



Triops on the Web!

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**2X the
Triops!**

Guaranteed to hatch!

*Twice the number of Triops
as other kits*

**Grow amazing
pond monsters**

TRIOPS WORLD

Designed for
children by
Nature Experts



 **Hatch in
24 hours**

 **Study the amazing
Triop life cycle**

 **Watch them double
in size every day!**

www.triopsworld.com



WARNING!

For children over 7 years of age only.



For use under adult supervision. Read the instructions before use. Follow them and keep them for reference.



Young children should have adult guidance when using this kit.

Not suitable for children under 36 months due to small parts that could represent a choking hazard.

None of the accessories in this kit should be allowed to come into contact with foodstuffs.

Wash hands after using this kit or the activities contained in this booklet.

Triops are totally harmless to humans and cannot bite or cause injury. However, always wash your hands after handling Triops eggs, food or water, and anything that has come into contact with them.

Always place the tank out of the reach of small children and animals.

Should any water from the Triop Tank come into contact with eyes, rinse immediately with plenty of water for at least 5 minutes, holding the eye open if necessary.

Disposal: Dispose of any waste material in the rubbish bin.

Dirty water should be flushed down a toilet and not down a sink.

This kit conforms to the following safety standards:

Europe: CE and EN71

USA: ASTM



About this kit!

This kit is a hands-on guide for budding naturalists and contains the equipment you need to observe and study the fascinating life cycle of Triops. The kit is designed to be fun and informative for kids of all ages. However, young children will need the help and supervision of an adult.

Your Triops are guaranteed to hatch, so if you have any problems see the details at the back of this booklet.

Finally, I hope you have fun with this kit and discover some fascinating insights into the truly amazing life of a Triop.

Contents

- **Tank and lid**
- **Triop eggs**
- **Triop food**
- **Pipette**
- **Sand**
- **Thermometer**

You will also need

- **A bottle of distilled water**
- **40-60 watt lamp**

Introduction

When you add water to the little packet of 'detritus' that is included in this kit you will be launching the bizarre life of an ancient little animal that has been doing the same thing rather successfully for some 300 million years! Triops (pronounced 'try -ops'), which are also called Tadpole or Shield Shrimps, are creatures that biologists often call living fossils and Triops have truly earned this title.

They first stepped onto the scene somewhere in the Triassic period and since then they have witnessed many large and spectacular creatures, including the dinosaurs, come and go.

The secret of their success is all down to simplicity, they have become masters of a habitat that is too tough for many and that is the temporary pool. These shallow pools and puddles appear after rain and then very quickly dry up again. For aquatic animals this presents many



real challenges. Not only do the temperatures in these puddles go up and down, but so do the chemicals in the water and the amount of oxygen dissolved in it. As if this doesn't make it tough enough these puddles are not called 'temporary' for nothing and some may last just a matter of a few days before the water dries up and the ground turns to dust again!

How on earth does a delicate creature like a Triop cope with all this? Why does it choose such a harsh place to live and where does it go when the water evaporates? Well with your Triop World all these questions and more will be answered and all you need to do is add water...



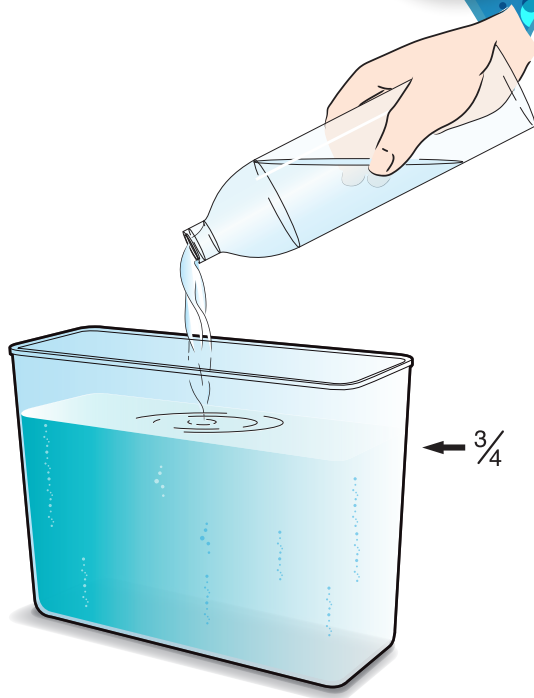
Getting started...

