

Parasitic Diseases in Tilapia and Carp Production

A.N. OKAEME
Kainji Lake Research Institute
New Bussa, Nigeria

Surveys on parasites of feral tilapias from the river Niger and associated lakes, outdoor ponds, reservoirs and indoor enclosure pens of the Kainji Lake area in Nigeria are beginning to reveal that parasites which under natural conditions are free-living can become prolific and produce pathological lesions in tilapias under intensive management. Several of these parasites which include protozoans and fungal and bacterial parasites cause fish mortality. Affected fish decrease food intake and lose weight. Growth is stunted and damage or injuries to fish organs reduce their productivity. These disease problems have been found to be more prevalent in fish production with high biomass over limited space.

Parasites and Changing Ecology

In very wide lakes and reservoirs, helminth parasites *Neascus* sp., *Clinostomum tilapia* and *Acanthostomum* spp. cysts are commonly found on the skin, gills, fins and mucus membrane of the tilapias. These parasites in large numbers are an objectionable sight on the scales of fish. Bacterial isolates of *Aeromonas* spp., *Pseudomonas* spp. and *Proteus* spp. are also common as secondary bacterial infection in dead tilapia found floating on waters of lakes and reservoirs.

The ecology of the parasites is affected when waters become restricted, such as within a pond, when the rate of water flush slackens, or within pens and similar enclosures placed in open bodies of water. While the number of individual species of helminth is reduced, the host range becomes wider due to closer contact between parasites and host, and several other types of parasites begin to appear. For example *Acanthogyryus* sp. and *Acanthostomum* spp. have been found to form in the intestines of tilapias nodular cysts that tend to distort the gastrointestinal structure.

Other organisms found in such restricted water include leeches, crustaceans, suckers such as *Trichopyra* sp., *Icthyophthirus multifilis*, ameba, algae, *Oodinium* spp. and several attached zooplanktons. These organisms can be considered commensal but if they are found in large numbers in the gills their effect may

be like that of foreign bodies and they may impair the functioning of the gills. Large numbers of these organisms on the skin and fish tend to induce excessive mucus secretion. Although there are no evidences of pathology the presence of these organisms can not go unnoticed.

When production is restricted to cages, hapas and indoor concrete tanks with natural supply of pond or reservoir water, new organisms, mainly protozoans, tend to invade. These include *Trichodina* sp., *Eimeria* spp., *Myxosoma* sp., *Nosema* sp., *Hennugyia* sp. and *Hexamita*. This does not exclude completely zooplankton and algae. Injuries were found associated with these organisms. There are also cases of bacterial and furuncular fungal infections. The bacterial infections are usually nonproliferative with acute septicemic symptoms, necrosis and skin ulceration. Common bacterial isolates were *Streptococcus* sp., *Aeromonas* sp., *Pseudomonas* spp. and *Aerobacter* sp. These parasite problems in tilapia production have brought the mortality rate to 5-50%.

Parasitic diseases as a limiting factor in tropical freshwater have not been recognized as significant because in most tropical countries fish production is artisanal, and captured fish are from large and wide rivers and water bodies where the ecology permits the parasites to behave as free-living organisms. However with increasing intensive fish production these organisms become parasitic. Studies by the Kainji Lake Research Institute have shown that an infection due to myxosporidia in indoor tilapia culture could result in stunted growth, damage to the gonad due to degenerative processes, skin blemishes, necrosis, exophthalmia, mortality and reduced market value of the fish. Thus parasitic diseases could be a constraint with far reaching economic consequences when not considered in planning and controlled.

Tilapia and Carp

Because of the high fecundity, rapid growth rate and availability of tilapia and

carp these species are now intensively produced and are entering international business trade in the tropics. But just as tilapia production can be hampered by the parasites discussed above, carp production can be affected by bacterial slime disease, ulcer disease, gill necrosis, columnaris disease and carp erythrodermatitis. Flow of information is therefore needed between producers so as to avoid a wide range of disease dissemination at international epizootic levels considering the rate at which live fish and eggs are allowed to cross international borders. A disease certification for tilapia and carp is important because a disease epidemic introduced into an area where it is exotic can bring about severe economic losses.

Selection of good breeding stock, balanced feed, good water quality and management are requisites to fish production but the right ethic should include disease control, treatment and logistics associated with producing healthy fish. Tilapia and carp producers and other fish producers as well should start taking the following precautions.

- * Stocks should be certified as healthy by fishery workers.
- * Farmers should be aware of epizootic fish disease in their area of operation and from their source of seed.
- * International import and export of live fish and eggs should require stock health certificates and extension leaflets on diseases affecting the fish, their treatment and their control.
- * Records on fish mortality should be strictly kept in farms so as to adequately assess the economic impact of any disease outbreak. This will help the producer in his investment policies.
- * Proper hygiene should be maintained in farms and the number of visitors should be kept at a minimum (they are a possible source of infection). Fish pathologists and fish culturists should be available for advice.