

INFORMATION

Bibliography of Salmonids published in Japan (13): 1998

Edited by Shigehiko Urawa

*Research Division, National Salmon Resources Center, Fisheries Agency of Japan,
2-2 Nakanoshima, Toyohira-ku, Sapporo 062-0922, Japan
(urawa@salmon.affrc.go.jp)*

This current salmonid bibliography, distributed yearly since 1988, covers scientific publications in Japan. The former twelve issues were published in Technical Reports of Hokkaido Salmon Hatchery (Fish and Eggs), No. 157-163, Scientific Reports of Hokkaido Salmon Hatchery, No. 49-50, and Bulletin of National Salmon Resources Center, No. 1. Titles are given in English for all articles. A reprint of article may be available from the author. An author's address is shown in square brackets following the citation. This 13th issue has covered literature published in 1998. The bibliography is divided into the following sections:

Ecology-General	39
Distribution and Migrations	39
Breeding and Reproduction	40
Feeding, Diets, and Growth	40
Population and Management	41
Stock Identification	41
Morphology, Taxonomy and Phylogeny ..	42
Physiology and Endocrinology	42
Biochemistry	43
Genetics	44
Diseases and Parasites	45
Toxicology	45
Politics	46
Supplement	46
Author Index	47

Key words: salmonid fish, bibliography, Japan

Ecology-General

98-001 Roles of riparian vegetation in the river environment of masu salmon juveniles, *Oncorhynchus masou*. Nagata, M., H. Sato, M. Miyamoto, S. Ohkubo, S. Yanai, and Y. Nagasaka. 1998. Sci. Rep. Hokkaido Fish Hatchery, 52: 45-53. In Japanese with English summary. [Hokkaido Fish Hatchery, Kitakashiwagi 3-373, Eniwa, Hokkaido 061-1433, Japan; PGB01434@nifty.ne.jp]

98-002 Influences of microhabitat use and foraging mode similarities on intra- and interspecific aggressive interactions in a size-structured stream fish assemblage. Usio, N., and S. Nakano. 1998. Ichthyol. Res., 45: 19-28. [Department of Zoology, University of Otago, P. O. Box 56, Dunedin, New Zealand; nisikawa.usio@stonebow.otago.ac.nz]

Distribution and Migrations

98-003 Application of otolith Sr: Ca ratios to estimate the migratory history of masu salmon, *Oncorhynchus masou*. Arai, T., and K. Tsukamoto. 1998. Ichthyol. Res., 45: 309-313. [Ocean Research Institute, The University of Tokyo, 1-15-1 Minamidai, Nakano, Tokyo 164-8639, Japan; arait@ori.u-tokyo.ac.jp]

98-004 Vertical movement of chum salmon, *Oncorhynchus keta*, in the western North Pacific Ocean as determined by a depth-recording archival tag. Ishida, Y., A. Yano, M. Ban, and M. Ogura. 1998. Salmon Report Series, 45: 199-211. [Hokkaido National Fisheries Research Institute, Katsurakoi 116, Kushiro, Hokkaido 085-0802, Japan; ishiday@hnf.affrc.go.jp]

98-005 A record of adult coho salmon (*Oncorhynchus kisutch*) strayed into the Chitose River. Kikuchi, M., S. Urawa, K. Ohkuma, and M. Kaeriyama. 1998. Bull. Natl. Salmon Resources Center, 1: 39-43. In Japanese with English summary. [Chitose Salmon Aquarium, Chitose, Hokkaido 066-0028, Japan]

98-006 Recoveries of masu salmon strayed into Shokanbetsu River, northern Hokkaido, Japan. Miyakoshi, Y. 1998. Sci. Rep. Hokkaido Fish Hatchery, 52: 75-77. [Hokkaido Fish Hatchery, Kitakashiwagi 3-373, Eniwa, Hokkaido 061-1433, Japan]

98-007 Japan-U.S. cooperative high-seas salmonid research aboard the R/V Wakatake maru from June 11 to July 25, 1997. Nagasawa, K., N. D. Davis, and Y. Uwano. 1998. Salmon Report Series, 45: 161-194. [National Research Institute of Far Seas Fisheries, Orido, Shimizu, Shizuoka 424-8633, Japan; ornatus@ss.enyo.affrc.go.jp]

98-008 Autumn distribution of epipelagic fishes and squids in the Okhotsk Sea and western North Pacific Ocean off the Kuril Islands and southeast Hokkaido. Nagasawa, K., Y. Ueno, J. Sakai, and J. Mori. 1998. Bull. Nat. Res. Inst. Far Seas Fish., 35: 113-130. [National Research Institute of Far Seas Fisheries, Orido, Shimizu, Shizuoka 424-8633, Japan; ornatus@ss.enyo.affrc.go.jp]

98-009 Burst swimming speed of chum salmon fry measured with a simple water tunnel apparatus. Ohkuma, K., S. Sasaki, A. Wada, and T. Tojima. 1998. Bull. Natl. Salmon Resources Center, 1: 45-48. In Japanese with English summary. [Research Division, National Salmon Resources Center, Fisheries Agency of Japan, 2-2 Nakanoshima, Toyohiraku, Sapporo 062-0922, Japan; ohkuma@salmon.affrc.go.jp]

98-010 An acoustic survey of salmon juveniles in the Okhotsk Sea during the autumn of 1996. Sakai, J., and Y. Ueno. 1998. Salmon Report Series, 45: 213-220. [National Research Institute of Far Seas Fish-

eries, Orido, Shimizu, Shizuoka 424-8633, Japan]