...just add water (but not tap water!)

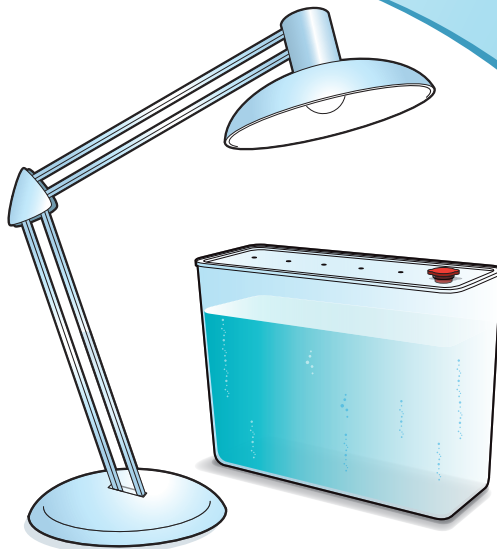
All you need to do in order to get the most out of your Triops is to re-create the conditions in a temporary pool.

So first you need to source some water, enough to fill the Triop tank. Distilled water is best. If using bottled water read the small print and try and avoid using any 'purified' water. Also avoid water that has chlorine added to it (this includes tap water but also some bottled water).

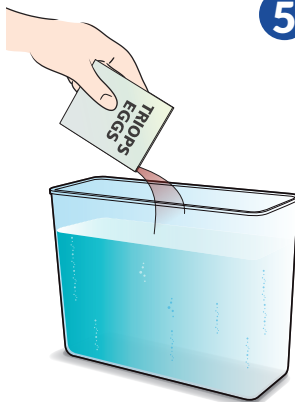
- 1** Rinse out your tank with a little of your water, don't use tap water or soap, and then wipe it dry with kitchen towel or tissue paper.
- 2** Add distilled water to the tank until about $\frac{3}{4}$ full.



- 3** **Ensure the water in the tank is at a temperature of 80°F / 26°C before adding your eggs.** Normally you will need to provide an artificial heat and light source. This can be achieved by using a desk lamp with a 40 watt bulb (not one of the Eco variety, they don't get warm enough), or a small 'spider mat' (available from most pet stores). Place the lid on the tank to avoid the water evaporating and to help maintain the water at a constant temperature.

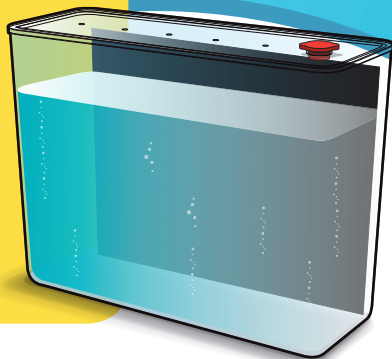


- 4** When the water is up to temperature, sprinkle the bag of detritus onto the water - this contains the Triop eggs. Give the detritus a brisk stir with the pipette to mix it thoroughly with the water. Then use the pipette to wash down the sides of the tank with clean water to ensure no eggs are stuck to the side of the tank (the eggs are so small you will not be able to see them).



- 5** Your Triops should start to hatch within 24 hours but they may take upwards of 7 days so be patient (sometimes they don't hatch, but don't panic we have solutions, see the back of this book) although in their early stages they will be so small they will be difficult to see.

Placing some black card behind the tank and shining a flashlight in from the side while viewing from the front may reveal the very first twitching of life.



Designed for
children by
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Feeding instructions

The little packet of detritus that you first tipped into your tank has now magically produced life and it contains enough of the essential nutrients to feed your Triops for the first three days of their life.

On day four, after the triops hatch, sprinkle just a few granules of food onto the surface of the water. Thereafter, feed every two days, slightly increasing the amount given as they grow in size. In the first week be careful not to over-feed your Triops as uneaten food will quickly contaminate the water which will harm your Triops.

At adult size, about 2 weeks, one very small pinch of food per adult every two days is plenty to keep them well fed.

Always wash your hands after handling the food.

