

WHITE-SPOT DISEASE OF FISH EGGS AND FRY

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INTRODUCTION

White-spot disease occurs in both eggs and fry of fishes. It should not be confused with a parasitic disease called white-spot disease by aquarists who use this term referring to an intracutaneous infestation by a protozoan belonging to genus Ichthyophthirius. A disease similar if not identical to white-spot disease of eggs and fry is termed by some workers "coagulated yolk disease". It is stated that an aftermath of coagulated yolk disease is a large number of fingerlings with frayed fins.

IDENTIFICATION

As the name indicates, white-spot disease consists of white spots in eggs or newly hatched fishes (sac fry). The condition is most commonly associated with the yolk proper, and most spots are located at the surface of the yolk sac in a more or less random manner. The spots are areas or masses of coagulated or denatured yolk. Spots commonly enlarge with time, and adjacent spots may coalesce.

CAUSE OF THE DISEASE

First-hand accounts of white-spot disease usually mention bacteria that are found in the lesions. There is in these accounts little evidence of the same bacterium being present in

all lesions. It is very likely that the bacteria are opportunists, and nearly all workers consider their role to be that of a secondary invader. However, during 1956 one worker (unpublished), "found evidence of an infectious agent". Physical injury and effects of low temperature have been suggested as causes, but much of the supporting evidence is circumstantial. Leach favored the theory of physical injury and was, in fact, able to produce similar lesions in about one-half of the fish whose yolk sac he lightly pierced with a sharp needle. There is a widely held opinion among fish-culturists that white-spot disease is common among eggs which have been shipped long distances (shipments of long duration is probably implied) or handled roughly. Leach, however, was not able to obtain a significant increase in white-spot disease by dropping a case of 200 salmon eggs a distance of 3 feet. One of the German texts on fish culture gives very brief mention of egg mortality which was preceded by white spotting. Cause of the mortality was thought to be due to incubation of the eggs in zinc-bottomed troughs through which iron-bearing acid water flowed (pH 5.7). Exposure of eggs to DC electrical current was found to produce a similar condition, but this is not apt to be the usual cause of white-spot disease. Layman, the Russian fish pathologist, states ambiguously that although the cause has not been made clear, a virus is known to cause white spotting in salmonid eggs. In the final analysis, although a physical

factor or factors is likely to cause the lesions, white-spot disease may be produced by several different agents or factors.

SOURCE AND RESERVOIR OF INFECTION

Not applicable since it is probable that this is not a communicable disease.

MODE OF TRANSMISSION

Not applicable.

INCUBATION PERIOD

Not applicable.

PERIOD OF COMMUNICABILITY

Not applicable.

SUSCEPTIBILITY AND RESISTANCE

Sac fry and eggs of all ages are subject to white-spot disease. It is very likely that all species of oviparous fishes are affected. Leach considered the lesions to represent certain death, but this is probably an extreme view. Virtually no information has been published on the prognosis of affected eggs or fry. The work of Agersborg, however, argues for recovery under favorable conditions, and this is considered to be a more realistic viewpoint.

RANGE

Unknown.

OCCURRENCE

As far as is known, white-spot disease is likely to occur wherever fish eggs are incubated.

METHODS OF CONTROL

Until such time as the cause (or causes) of white-spot disease have been convincingly demonstrated, there can be but little basis for rational control. What evidence there is favors physical causes, therefore, one should exercise care and sanitary practices in handling eggs and sac fry. Agersborg's findings merit considera-

tion, and if possible to do so, white-spot diseased eggs or fry might profitably be given a larger flow of clean, cold, well oxygenated water.

ANNOTATED BIBLIOGRAPHY

- *Agersborg, H. P. Kjershow
1933. Salient problems in the artificial rearing of salmonoid fishes, with special reference to intestinal fungisitis and the cause of white-spot disease. Trans. Amer. Fish. Soc., Vol. 63, pp. 240-250. This is one of the few published observations on white-spot disease for which there is evidence of a cause and for which there was seemingly a response to treatment. Unfortunately, it is the observation of but a single occurrence.
- *Davis, H.S.
1953. Culture and Diseases of Game Fishes. Univ. of Calif. Press, Berkeley and Los Angeles, 332 pp., (illus. (pp. 293-294) A summary of information (largely Leach's) on white-spot disease. The author has omitted Agersborg's work.
- Leach, G. C.
1924. Artificial propagation of brook trout and rainbow trout, with notes on three other species. Rpt. U.S. Comm. of Fish for 1923, Appendix VI, Doc. 955, pp. 1-74, illus. (pp. 69-72) Fairly detailed account of the author's findings among eggs and fry having white-spot disease. Physical injury initiates the condition; bacteria and "periblastic cell activity" are instrumental in its progress.

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* Papers indicated by an asterisk are of special importance to fish culturists.