98-011 Distribution, migration, and abundance estimation of Asian juvenile salmon. Ueno, Y. 1998. Salmon Report Series, 45: 83-103. [Hachinohe Branch, Tohoku National Fisheries Research Institute, Hachinohe 031-0841, Aomori, Japan; uenoy@myg.affrc.go.jp]

98-012 Distribution and biological characteristics of juvenile salmon in the Okhotsk Sea in the early summer of 1997. Ueno, Y. 1998. Salmon Report Series, 45: 134-159. [Hachinohe Branch, Tohoku National Fisheries Research Institute, Hachinohe 031-0841, Aomori, Japan; uenoy@myg.affrc.go.jp]

98-013 Winter distribution and migration of Pacific salmon. Ueno, Y., Y. Ishida, K. Nagasawa, and T. Watanabe. 1998. Salmon Report Series, 45: 59-82. [Hachinohe Branch, Tohoku National Fisheries Research Institute, Hachinohe 031-0841, Aomori, Japan; uenoy@myg.affrc.go.jp]

98-014 Distribution, biological characteristics and abundance estimation of Asian juvenile salmon in the Okhotsk Sea in the autumn of 1996. Ueno, Y., and J. Sakai. 1998. Salmon Report Series, 45: 105-127. [Hachinohe Branch, Tohoku National Fisheries Research Institute, Hachinohe 031-0841, Aomori, Japan; uenoy@myg.affrc.go.jp]

98-015 Rate of entrainment of the juvenile masu salmon *Oncorhynchus masou* through the intake of agricultural diversion weirs during downstream migration in the Kaji River. Yoneyama, Y., K. Tsukamoto, and S. Kitada. 1998. Nippon Suisan Gakkaishi, 64: 398-405. In Japanese with English summary. [Niigata Prefectural Inland Water Fisheries Experiment Station, Oogawara, Nagaoka, Niigata 940-1137, Japan]

Breeding and Reproduction

98-016 An ultrastructural review on the spermatozoa of Japanese fishes. Hara, M., and M. Okiyama. 1998. Bull. Ocean Res. Inst., Univ. Tokyo, 33: 1-152. [Ocean Research Institute, The University of Tokyo, Minamidai, Nakano-ku, Tokyo 164-8639, Japan]

Feeding, Diets, and Growth

98-017 Preliminary analysis of chum salmon feeding ecology in relation to reduction in growth. Ishida, Y., and N. D. Davis. 1998. Salmon Report Series, 45:

221-225. [Hokkaido National Fisheries Research Institute, Katsurakoi 116, Kushiro, Hokkaido 085-0802, Japan; ishiday@hnf.affrc.go.jp]

98-018 Density-dependent effects on body weight of the pink salmon in the Japan Sea. Hiyama, Y., S. Hasegawa, and F. Kato. 1998. Bull. Japan Sea Natl. Fish. Res. Inst., 48: 17-25. [Japan Sea National Fisheries Research Institute, Suido-cho, Niigata 951-8121, Japan]

98-019 Effects of turbidity on the feeding behavior of juvenile masu salmon (*Oncorhynchus masou*). Mayama, H. 1998. Bull. Natl. Salmon Resources Center, 1: 1-11. In Japanese with English summary. [Research Division, National Salmon Resources Center, Fisheries Agency of Japan, 2-2 Nakanoshima, Toyohira-ku, Sapporo 062-0922, Japan; mayama@salmon.affrc.go.jp]

98-020 Japanese anchovy (*Engraulis japonicus*) collected in the central North Pacific Ocean, from the stomach contents of coho salmon (*Oncorhynchus kisutch*) and from surface gillnets. Nagasawa, K., and N. D. Davis. 1998. Salmon Report Series, 45: 267-270. [National Research Institute of Far Seas Fisheries, Orido, Shimizu, Shizuoka 424-8633, Japan; ornatus@ss.enyo.affrc.go.jp]

98-021 Diel migration of zooplankton and feeding behavior of juvenile chum salmon in the central Pacific coast of Hokkaido. Seki, J., and I. Shimizu. 1998. Bull. Natl. Salmon Resources Center, 1: 13-27. In Japanese with English summary. [Research Division, National Salmon Resources Center, Fisheries Agency of Japan, 2-2 Nakanoshima, Toyohira-ku, Sapporo 062-0922, Japan; sekijiro@salmon.affrc.go.jp]

98-022 Individual growth and life-history divergence of juvenile masu salmon (*Oncorhynchus masou*) in a northern Japanese stream. Takami, T., T. Aoyama, M. Nagata, M. Miyamoto, S. Ohkubo, and H. Kawamura. 1998. Sci. Rep. Hokkaido Fish Hatchery, 52: 21-29. [Mashike Branch, Hokkaido Fish Hatchery, Mashike, Hokkaido 077-0216, Japan; takamit@fish-exp.pref.hokkaido.jp]

98-023 Influence of high water temperature on feeding responses and thermal death of juvenile masu salmon under aquarium settings. Takami, T., and H. Sato. 1998. Sci. Rep. Hokkaido Fish Hatchery, 52: 79-82. [Mashike Branch, Hokkaido Fish Hatchery, Mashike, Hokkaido 077-0216, Japan; takamit@fish-

exp.pref.hokkaido.jp]

98-024 A growth of kokanee, *Oncorhynchus nerka*, stocked in the Oka marsh in the Yakumo practice forests, Nihon University, Hokkaido. Yoshihara, K., and N. Ohi. 1998. Suisanzoshoku, 46: 47-56. In Japanese with English summary. [Nihon University, 1866 Kameino, Fujisawa, Kanagawa 252-8510, Japan]