There should be enough food to last the lifetime of your Triops. Should you run out of food or need more for a second generation of Triops, Triops World will be happy to supply you with some. Alternatively, you can feed your Triops on a good quality fish food available from pet shops - use granules, not the flake variety, crushed carp pellets are ideal. I have also found that my Triops are rather partial to grated carrot (washed and peeled).

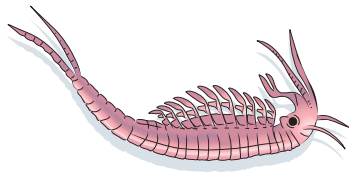
Free extra pets!

Triops are not the only creatures that live in temporary pools and your bag of Triop eggs and detritus may well contain a few extra surprises. More ancient animals that share a similar success story to your Triops. Crustaceans such as Water Fleas (Daphnia), Clam Shrimps and Fairy Shrimps are all possible. See the pictures to identify what is what and who is who.

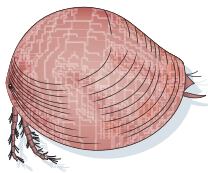
Sometimes they hatch at the right time and you will have a veritable micro-collection of creatures all swimming around in your tank at the same time. Although more often than not, the Triops beat them too it and ultimately win the race to survive and eat the smaller creatures!

All of these animals have been around for a long time. Fairy Shrimps and Water Fleas came about in the Triassic period some 200 million years ago.

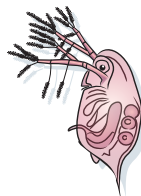
If you want to keep your micro-pets separate and stop them eating each other, then using a clean teaspoon or the pipette provided, gently move them to another tank or jar but make sure it contains the same water at the temperature they are used to.



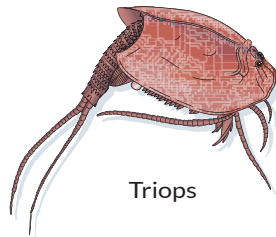
Fairy Shrimp



Clam Shrimp



Daphnia



Triops



Looking after your Triops

2-3 days after the eggs have been added to the water, stare into your tank and you should see tiny little pale things twitching and swimming around. These are creatures that have hatched from eggs contained in the packet of detritus, there will be Triops as well as the potential of a few other creatures too.

Now is a good time to skim the detritus off the surface of the water, it makes it easier to keep an eye on things and tidies the tank up a bit. You can do this by carefully scooping it off the surface with a clean teaspoon. Any waste can now be carefully disposed of in the bin. Remember to wash your hands and the spoon afterwards.

After a few days you will notice your Triops growing fast! In the first few days they will moult several times a day, (they slow down as they get bigger) and will put away 40% of their own body weight a day in food

which is why after 3 days it is time to add a little of the food provided.

In the first week after hatching they are quite sensitive to water conditions. So be careful not to over feed them and foul the water, you really only need a tiny amount of food about 3 times a week. I'm not sure why but Triops go crazy for carrot. I don't add too much but if you cut and drop in a little cube (5 x 5mm) you will see what I mean.

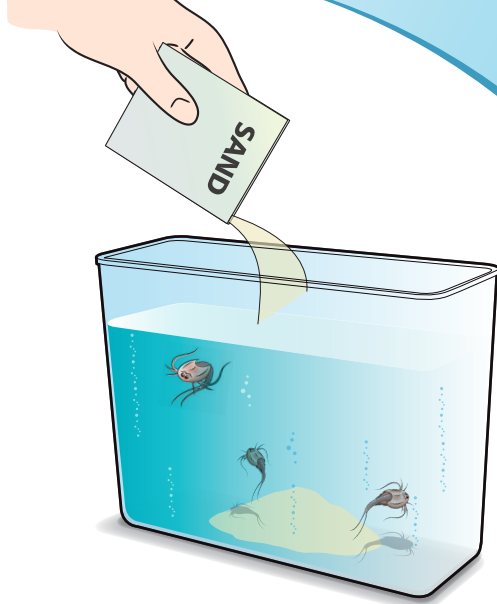
How much you feed your Triops depends a bit on how many have hatched and how big they are but as a guide a couple of pinches of food a week per adult is about right. If you watch your Triops at feeding time and they immediately start to feed in a bit of a frenzy then you are getting it about right.

When your Triops are about two weeks old, add the sand provided in the kit by simply pouring it in the tank. This helps keep the water clear and your Triops will love scurrying around in it, searching for tiny particles of food.

