

Pike Anglers Club of Great Britain



Black spot & Red sore or Red sore disease by Dr E.J. Crossman

One of the indications of decreasing water quality is an increase in the number of pathological conditions in aquatic animals and an increase in the number of individuals effected by them.

One of these pathological conditions of considerable interest to muskellunge fishermen in North America and to pike anglers in Britain and Ireland, is the cancerous Lymphosarcoma, which causes very ugly lesions in that species. The obvious concerns of the angler are: 1) danger to anglers handling effected fish; 2) edibility of effected fish; 3) survival of the effected individual; 4) likelihood that the release of an effected fish will transmit the problem to other individuals. The published works of Dr. R. A. Sonstegard, of McMaster University, Hamilton, Ontario, including a paper in the proceedings of the 1984 Muskie Symposium, address all these points. Publications by Maire F. Mulcahy, University College, Cork, describe Lymphosarcoma in the pike in Ireland as well as survey reports of other tumors in that species.

In regard to anglers catching pike in North America, these same concerns have usually been directed toward problems known as: 1) Blackspot Parasite, and 2) Red Sore or Red Disease.

1) Blackspot or Black Grub Parasite in Pike

Fish with this condition are covered externally to an extremely variable extent with small, circular black spots. The spots are about the size of the head of a pin and are slightly raised. They are found on, or just under, the surface of the scales and fins.

The raised area contains an immature stage (metacercaria) of a fluke or trematode. Its existence in the fish is a developmental stage only. The final host of the parasite, in which it becomes a reproductive adult, is one of several fish eating birds, depending on the fluke involved. To complete the life history, the fluke must "pass through" two intermediate hosts — a snail and a fish. It is rare that the parasite, unsightly as in heavy infestations, does any damage to the intermediate fish host, the pike. Also, since the final host is a fish eating bird, the parasite is not viable humans. As a result, there is no danger in handling the pike or in eating the pike. If the fish are skinned rather scaled, virtually all of the parasites are removed. In addition, the stage of the fluke in the black spot cannot survive the temperature usual in cooking. There is an Information Leaflet available from the Department of Ichthyology and Herpetology, Royal Ontario Museum, which provides more details on this problem.

2) Red Sore and Red Disease in Pike

The increasing interest in toxic substances in water seems to have re-kindled interest of North American anglers in an even older problem in the pike — Red Disease or Red Sore. This name is applied to pike which have either a general condition on parts of the body and fins resembling a haemorrhage, or isolated, red, slimy areas of dying tissue. It has long been considered that the problem is related to a superficially similar problem in frogs called "Redleg". Redleg in frogs in crowded conditions in captivity can kill large numbers of individuals in a very short period of time.

As with muskellunge with Lymphosarcoma, anglers are often apprehensive about handling pike with this unsightly problem, and often ask what they should do with individuals effected in this way.

It appears that "red diseases" are a group of diseases which may be associated with certain groups of bacteria. There may be viruses associated with these bacteria but this is not definitely known. A virus has been found associated red sore in European *E. lucius* and some consider this reason to eliminate bacteria as the cause of red sore, at least in that species. Other people feel red sore on *E. lucius* may be caused by a bacterium different from the causative organism of red sore in other animals. They also state that some of the confusion may be the result of contamination of samples when they cultured for identification.

Possibly the first discussion of the "disease" called Red Sore appeared in print in a 1941 article in the Canadian Journal of Research (Vol. 19, Sec, D, No. 5). The authors were a bacteriologist, Dr. G. B. Reed of Queen's University.

Kingston, and Mr. George Toner, an active naturalist in that part of Ontario. They stated (p. 139) that "the disease in pike is extremely varied. In its mildest form, it varies from reddened points in the skin suggesting slight petechial haemorrhage, to deep red areas several square centimetres in extent, the scales frequently being displaced. In the more severe form, it appears as red, slimy, necrotic areas extending through the skin and in some instances, deep into the muscle. The visceral organs, in gross appearance, are unchanged or in some instances the kidney appears darker in colour and softer in texture than the normal." Reed and Toner cultured material from several pike, from different lakes, which had severe lesions. A number of bacteria

were identified but they concentrated on *Proteus hydropholis* because that bacterium was considered the causative organism of the superficially similar "red leg disease" in frogs.

The story after that point is never as clear again. Later accounts considered that the problem was not caused by *Proteus hydropholis*. In 1970, Snieszko, in publication derived from a Symposium on Diseases of Fishes and Shellfishes, suggested it was a form of haemorrhagic septicaemia caused by one or more of the bacteria *Areobacter liquefaciens*, *Pseudomonas fluorescens* and *Vibrio anguillarum*, which were said to be similar taxonomically. Poor environmental conditions and stress appeared to trigger and spread the problem. The last named bacterium was said to produce a similar problem in marine and brackish conditions.

In a 1971 book entitled "Diseases of Fishes", edited by Snieszko and Axelrod, it was suggested that red sore of pike was probably caused by *Aerobacter cloacae*. In the same year, Bootsma, in a paper in the *Journal of Fish Biology*, said that red disease killed large numbers of pike fry in European hatchery situations, that it might be related to red sore disease but that the fry died before visual sores developed. He stated also that on culturing material from the fry, no pathogens were found and that "considerable confusion exists concerning the etiology of red sore disease in pike".

In 1973 Bootsma and co-authors writing in *Nature* claimed to have isolated and identified the causative agent of European Red Disease of pike. They stated that it was a haemorrhagic disease which causes epidemics but could find no evidence of a bacterial cause. They did find evidence of an unknown rhabdovirus in the infected fish. When they inoculated this virus into healthy fish, those fish became diseased. These authors said it was a disease which attacks young fry, that the mode of transmission was unknown, and that it might be transmitted by adults at spawning time.

In 1973 van Duijn wrote, in the book *Diseases of Fishes*, about a disease caused by the bacterium *Vibrio anguillarum* which causes reddening of fins, etc., of the perch and the pike in the brackish waters of the Baltic Sea.

In 1975 Ribelin and Migaki, in an article in the book *Pathology of Fishes*, stated that some authors thought *Aerobacter cloacae* might be the cause of red sore in pike, but suggested that *A. cloacae* may, in fact, have replaced the original pathogen after the samples were taken. Ribelin and Migaki stated also that *Aeromonas liquefaciens* leads to haemorrhagic septicemia and several diseases including red sore in pike, that there were several synonyms for the bacterium, and that the etiology of the disease and the involvement of a virus are uncertain.

I could find no more recent literature on the subject so it seems that Red Sore or Red Disease in pike is one of the continuing enigmas of the fish world.

A check with a microbiologist revealed that there was little probability of problems to humans from handling an infected pike since the intact skin forms an adequate barrier to bacteria. Since the causative organism has apparently never been satisfactorily identified, it is impossible to forecast consequences of direct human contact via a cut or other break in the skin.

The general rule with bacteria suggests that returning a severely infected individual to the water could transmit the infection to other pike and possibly to other species of fishes. Effective control of the causal organism in the wild is virtually impossible. The condition on individual fish probably could be treated but even this would be difficult without identification of the causal organism. It appeared that the European hatchery fry died too quickly of red disease to be saved by prophylactic treatment.

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