



HOKKAIDO UNIVERSITY

| | |
|------------------|---|
| Title | New Record of Albino Japanese Huchen, <i>Hucho perryi</i> |
| Author(s) | KIMURA, Shizuo; 木村, 志津雄; HARA, Akihiko et al. |
| Citation | 北海道大學水産學部研究彙報, 44(2), 76-79 |
| Issue Date | 1993-05 |
| Doc URL | https://hdl.handle.net/2115/24112 |
| Type | departmental bulletin paper |
| File Information | 44(2)_P76-79.pdf |



New Record of Albino Japanese Huchen, *Hucho perryi**

Shizuo KIMURA** and Akihiko HARA**

Abstract

Japanese huchen have been reared at the Nanae Fish Culture Experimental Station, Faculty of Fisheries, Hokkaido University since 1971. The 1979 brood-year huchen, which were received from Hokkaido Fish Hatchery as fingerlings, were the progeny of a pair of wild fish from the Sorachi River in Hokkaido. We have produced huchen fry from these parents every year since 1986. On May 1st, 1989, we obtained 28,111 fertilized eggs from 8 females and 6 males of this parent stock. On July 22, just before the alevins first started to feed, one albino was found in the incubator egg basket. The albino huchen has been reared for over three years. We believe this to be the first report of an albino Japanese huchen.

Introduction

Japanese huchen, *Hucho perryi*, are the largest salmonid in Japan. They are depleted in Hokkaido streams from overfishing, loss of spawning grounds and water pollution. A source of gametes is necessary for propagating and preserving the species. Huchen broodstocks are just now being developed.

Since 1971, Japanese huchen have been reared at the Nanae Fish Culture Experimental Station, Faculty of Fisheries, Hokkaido University. Production of fertilized huchen eggs was accomplished for the first time in 1981 (Kimura and Hara, 1989). Until now, about 100,000 eggs have been taken in spawning operations at our station. Most of the eyed eggs have been transported to other hatcheries and fish farms for basic studies on aquaculture and to preserve the species. Recently, huchen are being considered as a new species for aquaculture, and they are being reared in several places in Japan, including the Hokkaido Fish Hatchery, the Sapporo Salmon Museum, the National Research Institute of Aquaculture, a Huchen Farm in Ajigasawa (Aomori Prefecture), and a private fish farm in Kushiro. However, we still have little knowledge of their reproductive biology. Previously, we reported on the culture and artificial fertilization of Japanese huchen (Kimura and Hara, 1989).

Here we report the discovery of one albino huchen in about 28,000 larva from the 1989 brood-year produced in the course of our studies of the reproductive biology of huchen. We have reared the albino huchen for over three years. We believe this to be the first report of an albino Japanese huchen.

* Contribution No. 69 from Nanae Fish Culture Experimental Station, Faculty of Fisheries, Hokkaido University.

(北海道大学水産学部附属七飯養魚実習施設業績第 69 号)

** Nanae Fish Culture Experimental Station, Faculty of Fisheries, Hokkaido University

(北海道大学水産学部附属七飯養魚実習施設)

New Record

The 1979 brood-year huchen, which were received from Dr. Yoji Kawamura, Hokkaido Fish Hatchery as fingerlings (4 months-old), were the progeny of a pair of wild fish from the Sorachi River, a branch of the Ishikari River in Hokkaido. They were successfully spawned in 1986, for the first time. We have produced huchen fry from these parents every year since then. On May 1st, 1989, we obtained 28,111 fertilized eggs from 8 females and 6 males of this parent stock. The average body weight and length of the adult fish were 4.9 kg (3.9–5.5 kg) and 68 cm (66–72 cm) for males, and 5.5 kg (4.1–6.4 kg) and 69 cm (62–72 cm) for females. The average weight and diameter of the huchen eggs were 137 mg and 6.7 mm, respectively. The eggs hatched 34 days after fertilization, on July 4th.

On July 22, just before the alevins first started to feed, one albino was found in the incubator egg basket. The white color of its body and its red eyes were very striking. Since we observed that the albino was attacked by normal alevins, presumably as a result of its abnormal pigmentation, we separated it from its brood mates and reared it in solitary confinement until now.

Rearing methods used for the albino were almost the same as for the rest of its



Fig. 1. Photographs of the Japanese huchen albino at different ages. (A); ten month, 10.0 cm BL, (B); two years, 25.8 cm BL.

