and 2000-2010s (15 individuals, each period). The high-precision micromilling system GEOMILL 326 was used for otolith samples. At every 10 daily rings (20-30 daily rings in section including core), a ring was tracked and used as the boundary of the micromilling area. $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ were determined using isotope ratio mass spectrometer (Delta V plus). As a result, there was no significant differences between the two survey periods in the larval-juvenile experienced temperature which is estimated from $\delta^{18}\text{O}$. It was considered that both jack mackerel from different periods utilized a similar environment under a changing environment. There was a significant positive relationship between experienced temperature and growth rates based on otolith increment width in the juvenile stage. This suggested that the effect of water temperature on the growth of jack mackerel in early life stage. Thus, there is a possibility that jack mackerel in ECS may adapt environmental changes and select the preferred environment.

Keywords: jack mackerel, oxygen isotope, otolith