
A guide to keeping Tadpoles

Caring for pond-dwelling species

People wanting to keep tadpoles or experience the magic of metamorphosis often contact the ARC. The tadpole tank has become popular culture in the schoolroom yet the quality of brief descriptions of tadpole-rearing in publications available to most schools and school students leave a lot to be desired. As a consequence a potentially positive experience can be spoiled and it is often too late when a teacher or taddie raiser calls us for assistance. In the interests of proper treatment of tadpoles we have written this very brief instruction. It is intended to give an idea of the practicalities of raising tadpoles. As a consequence some of the more technical explanations of why to do certain things are skimmed over. We hope this tadpole care information is of assistance and that your tadpole raising experience will be both an educational and a pleasurable one.

Frog eggs

Fertilization of a frog's eggs is external with the male stimulating the release of the female's eggs by grasping her around her body in a grip known as amplexus. At the moment the female releases her eggs, the male deposits sperm into the water to fertilise them. Spawn is the term used to describe the fertilised eggs and the jelly that surrounds them. Often different frog species have characteristic egg masses or spawn. Some eggs float on the water surface while others sink to the bottom. Species of *Pseudophryne* like the Corroboree Frog lay their eggs on land where they lay dormant for months in anticipation of rain. Some species lay their eggs in frothy masses, others lay eggs in jelly. Some frogs may lay as few as two eggs while others can produce tens of thousands. Inside the jelly capsule the eggs develop. Some tadpoles develop entirely within the capsule; others hatch at various stages of their development and become free living in water.

Tadpole development

There are many factors that determine how fast the tadpole can turn into a frog. Some species, like the Southern Brown Tree Frog *Litoria ewingi*, can take as little as eight weeks to become a frog while the Banjo Frog *Limnodynastes dumerilii* can take up to fifteen months to metamorphose. Environmental factors like the temperature of the water, the amount and quality of the food available to the tadpoles, the cleanliness of the water, and how many other tadpoles are in the same water can affect the rate of development. Tadpoles get oxygen via their gills. Most pond species graze upon rotting materials using their hundreds of teeth and filter microscopic particles out of the water with the use of their gills. They get most of their nutrition from decomposing organisms that are breaking down the material they ingest. They get little in the way of nutrients from the dead plant material that they are feeding upon. Organisms such as tadpoles that eat dead organic matter are called detritivores. Frogs, on the other hand, breathe via their lungs and eat only living things - mainly insects. Larger frogs may eat other frogs, mice, lizards and many other things that they encounter. Frogs don't have teeth like tadpoles do - these are lost during development. Instead frogs swallow their food whole, sometimes using their hands to push the food into their mouth.

Metamorphosis is the term given to the formation stages that occur as a tadpole develops and becomes a frog. One of the first visible signs of metamorphosis is the growth of the back legs. In frogs and toads the back legs always develop before the front legs and they simply develop out from the surface of the skin. The front legs form underneath the skin. When fully developed, one leg exits through the spiracle while the other pushes itself out through a weakened section of skin on the other side of the branchial chamber. The spiracle is where the water exits the tadpole when it has passed through the gills. While this is all occurring a growth-spurt of the head has slowly caused it to resemble a frog. During this stage the teeth are being shed. After the legs have developed the tail begins to shrink. The tail does not fall off the frog, as it is a very valuable food source. While its stores of nutrients are being used up the tail begins to shrink and the frog ceases feeding until the tail is completely absorbed. The metamorphosing frog often leaves the water before the tail is completely absorbed. After leaving the water the frog's main objective is to find a safe moist place away from the view of predators, to continue to grow and eventually reproduce.

Looking after your tadpoles

A warmer environment will result in tadpoles developing into frogs quicker - room temperature is quite sufficient. Warmer water becomes dirty more quickly, and will need to be changed more frequently. One of the factors that are causing a reduction of frog numbers in the wild is the presence of fish that feed on eggs and tadpoles. It is a very bad idea to keep fish with tadpoles or to have fish in ponds that frogs may breed in. Tadpoles eat their own faeces so it is important that their tanks are not kept too clean. The water can be changed on a regular basis but the faeces on the bottom of the tank should remain as a food source for the tadpoles. Regular water changes are important for good growth and survival rates as tadpoles release a chemical to restrict the growth of other tadpoles into their surrounding water supply. This is probably done when resources are scarce so that the first frogs to exit the water will have fewer competitors and manipulate any resources that are limited. This will give them a greater chance of survival.

Although Melbourne water is safe to use for frogs, the chlorine and chloramines in the water can affect your tadpoles. Water that comes out of your tap is also under pressure and contains high concentrations of air. If tadpoles are placed in water that is taken straight from the tap it can quite often result in the inside of the tadpoles absorbing air from the water causing it to float and lose control of its movements. To avoid this allow the water to stand for a period of 24 hours in a clean bucket. During this time the chlorine will evaporate and the excess air will exit the water. When feeding your tadpoles we suggest that you use frozen endive or another green leafy vegetable such as lettuce. After it has been frozen break it up in your hand to make more surface area for the tadpole to graze upon. Freezing your food is a better method than boiling, as when matter is boiled, the cells rupture and all the goodness ends up in the water. Freezing the endive also breaks up the cells and allows the tadpoles to get nutrients out of it sooner than if it was fresh. Another problem is that excess food in the water will cause it to quickly go off. Tadpoles may die from polluted water before humans notice it. If at any time the water becomes cloudy or milky change at least half of it immediately but if possible it is best to change the water before it reaches this point.

Metamorphosis

When your tadpoles develop their front legs, remove them from the water and place them in shallow water with some land easily accessible to them. Although frogs are amphibians, young frogs are not able to swim for long periods of time and often die of exhaustion when left in the water. Frogs that still maintain their tail may not feed until several days after their tail is completely absorbed into the body. They should then be fed small insects.

Both tadpoles and frogs are very sensitive to the conditions of their environment. It is extremely important that no chemicals, such as aerosol deodorants, fly sprays, and other cleaning products, are used near your tank. Exposure to such chemicals will often result in the death of your tadpoles or young frogs. With a bit of care your experience with your tadpoles will be an enjoyable and educational one.

Licensing and legal matters

It should be remembered that all frogs and tadpoles are protected in Victoria and many other states. Protection varies so consult your local conservation department for areas outside Victoria. In Victoria tadpoles may only be obtained from captive breeding. This is an advantage as you will know exactly what species you have, how long they will take to metamorphose and what special care they may require as either a tadpole or frog. Supplies of tadpoles and everything else needed to raise them are available all year round from the Amphibian Research Centre.

Good luck

We trust that, for you, tadpole-raising is an enriching experience, both pleasurable and educational. May your tadpole days be filled with joy and wonderment.