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A-600 KENJI SAKAGUCHI, TAKAHIRO TAKASHIMA and YUTARO SUZUKI

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Spawning season and temperature conditions of the Arabesque greenling *Pleurogrammus azonus* in the Sea of Japan near Suttsu, Hokkaido

The maturity state of the Arabesque greenling *Pleurogrammus azonus* and the temperature conditions of the spawning ground in the Sea of Japan near Suttsu, Hokkaido, from October to December 2013-2017, were examined as indicators that could determine the period of resource management measures. The spawning dates of the fish were from November 8th to December 3rd. The bottom water temperature at the spawning date ranged between 12.0 and 13.8°C.

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A-601 TAKASHI MUTOH and OSAMU SHIDA

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Recent distribution and annual change of adult walleye pollock *Gadus chalcogrammus* in the pre-spawning season near the Pacific coast of southwestern Hokkaido

We examined the distribution of adult walleye pollock *Gadus chalcogrammus*, on the Pacific coast of southwestern Hokkaido using acoustic surveys with a quantitative echo sounder in the pre-spawning season of November from 2008 to 2017. The surveys revealed changes in the abundance and distribution area of adult fish. A high-density area was located around the spawning ground, and it expanded and reduced depending on changes in fish abundance. In particular, the decrease in fish abundance in the Oshima area was considerable, and water temperature and a feature of the sea bottom topography likely affected these changes in the pollock distribution.

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A-602 MASAFUMI NATSUIKE, MAKOTO KANAMORI, HIROYUKI ICHINOSE and YUKIYASU NAKATA

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Effects of ear-hanging time on survival and growth of Yesso scallops (*Mizuhopecten yessoensis*) in Funka Bay, Hokkaido, Japan

For Yesso scallop aquaculture in Funka Bay, Hokkaido, Japan, ear-hanging is a process that changes the intermediate to the final suspended culture. This process requires considerable effort and causes stress to the scallops. Thus, effective and efficient methods for ear-hanging are required. This study aimed to reveal a suitable duration for the ear-hanging process. Ear-hanging was performed in three months (April, May, and June), and survival and growth were followed until the scallop harvest time (the following February). This examination was conducted on three year classes of scallops (born in 2016, 2017, and 2018, and suspended in 2017, 2018, and 2019, respectively). The survival ratios of the scallops suspended in 2018 were remarkably lower than those in 2017 and 2019, regardless of ear-hanging time; however, their survival ratios and weights suspended in June were lower than those in April and May in all year classes. Thus, the ear-hanging process should be completed by May at the latest in order to reduce mortality of the scallops in Funka Bay.

A-603 HIDETSUGU YOSHIDA, JUNKI ATAKA, MAKOTO FUJII, YOSHIFUMI KONNO  
and HISAYA NII

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Declining body size of the Shishamo smelt *Spirinchus lanceolatus* on the Pacific coast of southern Hokkaido (Note)

A-604 YOSHIYUKI TAKAYA, TADASHI KAWAI and HIDEKI AKINO

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A simplified estimation method of the sorus area of the sporophyte of the kelp *Saccharina japonica* ver. *religiosa* in Oshoro Bay, southwestern Hokkaido (Note)