

Understanding Praziquantel

By: Karl Schoeler

Praziquantel is a drug used for treating skin and gill flukes in koi and goldfish. It is a trematodicide and has a chemical name and molecular formula longer than most pre-nupts.

Praziquantel is a white crystalline powder easily soluble in Formaldehyde and Malachite Green (FMG) solutions or the retail product Terminate or ProformC. Using it with FMG has beneficial side effects as the two used together in proper dosage will set back every microscopic parasite common to koi. I did say "set back". There's no sense beating around the bush when it comes to parasites. They will always be available if the situation presents itself. The object is to reduce their numbers and keep them in check with good husbandry skills.

A common mistake is to mix Terminate or ProformC or FMG with Praziquantel and make a stock solution which sits on the shelf until needed. Praziquantel will break down in this mixture. When using these products together, mix only what is needed for each treatment. Also if using Terminate or ProformC for a specific parasite such as Costis or Chilodonella, it is best to use it separately on the first two treatments per the label instructions (daily) and then I like to see a 25% water change and a re-treatment of Terminate or ProformC and Praziquantel mixed on the third day. Allow that to "stand" for a minimum of seven days. Obviously water quality must be pristine, well-filtered, and aerated for these treatments.

Once ingested, Praziquantel induces a rapid contraction of schistosomes (a worm or fluke) by a specific effect on the permeability of the cell membrane. The drug further causes vacuolization (causes more spaces or cavities within each individual cell) and disintegration of the schistosome tegument (the fluke body covering). Bursting of the cell walls might be a much simpler way to put it and may be equally correct.

In any event the success of Praziquantel is tied to one thing more than any other: It must be ingested by the fluke. Here's where koi keepers have sometimes said that flukes, especially gill flukes seem to be resistant to Praziquantel. There are two reasons for this:

First, as we've become more adept at finding flukes with a microscope we can say that there still are some there. In the past people just assumed that the parasite was eradicated after the label treatments were followed. Parasites are nearly always present.

Second, and this is really why flukes appear to be resistant, Koi and other bottom feeders put out a significantly heavier slime coat compared to other more predatory fish. Because they feed on the bottom, and churn up the mud in their hunt, they need more protection for their gills.

Then there is one more factor: When flukes attach themselves they stimulate the slime coat that further embeds them and makes them even harder to treat.

So, when gill flukes are discovered by flashing symptoms and a scrape and scope, we are dealt a difficult hand. Medicating with something which will sooner or later be ingested by the fluke, and yet using something safe even at significantly higher doses where necessary.

Testing of Praziquantel was done by Victoria Burnley Vaughn and she arrived at a dosage of 1 gram per 100 gallons of water for eradicating flukes. I do not know of any other conditions which may affect this dosage except some water conditioners containing a slime coat enhancing chemical such as Novaqua or Ultimate.

My testing was done in hard water: 20-28 grains of hardness, a Kh of 220 -275 and a Ph of 7.2 to 7.8. I used Praziquantel at a rate of 4.5 grams per 300 gallons followed in 48 hours by a duplicate treatment as a kicker. This represents a 50% over treatment if the first dosage maintained its efficacy. Since Praziquantel is completely dissolved and becomes liquid the efficacy of the dose should remain for several days.

Although the directions for Praziquantel indicate the use of a level tablespoon treating 300 gallons I would strongly suggest the use of a gram scale. A tablespoon can hold anywhere between 2.5 to 4.5 grams of Praziquantel. It all depends on how it is scooped up. At \$150.00 for 100 grams of Praziquantel, precise measuring is important.

In my testing, I found no ill effects on koi even when overdosed by 50%. That is important for the hobbyist since many people have a tendency to over estimate the number of gallons of water in their pond. Koi, whether domestic or high end Japanese, were unfazed by the treatment.

Although Praziquantel is relatively expensive it does represent about the best thing we have for fluke treatments in well-filtered, closed systems. Organophosphates are Kh dependent and are also very likely to kill koi if even slightly over-dosed. Supaverm is used by very experienced koi keepers and I've heard horror stories of fins burns and immuno-depressed fish that eventually die. I've also heard of many successful treatments with Supaverm. At this point there are too many Questions about Supaverm to recommend it. So, if you have fish "flashing" in your pond and/or you have reason to believe flukes are present Praziquantel is the medication of choice.

NOTE: The biggest bang for the buck is treating with one of the retail products Terminate or ProformC. Water change is not that important after the two day treatment, But for sure: no water change for at least seven days. This will take care of eggs, larva and adults.

**Tip: Shipping cost will be less when you order:
Terminate if you are from the east coast
ProformC if you are from the west coast.**