It's normal for only one or two individuals to survive to maturity in your Triops World. If more than that hatch you can separate them out into separate containers. While your Triops will do fine in the tank provided, you could try setting them up in a larger fish tank. It's interesting to discover that the bigger the space they have to grow in, the bigger they grow. I have seen monster ones, nearly 10cm long from tip to tail! However, never put your Triops in with fish in an aquarium as they'll soon be gobbled up.

Note:

Always wash your hands and equipment after handling Triop food or water.



Cleaning

Because in the wild Triops live in puddles, they do not need to be kept spotlessly clean like fish and they can seem to cope with fairly murky water. However, to stop it becoming too murky and smelly and so you can see and enjoy your pets, it's a good idea to partially change the water every week as they get older.



- First, get some distilled water and let it get to the same temperature as that in your Triop Tank. Second, carefully pour away half the water in their tank - be very careful not to tip away any Triops when you do this. Third, top off your Triop Tank with the clean water, you can repeat this anytime the water gets too murky.

A new generation

Sadly Triops live fast and die young and after a period of between 4 and 12 weeks they will finally cease their energetic antics and will twitch their final leg and die.

They seem to simply slow down, like a clock-work toy that needs rewinding. This is exactly what would happen in the wild, usually the pool will dry up and they with it. But in their short period of life they will have left the next generation in the form of tiny almost invisible eggs that are less than 0.4 mm across.

No matter if you only had one Triop in the first place they can often produce eggs without ever meeting and mating with another! This is a bit of magic called parthenogenesis and is another trick the Triops use to survive in such harsh places.

To get a new generation, do not empty the tank, but let the water dry up completely over a period of two or three weeks or more, until all that is left is scum, dirt and dry sand in the bottom. Gently free it up by scraping it loose with your spoon and then tipping this into a small container. Then wash and wipe your tank and you are now ready to start again! Simply add the detritus back in the tank and add water, with any luck you should get a second generation hatch.

Other things you might want to know...

I have found the longer you leave the detritus to dry, the better the chances of a new generation. I have also read that keeping the dried detritus in a freezer for a week or two also can benefit the hatching process because it mimics cold winter conditions in the desert areas where Triops originate. I have not tested this idea but it would be an interesting experiment for you to try out.

The eggs are remarkable in that they can survive for decades, maybe even centuries as no more than dust. They can withstand freezing and roasting hot temperatures and even though they seem to have no life within them, when the right conditions occur off they go again. Only those exposed to light will hatch and even then not all of them. This is another way they insure that whatever happens to the pool, if it dries up before those that hatched got a chance to breed there will always be some eggs left. This is another reason why it is worth drying out the substrate in your tank when they've finished as even if you never saw any eggs formed on your

Triops, the chances are there will still be some of the originals unhatched.

There are over 15 species of Tadpole Shrimp in the world, although the exact number is still a matter of debate among the world's Tadpole Shrimp experts. They are quite a successful group with every continent except Antarctica having at least one species. They all specialize in temporary puddles and water bodies.

The Triops that you've got in your Triops World are commonly called the American, Long-Tailed or Tadpole Shrimp and just to be thorough and avoid confusion its Latin name is *Triops longicaudatus*. They are native to America. *Triops longicaudatus* might sound like a horrible long name but it makes sense when you realize what it means. *Triops* means 3-eyed while *Longicaudatus* refers to the two long tails of this species; *longi* = long, *caudata* = tail.

Your Triops can grow to 7-8cm long but more usually 4-5 cm is expected from the Long-Tailed species.



Like all arthropods (a group which includes the insects, arachnids, crustaceans, centipedes and millipedes) Triops have a skeleton on the outside called an exoskeleton. This is very useful as it acts almost like a suit of armor protecting all the soft and delicate bits inside but the downside is it needs to be taken off and moulted if the animal is to grow. Your Triops will moult many times in its life cycle, each time getting bigger and bigger. You will see evidence of this process in the pale clear washed out looking skins left behind in your tank.