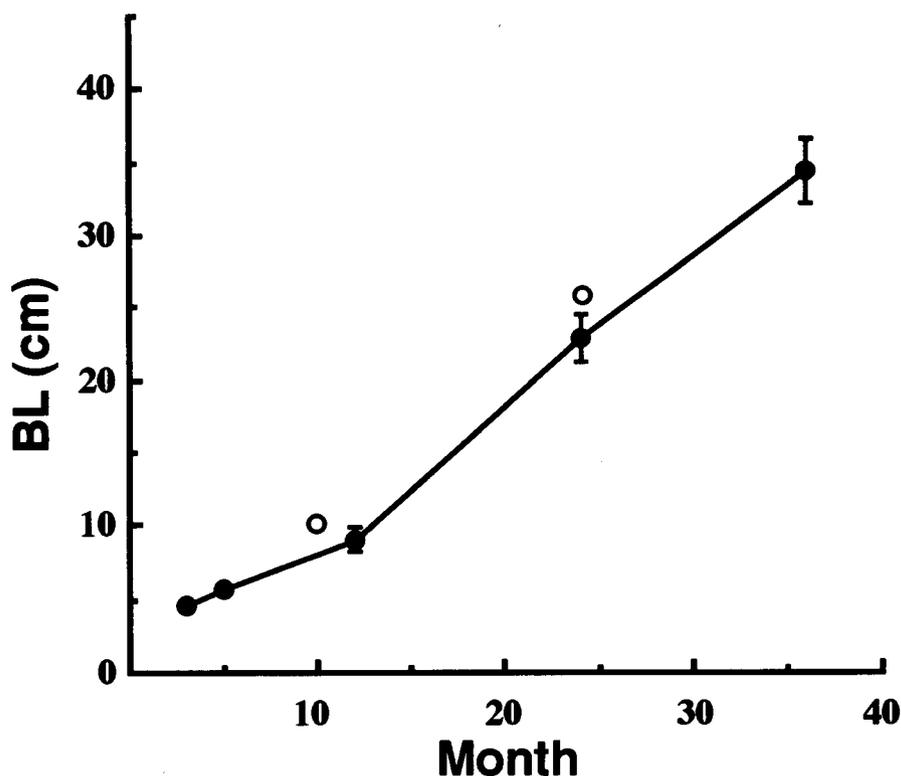


Fig. 2. Growth curve of normal huchen (closed circle) and albino (open circle). The symbols indicate mean body length \pm SEM (N=30).

brood, except for the specific cage or tank used and the number of fish per container. Figure 1 shows photographs of the albino huchen after ten months and two years of growth. This fish has no other obvious pigmentation on body surface as compared with normal fish. Growth of the albino was compared with data from normal fish as shown in Fig. 2. Its body length was larger than the average for normally pigmented fish at a given stage, probably as a result of its being reared alone and having no competition for food or space.

Discussion

There are many reports of anomalies for fish of various species as cited in the bibliographies of Dawson (1964, 1966 and 1971). However, reports of albinism in salmonids are mainly restricted to rainbow trout, *Oncorhynchus mykiss*. Albino rainbow trout are now widely distributed on fish farms. The occurrence of lake trout, *Salvelinus namaycush* (Hazzard, 1943; Allin, 1945), brook trout, *Salvelinus fontinalis* (Pettis, 1904), and chinook salmon, *Oncorhynchus tshawytscha* (Leonards

and Madden, 1963) albinos has also been reported. The reasons for no prior report of a Japanese huchen albino are probably related to its limited distribution and small populations as well as to the fact that it has only been cultured for a short time. In the present study, only one albino huchen was observed among over 100,000 eggs, the total number of eggs spawned at the Nanae Fish Culture Experimental Station during the past 10 years. This discovery was very fortunate because usually most of the eyed eggs are transported to other places. We observed overt aggression directed at the albino by the normal alevins. If it were not reared in solitary confinement, it seems likely that it would have been killed by its brood mates. Accordingly, albino huchen may not be able to survive in nature. In the case of rainbow trout, it is known that wild birds catch the albino fish preferentially.

The albino huchen is still alive and growing, but its gender has not yet been identified. We are eager to get eggs or sperm from the albino for further studies to evaluate the mode of inheritance of albinism in Japanese huchen. Albinism would likely be a very useful natural marker in laboratory studies of huchen genetics, physiology and nutrition. For example, albino rainbow trout have been used in the United States to balance tank loading densities or replace moribund fish in nutrition experiments. They can easily be identified and excluded from routine sampling (C.V. Sullivan, personal communication).

Acknowledgements

The authors would like to thank to Professor Kunio Amaoka, Faculty of Fisheries, Hokkaido University, for his useful comments and discussion. Thanks are also due to Dr. Craig V. Sullivan, Department of Zoology, North Carolina State University, USA, for critically reading the manuscript. This study was supported in part by a Grant-in Aid for Science Research from the Ministry of Education, Science and Culture, Japan.

References

- Allin, A.E. (1945). Another albino lake trout. *Copeia* 1945 (1), 55.
 Dawson, C.E. (1964). A bibliography of anomalies of fishes. *Gulf Research Reports* 1, 308-399.
 Dawson, C.E. (1966). A bibliography of anomalies of fishes. *Ibid.* 2, 169-176.
 Dawson, C.E. (1971). A bibliography of anomalies of fishes. *Ibid.* 3, 215-239.
 Hazzard, A.S. (1943). Record of an "albino" lake trout, *Cristivomer namaycush*, *namaycush* (Walbaum). *Copeia* 1943(4), 253.
 Kimura, S. and Hara, A. (1989). Culture and artificial fertilization of Japanese huchen *Hucho perryi*. *Suisanzoshoku* 37, 121-128.
 Leonards, L. and Madden, E. (1963). Possible albino adult chinook salmon observed. *Res. Briefs Ore. Fish Comm.* 9, 67.
 Pettis, C.R. (1904). The albino brook trout. *Science* 19, 867-868.