

A Quick Guide to Poison Dart Frogs

Matthew B. Willis and Michael Wells



Featuring Articles by Marty Krol of Mistking.com and
Joshua Willard of Joshsfrogs.com



amphibian ark // AmphibianArk.org

“A portion of proceeds go to help Amphibian Ark”

**Excerpt from the upcoming book
Regarding misting and humidity**

**Please do not copy or reproduce without permission
from book authors Matthew B. Willis and Michael Wells**

Automatic Misting Systems & Humidity

by Marty Krol

Dart frogs do not drink water. They absorb it through their skin. “Moist and humid” is a basic requirement for a dart frog environment. This chapter will concentrate on how to achieve ideal moisture levels, without being a slave to your hobby.

All dart frogs come from tropical areas which are often drenched by torrential downpours. The good thing is that it’s impossible to have a humidity level that is too high. It is however possible to have too little. Simply put, dart frogs cannot be over misted. It is therefore better to over spray than to not spray enough. How much is too little? I’m sure many would argue what is safe and at what levels one can sustain dart frogs alive. You’re not reading this to sustain your frog alive, but you’re interested in providing conditions in which your frogs will thrive and breed.

Hand Misting

Let’s start from the beginning with the basics. Everyone has done it and many will continue to hand mist. It’s the most economical way, without a doubt, to introduce humidity into the Vivarium. Many dart keepers prefer daily hand misting because it gives them the opportunity to ‘peek’ into the enclosure to make sure everything is well.

In poorly ventilated tanks, hand misting may be adequate to raise the tank humidity to sufficient levels. However with poor ventilation comes poor visibility. Condensation collects on the sides of the glass and algae quickly settles in. Before you know it, you have adequate humidity, but you also have green glass and aren’t able to see into the Vivarium. Works, but cuts down on the enjoyment of the hobby if you cannot see the frogs.

Insufficient ventilation may also spawn a host of other problems, such as fungus and

mold to appear in the enclosure. In addition, the lack of air flow in the Vivarium will seriously restrict the types of plants that may be successfully grown. For example, most types of tropical plants, including Orchids and Bromeliads flourish even with a minimal air movement. With high humidity and stagnant air you may see your floral investment simply rot away.

In addition, the constant prying into the environment with a squirt bottle adds to the stress of the frogs, which may or may not be enough to prevent them from breeding and eating properly.

Mist that comes out of the manual misting bottles is not very fine and quickly settles on the substrate. It makes things wet, but the increase in humidity does not linger for long.

If there happens to be enough ventilation to the point that you can actually see into the tank, then most likely the momentary single humidity spike at the time of misting will not be enough for optimal conditions for the frogs.

Hand misting is not an optimal way of creating sufficient levels of humidity in the dart frog Vivarium. If you have multiple setups, then the problem becomes compounded and downright cumbersome and not sustainable in the long run, often negatively affecting frogs due to insufficient humidity levels.

With hand misting either you suffer due to the lack of visibility and increased maintenance or your frogs suffer due to the lack of humidity.



Automated Misting

Born out of personal necessity, automated misting is something that has kept me at pinnacle of dart frog hobby enjoyment. It has allowed my frogs to call and breed, Vivarium plants and mosses to flourish and tank maintenance to be virtually kept at a minimum due to elimination of burdensome chore of hand misting.

Any dart frog keeper, who is serious about providing the best possible conditions for their frogs, should without a doubt invest in a misting system. Whether you keep 2 frogs or 200 frogs, a misting system will pay for itself many times over, with extra breeding stock, less losses and less time spent on maintenance. This really is one of the simplest decisions if you're serious about the hobby.

It will virtually be impossible for me to talk about misting without mentioning MistKing.com, which has been constantly growing and evolving with the dart frog hobby since its inception several years ago. We're relentlessly tweaking and improving our systems both technically and esthetically. For many a rainforest Vivarium is a centerpiece of décor that allows the passion and devotion to show through their tropical displays. We build our systems out of the absolute best grade components with majority of the items being custom manufactured specifically for us to fit the particular needs that our customers demand.

Providing the top quality with the highest esthetic appeal is principal priority for us. Our dedication to quality products and unsurpassed customer service has not gone unnoticed. MistKing Systems are currently used in countless ZOOs, Botanical Gardens, institutions, corporate displays and thousands of individuals around the world.

Mist produced by our custom nozzles is incredibly fine and if you look closely you'll see it floating on air. Pumps currently in use are virtually silent.

Fascination with dart frogs has started at an early age for me. Misting systems evolved out of my own personal hobby needs. Being a 'techie' and automation junky, it was a natural progression for me to include automated misting for my own dart frog collection. Initially it was to better control the humidity in the tanks, but I soon realized the reduced maintenance aspect and increased breeding activity that came along with having a misting system. It also became possible for me to go for vacation without arranging for a frog sitter!

I've tried and purchased various systems available in the hobby and while some may have had a price appeal, I found them all in my personal experience to always lack in either esthetics or performance. Since my own dart frog hobby has been co-evolving my misting systems, it will therefore be difficult to speak in generalities without mentioning or pointing to products available at MistKing.com.

