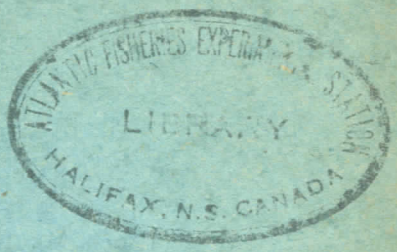

FISHERIES RESEARCH BOARD OF CANADA

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Report on the effect of salinities and temperature in the hatching of eggs of speckled trout, brown trout and Loch Leven trout.

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Report on the effect of salinities and temperature in the hatching of eggs of speckled trout, brown trout and Loch Leven trout.

Author

W. S. Hall

REPORT ON THE EFFECT OF SALINITIES AND TEMPERATURE IN THE HATCHING OF EGGS OF SPECKLED TROUT, BROWN TROUT AND LOCH LEVEN TROUT.

The aim of the experiment was to obtain information concerning the effect of salinity and temperature of the water in the hatching of fish eggs. The eggs used were obtained from one-year old Brown Trout, one-year old Speckled Trout, three-year old Speckled Trout, Loch Leven Trout and White Fish. The temperatures used were 0.0°C, 2.5°C, 5.0°C, 10.0°C, and 12.0°C. The salinities were prepared from sea-water from St.Andrews and fresh water from York Springs to 0%, 3%, 6%, 9%, and 12%.

The eggs arrived in Toronto on November the ninth, and were transferred to carefully cleaned glass pint jars. Five or six eggs were placed in each jar and covered to a depth of one to two centimetres with water of the desired salinity. The jars were placed in refrigerator boxes which were kept at the desired temperatures with ice and thermostats. The water on theeggs at temperatures of 10.0°C, and 12.5°C were changed twice each week. The water on the eggs at 0.0°C, 2.5°C, 5.0°C, and 7.5°C, was changed once each week.

The jars containing the eggs at 2.5°C, 5.0°C, 7.5°C, 10.0°C, and 12.5°C were placed on trays which were slowly rocked on a pivot along the middle of the tray, once in forty-five seconds. This motion kept the water in circulation within the jars and served to aerate the water. This movement was utilized also to secure an even temperature for the jars in each tray. The tray was lined with a zinc lining and water placed in the tray. The rocking movement kept the water in circulation and kept all the jars at the same temperature.

No satisfactory results were obtained with the Brown Trout eggs.

For the eggs of the one-year old Speckled Trout the best results were with temperatures at 5.0°C and 7.5°C with salinities of 3%, 6%, and 9%.

With the eggs of the three-year old Speckled Trout the best results were obtained with temperatures of 5.0°C and 7.5°C and salinities of 3% and 6%.

With the eggs of Loch Leven Trout the best results were obtained with temperatures of 5.0°C and 7.5°C and with salinities of 0% and 3%.

With the eggs of White Fish the best results were with temperatures of 2.5°C and 5.0°C and with salinities of 3% and 6%.

FISH	TEMP. Cent.	SALINITY Per mille.	NUMBER HATCHING	MAX. LIFE OF LARVAE	AV. LIFE OF LARVAE.	AV. TIME TO HATCH
Loch Leven Trout.	0.0	0.0	None.			
	0.0	3.0	None.			
	2.5	0.0	None.			
	2.5	3.0	Two 16%.	49 days. #		143 days
	5.0	0.0	Ten 77%.	100 days. #		89 days.
	5.0	3.0	Seven 58%.	94 days. #		93 days.
	5.0	6.0	None.			
	5.0	9.0	None.			
	5.0	12.0	None.			
	7.5	0.0	Ten. 83%.	69 days.	53 days.	62 days.
	7.5	3.0	Seven. 50%.	41 days.	32 days.	63 days.
	10.0	0.0	Twelve 100%.	115 days.	68 days.	48 days.
	10.0	3.0	Ten 83%.	85 days.	49 days.	48 days.
	12.5	0.0	Seven. 58%.	0 days		37 days.
	12.5	3.0	Seven. 58%.	?	?	32 days.

- Some of the larvae were still alive when they were preserved in formalin on May the thirteenth.