Population and Management

98-025 Spatial correlations between survival rates of pink salmon (*Oncorhynchus gorbuscha*) and sea surface temperatures in the North Pacific Ocean. Azumaya, T., Y. Ishida, Y. Ueno, and T. Watanabe. 1998. Salmon Report Series, 45: 227-238. In Japanese with English summary. [Hokkaido National Fisheries Research Institute, Katsurakoi 116, Kushiro, Hokkaido 085-0802, Japan; azumaya@hnf.affrc.go.jp]

98-026 Relative abundance and fish size of Pacific salmon in the North Pacific Ocean, 1997. Ishida, Y., S. Ito, G. Anma, T. Meguro, H. Yamaguchi, and Y. Kajiwar. 1998. Salmon Report Series, 45: 5-38. [Hokkaido National Fisheries Research Institute, Katsurakoi 116, Kushiro, Hokkaido 085-0802, Japan; ishiday@hnf.affrc.go.jp]

98-027 Math-ecological study on himemasu and honmasu in Lake Tyuzenji. Ishijima, H. 1998. Bull. Tochigi Pref. Fish. Exp. Stat., 41: 3-12. In Japanese. [Tochigi Prefectural Fisheries Experimental Station, Yanagida 1260, Utsunomiya, Tochigi 321-0902, Japan]

98-028 Assessment of hatchery origin and wild masu salmon (*Oncorhynchus masou*) smolts in the Masuhoro River, 1996. Miyakoshi, Y., H. Hayano, M. Fujiwara, K. Sugiwaka, and J. R. Irvine. 1998. Sci. Rep. Hokkaido Fish Hatchery, 52: 1-10. [Hokkaido Fish Hatchery, Kitakashiwagi 3-373, Eniwa, Hokkaido 061-1433, Japan]

Stock Identification

98-029 Tag loss of masu salmon marked with coded wire tags in different tag placements. Nagata, M., J. R. Irvine, M. Miyamoto, S. Ohkubo, and M. Kobayashi. 1998. Sci. Rep. Hokkaido Fish Hatchery, 52: 37-43. In Japanese with English summary. [Hokkaido Fish Hatchery, Kitakashiwagi 3-373, Eniwa, Hokkaido 061-1433, Japan; PGB01434@nifty.

ne.jp]

98-030 Salmon tagging experiments and recovery of salmon lacking adipose fin collected by Japanese salmon research vessels in the North Pacific Ocean, 1997. Ito, S., and Y. Ishida. 1998. Salmon Report Series, 45: 51-57. [National Research Institute of Far Seas Fisheries, Orido, Shimizu, Shizuoka 424-8633, Japan]

98-031 Thermal induced bar-code otolith marking applied to masu salmon. Tsujimoto, R., and Y. Tago. 1998. Bull. Toyama Pref. Fish. Res. Inst., 10: 21-26. In Japanese with English summary. [Toyama Prefectural Fisheries Research Institute, Namerikawa, Toyama 936-8536, Japan; r.tsujimoto@fish.pref.toyama.jp]

Morphology, Taxonomy and Phylogeny

98-032 Age determination of salmon (*Oncorhynchus keta*) using scale pattern analysis. Endo, Y., O. Watarai, and M. Igarashi. 1998. J. School Marine Sci. Tech. Tokai Univ., 46: 1-15. In Japanese with English summary. [School of Marine Science and Technology, Tokai University, Shimizu, Shizuoka 424-8610, Japan]

98-033 Species identification and age determination of Pacific salmon (*Oncorhynchus* spp.) by scale patterns. Ito, S., and Y. Ishida. 1998. Bull. Nat. Res. Inst. Far Seas Fish., 35: 131-154. In Japanese with English summary. [National Research Institute of Far Seas Fisheries, Orido, Shimizu, Shizuoka 424-8633, Japan]

98-034 Validity of age determination in the fluvial Japanese charr *Salvelinus leucomaenis* by scale reading. Nakamura, T., T. Maruyama, and S. Watanabe. 1998. Fish. Sci., 64: 385-387. [Nakagawa Branch, Tochigi Prefectural Fisheries Experimental Station, Ogawa, Nasu, Tochigi 324-0501, Japan]

Physiology and Endocrinology

98-035 Low GnRH levels in the brain and the pituitary in triploid female sockeye salmon. Amano, M., M. Kobayashi, N. Okumoto, and K. Aida. 1998. Fish. Sci., 64: 340-341. [Nikko Branch, National Research Institute of Aquaculture, Nikko, Tochigi 321-1661, Japan]

98-036 Localization of mRNA encoding thyrotropin-releasing hormone precursor in the brain of sockeye

salmon. Ando, H., J. Ando, and A. Urano. 1998. Zool. Sci., 15: 945-953. [Graduate School of Science, Hokkaido University, Sapporo 060-0810, Japan]

98-037 Evaluation of seawater adaptability of 0+ amago salmon related to possibility of culture in seawater. Gorie, S. 1998. Fish. Sci., 64: 338-339. [Hyogo Prefectural Tajima Fisheries Experimental Station, Kasumi, Kinosaki, Hyogo 669-6541, Japan]

98-038 Heparin essential for tissue culture with fish fibroblast growth factor 2. Hata, J., J. Takeo, and S. Yamashita. 1998. Fish. Sci., 64: 216-219. [Central Research Laboratory, Nippon Suisan Kaisha Ltd., Kitanomachi, Hachioji, Tokyo 192-0906, Japan]