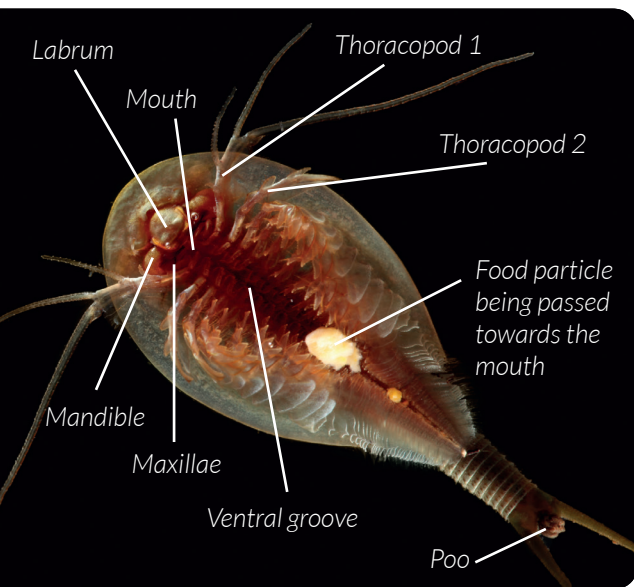
I tend to leave mine in place and in time they will soften up and get eaten and recycled by their previous owners! You can however carefully remove the empty skins when you find them (use a spoon) and then if you are very careful, pop them on a piece of absorbent kitchen paper, and using a pin you can arrange it nicely and then let it dry out until crispy - you now have your own souvenir Triop exoskeleton.

If your Triops have trouble moulting it maybe because they don't have enough of a chemical called iodine in their diet. This can be easily rectified by simply adding a bit of pond weed to the tank or a small piece of kelp tablet (available from health food stores)

Watch your Triops feeding, they grovel around in the sand and any detritus in the tank and as they do so they rapidly wave their limbs, particularly the ones towards the back which are flattened and paddle shaped. These set up currents in the water and food is then drawn into the groove on the underside of the Triop's body and passed up the middle towards the mouth.

Know your way around your pet

Part of the appeal of Triops is that they are like little robots, survival machines. Just like a machine all the bits have names and although some of the words may seem a little strange, they are all easy enough to learn and say with practice.



Eyes: The rather expressive ‘face’ is bedecked by a fine pair of compound eyes and between them a third ‘eye’ or naupilar eye. This middle eye is actually a window through the tough shield like carapace to the simple eye deep beneath it. These three eye clusters are what gives the animal the name Triops which translates as ‘three eyes’.



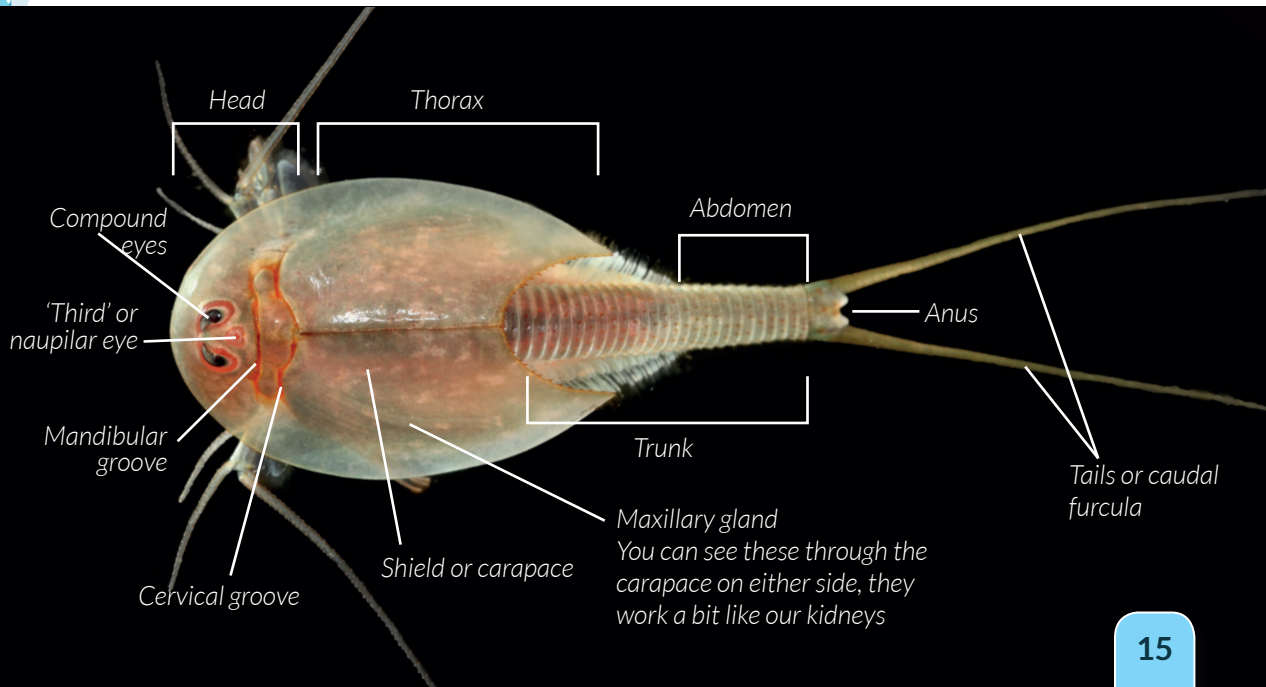
Carapace: This is the tough shield-like shell that makes these little creatures pretty hardy and robust, protecting all the delicate bits and pieces that make up the rest of its body.

