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MONTANA DEPARTMENT OF FISH AND GAME

BACTERIAL KIDNEY DISEASE (BKD) CONTROL WORK AT YELLOWSTONE RIVER TROUT HATCHERY

PROGRESS REPORT

By

THURSTON DOTSON
September 30, 1977

Location and Water Supply

The Yellowstone River Trout Hatchery is located in Sweetgrass County, Big Timber, Montana. The hatchery is fed from springs at a constant 52°F. Volume varies from 250 gallons per minute to over 600 gpm. Hatchery effluent flows into the Yellowstone River approximately 300 yards from the hatchery exit.

Recent Health History

In 1972 adult Yellowstone cutthroat brood stock experienced a severe epizootic of Furunculosis. The strain of Furunculosis bacteria was very strong and could not be controlled with antibiotics administered orally. Because of the virulency of this organism, the brood stock was destroyed and the hatchery disinfected.

Of secondary interest, during the Furunculosis epizootic, examination of slides taken from adult fish contained some gram positive diplobacillic organisms resembling the BKD organisms. Because of the lack of knowledge about BKD at the time a confirmatory diagnosis could not be made.

No evidence of Furunculosis or BKD was found during annual disease certification from 1973 to 1975. During the annual certification in March of 1976 three fish out of 60 examined were infected with BKD. Confirmatory diagnosis was made by personnel at the Fish Disease Control Center, Fort Morgan, Colorado using the fluorescent antibody technique.

Perspective

With advances in diagnostic techniques came research in the control of BKD. The most promising method of control is a two-phase Erythromycin treatment. Phase one is injecting adult brood stock with 5 mg of active drug per pound of fish and the second is water hardening eggs in 2ppm solution of Erythromycin. This method was developed by Dr. George Klontz at the University of Idaho. After consultation with Dr. Klontz, the department decided to attempt control of BKD at Big Timber with injection of adults and water hardening eggs in Erythromycin.

Materials and Methods

1. Erythro-200, a water soluble solution of Erythromycin especially prepared for direct injection produced by Abbott Laboratories. Erythro-200 has 200 mg active ingredient per cc.

2. 1 cc. tuberculin syringes.

3. 1 - 1½-inch 18-guage veterinary needle.

4. Solution of Erythromycin Phosphate in sufficient quantities to water harden eggs from various takes.

Erythromycin was injected in a test lot of 117, 2-year-old McBride strain cutthroat on March 2, 1977. The Erythromycin was injected subcutaneously forward of the dorsal fin. The fish showed no adverse reaction to the injection. They were adipose fin clipped for identification and have been kept in the same raceway with uninjected brood stock.

Water hardening of eggs was accomplished by placing fertilized eggs in a 2ppm solution of Erythromycin immediately after spawning. The eggs remained in solution for a minimum of 30 minutes. One lot of eggs taken were left untreated for a control lot and will remain in the hatchery for one year. In addition, one lot of eggs from injected females and water hardened in Erythromycin will remain for one year. The rest of the eggs taken in 1977 were water hardened in 2 ppm solution of Erythromycin. The entire brood population (1,307 fish) was injected with Erythromycin on July 6, 7 and 8, 1977.

Results

No definite conclusions can be drawn at this early stage of the treatment but results are encouraging. The 117 fish that were injected had no mortalities from March 2 through July 15. The remaining 1190 uninjected fish had 20 mortalities during the same period. Nine of these showed positive for BKD (confirmed by Fort Morgan FDCC).

In late July and August, after all fish were injected, 54 mortalities occurred associated with a fungal gill infection. Only one of these 54 fish showed KD bacteria. No difference in egg mortalities was noted between the eggs that were water hardened in Erythromycin and those that were not.

Recommendations

Erythromycin treatment should continue as outlined in the working plan of February 24, 1977.

In addition, all wood and zinc coated pipelines and fixtures should be replaced to improve the sanitary condition at the station. The brood pond should be redesigned and replaced to facilitate more efficient handling of brood stock. The rock-filled ramp in the brood pond is a rich environment for the incubation of fungus and other disease organisms. This raceway urgently needs major repairs for sanitary and structural reasons.

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