

A-583 MITSURU TORAO, MAHITO MIYAMOTO and MIKI KOBAYASH

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A simple method for measuring the swimming speed of salmon fry using escape behavior

We attempted to establish a simple swimming speed measurement method (escape measurement method) for chum salmon fry by video recording escape behavior and analyzing it. Fry were placed in a circular test tank, and sound stimuli were provided twice at 10-second intervals to induce escape behavior. A video recording of the swimming behavior was taken with a digital camera, from which the burst speed and cruise speed were measured by video analysis using free software. The measured burst speed ranged from 70 cm/s to 110 cm/s (18–22 fork length/second, FL /s), and the cruising speed was 10–22 cm/s (2–4 FL/s). A strong positive correlation was found between swimming speed measured by the escape measurement method and the stamina tunnel method, suggesting that the escape measurement method is a valid measure of the swimming speed of salmon fry. The apparatus used in this measurement method is very simple, and it is expected to be applied to various investigations in the future.

A-584 KIYOSHI KASUGAI, HAYATO SANEYOSHI and YOSHITAKA SASAKI

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Periods of upriver migration and spawning, and annual change in upriver migration of pink salmon *Oncorhynchus gorbuscha* in the Uebetsu River, a non-hatchery-operations river, in the Nemuro area of eastern Hokkaido, Japan

We surveyed the number and noted the period of upriver migrating pink salmon *Oncorhynchus gorbuscha* in the Uebetsu River, a non-hatchery-operations river (adult fish are not collected for hatchery programs and fry are not released), of the northern Nemuro area, between 2008 and 2015. In the Uebetsu River, the observed numbers of pink salmon and their redds peaked between mid-and late September, and between mid-September and early October, respectively. The total number of pink salmon observed in the Uebetsu River peaked in 2009 and 2010 of the odd years and even years, respectively and decreased dramatically after those

years. The total number of pink salmon observed in the Uebetsu River significantly correlated with the coastal and river catches of pink salmon in the northern Nemuro area.

A-585 YOSUKE KOSHINO, YOSHIHITO SHINRIKI, TOMOYA AOYAMA, KATSUMI TAKEUCHI, HAYATO SANEYOSHI and YASUYUKI MIYAKOSHI

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Residence time of stocked chum salmon fry in the Shiriuchi River, in southwestern Hokkaido

We collected the otolith-marked chum salmon fry that were released at different periods to determine the residence time of stocked fry in the Shiriuchi River of southwestern Hokkaido. The number of chum salmon fry collected with a fyke net trap decreased notably within approximately 2 days after release. While salmon fry were not collected during the day, many were collected at night. These results suggest that the salmon fry stocked at the Shiriuchi River, where the distance from the release site to the estuary is short, migrate to sea quickly and mainly at night.

A-586 YOSHIYUKI TAKAYA

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An improved method of real-time PCR assay for zoospores of *Saccharina japonica* var. *religiosa*. (Technical report)