

外部発表業績

Fish pathology

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Effect of Tobramycin Supplementation to Medium on Isolation of *Flavobacterium psychrophilum* from Ayu *Plecoglossus altivelis* (英文)

39, 75-78, 2004

トブラマイシンに対する冷水病菌以外の魚病細菌 4 種 7 株の MIC は 0.2~6.3 $\mu\text{g}/\text{ml}$ であったが、冷水病菌 37 株は 6.3~100 $<\mu\text{g}/\text{ml}$ と高く、トブラマイシン 5 $\mu\text{g}/\text{ml}$ の AOAE 培地への添加は冷水病菌の増殖に影響を与えなかった。病魚からの冷水病菌分離では、無添加培地で雑菌の繁殖により分離率が低下したが、5 $\mu\text{g}/\text{ml}$ 添加培地ではそれが軽減され分離率が向上した。一方、10 $\mu\text{g}/\text{ml}$ 添加培地では分離率が低下した。以上、5 $\mu\text{g}/\text{ml}$ 添加培地は冷水病菌の分離に有効と判断された。

Fish pathology

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No Evidence for the Presence of *Flavobacterium psychrophilum* within Ayu Eggs (英文)

39, 183-187, 2004

冷水病に自然感染したアユを材料として、病原体 *Flavobacterium psychrophilum* の卵表面および卵内での存在の有無を培養法で検討した。未受精卵と受精卵の表面からの冷水病菌検出率はそれぞれ 29% (65 尾中 19 尾) と 17% (30 尾中 5 尾) であったが、ヨード剤 (5 ppm, 10 分) または過酸化水素 (150 ppm, 30 分) による消毒後には卵表面からだけでなく卵内からも検出されなかった。以上の結果から、アユにおいては冷水病菌の卵内感染の可能性は低く、消毒剤で卵表面を殺菌することにより冷水病の垂直伝播を防止できると考えられる。

Journal of Shellfish Research

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The identification of genetic resistance to amyotrophy in Japanese abalone, *Haliotis discus discus*

23, 1157-1161, 20

This experiment was designed to evaluate the genetic resistance to amyotrophy of Japanese abalone (*Haliotis discus discus*) under a mixed rearing environment. Two selected families which had previously shown resistance to abalone amyotrophy as candidates, two non-selected families as controls which had previously not shown resistance and two hybrid families were used. Individuals from these families were fertilized and mixed immediately after hatching, and then they were raised in a mixed rearing tank at an abalone hatchery during the period of frequent spontaneous occurrences of abalone amyotrophy. Furthermore, we have isolated seven new microsatellite DNA loci for identifying families, and so the six offspring families in the mixed rearing tank could be discriminated unambiguously. The survival ratio of the two selected families was 87% and 93% after the occurrence of mass-mortality caused by abalone amyotrophy. While, that of the four other families ranged from 0% to 37%. Survival performance among the offspring families was significantly different under the mixed rearing environment. This result suggests strongly that resistance to abalone amyotrophy of juveniles is related to the genetic characters of the spawners. Therefore, this experiment shows that resistance to the disease is a heritable trait, because the two selected families produced offspring with a high survival ratio after the occurrence of abalone amyotrophy.

日本水産学会誌

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特集 海外からの病気の侵入…ギンザケの冷水病

71, 645-649, 2005

国内の淡水ギンザケ養殖で報告されている冷水病について概説した。1990年にギンザケ輸入卵を導入した複数の養魚場の稚魚に国内で初めて冷水病の発生が確認された。国内と米国のギンザケ病魚から分離された冷水病菌が同一の血清型であることや、ギンザケ輸入卵が冷水病菌に高率に汚染されていることから、本病が輸入卵由来であることが判明した。そして、冷水病に対してはヨード剤による卵消毒が無効であるという現場での事実が、実験的に作出した卵内感染卵を用いて証明された。卵表面に存在した菌が吸水時に卵門經由で卵内に侵入すると考えられている。国産卵由来のギンザケ稚魚では冷水病が発生していないことから、1994年以降宮城県では国産卵の普及が図られ、本病の被害が大きく減少した。最後に、卵内感染、国内外の養殖サイクルの違い、および宿主転換により、海外から侵入した魚病の被害が甚大になる事例と防疫対策について論じた。

FISHERIES SCIENCE

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Comparison of environmental conditions in two representative oyster farming areas : Hiroshima Bay, western Japan and Oginohama Bay (a branch of Ishinomaki Bay), northern Japan

71(6), 1295-1303(2005)

Sea water environmental conditions over annual cycles were investigated and compared between two oyster farming areas, western Hiroshima Bay and Oginohama Bay (a branch of Ishinomaki Bay) in Miyagi Prefecture, to appropriately manage oyster culture or more efficiently utilize farming areas. The environmental parameters of temperature, salinity, nutrient concentrations (NO₂-N, NO₃-N, NH₄-N, PO₄-P, and SiO₂-Si) and size-fractionated chlorophylla (<0.2, 2-20, >20μm), and abundances of microzooplankton were measured in each bay at the surface, and 2 and 5 m depth layers. Differences in the annual mean values and results with monthly paired Student's t-tests showed that salinity was lower, and temperature, nutrient (especially PO₄-P) and chlorophylla concentrations, and abundance of microzooplankton, were higher in Hiroshima Bay than in Oginohama Bay. Differences in environmental conditions between inshore and offshore areas of each bay suggest that inflows of river water in western Hiroshima Bay and sea water from offshore had the most significant effects on the environmental conditions. It is concluded that such oceanographic and biological differences strongly affect the oyster farming system, especially regarding the optimum usage of offshore areas in Summer under clean, cold and stable seawater conditions, rather than food quantity in Hiroshima Bay, and under more abundant food conditions in Oginohama Bay.

Journal of Experimental Marine Biology and Ecology

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Age determination and estimation of larval period in field caught abalone (*Haliotis discus hannai* Ino 1953) larvae and newly metamorphosed post-larvae by counts of radular teeth rows

328, 289-301(2006)

We developed an age determination method for larval and newly metamorphosed post-larval abalone *Haliotis discus hannai* in a laboratory experiment and determined the age of field caught individuals. Laboratory experiments showed that competent veliger larvae (4 days after fertilization) had a radula and regularly added rows

of radular teeth with age in the absence of metamorphosis. Under environmentally relevant temperatures (17-22 °C), the number of rows of radular teeth increased linearly with age, but slopes of the regression lines were different among temperatures. Rows of radular teeth were added more slowly at lower temperatures. The effect of temperature on the development rate of the radula was quantified by the regression and the temperature coefficient, Q_{10} . The radular development of newly metamorphosed post-larvae, which had not acquired a peristomal shell (adult shell), was comparable with that of veliger larvae, although older post-larvae had a larger number of rows of radula than those of the same age of veliger larvae. From these results, an age determination method of veliger larvae and newly metamorphosed post-larvae was established, using the number of rows of radular teeth. The age of veliger larvae and newly metamorphosed post-larvae was determined by the age determination method for samples collected in August to October of 2003 and 2004 for which the thermal history of the coastal water of Miyagi Prefecture Japan was available. Only 9.1% of veliger larvae ($n=8$) captured in the field had formed a radula and these were estimated to be 4-6 days old. The remaining 90.9% of larvae ($n=80$) that had not formed a radula were classified as younger than 4 days old. All newly metamorphosed post-larvae ($n=24$) that had metamorphosed on substrata were estimated to be 4-6 days old. Results of the field study indicate that these abalone metamorphosed within a few days after the acquisition of competence (4 days after fertilization) at this site, which has suitable crustose algal habitat.

