



Commercial Fish & Shellfish Technology fact sheet

Common Diseases of Commercially Cultured Yellow Perch, *Perca flavescens*

Fish health and disease

Similar to other cultured fish species, the yellow perch, *Perca flavescens*, is susceptible to a variety of infectious pathogens including parasites, bacteria, viruses and fungi. There are also a number of non-infectious syndromes that may affect the health of yellow perch in a culture facility. To maximize production, intensive fish culture facilities generally maintain fish at high stocking densities and aim to maximize growth by high feed intake. These conditions often compromise fish health which can then progress to clinical disease and mortality because of poor water quality and excessive stress. In addition, high stocking densities increase the risk of fish-to-fish transmission of diseases within a cultured population.

Infectious diseases

Infectious diseases are one of the most common causes of fish loss in aquaculture, therefore it is important to recognize the early signs of disease and identify the possible causes of disease outbreaks. Appropriate methods must then be used to accurately identify and reliably prevent the introduction or dissemination of disease in an aquaculture facility.

Parasites – Parasitic infestations are a common problem in yellow perch culture. External parasites such as *Ichthyophthirius multifiliis*, *Trichodina* sp., *Epistylis* sp., and monogenic trematodes may have harmful health consequences when fish are severely parasitized or heavily infested (Muzzall, 1995, Smith and Noga, 1992).

Ichthyophthirius multifiliis, which causes “ich” or “white spot disease” in many species of freshwater fish, has been reported to cause severe mortalities in yellow perch (Figure 1). This parasite burrows into the skin and gill tissue resulting in osmotic stress and

secondary bacterial and fungal infections at the site of penetration. The buried location of this parasite protects it from the outside environment and makes treatment of this parasite very difficult.



Figure 1. *Ichthyophthirius multifiliis* from a skin scrape of a yellow perch. Note the large C-shaped nucleus used to identify this parasite.

Infestations of *Trichodina* sp. may cause skin ulceration, as well as fin and tail erosion. This protozoan parasite may also infest the gills (Figure 2). Though this parasite does not bury itself in the tissues, its feeding activity on the surface of the fish compromises the integrity of the tissues resulting in osmotic stress and secondary bacterial and fungal infections.

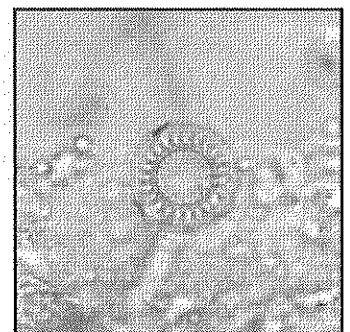


Figure 2. *Trichodina* sp. from a skin scrape of a yellow perch. Note the internal “tooth-like” ring used to identify this parasite.

Another external parasite that commonly causes problems in cultured yellow perch is *Epistylis* sp. This stalked ciliated protozoan, which attaches to the skin of the fish, feeds on material from the water column. Thus, this organism is generally only a problem when massive numbers exist on the skin of the fish disrupting normal oxygen exchange and osmoregulatory processes. This parasite is often found on fish reared in aquaculture systems or ponds containing high organic loads.

Monogenic trematodes are another common external parasite of yellow perch. These flatworms cause local skin and gill irritation at the site of attachment. The presence of these trematodes in a fish population often indicates poor husbandry.

In addition, there are a number of internal parasites, including larval digenetic trematodes, tapeworms and roundworms reported from wild yellow perch, but these are generally not a serious problem in cultured yellow perch.

Bacteria – Most bacterial pathogens of fish are ubiquitous in the fish and in the environment, and may not produce obvious clinical signs. However, when fish become stressed or injured, these infectious agents may cause high morbidity (clinical illness) and mortality. Common bacteria pathogenic to cultured yellow perch include *Flavobacterium* sp., *Aeromonas* sp., and *Mycobacterium* sp.

