



Aquarium Professionals Group

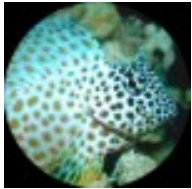
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PHOSPHATES!

As Much As 10 Parts per Million In Chicago Tap Water! Phosphate Use in Water Treatment



Phosphates in Chicago Tap Water - The Beginning:

My discovery of relatively high tap water phosphate levels occurred while I was working at a large aquarium store in Chicago. Beginning in late 1989 and early 1990, many of our customers began to report blooms of algae in their aquariums that were far worse than normal. The types of algae problems described were diverse, occurring in both freshwater and marine aquariums, and ranging from green hair algae to heavy growths of cyanobacteria (blue-green and red slime algae).

Until then, we had recommended several methods of algae control, depending on the type of algae, aquarium volume, lighting, number of fish, fish-feeding practices, water test results and other parameters. We would rarely recommend chemical control, as our experience had taught us that most algicides had a negative effect on the aquarium ecology.

Depending on the circumstances, we might have suggested removing as much of the algae growth as possible, coupled with a good water change or two and/or vacuuming the substrate to reduce organics and nitrates. Reducing the amount of light the aquarium received for a period of time would also work. In saltwater, correcting pH, alkalinity and calcium levels would sometimes work. Algae-consuming animals might also provide a partial solution. Sometimes modifying aquarium management practices was part of the solution, if over-feeding or infrequent water changes were indicated. If the aquarium was a saltwater live-reef or freshwater planted tank, we would often suggest using macroalgae, more corals or live plants to compete with algae growth.

These solutions had often worked well in the past. In many cases however, these solutions no longer proved adequate and sometimes made the problem worse. Many aquarists were reporting that their algae problems seemed to escalate after doing a water change, and we began to suspect the tap water was to blame. Sure enough, testing of the tap water by us and our customers revealed relatively high levels of phosphates.

Readings ranged from levels as high as 0.1 mg/L to way off the scale of aquarium phosphate tests at greater than 10 mg/L (obtained by diluting the sample being tested with distilled water). Before these particular tests, tap water tests had never shown readable levels of phosphates, at least in the Chicago area. We contacted the Chicago water department and were surprised to learn that the city had begun using special phosphate compounds (orthophosphates and/or polyphosphates) to remove lead from drinking water. Although the city insisted these low levels of phosphates (by EPA standards) posed no human health risk, there was no question that their use was having a negative effect on aquaria.

What We Did Then and What to Do Now:

Back then, there were nowhere near as many solutions as there are today. Pre-treatment of tap water to remove phosphates was the obvious solution, but many of these methods were expensive for the average hobbyist ten or fifteen years ago. Reverse osmosis systems cost as much then as a complete filtration system. Phosphate removal resins and compounds were crude and not that reliable.

The problem hasn't gone away. The phosphates are still in our tap water, and may now be found in almost all municipal water across the country. Aquarium hobbyists have cried out for solutions, and manufacturers have responded. For the last ten years, I've watched as less-expensive reverse osmosis and de-ionization systems have flooded the market. Aquarium supply manufacturers have introduced a whole slew of "improved" phosphate adsorption filter materials. There are even bacteria and chemical-based aquarium additives that promise to reduce phosphates. Package labels on marine salts and aquarium supplements all make claims that their products are "phosphate-free."

Marine reef tank hobbyists are loading up their aquaria with algae-eating snails, sea urchins, Crustacea and fish. Newer improved venturi and down-draft type protein skimmers seem to remove phosphates efficiently. More importantly (for marine reef aquarium hobbyists anyway), research into natural algae control methods has yielded some important information about the cultivation of micro-fauna that consume algae.

What bothers us?

As aquarists, we are now armed with many varied weapons to combat phosphates, both in our tap water and aquariums. We now know a lot more about the effects of phosphates in aquaria and how to control algae growth. Yet somehow, as I write this article, I am still plagued by two nagging questions: "Isn't there some other way to control lead and corrosion in our tap water?" and "Is the phosphate in our tap water really safe for human consumption?" These questions worry me, but what also worries me is what appears to be an acceptance of this situation by the general public (aquarists included).

Seems to me that not that long ago, there was a huge outcry over phosphates in soaps and detergents, which were supposedly causing lower phosphate levels in tap water than what we find today. I also seem to recall that the main point of this public outrage was that phosphates consumed in drinking water were harmful to our health because they could accumulate in our system. We may have found solutions for our aquariums . . . but are **we** safe? Are we to be condemned to consuming expensive bottled water for the rest of our lives? In the links below, please visit the Arm and Hammer® site where they discuss experiments and alternate methods to reduce lead and metal corrosion in tap water using less-expensive sodium bicarbonate as opposed to expensive phosphates. The experiments proved to be quite successful, so why aren't these methods in use? We think this is a subject worthy of discussion, and we want to hear from you.

Dave Hauser, President
Aquarium Professionals Group, August, 2000

Note: As of the date that we transferred our pages to our new web site on May 1, 2001, the phosphate problem in Chicago water has not improved. In fact, it has gotten much worse! D.H.