

TR 73-2

5207
6008

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

Fisheries Division

A REPORT ON THE USE OF POLYVINYLPIRROLIDONE-IODINE
IN AN ATTEMPT TO CONTROL MORTALITIES IN
BROOK TROUT INFECTED WITH INFECTIOUS PANCREATIC NECROSIS VIRUS

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SUMMARY

Thompson strain brook trout fry at 4141/lb. were suffering from a mortality due to Infectious Pancreatic Necrosis Virus (IPN) and were treated with Polyvinylpyrrolidone-iodine in their diet in an experimental attempt to control the viral disease. Mortalities for the experimental period were significantly higher in the treated than in the non-treated controls. It is obvious from this experiment that in order to control IPN losses with PVP - I, treatments must be initiated before any significant mortality due to the virus begins.

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With the realization that the State of Michigan has endemic Infectious Pancreatic Necrosis (IPN), and the knowledge that this disease can, under certain circumstances, cause severe mortalities in salmonids, when an outbreak of this disease occurred at the Thompson State Fish Hatchery it provided an opportune chance to test the efficacy of Polyvinylpyrrolidone-Iodine as a control for the disease. The methods used followed those described as reducing mortalities by 50% in experimental trials in Minnesota.¹

The fish used for this study were Brook Trout, Thompson, 1972, and had suffered a mortality of 41.9% for the month of January, 1973. Mortalities ranged from 0.3% to 8.6% per day for that month.

The chemical used for treatment was GAF PVP-Iodine 10, containing 10 parts active halogen per 100 parts dry powder.² The treatment level used was 1.9 g active halogen per kilogram of fish per day for 14 days. This material was fed in a diet of 80% beef liver, 20% dry diet, 1% salt, and was fed several times daily to total the above rate of PVP-Iodine. Two lots were established, of 4141 fish (1 pound) each, one lot (control) receiving the liver diet as per above, and the second lot (experimental) receiving the same diet plus PVP-Iodine as per above. A daily mortality record was kept for each lot with the results as shown below.

<u>Controls</u>		<u>PVP-I Treated</u>
607	loss	978
14.7%	% loss	23.6%

The attached graph shows the pattern of the mortality in relation to the treatment period.

Examination of fish from both lots periodically through the course of this study in every case showed evidence of IPN virus in both groups, even after the complete treatment period.

DISCUSSION

The compound PVP - I has been demonstrated to reduce mortalities associated with IPN outbreaks in brook trout.¹ At first glance, the results of this trial would seem to indicate otherwise. However, discussion with the author from Minnesota¹ indicated a plausible explanation for our dramatic nonsuccess. The PVP - I compound does not have the characteristic of "curing" fish with IPN, but seems primarily to help a fish resist infection or to fight the infection should he later be exposed. From the records of this IPN outbreak at Thompson, it is learned that 41.9% of the fish were lost in January, with an additional 31.8% lost in February before the

experimental trial was initiated. Thus, the peak of the mortality had passed before the treatment had even begun, and by this time every fish in the population could be assumed to have the virus. Coupling the facts of already infected fish with the knowledge that the PVP - I cannot cure fish, we have an explanation for our results. In addition, the higher losses we experienced in the treated over the non-treated could be possibly explained by the slightly toxic nature of the PVP - I, the obvious reluctance of fish to feed on the medicated food, and the initiation of treatment at too late a time to help.