Several different bacterial species of the genus *Flavobacterium* cause external skin and gill infections. *Flavobacterium columnaris* is the agent responsible for “columnaris” in fish. This pathogen most commonly infects the skin resulting in scale loss, hemorrhage and tissue ulceration (Figure 3). The affected areas are often colonized by secondary fungal infections. Another species of *Flavobacterium* affects the gill tissue caus-

ing “bacterial gill disease” where the tissue of the gill becomes thickened, hindering oxygen-carbon dioxide exchange.

Aeromonas sp. is a skin pathogen of fish, and is often a secondary pathogen of yellow perch resulting from poor water quality or skin injury. This bacteria may also cause a systemic infection leading to pathology in various internal organs such as the liver, kidney, and spleen.

Mycobacterium sp. causes a chronic disease of numerous species of wild and cultured fish including yellow perch. Mycobacteriosis in fish has multiple clinical presentations. Yellow perch may develop a variety of lesions including skin ulcerations and erosions, abdominal distention, anorexia (“off feed”) and a generalized chronic wasting syndrome (Daoust, 1989). This disease is not treatable in foodfish and infected fish are unsuitable for human consumption. In addition, these aquatic species of *Mycobacterium* are zoonotic pathogens, i.e. capable of causing disease in humans, thus elimination of all infected fish stock is recommended.

Viruses - Only one viral disease, lymphocystis, has been reported from wild or cultured yellow perch (Amin, 1979). Lymphocystis causes superficial skin and fin lesions in juvenile and adult yellow perch. There is no known treatment for this viral disease, but infections are rarely lethal. Therefore, infected yellow perch fingerlings with clinical signs of this disease should not be sold or purchased as potential production stock for an aquaculture facility until the disease runs its course through a population and the majority of lesions are healed. A number of other viral agents have been reported from the European perch, *Perca fluviatilis*, and it is possible that these viruses would also be infectious to *P. flavescens* (Dorson et al., 1984; Langdon and Humphrey, 1987).

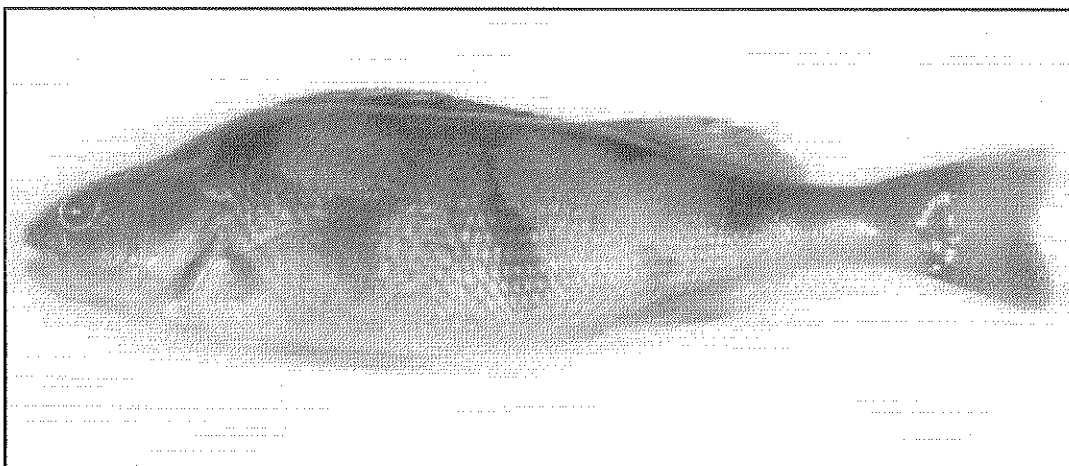


Figure 3. *Columnaris* infection in a yellow perch.

Fungi – Fungal diseases of yellow perch are caused by opportunistic pathogens, such as *Saprolegnia* sp. that colonize pre-existing lesions on the skin, fins or gills (Figure 4). Infections generally occur secondary to bacterial or parasitic infestations or because of poor water quality and husbandry (Bruno and Wood, 1999). An infectious swimming zoospore stage in the water spreads this fungal pathogen from fish to fish.