98-039 Pretreatment reproductive stage and oocyte development induced by salmon pituitary homogenate in the Japanese eel *Anguilla japonica*. Ijiri, S., T. Kayaba, N. Takeda, H. Tachiki, S. Adachi, and K. Yamauchi. 1998. Fish. Sci., 64: 531-537. [Department of Biology, Faculty of Fisheries, Hokkaido University, Hakodate 041-8611, Japan]

98-040 GnRH analog stimulates gonadotropin II gene expression in maturing sockeye salmon. Kitahashi, T., D. Alok, H. Ando, M. Kaeriyama, Y. Zohar, H. Ueda, and A. Urano. 1998. Zool. Sci., 15: 761-765. [Graduate School of Science, Hokkaido University, Sapporo 060-0810, Japan]

98-041 Changes in the levels of gonadotropin subunit mRNAs in the pituitary of pre-spawning chum salmon. Kitahashi, T., H. Ando, M. Ban, H. Ueda, and A. Urano. 1998. Zool. Sci., 15: 753-760. [Graduate School of Science, Hokkaido University, Sapporo 060-0810, Japan]

98-042 Gonadotropin-releasing hormone analog and sex steroids shorten homing duration of sockeye salmon in Lake Shikotsu. Kitahashi, T., A. Sato, D. Alok, M. Kaeriyama, Y. Zohar, K. Yamauchi, A. Urano, and H. Ueda. 1998. Zool. Sci., 15: 767-771. [Graduate School of Science, Hokkaido University, Sapporo 060-0810, Japan]

98-043 Oogenesis and changes in the levels of reproductive hormones in triploid female rainbow trout. Kobayashi, T., S. Fushiki, N. Sakai, A. Hara, M. Amano, K. Aida, M. Nakamura, and Y. Nagahama. 1998. Fish. Sci., 64: 206-215. [Shiga Prefectural Samegai Trout Farm, Kaminyu, Maihara, Shiga 521-0033, Japan]

98-044 Carbohydrate and amino acid metabolism in the liver of masu salmon *Oncorhynchus masou* in the early period of seawater migration. Shikata, T. 1998. Fish. Sci., 64: 487-491. [Ishikawa Prefectural Fisheries Research Center, Ushitsu, Noto, Ishikawa 927-0435, Japan]

98-045 Immunochemical detection, estrogen induction and occurrence in serum of vitelline envelope-related proteins of Sakhalin taimen *Hucho perryi*. Shimizu, M., T. Fujita, N. Hiramatsu, and A. Hara. 1998. Fish. Sci., 64: 600-605. [Nanae Fish Culture Experimental Station, Faculty of Fisheries, Hokkaido University, Nanae, Kamada-gun, Hokkaido 041-1105, Japan]

98-046 Ability to thermal resistance of thermal resistant rainbow trout *Oncorhynchus mykiss*. Suzuki, S., K. Suzuki, and Y. Ootomo. 1998. Bull. Saitama Pref. Fish Exp. Stat., 56: 22-25. In Japanese. [Saitama Prefectural Fisheries Experiment Station, Kitakohama 1060, Kazo, Saitama 347-0011, Japan]

98-047 Seawater tolerance of white-spotted charr (*Salvelinus leucomaenis*) related to water temperature. Takami, T. 1998. Sci. Rep. Hokkaido Fish Hatchery, 52: 11-19. [Mashike Branch, Hokkaido Fish Hatchery, Mashike, Hokkaido 077-0216, Japan; takamit@fishexp.pref.hokkaido.jp]

98-048 Effects of calcium agonists on vitellogenin induction by estradiol-17 β in primary hepatocyte culture in the rainbow trout *Oncorhynchus mykiss*. Yeo, I. -K., and Y. Mugiya. 1998. Fish. Sci., 64: 443-447. [Laboratory of Comparative Physiology, Faculty of Fisheries, Hokkaido University, Minato, Hakodate 041-8611, Japan]

Biochemistry

98-049 Molecular cloning and characterization of a cDNA encoding the retinal arylalkylamine N-acetyltransferase of the rainbow trout, *Oncorhynchus mykiss*. Mizusawa, K., M. Iigo, H. Suetake, Y. Yoshiura, K. Gen, K. Kikuchi, T. Okano, Y. Fukada, and K. Aida. 1998. Zool. Sci., 15: 345-351. [Graduate School of Agricultural and Life Sciences, The University of Tokyo, Bunkyo-ku, Tokyo 113-0033, Japan]

98-050 Compositions of free amino acids and related compounds in the edible portion of ten salmonid species. Murata, Y., M. Kaneniwa, Y. Yamashita, H. Iida, and M. Yokoyama. 1998. Bull. Natl. Res. Inst.

