

Killer Chlorine

Do not underestimate the toxicity of this compound to fish

By Stephen M. Meyer

Q. I have been keeping aquarium fish for many years, but the problem I am having with the pond I recently installed in my backyard is like nothing I've encountered before. None of the fish I put in it live for more than four days.

The pond is above ground and constructed of landscape timbers. It measures about 8 feet by 9 feet, and varies in depth from about 16 inches at one end to about 28 inches at the opposite end. I figure about 800 gallons. The ground and timbers were covered with a felt-like pad and then a 40-mil-thick rubber (polybutyl?) liner. The liner extends over the top of the landscape timbers. It's a very shady pond, with large tulip poplars and oak trees shading it most of the day. It has a Beckett "Versa Pond" biological pond filter, which consists of a plastic box holding about 2 gallons of bioballs and a pump. The discharge tube from the pump goes out the top of the box to form a fountain above the water.

I have tried some seven pairs of fish, mostly goldfish — regular and pond comets. None of them lived longer than four days. The pond has been drained and refilled twice, to no effect. The fish show no external signs of disease, but just sit on the bottom of the pond, usually in a corner. This begins about a day after they are put in and continues until they die. The pH is about 7, temperature of the water is about 65 to 70 degrees Fahrenheit, and ammonia and nitrates are low. There have been no fertilizers or insecticides used in the yard. I did spray some weed killer in the general area, but that was two water changes ago, and there is no way any runoff can get into the pond — and I was very careful to apply it on a calm day and with extreme caution near the pond.

I'm stumped, as is everyone I've talked with. Any idea what's killing my fish?

A. On the basis of your description of the behavior of the fish and the time involved, I can say with confidence that no disease or parasites produce this type of problem. When you see rapid and complete mortalities of this type in a new setup you should begin your diagnosis with the assumption that the problem is with the water.

Let's start with the obvious: pH. The pH may be 7, but what was the pH of the water in which the fish were being held? Was it 8.5 or 6.0? pH shock usually causes goldfish to act skittish, darting around the tank. Other times they behave as you describe before they die. Goldfish may be hardy, but pH shock really can kill them — just like any other fish.

You say you have long experience with aquariums, so I presume you have tested for and neutralized any chlorine or chloramine in your water. Chlorine poisoning produces the very effects you describe. The chemical burns sensitive gill filaments, causing the fish to slowly suffocate. It usually takes several days. Perhaps you have just moved to a new area and took for granted that the water did not have chlorine.

Test the water with one of the many inexpensive test kits available. And test of chloramine as well.

Then there is nitrogenous waste pollution. Your letter indicates you tested for ammonia and nitrate. Even 20 large goldfish in 800 gallons of water with a pH around 7 could not produce enough ammonia to kill themselves in so short a period of time. Assuming no biological filter at all, they would produce about 500 milligrams of ammonia per day, which in your pond would result in an ammonia concentration of about 0.2 parts per million (ppm). After five days you would have at most only 1 ppm of ammonia. At the neutral pH you report the amount of toxic ammonia would be less than 0.005 ppm — well within safety limits for long-term exposure.

Nitrate will not harm, let alone kill, goldfish. What about nitrite? Given the fish load in your pond, I cannot see nitrite poisoning as a serious possibility either. Moreover, goldfish usually gulp at the surface if they are having nitrite problems.

I do not believe that weed killer is the culprit, especially after two water changes. Of course if it is a persistent type with a "sticking agent" added, and if heavy rains or watering were able to continually flush it into the pond, then there would be a chance of it re-poisoning your pond after every water change. But, in your situation this is rather unlikely.

So, that brings us to the liner. Yes, the liner may well be toxic. The symptoms you describe are entirely consistent with liner-borne toxins. I have seen this several times over the past few years, usually when people try to use ordinary swimming pool liners rather than more expensive fish-grade liners. Non-fish-grade EPDM liners will also kill fish in the

same way, and four days is right on the money.

While I appreciate you sending a sample of the liner, unfortunately, I cannot test it for you. If you want to know for sure, do the following: Cut a large piece of liner and place it inside a 5-gallon pail. Fill it with fresh, dechlorinated, water. Add an airstone and place a feeder goldfish in the pail. Do not feed, just watch. You will know the answer soon enough.