

## Herps and Distilled Water

**Never use distilled water for pet herps.**

*By Margaret A. Wissman, DVM, DABVP*

We have had Spotty the Salamander for about a year and half. We inherited him from my husband's nephew. He is a great salamander. He has been big and fat for about 6 weeks, and we have tried doing something to help him out. We feed him mealworms and pellets. He gets crickets as treats. We had a heat lamp over them (there's another salamander named Dylan), but were advised to take that down. The temperature in the house is pretty good.

We always have a pool of water for them, which they hang out in. I normally set out tap water for a minimum of 24 hours before I use it, but I changed to distilled water for about a month. We had him out and away from water two days ago, and he was so much thinner. When we put him back in the aquarium, the salamanders sat in the pool of water and Spotty got huge again! Last night I made sure there was water in the "Jacuzzi," but not as much, so he would not soak it up. I am not sure if he is going to the restroom and eating it, or if he has diarrhea (which I think he does).

I am attaching some pictures for you to see him. Please let me know if you can recommend anything. I will take him to a vet, but I can't put the little guy through surgery, it just is not natural. I want to do all that I can though. Thank you for your service.

Thank you for writing. I'm really glad that you did, as you have brought up a very important point that my readers need to know. I think your major problem is occurring as a result of you switching to distilled water. This is something that every herp owner should know: **NEVER USE DISTILLED WATER WITH PET HERPS.**

I think everyone needs to know about the differences between the varieties of bottled water offered for sale versus using tap water that has been altered in some way (i.e. through filtration, chemical dechlorination, etc.). It is probably safest to use bottled water if you are unsure if your municipal water is fish-safe. Chlorine is easily removed from tap water by the use of drops that dechlorinate the water, however, many areas of the country now use chloramines as sanitizing agents, and these compounds are much more difficult to safely remove. Cities that use chloramines in their water usually include information about it in the monthly billing statements, and this information is also available online or if you call their office and request information about the safety of using tap water for aquarium fish. If the water is not recommended for aquarium fish, then you should also not use it with herps, especially amphibians.

Amphibians are unique in that they can absorb oxygen through their skin, and dissipate carbon dioxide, as well. Because their skin should be kept moist in order for them to "breathe" and also because the skin absorbs water, the type of water they are given is very important.

Distilled water is basically water with nothing else in it. That means that there are no dissolved salts and minerals. This is a type of water that a wild animal would never be exposed to. All water found in nature has some salt and minerals dissolved in it, and this is important for something called osmotic regulation. Suffice it to say that this term means how water passes into and out of cells and is regulated, in part, by the dissolved solids in the water. Water routinely passes in and out of cells, which is how the body regulates almost all bodily functions. So, dissolved minerals and salts are very important for normal physiological functions. Distilled water, with no dissolved salts and minerals, cannot support those normal bodily functions. That is why your poor salamander blew up from absorbing water because there was nothing in that water to prevent absorption.

When a human or an animal is given intravenous fluids that fluid is far from distilled water. It is sterile, however, but it contains dissolved sodium chloride (salt) at the same percentage as blood, which is 0.9 percent and is called physiological saline. Other sterile IV fluids may include one called Ringer's Lactate, which is a combination of salts dissolved in the fluid, and pH buffered for IV use. A type of sugar called dextrose can also be dissolved in the fluid to provide some energy for the patient.

Tap water also has dissolved salts, but also may have fluoride, chlorine or chloramines added. The pH, or how acid or alkaline the water is, may vary greatly in tap water. There are usually a variable number of harmless and potentially dangerous microscopic organisms in the water.

Bottled water also has dissolved salts and minerals in it and may also have a wide range of pH. Some bottled spring water is just that, natural spring water with dissolved minerals. Most spring water comes from deep in the ground, having been filtered through porous limestone or other rock, purifying it along the way. When being bottled, spring water is often

treated with ultraviolet light to kill any live organisms that may be present in the water, such as algae, or it may be run through a micron filter to remove particulate matter, such as fine sand, silica, etc. Natural spring water is usually not carbonated (containing bubbles); however, rarely a spring may produce naturally carbonated water (Perrier is an example). Bottled natural spring water is probably the safest to use for amphibians, although it is probably a good idea to use a pH test strip to ascertain the pH of the water, to ensure that it is suitable for the particular species that you are keeping. Low pH means that the liquid is acidic, and a high pH means that the liquid is alkaline. A pH of 7.0 is neutral, being neither acidic nor alkaline.