Fish. Sci., 11: 65-73. In Japanese with English summary. [National Research Institute of Fisheries Science, 2-12-4, Fukuura, Kanazawa, Yokohama 236-8648, Japan; betty@nrifs.affrc.go.jp]

98-051 The oxidative stabilities of polyunsaturated fatty acids in salmon egg phosphatidylcholine liposomes. Nara, E., K. Miyashita, T. Ota, and Y. Nadachi. 1998. Fish. Sci., 64: 282-286. [Department of Chemistry, Faculty of Fisheries, Hokkaido University, 3-1-1 Minato, Hakodate 041-0821, Japan]

98-052 Effect of feed preparation methods on dietary energy budgets in carp and rainbow trout. Ohta, M., and T. Watanabe. 1998. Fish. Sci., 64: 99-114. [Aquaculture Research Center, Nippon Formula Feed Mfg. Co., Ltd., Oozima, Yaizu, Shizuoka 425-0066, Japan]

98-053 Effect of dietary sodium chloride levels on growth and tolerance to sea water of rainbow trout. Park, G. -S., T. Takeuchi, M. Yokoyama, and S. Satoh. 1998. Nippon Suisan Gakkaishi, 64: 469-474. In Japanese with English summary. [Department of Aquatic Biosciences, Tokyo University of Fisheries, Konan, Minato, Tokyo 108-8477, Japan]

98-054 Removal of lipids from salmon and trout skin using supercritical carbon dioxide extraction. Shimizu, H., Y. Kumabayashi, S. Kono, and K. Yamazaki. 1998. Bull. Hokkaido Food Processing Research Center, 3: 51-54. In Japanese with English summary. [Hokkaido Food Processing Research Center, Bunkyo-dai Midorimachi 589-4, Ebetsu, Hokkaido 069-0836, Japan]

98-055 HPLC determination of N-acetyl-L-histidine and its related compounds in fish tissues. Togashi, M., E. Okuma, and H. Abe. 1998. Fish. Sci., 64: 174-175. [Department of Food Science and Nutrition, Kyoritsu Women's University, Hitotsubashi, Chiyoda, Tokyo 101-8433, Japan]

98-056 Apparent and true availabilities of amino acids from several protein sources for fingerling rainbow trout, common carp, and red sea bream. Yamamoto, T., A. Akimoto, S. Kishi, T. Unuma, and T. Akiyama. 1998. Fish. Sci., 64: 448-458. [Nutrition Section, Inland Station, National Research Institute of Aquaculture, Tamaki, Mie 519-0423, Japan]

98-057 Postprandial changes in plasma free amino acid concentrations of rainbow trout fed diets containing different protein sources. Yamamoto, T., T.

Unuma, and T. Akiyama. 1998. Fish. Sci., 64: 474-481. [Nutrition Section, Inland Station, National Research Institute of Aquaculture, Tamaki, Mie 519-0423, Japan]

98-058 Effect of bovine plasma on heat-induced gelatin of salt-ground meat from walleye pollack and chum salmon. Yasunaga, K., Y. Abe, F. Nishioka, and K. Arai. 1998. Nippon Suisan Gakkaishi, 64: 685-696. In Japanese with English summary. [National Research Institute of Fisheries Science, Fukuura 2-12-4, Kanazawa, Yokohama 236-8648, Japan]

98-059 Change in quality of preheated gel and two-step heated gel from walleye pollack and chum salmon on addition of microbial transglutaminase. Yasunaga, K., Y. Abe, F. Nishioka, and K. Arai. 1998. Nippon Suisan Gakkaishi, 64: 702-709. In Japanese with English summary. [National Research Institute of Fisheries Science, Fukuura 2-12-4, Kanazawa, Yokohama 236-8648, Japan]

98-060 Effect of oral administration of L-cystine on hypotaurine level in rainbow trout. Yokoyama, M., and J. Nakazoe. 1998. Fish. Sci., 64: 144-147. [National Research Institute of Fisheries Science, Fukuura, Kanazawa, Yokohama 236-8648, Japan; yokoyama@nrifs.affrc.go.jp]

98-061 Fermented chum salmon paste containing fish bone. Yoshikawa, S., K. Asano, and Y. Tamura. 1998. Bull. Hokkaido Food Processing Research Center, 3: 65-67. In Japanese with English summary. [Hokkaido Food Processing Research Center, Bunkyo-dai Midorimachi 589-4, Ebetsu, Hokkaido 069-0836, Japan]

Genetics

98-062 Estimation of heritabilities of growth traits, and phenotypic and genetic correlations in juvenile masu salmon *Oncorhynchus masou*. Choe, M. -K., and F. Yamazaki. 1998. Fish. Sci., 64: 903-908. [Faculty of Fisheries, Hokkaido University, Minato-cho, Hakodate, Hokkaido 041-8611, Japan]

98-063 Universal PCR primer for calmodulin gene intron in fish. Chow, S. 1998. Fish. Sci., 64: 999-1000. [Division of Pelagic Fish Resources, National Research Institute of Far Seas Fisheries, Ordo, Shimizu 424-8633, Japan; chow@enyo.affrc.go.jp]

98-064 Genetic difference between two streams of

Ohigawa River at the two isozymic loci in Yamato-iwana, *Salvelinus leucomaenis*. Goto, H., Y. Maeda, and A. Kijima. 1998. Fish Genetics Breeding Sci., 26: 41-47. In Japanese with English summary. [Fuji Trout Farm of Shizuoka Prefectural Fisheries Experimental Station, 579-2, Inokashira, Fujinomiya, Shizuoka 418-0108, Japan]

98-065 Cytological observation on behavior of the nuclei after chromosome manipulation during early development of rainbow trout. Kobayashi, T. 1998. Nippon Suisan Gakkaishi, 64: 782-791. In Japanese with English summary. [Shiga Prefectural Samegai Trout Farm, Maibara, Shiga 521-0033, Japan]

98-066 Estimates of heritability in rates and timing of smoltification for underyearling masu salmon (*Oncorhynchus masou*). Koyama, T., Y. Sasaki, H. Ohmori, and N. Koide. 1998. Sci. Rep. Hokkaido Fish Hatchery, 52: 55-63. In Japanese with English summary. [Hokkaido Fish Hatchery, Kitakashiwagi 3-373, Eniwa, Hokkaido 061-1433, Japan]