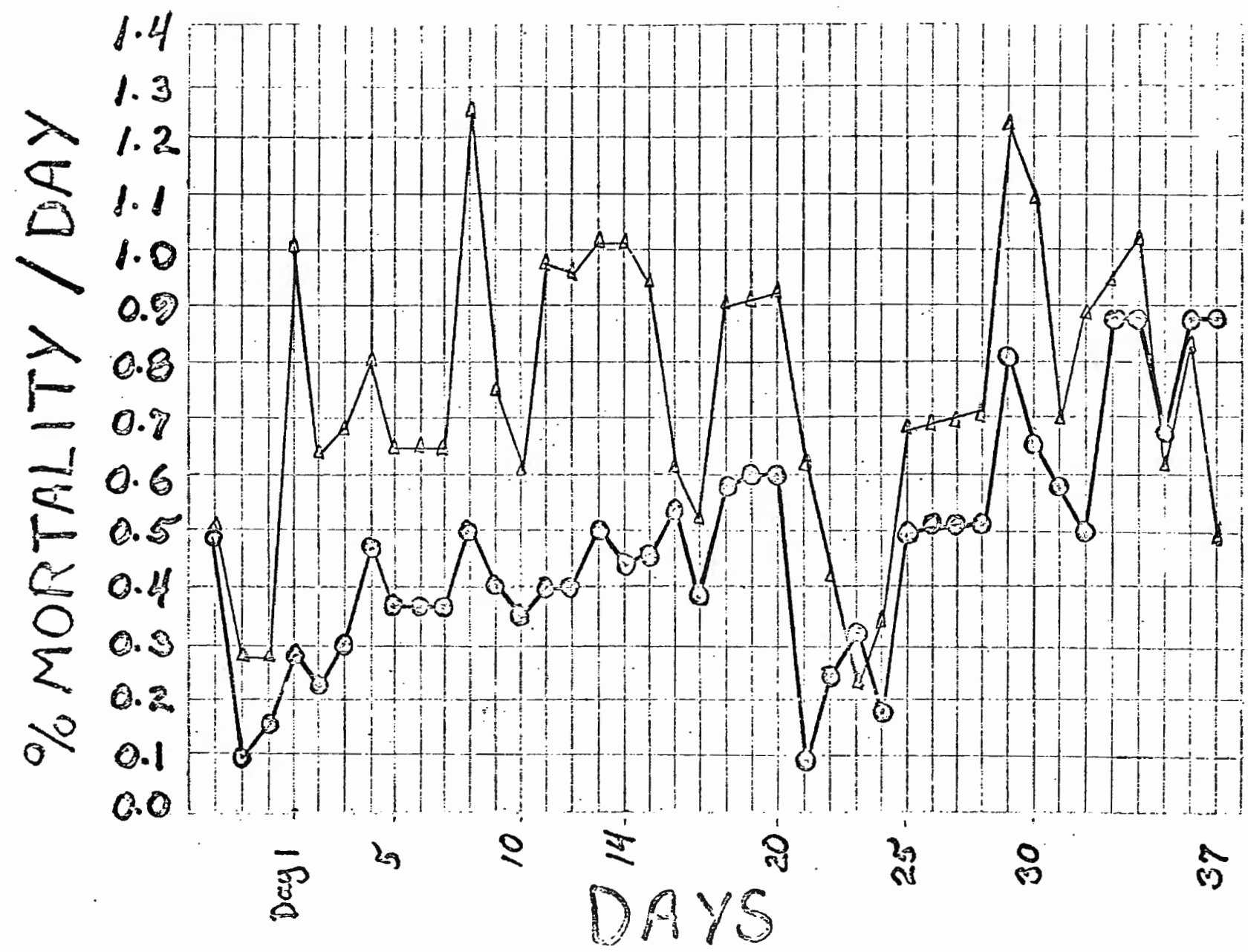
CONCLUSION

It is obvious that treatment of fish for the control of IPN is unsuccessful when initiated after the period of peak mortality. Since this compound has proved effective for others, we should attempt to reevaluate it when treatment can be initiated concurrent with the beginnings of a mortality known to be caused by IPN. This situation may be difficult to anticipate in our hatchery system unless from past experience we can anticipate an IPN infection in fry and begin PVP - I feeding "...about 10 days in advance of the first significant increase in raceway mortality ..."

LITERATURE

1. Economon, P.P. 1972. Polyvinylpyrrolidone-Iodine as a Control for Infectious Pancreatic Necrosis of Brook Trout. FAO/EIFAC 72/SC II-Symp. 13.
2. PVP-Iodine; Polyvinylpyrrolidone-iodine complex, water soluble, non-irritating microbicide with broad spectrum activity for human and veterinary pharmaceuticals. 1966. General Aniline & Film Corporation, Technical Bull. 7543-004.

BROOK TROUT FRY MORTALITY



△ - PVP-1 Treated
 ○ - Control

Day 1 - 1st day of treatment
 Day 14 - last day of treatment