When conceptualizing my own, ideal misting system the following wishful options had to be fulfilled:

- Value
- Minimal noise level
- Robust pumps
- Super fine mist
- Ability to direct the mist where needed
- Scalability. Adding more nozzles as the hobby grows
- Maintenance Free & Reliable
- Ability to set misting time in seconds, not minutes
- Esthetic appeal

It was a long process, where we needed to collaborate with various manufacturers to create products that would fulfill our objectives with ZERO compromise. We have fulfilled all of the wishful targets and now offer misting systems that are virtually silent, where the pump operation is eclipsed by the sound of the mist coming from the nozzles. The self priming pumps can also run for extended periods of time, even dry without damage. The mist particles are some of the finest on the market, with a median droplet size of 55 Microns.

Nozzles have 360 degree swivel adjustability and can direct the mist anywhere it is needed. Misting assemblies are extremely durable, based on industrial grade polymer, and spraying nozzles sit in a nickel plated brass fittings providing years of worry free use. We offer systems that can run from 1 nozzle to 70 nozzles.

To offer even greater value for the budget conscious hobbyists we are now offering a full line of VALUE nozzles. These are made of a lower grade plastic used in potable liquid industry, also custom made specifically for MistKing.com in black. These are a bit larger, but work just as well and cost about 30% less than the premium line.



Abundance of light and humid environment makes for a lush Vivarium with a lot of plant growth

Timers

Connecting a misting system to a timer sounds very easy. Go to your local hardware store, purchase a digital timer and you're done! Well not quite. We found out the hard way that digital timers available on the market have two major pitfalls that will eventually catch up with you. **One:** The minimum cycle time is 1 minute. If you have a large enclosure with multiple nozzles then misting for one minute will add quite a bit of water to the environment. If the enclosure is drained, then this may not be such a big problem, but if your enclosure is not drained and you count on natural evaporation to take care of the excess water, then misting for 1 minute interval isn't ideal. Other than adding 1 minute increments to your misting you do not have any options. **Two:** the timer depends on watch style batteries that keep the time and also control the relay which turns the connected appliance ON and OFF. When these batteries are nearly drained, then the relay may or may not trigger and fail to turn the misting system on or off. Serious problems start when the timer does not turn the power off and allows the pump to run for hours, often draining the reservoir and possibly damaging the pump. Fortunately, our pumps are continuous duty pumps and can take the extra abuse.

What better timing solutions are available?

Repeat Cycle Timers (RCT) work by allowing you to set an "ON" cycle and an "OFF" cycle. For example, setting on cycle for 20 seconds and off cycle for 2 hrs will make the timer turn on the connected appliance (or misting system) for 20 seconds every 2 hrs. RCTs address the two pitfalls of the hardware store style digital timers. RCTs do not rely on watch style batteries

and are therefore much safer. Misting cycles can now be less than 1 minute and are a much better alternative.

These timers have three annoyances of their own. **One:** The timer will cycle 'forever' and cannot be turned off, unless plugged into another timer. A bit redundant, but has been used by hobbyists successfully due to a lack of a better alternative. **Two:** Cycle times are identical. Every time the RCT engages the same cycle will take place. In other words, misting time is exactly the same every time. **Three:** Price! RCT cost about 4 times the price of a digital timer.

Repeat Cycle Timers are a far better alternative, but are not ideal solutions that hardly mimic naturally variable cycles.

We've perfected our misting system and it would be a shame to now downgrade its operation due to a weak timer. Once again, we needed to take matters into our own hands. We have partnered with a timer manufacturer and now offer a timer produced for MistKing.com that can have 8 timing cycle with a minimum cycle of 1 second. The timer does rely on a small watch style battery, but one that is rechargeable, greatly reducing or even eliminating problems associated with relay triggering. At last, it's now possible to have your own, custom mist schedule. For example

- 45 second at 7 am to get the Vivarium re-hydrated from the night and to wake up the occupants with a refreshing morning shower,
- 20 seconds at 9am, 11:30am, 2:30pm, 4pm to maintain the humidity throughout the day.
- 1 minute 30 seconds at 5:30pm for a little afternoon drenching.
- Then 40 seconds at 8:30PM right before lights out to keep the

enclosure nice and moist for the night.

Of course, depending on your level of ventilation, rate of evaporation and existence of drains, your misting schedule could be completely different. Also, whether you're simulating the dry or wet season, the schedule would also be altered to suit the frogs better. Having a quality system, connected to an accommodating timer makes all the difference. This is practically impossible to accomplish with manual misting.

Type of water

Water quality and type are very important to the operation of misting systems. The initial perception would be to use either collected rain water or sump water that may be re-circulated via a false bottom filter or water with tannins added to reproduce the natural quality of water found in the rainforest. This is a great idea for the first several weeks until the misting nozzles get completely clogged and the Vivarium glass is virtually un-washable due to the heavy mineral deposits.

The ideal water to use in a misting system is distilled or reverse osmosis (RO) water. The de-mineralized water will never clog the nozzles and any overspray that lands on glass or acrylic will dry spot free and crystal clear.

RO water can be purchased at most supermarkets in large bottles or a more viable long term solution is to invest in a Reverse Osmosis filter. The great thing is that you can use the water for your misting system and the family can use it for cooking and drinking.