98-067 Studies on breeding of salmonid fishes by chromosome manipulation. Suppression on the first cell cleavage by two times heat-shock-treatment to rainbow trout (*Oncorhynchus mykiss*). Kuwada, T. 1998. Rep. Gifu Pref. Fish. Exp. Stat., 43: 9-14. In Japanese. [Gifu Prefectural Fisheries Experimental Station, 2605 Hane, Hagiwara-cho, Masuda, Gifu 509-2506, Japan]

98-068 Genetic relationship between masu and amago salmon examined through sequence analysis of nuclear and mitochondrial DNA. McKay, S. J., I. Nakayama, M. J. Smith, and R. H. Devlin. 1998. Zool. Sci., 15: 971-979. [Centre for Environmental Health, Department of Biology, University of Victoria, Victoria, B. C., Canada V8W 3N5]

98-069 Aquatic animal genome mapping. Nakayama, I. 1998. Bull. Natl. Res. Inst. Aquacult. 27: 1-11. In Japanese with English summary. [Inland Station, National Research Institute of Aquaculture, Tamaki, Mie 519-0423, Japan]

98-070 Partial characterization of cDNA clones encoding the three distinct pro α chains of type I collagen from rainbow trout. Saito, M., N. Kunisaki, I. Hirono, T. Aoki, M. Ishida, N. Urano, and S. Kimura. 1998. Fish. Sci., 64: 780-786. [Kagawa Nutrition College, Komagome, Toshima, Tokyo 170-8481, Japan]

Diseases and Parasites

98-071 Ineffectiveness of iodophore treatment in disinfecting salmonid eggs carrying *Cytophaga psychrophila*. Kumagai, A., K. Takahashi, S. Yamaoka, and H. Wakabayashi. 1998. Fish Pathol., 33: 123-128. [National Research Institute of Aquaculture, Nansei, Mie 516-0193, Japan; akumagai@nria.affrc.go.jp]

98-072 Correlation between plasma component levels of cultured fish and resistance to bacterial infection. Maita, M., K. Satoh, Y. Fukuda, H. -K. Lee, J. R. Winton, and N. Okamoto. 1998. Fish Pathol., 33: 129-133. [Department of Aquatic Biosciences, Tokyo University of Fisheries, Konan 4, Minato, Tokyo 108-8477, Japan; mmaita@tokyo-u-fish.ac.jp]

98-073 Biochemical properties of coho salmon artificially infected with erythrocytic inclusion body syndrome virus. Maita, M., T. Oshima, S. Horikuchi, and N. Okamoto. 1998. Fish Pathol., 33: 53-58. [Department of Aquatic Biosciences, Tokyo University of Fisheries, Konan 4, Minato, Tokyo 108-8477, Japan; mmaita@tokyo-u-fish.ac.jp]

98-074 Influences of pH and temperature on lysozyme activity in the plasma of Japanese flounder and Japanese char. Miyazaki, T. 1998. Fish Pathol., 33: 7-10. [Toyama Prefecture Fisheries Research Institute, Takatsuka, Namerikawa, Toyama 936-8536, Japan]

98-075 Viral diseases of fish and shellfish in Australian mariculture. Munday, B. L., and L. Owens. 1998. Fish Pathol., 33: 193-200. [Department of Aquaculture, University of Tasmania, P. O. Box 1214, Launceston, Tasmania 7250, Australia]

98-076 Alive freshwater parasitic copepods (*Salmincola californiensis*) found on the gills of ocean-caught steelhead trout (*Oncorhynchus mykiss*). Nagasawa, K. 1998. Salmon Report Series, 45: 277-279. [National Research Institute of Far Seas Fisheries, Ordo, Shimizu, Shizuoka 424-8633, Japan; ornatus@aa.enyo.affrc.go.jp]

98-077 A case of infectious hematopoietic necrosis recognized under higher water temperature. Nakai, Y. 1998. Rep. Gifu Pref. Fish. Exp. Stat., 43: 29-30. In Japanese. [Gifu Prefectural Fisheries Experimental Station, 2605 Hane, Hagiwara-cho, Masuda, Gifu

509-2506, Japan]

98-078 Examples of outbreaks of viral disease like viral whirling disease on cultured salmonids in Saitama Prefecture. Suzuki, K., S. Suzuki, and Y. Ootomo. 1998. Bull. Saitama Pref. Fish Exp. Stat., 56: 26-30. In Japanese. [Saitama Prefectural Fisheries Experiment Station, Kitakohama 1060, Kazo, Saitama 347-0011, Japan]

98-079 A status of *Lepeophtheirus salmonis* (Copepoda: Caligidae) on seawater-cultured coho salmon (*Oncorhynchus kisutch*) and rainbow trout (*O. mykiss*) in Japan. Urawa, S., T. Kato, and A. Kumagai. 1998. Bull. Natl. Salmon Resources Center, 1: 35-38. [Research Division, National Salmon Resources Center, Fisheries Agency of Japan, 2-2 Nakanoshima, Toyohira-ku, Sapporo 062-0922, Japan; urawa@salmon.affrc.go.jp]

98-080 A review of *Ichthyobodo* infection in marine fishes. Urawa, S., N. Ueki, and E. Karlsbakk. 1998. Fish Pathol., 33: 311-320. [Research Division, National Salmon Resources Center, 2-2 Nakanoshima, Toyohira-ku, Sapporo 062-0922, Japan; urawa@salmon.affrc.go.jp]