FISH	TEMP. Cent.	SALINITY Per mille.	NUMBER HATCHING	MAX. LIFE OF LARVAE	AV. LIFE OF LARVAE	AV. TIME TO HATCH
Speckled Trout. 1-year old.	0.0	0.0	None.			
	0.0	3.0	None.			
	2.5	0.0	Eleven. 93%.	63 days.#		124 days.
	2.5	3.0	Six. 50%.	63 days.#		127 days.
	5.0	0.0	Eight. 66%.	107 days.#		84 days.
	5.0	3.0	Twelve. 100%.	100 days.#		90 days.
	5.0	6.0	Eleven. 93%.	100 days.#		94 days.
	5.0	9.0	Twelve. 100%.	107 days.#		86 days.
	5.0	12.0	Ten. 83%.	42 days.	27 days.	85 days.
	7.5	0.0	Seven. 58%.	69 days.	53 days.	64 days.
	7.5	3.0	Twelve. 100%.	100 days.	47 days.	59 days.
	10.0	0.0	Eleven. 93%.	11 days.	8 days.	48 days.
	10.0	3.0	Eleven. 93%	106 days	79 days.	48 days.
	12.5	0.0	Six. 50%.	16 days.	13 days.	35 days.
	12.5	3.0	Nine. 75%.	0 days.		36 days.

- Some of the larvae alive when they were preserved in formalin on May the thirteenth.

FISH	TEMP? Cent.	SALINITY Per mille	NUMBER HATCHING	MAX. LIFE OF LARVAE	AV. LIFE OF LARVAE	AV. TIME TO HATCH
Speckled Trout. 3-years old.	0.0	0.0	None			
	0.0	3.0	One-ab.	0 days		157 days.
	2.5	0.0	None.			
	2.5	3.0	Eight 80%	63 days.#		126 days.
	5.0	0.0	None.			
	5.0	6.0	Nine 75%	100 days.#		93 days.
	5.0	3.0	Eight 80%	114 days.#		85 days.
	5.0	9.0	Five 42%	100 days.#		89 days.
	5.0	12.0	Six 50%	35 days.	34 days.	79 days.
	7.5	0.0	None.			
	7.5	3.0	Six 60%	121 days.#	85 days.	65 days.
	10.0	0.0	None.			
	10.0	3.0	Seven. 70%.	?		48 days.
	12.5	0.0	None.			
	12.5	3.0	None.			

- Some of the larvae alive when they were preserved in formalin on May the thirteenth.

? - A lethal temperature experiment was performed with the two still living on March the eighth.
Lethal temperatures - 27.2C. and 27.6C.

FISH	TEMP. Cent.	SALINITY Per mille	NUMBER HATCHING	MAX. LIFE OF LARVAE	AV. LIFE OF LARVAE	AV. TIME TO HATCH.
White Fish.	0.0	0.0	One 10%	31 days.	31 days.	199 days.
	0.0	3.0	Three 30%.	28 days.	23 days.	204 days.
	2.5	0.0	Four. 33%.	43 days.#		155 days.
	5.0	0.0	One 10%.	?		106 days.
	2.5	3.0	Three 30%.	36 days.#		162 days.
	5.0	3.0	Five. 50%.	87 days.#		106 days.
	5.0	6.0	Six. 60%	87 days.#		108 days.
	5.0	9.0	None.			
	5.0	12.0	None.			
	7.5	0.0	None.			
	7.5	0.0	None.			
	10.0	0.0	None.			
	10.0	3.0	None.			
	12.5	0.0	None.			
	12.5	3.0	None.			

- Some of the larvae were alive when they were preserved in formalin on May the thirteenth.

? - Removed on March the fifteenth.

Temp. Cent.	Salinity Per mille	Loch Leven Trout	Speckled Trout 1-year old	Speckled Trout 3-year old	White Fish
0.0	0.0	0.	0.	0.	1-N.
0.0	3.0	0.	0.	0.	3-N.
2.5	0.0	0.	11-N.	0.	4-N.
2.5	3.0	1-N. 1-Ab.	6-N.	8-N.	3-N.
5.0	0.0	10-N.	8-N.	0.	1-N.
5.0	3.0	7-N.	12-N.	7-N. 1-dead.	5-N.
5.0	6.0	0.	11-N.	9.N.	6-N.
5.0	9.0	0.	12-N.	4-N. 1-Ab.	0.
5.0	12.0	0.	8-N. 2-dead.	6-N.	0.
7.5	0.0	10-N.	1-dead. 6-N.	0.	0.
7.5	3.0	7-N.	12-N.	6-N.	0.
10.0	0.0	12-N.	5-N. 5-dead.	0.	0.
10.0	3.0	10-N.	11-N.	6-N. 1-Ab.	0.
12.5	0.0	1-N. 6-Ab.	4-N. 2-Ab.	0.	0.
12.5	3.0	5-N. 2-Ab.	5-N. dead 4-Ab.dead	0.	0.

N.-Normal. Ab.-Abnormal.

This table shows the number hatched.