Distilled water being demineralized, contains more hydrogen and is considered an acid, with a pH of less than 7.0. Any time a human or animal consumes or, in the case of an amphibian, is soaked in distilled water, the body pulls minerals from teeth (if they have them) and bones to produce bicarbonate to neutralize the acid. This can prove dangerous over time. Another problem with distilled water is that acidic liquids will result in the production of more free-radicals, which are molecules that can increase the risk for cancer. There are people who feel that distilled water is safe and healthful to drink, but the mainstream medical community discourages the consumption of distilled water. Likewise, providing pet herps with distilled water is not recommended. Because amphibians respire through their skin and also absorb water through the skin, distilled water can be particularly dangerous to them.

Other types of bottled water are also available. Bottled water is just water from any source that has been treated, either by reverse osmosis, filtration or some other process, and then the water will have minerals and salts added afterwards (otherwise it would end up being distilled water, devoid of dissolved salts and minerals). Minerals added are usually magnesium sulfate, potassium chloride and sodium chloride (table salt). These bottled waters are also safe to offer to pet herps.

It is a good idea to get used to reading the labels on those bottles of water offered for sale, as there are a great variety of water types being offered to the public.

I wish that you had given me more specifics about your salamander. I see its name is "Spotty" but I don't think it is a spotted salamander (*Ambystoma maculatum*), as the range of the spotted salamander does not include Utah. I think that it is a tiger salamander (*Ambystoma tigrinum*). They prefer it cool, dark and moist. They usually eat earthworm segments, insects, small tadpoles, small fish and invertebrates that they come upon and capture. If it fits in the mouth, they can eat it. Some salamanders can be taught to eat pellets, which is always a good way to provide balanced nutrients, although I think the more you can vary the diet with live prey, the better off your salamander will be. Salamanders will also occasionally mistakenly consume a small pebble or rock, so make sure that the habitat substrate is salamander-safe.

The heat lamp was a bad idea, so I'm glad that you removed that. Salamanders do best away from direct sunlight or incandescent light, as that can dry them out or desiccate them. Make sure that your salamanders have pieces of light wood that they can hide under, and be sure that you provide them with moss or other substrate that holds water and will help keep them moist. They are shy, secretive animals that usually do their feeding at night, so they are not social creatures. Sometimes it is OK to keep several together; however, mixing species can stress them and sometimes also may introduce disease from one to another.

You should handle salamanders as little as possible, and if you do need to handle them, you should always wash your hands thoroughly before you handle them and again after you handle them. Some amphibians secrete irritating or toxic substances through the skin, along with the mucus secretions, so be sure that you don't touch your face, or especially your eyes, after handling them.

I suspect that your salamander's problems with swelling up is directly related to soaking in distilled water after spending two days out of the water entirely. Some of the photos you provided show your salamanders on some indoor/outdoor carpeting (I think) with some flip-flops for hiding areas. I hope this is not where they are spending most of their time, as it is too open and too dry for them. You need to provide them with a habitat that supplies them with consistent moisture, hiding places and a small water pool. You can check with your local pet retailers or on the Internet to get ideas about proper habitat and substrates. There are some really nice molded plastic and glass tanks that are suitable and appropriate for salamanders. You can also check some of the advertisements in REPTILES magazine for appropriate terrariums.

I don't think that your salamander is going to require surgery or any sort of drastic procedures; however, because I have not seen your amphibian, I can only make suggestions and speculate about what is going on. Unfortunately, there aren't many herp veterinarians out there who have much experience with amphibians, and salamanders in particular, but if it appears that Spotty is not doing well, then you will need to find a herp vet who is willing to examine your salamander and perhaps treat it.

If the vet that you choose admits that he or she doesn't have much experience with amphibians, including salamanders (which is not to say that he or she is not an excellent vet), you can suggest that your vet call the diagnostic lab that they use, and request a consultation with a vet with more experience with reptiles and amphibians. These consultations are usually offered free-of-charge for veterinarians using the lab, and can provide a wealth of information for new and experienced veterinarians alike.

Good luck with your salamanders. They are very cool creatures and I have always had an interest in them, having found some every summer under rocks in Connecticut, where I grew up.

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#### Need a Herp Vet?

If you are looking for a herp-knowledgeable veterinarian in your area, a good place to start is by checking the list of members on the Association of Reptilian and Amphibian Veterinarian (ARAV) web site at [www.arav.com](http://www.arav.com). Look for DVMs who appear to maintain actual veterinary offices that you could contact.