98-081 Detection of infectious hematopoietic necrosis virus using RT-PCR combined with tissue culture. Yoshinaka, T., Y. Hori, A. Motonishi, K. Kasai, A. Yamamoto, K. Suzuki, M. Ugazin, T. Nomura, and M. Yoshimizu. 1998. Bull. Natl. Salmon Resources Center, 1: 29-34. In Japanese with English summary. [Faculty of Fisheries, Hokkaido University, Minato 3-1-1, Hakodate, Hokkaido 041-8611, Japan]

98-082 Simultaneous detection of infectious hematopoietic necrosis virus (IHNV) and infectious pancreatic necrosis virus (IPNV) by reverse transcription (RT)-polymerase chain reaction (PCR). Yoshinaka, T., M. Yoshimizu, and Y. Ezura. 1998. Fish. Sci., 64: 650-651. [Faculty of Fisheries, Hokkaido University, Minato 3-1-1, Hakodate, Hokkaido 041-8611, Japan]

Toxicology

98-083 Toxicity of agricultural chemicals to fish-XXI. Kuge, T., H. Arai, M. Mogi, and K. Satsumi. 1998. Rep. Gunma Fish. Exp. Stat., 4: 1-2. In Japanese. [Gunma Fisheries Experimental Station, Shikishima 13, Maebashi, Gunma 371-0036, Japan]

98-084 Application of a suspension-cultured salmonid cell line CHSE-sp to cytotoxicity test. Mori, M., M. Wakabayashi, Y. Kaneko, and M. Hasobe. 1998. Fish. Sci., 64: 991-992. [Tokyo Metropolitan Research Institute for Environmental Protection, Shinsuna, Koto, Tokyo 136-0075, Japan]

Politics

98-085 Formation of the fisheries in the Far East USSR and the fisheries relationship between Japan and the USSR in the NEP period. Menjo, A., and K. Hasegawa. 1998. Bull. Fac. Bioresources Mie Univ., 20: 55-67. In Japanese with English summary. [Mie

University, Kamihama-cho, Tsu, Mie 514-8507, Japan]

Supplement

98-086 Antihypertensive action of the orally administered protease hydrolysates of chum salmon head and their angiotensin I-converting enzyme inhibitory peptides. Ohta, T., A. Iwashita, S. Sasaki, and Y. Kawamura. 1997. Food Sci. Technol. Int. Tokyo, 3: 339-343. [Hokkaido Food Processing Research Center, Bunkyo-dai Midorimachi 589-4, Ebetsu, Hokkaido 069-0836, Japan]

Author Index

- Abe, H. 98-055.
 Abe, Y. 98-058, 98-059.
 Adachi, S. 98-039.
 Aida, K. 98-035, 98-043, 98-049.
 Akimoto, A. 98-056.
 Akiyama, T. 98-056, 98-057.
 Alok, D. 98-040, 98-042.
 Amano, M. 98-035, 98-043.
 Ando, H. 98-036, 98-040, 98-041.
 Ando, J. 98-036.
 Anma, G. 98-026.
 Aoki, T. 98-070.
 Aoyama, T. 98-022.
 Arai, H. 98-083.
 Arai, K. 98-058, 98-059.
 Arai, T. 98-003.
 Asano, K. 98-061.
 Azumaya, T. 98-025.
 Ban, M. 98-004, 98-041.
 Choe, M. -K. 98-062.
 Chow, S. 98-063.
 Davis, N. D. 98-007, 98-017, 98-020.
 Devlin, R. H. 98-068.
 Endo, Y. 98-032.
 Ezura, Y. 98-082.
 Fujita, T. 98-045.
 Fujiwara, M. 98-028.
 Fukada, Y. 98-049.
 Fukuda, Y. 98-072.
 Fushiki, S. 98-043.
 Gen, K. 98-049.
 Goto, H. 98-064.
 Gorie, S. 98-037.
 Hara, A. 98-043, 98-045.
 Hara, M. 98-016.
 Hasegawa, K. 98-085.
 Hasegawa, S. 98-018.
 Hasobe, M. 98-084.
 Hata, J. 98-038.
 Hayano, H. 98-028.
 Hiramatsu, N. 98-045.
 Hirono, I. 98-070.
 Hiyama, Y. 98-018.
 Hori, Y. 98-081.
 Horikuchi, S. 98-073.
 Igarashi, M. 98-032.
 Iida, H. 98-050.
 Iigo, M. 98-049.
 Ijiri, S. 98-039.
 Irvine, J. R. 98-028, 98-029.
 Ishida, M. 98-070.
 Ishida, Y. 98-004, 98-013, 98-017, 98-025, 98-026, 98-030, 98-033.
 Ishijima, H. 98-027.
 Ito, S. 98-026, 98-030, 98-033.
 Iwashita, A. 98-086.
 Kaeriyama, M. 98-005, 98-040, 98-042.
 Kajiwar, Y. 98-026.
 Kaneko, Y. 98-084.
 Kaneniwa, M. 98-050.
 Karlsbakk, E. 98-080.
 Kasai, K. 98-081.
 Kato, F. 98-018.
 Kato, T. 98-079.
 Kawamura, H. 98-022.
 Kawamura, Y. 98-086.
 Kayaba, T. 98-039.
 Kijima, A. 98-064.
 Kikuchi, K. 98-049.
 Kikuchi, M. 98-005.
 Kimura, S. 98-070.
 Kishi, S. 98-056.
 Kitada, S. 98-015.
 Kitahashi, T. 98-040, 98-041, 98-042.
 Kobayashi, Ma. 98-035.
 Kobayashi, Mi. 98-029.
 Kobayashi, T. 98-043, 98-065.
 Koide, N. 98-066.
 Kono, S. 98-054.
 Koyama, T. 98-066.
 Kuge, T. 98-083.
 Kumabayashi, Y. 98-054.
 Kumagai, A. 98-071, 98-079.
 Kunisaki, N. 98-070.
 Kuwada, T. 98-067.
 Lee, H. -K. 98-072.
 Maeda, Y. 98-064.
 Maita, M. 98-072, 98-073.
 Maruyama, T. 98-034.
 Mayama, H. 98-019.
 Mckay, S. J. 98-068.
 Meguro, T. 98-026.
 Menjo, A. 98-085.
 Miyakoshi, Y. 98-006, 98-028.
 Miyamoto, M. 98-001, 98-022, 98-029.
 Miyashita, K. 98-051.
 Miyazaki, T. 98-074.
 Mizusawa, K. 98-049.
 Mogi, M. 98-083.
 Mori, J. 98-008.
 Mori, M. 98-084.
 Motonishi, A. 98-081.
 Mugiya, Y. 98-048.
 Munday, B. L. 98-075.
 Murata, Y. 98-050.
 Nadachi, Y. 98-051.
 Nagahama, Y. 98-043.
 Nagasaka, Y. 98-001.
 Nagasawa, K. 98-007, 98-008, 98-013, 98-020, 98-076.
 Nagata, M. 98-001, 98-022, 98-029.
 Nakai, Y. 98-077.
 Nakamura, M. 98-043.
 Nakamura, T. 98-034.
 Nakano, S. 98-002.
 Nakayama, I. 98-068, 98-069.
 Nakazoe, J. 98-060.
 Nara, E. 98-051.
 Nishioka, F. 98-058, 98-059.
 Nomura, T. 98-081.
 Ogura, M. 98-004.
 Ohi, N. 98-024.
 Ohkubo, S. 98-001, 98-022, 98-029.
 Ohkuma, K. 98-005, 98-009.
 Ohmori, H. 98-066.
 Ohta, M. 98-052.
 Ohta, T. 98-086.
 Okamoto, N. 98-072, 98-073.
 Okano, T. 98-049.
 Okiyama, M. 98-016.
 Okuma, E. 98-055.
 Okumoto, N. 98-035.
 Ootomo, Y. 98-046, 98-078.
 Oshima, T. 98-073.
 Ota, T. 98-051.
 Owens, L. 98-075.
 Park, G. -S. 98-053.
 Saito, M. 98-070.
 Sakai, J. 98-008, 98-010, 98-014.
 Sakai, N. 98-043.
 Sasaki, Shi. 98-086.
 Sasaki, Sho. 98-009.
 Sasaki, Y. 98-066.
 Sato, A. 98-042.
 Sato, H. 98-001, 98-023.
 Satoh, K. 98-072.
 Satoh, S. 98-053.

