Temperature impacts on reproductive parameters for Japanese anchovy: Differences between inshore and offshore waters

Akinori Takasuka¹*, Yoshioki Oozeki¹, Hiroshi Kubota¹, Yoshinari Tsuruta¹, Tetsuichiro Funamoto²

¹National Research Institute of Fisheries Science, Fisheries Research Agency, 2-12-4 Fukuura, Kanazawa, Yokohama, Kanagawa 236-8648, Japan
²Hokkaido National Fisheries Research Institute, Fisheries Research Agency, 116, Katsurakoi, Kushiro, Hokkaido 085-0802, Japan
*E-mail: takasuka@affrc.go.jp

Reproductive parameters (batch fecundity and spawning frequency) for Japanese anchovy Engraulis japonicus, which were derived from the recent literature, were compared between inshore samples (Sagami Bay) and offshore samples (western North Pacific) of anchovy. The offshore anchovy were heavier in body weight and had heavier ovaries than the same-size inshore anchovy. Relative batch fecundity was positively related with gonadosomatic index (GSI) and sea surface temperature (SST) for both the inshore and offshore anchovy; however, the relationships with GSI and SST differed between these two groups. The relative batch fecundity of the inshore anchovy rapidly decreased as SST decreased, while that of the offshore anchovy decreased rather gradually. Although the level of spawning frequency seemed similar between the two groups, the positive relationships to sea temperature differed: the offshore anchovy would spawn at temperatures ca. 5°C lower as frequently as would the inshore anchovy. Comparison of temperature impacts on reproductive parameters suggested the existence of differences between the inshore and offshore anchovy in their specific spawning ecology. The inshore–offshore issue may be seen in different ecosystems.

Key words: Spawning ecology, Batch fecundity, Spawning frequency, Japanese anchovy, Engraulis japonicus, Sea surface temperature