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Report No. 1332

ADDRESS
UNIVERSITY MUSEUMS ANNEX
ANN ARBOR, MICHIGAN

May 26, 1952

ANESTHETIZATION OF ADULT BROWN TROUT AT PARIS HATCHERY FOR TAKING SPAWN

By

Leonard N. Allison

Abstract

Brown trout brook stock weighing from two to five pounds at Paris Hatchery were anesthetized with ether during the spawning operation in an attempt to reduce the large annual post-spawning mortality. Eggs and fry were also observed for incidence of blue-sac and survival.

Loss among the control group of breeders from September, 1951, to March, 1952, was 35.4 percent and was only 5.6 percent among the anesthetized group. Since there was a significant reduction in post-spawning mortality, and the anesthetized fish were much easier to handle, it is desirable for this procedure to be followed in the future. There was no significant reduction in mortality among the eggs and fry from the etherized group.

Because the difference in post-spawning mortality between the two groups of spawners was so great, it would be desirable to repeat the tests this year as a check of the validity of the results since unknown factors may have influenced the data.

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The taking of spawn from brown trout weighing from two to five pounds at Paris Hatchery has been followed for many years by a high mortality among the fish handled. Also, in some years, a large number of the resulting sac-fry developed a condition resembling blue-sac, with high mortality. Since the large fish are vigorous and it is necessary to use considerable force in taking spawn from them, anesthetization was tested for possible reduction in losses among both adults and sac-fry.

Method

Four tubs were used in this method. The first two tubs contained the etherized water, the third and fourth tubs fresh water. Fish were anesthetized in the first two tubs, bucks in one and does in the other, and transferred to the third. They were taken from the third tub and held over the fourth tub while being stripped. The tubs with fresh water served two purposes. If the fish remained in the etherized water too long they could be placed quickly into fresh water, and secondly, the ether was greatly diluted by the fresh water before the fish were stripped to prevent a higher concentration of ether from reaching the eggs and milt with possible adverse affects. To check the value of

this precaution, several fish were taken directly from the etherized water, stripped, and the eggs placed in trays in the hatchery trough. The survival of these eggs was very low indicating that the intermediate tub of fresh water for rinsing is necessary.

Results

Adult fish: An equal number (340) of fish were stripped from ponds No. 16 and No. 19, and returned to their respective ponds. Fish from pond No. 19 were etherized before stripping. Loss records for these ponds from September, 1951, to April, 1952, when the fish were stocked are given in Table 1.

Table 1

	Pond No. 16			Pond No. 19 (Etherized)		
	Fish on hand	Loss	Percent loss	Fish on hand	Loss	Percent loss
September	1,243	3	0.24	1,382	3	0.22
October	1,240	4	0.32	1,379	4	0.29
November	1,236	103	8.33	1,375	8	0.58
December	1,133	237	20.9	1,367	17	1.24
January	896	73	8.15	1,350	34	2.52
February	823	19	2.3	1,316	10	0.76
March	804	1	0.12	1,306	2	0.15
Total	1,243	440	35.4	1,382	78	5.6

Eggs and fry: Eggs taken from etherized fish (Lot No. 2) were kept separate from the control group (Lot No. 1) so that losses could be compared. Eggs were taken from a younger group of brood stock and placed in Lot No. 3 for observation as to survival. Loss records are given in Table 2.

Table 2.--Loss records for eggs and fry

Date	Lot No. 1			Lot No. 2			Lot No. 3		
	Number on hand	Loss	Percent loss	Number on hand	Loss	Percent loss	Number on hand	Loss	Percent loss
December 1-31, 1951	742,267	136,402	18.4	605,014	92,726	15.3	17,625	9,655	13.5
January 1-31, 1952	605,865	21,642	3.57	512,288	21,728	4.24	61,970	3,218	5.12
February 1-16, 1952	267,478 shipped out 316,745	6,631	2.1	490,560	6,570	1.34	58,752	549	0.93
February 17-29, 1952	310,114	2,423	0.78	483,990	11,315	2.34	58,203	489	0.84
March 1-14, 1952	307,691	4,465	1.45	472,675	3,417	0.72	57,714	677	1.17
March 15-31, 1952	303,226	5,063	1.68	469,258	3,137	0.67	57,037	564	0.99
April 1-15, 1952	215,000 stocked 83,163	1,152	1.38	466,121	1,361	0.23	56,473	193	0.34
Total	742,267	177,778	23.95	605,014	140,254	23.18	71,625	15,345	21.42

There was no significant difference in the loss of eggs and fry between Lot No. 1 and Lot No. 2. The incidence of blue-sac among the fry of all lots was low this year as compared to last year. There was no significant difference in the loss of eggs and fry of the younger spawners as compared with the other two lots. These fry will be held apart from the others during the summer for observation of vitality and survival.

Remarks

In using ether for anesthetization of brood stock, it was found that the recommended concentration did not remain effective and had to be strengthened frequently by the addition of more ether. Since the amount of ether necessary to supplement the original concentration depends upon the reaction of the fish, no definite quantity can be recommended. However, after a little experience with the method, the operator soon learns to estimate an effective quantity. Danger of an overdose is greatly lessened with a tub of fresh water placed beside the container with the etherized water. Fish in distress can quickly be transferred to the fresh water.

Conclusions

Anesthetization of brood stock during the taking of spawn greatly increases the ease of handling large fish and reduces mortality after stripping. There was, however, no significant benefit demonstrated in the survival of eggs and fry. There was a difference in the survival of eggs and fry between the younger brood stock and the control lot of older fish of 2.53 percent. These differences are small and may have little significance. However, the number of eggs taken is large and if the control group had a 2.53 percent reduction in mortality there would

have been an increase in survival of 18,780.35 fry, and if the mortality among the etherized lot was reduced 1.76 percent, the increase in survival would have been 10,648.25 fry.

Recommendations

Because of the great difference in survival rate of the anesthetized and control lots of brood stock, and the low incidence of blue-sac in the fry, this experiment should be repeated the the fall of 1952 as a check of the results.

The anesthetization of brown trout brood stock at Paris Hatchery should be continued in the future, whether the second test demonstrates the great difference in mortality, or not, since the etherized fish are much more easily handled.

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