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主論文の要約

博士の専攻分野の名称：博士（水産科学）

氏名：李 哲

学 位 論 文 題 目

A study on swimming behaviors of larval and juvenile Pacific cod *Gadus macrocephalus* in relation to temperature and food availability

（異なる餌条件と水温におけるマダラ仔稚魚の遊泳行動に関する研究）

This is a summary of the dissertation submitted by Zhe Li to the Graduate School of Fisheries Sciences, Hokkaido University. In this dissertation, the author endeavored to clarify behavioral responses of larvae and age-0 juveniles of Pacific cod to varying temperatures and prey availability under experimental conditions.

The Chapter 1 provided basic ecological information of Pacific cod and described the complicated environments they confront in the waters off Southern Hokkaido. The Chapter 2 and 3 tested vertical distributions and swimming activities of cod larvae at two exogenous feeding stages and age-0 juvenile cod with well-fed (WF) and food-deprived (FD) treatments. The Chapter 4 compiled the findings derived from Chapter 2 and 3, and compared the differences in the swimming behaviors between the larval and juvenile cod, providing implications for their survival in the complicated oceanographic settings.

The author found no effect of temperature or recent feeding history on larval vertical distribution and considered that geotaxis was the dominant factor; he also found the change in major factor affecting swimming activity from temperature to recent feeding history during the larval stages. In the juvenile cod, the author found close

relationships between vertical distribution and swimming activity and the two variables (*i.e.* water temperature and prey availability).

The author argued that young larvae have lower starvation resistance compared with old larvae in surface-warm conditions, because they do not take energy-saving behaviors. The author also argued that the juveniles possess stronger ability to cope with changing temperature and prey availability. Finally, the author concluded that the vulnerability of this species to the environmental variables decreases with ontogeny, due to more flexible behavioral responses.