
Fish Culture Technical Bulletin

Best Management Practices

FUNGUS CONTROL FOR WALLEYE EGGS DURING INCUBATION

BACKGROUND

The *Walleye Culture Manual, OMNR 1986 (Peter D. Richard & Julian Hynes)*, has not been updated since its release in 1986 and is considerably out-of-date. In recognition that this manual remains in widespread use and to insure that its users are aware of current federal regulation concerning drugs used in aquaculture, this Fish Culture Bulletin is being issued regarding chemical control of fungus on incubating walleye eggs. The procedures described in Section 1, Topic 5(c): Fungus Control (pp 23-26) of the *Walleye Culture Manual* should be disregarded. The procedure described below reflects current federal regulation governing approved drugs used in aquaculture and should be followed for chemical control of fungus on incubating walleye eggs.

INTRODUCTION

Fungus is a common problem culturists are faced with when incubating fish eggs. Fungal spores will attack dead organic material (i.e., dead eggs) and will spread to live eggs if left unchecked. *Saprolegnia* is the most commonly encountered genus of fungus affecting eggs during incubation.

Two methods of fungus control, mechanical and chemical, are applicable to eggs.

Mechanical methods involve physical removal (“picking”) of dead and fungus covered eggs in a tray or trough incubation system as is typically used for salmonid egg incubation. Hand-picking individual eggs is not practical in a hatching jar incubation system typically used for walleye eggs and dead and fungus covered eggs should be siphoned out during the daily routine maintenance check. Fungus covered eggs will often clump together *en masse* and it is important that any fungal clumps be removed at the earliest opportunity to reduce the loss of live eggs.

Chemical control is an alternative or supplementary method of fungus control to the mechanical method. Chemical control is a technique which can be effective in avoiding a fungal outbreak or halting the progress of a fungal attack.

Cette publication hautement spécialisée Fungus Control for Walleye Eggs During Incubation n'est disponible qu'en anglais conformément au Règlement 671/92, selon lequel il n'est pas obligatoire de la traduire en vertu de la Loi sur les services en français. Pour obtenir des renseignements en français, veuillez communiquer avec le ministère Ministry of Natural Resources and Forestry au (705) 755-1970 ou par courriel à Christopher.Wilson@Ontario.ca

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TO TREAT OR NOT TO TREAT?

The wide variation of water sources used for the incubation of walleye eggs within Ontario does not lend itself to an all-encompassing recommendation regarding treatment. Eggs incubated in certain water supply systems will require daily prophylactic treatment while eggs in other water supply systems will not require any treatment (more the exception than the rule). Use of mechanically filtered water and ultra-violet light disinfection may help to reduce or destroy fungal spores in the incubation water supply, but will not prevent fungal growth on eggs once fungus becomes established.

Where chemical control is chosen, use only chemicals that are approved for fungal control use in aquaculture in Canada such as Parasite-S™ (formaldehyde-based) and Perox-Aid™ (hydrogen peroxide-based). Both of these products are marketed by SYNDEL International Inc., a commercial aquaculture supplier located in Vancouver, B.C.. For specific product information please refer to the following web-site:

http://www.syndel.com/d_p_f_s/parasiticides_fungicides.html.

Products from alternative suppliers may be used provided they are labelled for use in aquaculture in Canada. The reader is referred to Health Canada's website at http://www.hc-sc.gc.ca/vetdrugs-medsvet/aquaculture_e.html#top for additional information on use of drugs in aquaculture.

The use of hydrogen-peroxide for fungal control can be difficult with variable results. It requires a complex automated dosage metering system to be used effectively and is not covered further here. Only formalin treatment will be discussed as a practical chemical fungal control alternative for walleye egg incubation.

FORMALIN TREATMENT

Equipment required

- Formalin (37% formaldehyde) which has been approved for aquaculture use
- Drip system (I.V. or homemade)

(A homemade drip system can be constructed using a plastic bottle of suitable volume, some rubber or Tygon™ tubing and a clamp)

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Comments

- Refer to the product Material Safety Data Sheet (MSDS) information for precautions to be taken when handling formalin; use of rubber gloves, eye protection, proper respiratory protection and ventilation is required.
- **DO NOT** use the formalin if it appears cloudy or if a white precipitate has formed in the container indicating the presence of paraformaldehyde which is toxic to fish; formalin must be stored properly to prevent paraformaldehyde formation and should appear as a completely clear liquid.
- Eyed walleye eggs may be treated with formalin, however, culturists must avoid treating eggs at the time of hatch as formalin is toxic to fry.

Procedure

- Fill the drip system with water, adjust the clamp so a drip starts, time for 15 minutes and record the number of litres (or ml) of water flowing out in this period of time.
- Calculate the inflow into the egg incubation battery (litres/min.).
- You now have two figures:
 - 1) The volume of liquid your drip system will distribute in 15 minutes, and
 - 2) The total flow rate through your incubation system
- You wish to treat your walleye eggs with a 1:600 concentration for 15 minutes, i.e., 1 part formalin to 600 parts water, for 15 minutes.
- Example calculation:
 - Assuming the flow rate through your system is 20 litres/min., the first calculation is simple, the treatment should last for 15 minutes so the total volume of 15 minutes flow is:
 - $20 \text{ litres/min.} \times 15 \text{ min.} = 300 \text{ litres}$
 - If the drip system delivers 2.25 litres in 15 minutes, then the required volume of formalin is:
 - $[1/600 \times 300 \text{ litres}] / 2.25 \text{ litres} = 0.22$
 - Therefore 22% of the volume of liquid in your drip system should be formalin
 - i.e., $2.25 \text{ L} \times 0.22 = 495 \text{ ml}$

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- Put 495 ml of formalin into the drip bottle and top up with water to 2.25 litres in total volume.
- Start the drip system flowing into your incubation inflow; make sure the clamp or flow regulator has not been adjusted from the setting used during calibration.
- Monitor and record your treatment; repeat treatments (i.e., daily, bi-weekly, weekly, etc.) only as frequently as required to keep the fungus in check.
- Ensure that the formalin stock solution is stored properly and that all usage is recorded by date, quantity used and user for inventory control and reporting.

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