- Satsumi, K. 98-083.
Seki, J. 98-021.
Shikata, T. 98-044.
Shimizu, H. 98-054.
Shimizu, I. 98-021.
Shimizu, M. 98-045.
Smith, M. J. 98-068.
Suetake, H. 98-049.
Sugiwaka, K. 98-028.
Suzuki, K. 98-046, 98-078, 98-081.
Suzuki, S. 98-046, 98-078.
Tachiki, H. 98-039.
Tago, Y. 98-031.
Takahashi, K. 98-071.
Takami, T. 98-022, 98-023, 98-047.
Takeda, N. 98-039.
Takeo, J. 98-038.
Takeuchi, T. 98-053.
Tamura, Y. 98-061.
Togashi, M. 98-055.
Tojima, T. 98-009.
Tsujiimoto, R. 98-031.
Tsukamoto, K. 98-003, 98-015.
Ueda, H. 98-040, 98-041, 98-042.
Ueki, N. 98-080.
Ueno, Y. 98-008, 98-010, 98-011, 98-012, 98-013, 98-014, 98-025.
Ugazin, M. 98-081.
Unuma, T. 98-056, 98-057.
Urano, A. 98-036, 98-040, 98-041, 98-042.
Urano, N. 98-070.
Urawa, S. 98-005, 98-079, 98-080.
Usio, N. 98-002.
Uwano, Y. 98-007.
Wada, A. 98-009.
Wakabayashi, H. 98-071.
Wakabayashi, M. 98-084.
Watanabe, S. 98-034.
Watanabe, Ta. 98-052.
Watanabe, To. 98-013, 98-025.
Watarai, O. 98-032.
Winton, J. R. 98-072.
Yamaguchi, H. 98-026.
Yamamoto, A. 98-081.
Yamamoto, T. 98-056, 98-057.
Yamaoka, S. 98-071.
Yamashita, S. 98-038.
Yamashita, Y. 98-050.
Yamauchi, K. 98-039, 98-042.
Yamazaki, F. 98-062.
Yamazaki, K. 98-054.
Yanai, S. 98-001.
Yano, A. 98-004.
Yasunaga, K. 98-058, 98-059.
Yeo, I. -K. 98-048.
Yokoyama, M. 98-050, 98-053, 98-060.
Yoneyama, Y. 98-015.
Yoshihara, K. 98-024.
Yoshikawa, S. 98-061.
Yoshimizu, M. 98-081, 98-082.
Yoshinaka, T. 98-081, 98-082.
Yoshiura, Y. 98-049.
Zohar, Y. 98-040, 98-042.