



## Iridovirus in Gouramis <sup>1</sup>

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### What Are Iridoviruses?

Iridoviruses are a family of viruses (130--300 nanometers in size) that contain DNA as their genetic material and have an icosahedral (20-sided) capsid. Iridoviruses have been found in a wide variety of fish, including both freshwater and saltwater species. Some iridoviruses have been associated with serious diseases (e.g., viral erythrocytic necrosis of salmonids) while others have only been found in apparently healthy animals (e.g., goldfish iridovirus). One iridovirus causes a disease called lymphocystis which causes unsightly skin lesions on infected fish, but otherwise is of little consequence.

### Iridovirus in Gouramis

An iridovirus was found in spleen and intestinal tissue of gouramis from the genus *Trichogaster* that were dying with signs of systemic disease. Mortality rates of affected fish have varied from low (0.5--10%) to moderate (50%) with death usually occurring 24--48 hours after the onset of signs. Clinical signs associated with the presence of the iridovirus have included darkening of body coloration and lethargy. Sick gouramis often stop eating and the abdomen may be distended. Internally, an enlarged spleen has been the most notable

abnormality. The intestine may be reddened, and a clear amber fluid may be present in the body cavity. Laboratory examination for bacterial, fungal, or parasitic agents has frequently been negative. Through electron microscopy (EM), abundant iridoviral particles have been found in the spleens and intestines of dying fish.

An iridovirus has been isolated in cell culture and cytopathic effect (death of infected cells) has been observed. Although the iridovirus has been implicated as a possible cause of disease in gouramis, efforts to reproduce the disease under laboratory conditions have not yet been successful.

### Implications of Possible Iridovirus Infection in Gouramis

It is not known whether or not the iridovirus observed with EM in tissues of sick gouramis is actually causing a disease, but it is suspect. It is also unknown whether the gourami iridovirus is capable of causing disease in other species. Iridoviruses have been associated with systemic disease and mortality rates of up to 80% in Ramirez dwarf cichlids (*Apistogramma ramirezi*) and angelfish (*Pterophyllum scalare*). Until the disease can be induced in the laboratory, it will be impossible to

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know whether the gourami iridovirus is species-specific, or if the iridoviruses reported in several species of freshwater tropical fish are all the same agent.

The mode of transmission of the iridovirus infection is unknown. Other iridovirus infections are believed to be transmitted by direct contact (i.e., exposure to viable virus particles in the water or fomites such as nets or siphon hoses), or ingestion of infected tissue (i.e., cannibalism of dead fish). Also, it is not known whether fish that survive the infection could carry the virus and serve as a potential source of infection to other fish.

### Management

Because the iridovirus found in gouramis has not been demonstrated to cause disease, it is premature to make sweeping recommendations for management. However, common sense would suggest that extra attention be paid to gouramis which may be susceptible, particularly blue, gold and platinum varieties. If any of these fish become sick, extra effort should be made to determine the cause of mortality. Water quality, nutritional, parasitic and bacterial problems should be identified and corrected. Effort should be made to provide fish a high quality diet, maintain them in clean facilities, and to keep sick or potentially infected stock separate from other animals. Equipment, boots, and hands should be washed with a disinfectant after handling. New fish should be isolated from established stocks for at least 3–4 weeks in an effort to avoid introducing infectious agents to established facilities.

Manipulation of environmental temperature has proven effective in controlling a number of infectious diseases of fish, and may be a potential tool that can be used to control the gourami iridovirus. Anecdotal evidence suggests that the disease may be more active in warmer weather (i.e., summer), however, this is speculative at the present time. Until this gourami disease is reproduced under laboratory conditions, it will be impossible to answer questions concerning the range of susceptible host species, whether or not a carrier-state exists, and which management strategies are most effective in controlling outbreaks of this disease.

### Summary

Iridoviruses are a family of DNA viruses that have been found in a variety of fish. Some iridoviruses have been associated with serious disease outbreaks, while others have not. Iridoviruses associated with disease and mortality of tropical fish have been reported in Ramirez dwarf cichlids, angelfish, and, most recently, gouramis from the genus *Trichogaster*. It is unknown whether the virus particles observed in tissues of sick fish are actually responsible for disease. Also, we do not know whether each iridovirus reported in freshwater tropical fish represents a different virus or are all caused by the same one. When disease occurs in blue, gold or platinum gouramis, efforts should be made to promptly submit a sample of sick fish to a diagnostic facility. There are no medications which can be used to cure viral infections. Early detection and treatment of other problems, such as parasitism or bacterial disease, will improve the chance of recovery of affected fish.