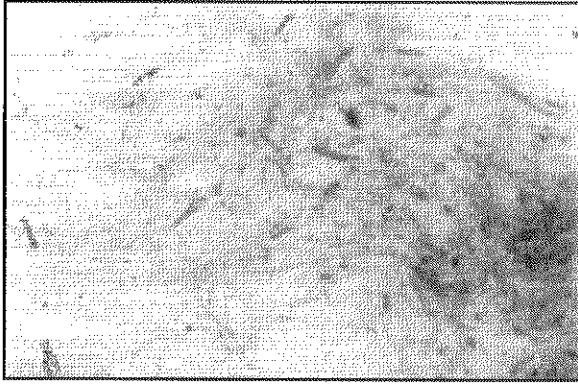


Figure 4. Fungal organisms from a skin scrape of an infected yellow perch.

Non-infectious syndromes

Poor water quality, nutritional excesses or insufficiencies, and gas supersaturation are non-infectious problems that may result in high morbidity and mortality in a cultured yellow perch population. Poor water quality may lead directly to stress, immunosuppression and gill pathology, and also predispose fish to secondary parasitic, bacterial, and fungal infections. Diets high in lipid content are linked to hepatic lipidosis (commonly called “fatty liver syndrome”) which may lead to other metabolic disturbances. Gas supersaturation in the culture water may cause chronic stress in the fish or overt clinical signs of air bubbles in the gill, fin and skin tissues of the fish.

Clinical signs

While there are many different causes of illness in cultured fish, clinical signs of these infections are often non-specific and similar in appearance. Common non-specific clinical signs include excessive mucus production, darkening or lightening of the skin color, focal hemorrhages, fin and tail erosion, skin erosion and ulcerations, general anorexia and lethargy. This makes diagnosis by visual inspection of clinical signs almost impossible. Therefore, proper diagnostic assays should be used to accurately identify diseases in fish.

Diagnostics

As proper diagnostic evaluation is necessary for both an accurate disease diagnosis and effective therapeutic recommendation, a veterinarian or fish health professional should be consulted. For the diagnosis of external parasites and fungal infections, skin scrapes and gill and fin clips are an essential component of the diagnostic evaluation. For bacterial diseases, culture and specific identification, as well as drug sensitivity testing are imperative for effective and lawful drug treatment. Although a number of diagnostic assays are available for viral diseases in other species of cultured fish, none are specific for viral diseases in yellow perch, since cell culture lines and immunological reagents specific for the yellow perch are not currently available. Finally for both infectious and non-infectious diseases, the histopathological examination of selected tissues is important for complete evaluation of the health of the fish. Then, through the correlation of the clinical history, water quality parameters and results of diagnostic examination results, an infectious disease or non-infectious syndrome can be properly identified and appropriately managed.

Only after a particular disease or syndrome has been properly identified, can a therapeutic recommendation be suggested. Often it is simply a matter of correcting inappropriate water quality parameters or management protocols. However, if there is a bacterial pathogen involved, a licensed veterinarian will need to be consulted for any recommended therapy as there are presently no U.S. Food and Drug Administration-approved antibiotics for the treatment of diseases in yellow perch.

Disease prevention and control

Disease agents may enter and be spread in a fish production facility via the water, feed, fish, equipment, and personnel. Water should be properly treated with EPA-approved chemicals, ultraviolet light and/or ozonation to reduce the number of water-borne pathogens. Feed should be purchased from a reputable dealer and stored under proper conditions. The use of live feed for fry is a common practice in yellow perch culture, but this may expose fry and fingerlings to potential pathogens. Presently, the yellow perch industry uses wild broodstock and pond culture of fingerlings as a source of production stock. For this reason, any new fish brought into a facility must be quarantined and appropriate biosecurity measures strictly enforced to eliminate the spread of disease to existing fish populations in the

facility. Equipment, which can act as mechanical vectors of disease agents, should be routinely disinfected to reduce the risk of spreading disease between tanks, systems and facilities. And finally, proper biosecurity protocols for all personnel should be established, implemented and validated on a regular basis.

References and Further Reading

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