Tails: These are called caudal furcula.

Trunk: This is the bendy bit at the back and is used to flip and flop the body around.

Ventral groove: The hollow that runs up the middle of the underside of the Triop and it is along this that the food particles are pushed.

Anus: I'm sure you'll want to know where the bottom of your Triop is right? It's right at the end of the body between the two tails, often you will see Triop droppings being dragged behind.

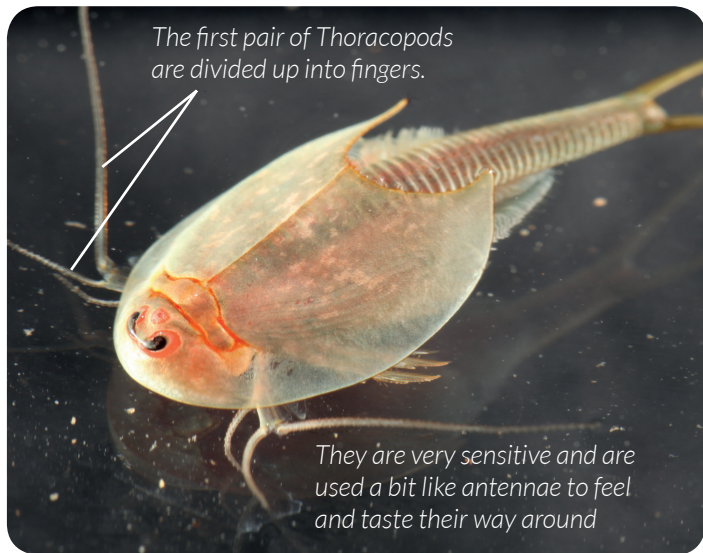


Mouth: This is quite difficult to actually see as most of the time it is hidden behind a flap called a labrum, but it is there and if you watch your Triops feeding closely you might even see the mandibles and the maxilla all chomping away, mashing the food up making it easy to swallow.

1st Thoracopods: The first pair of limbs are a bit different to the rest. Modified, they perform the same sort of jobs as antennae in other invertebrates. The first pair are split into several 'fingers'. Weirdly Triops do have antennae (in fact they have four) under the carapace in line with the eyes but they are very difficult to see.

The other limbs: There are 70 appendages on the thorax. The first eleven are the biggest and most developed called Thoracopods. They have numerous functions, each leg is divided into different sections, with spiky bits and flaps. They all work together, swishing water around they

stir up the sediment for feeding, they act as legs walking the Triop along the bottom and when it needs to they act as fins too, with the thin flappy sections, able to propel the crustacean through the water. They also



have the gills and the gnarly bits at the base which are used to mash and pass the food to the mouth.



The group of crustaceans that the Triops belong to are called the Branchiopods which means lung foot and refers to the ability of the animals to breathe through the gills on their legs.

In mature animals you might see on the 11th pair of appendages something that looks like a bag of miniature baked beans, these are eggs.

Maxillary gland: You can see these on either side of the carapace as pretty patterns, lots of squiggly concentric lines. This gland works a bit like our kidneys and is responsible for managing the chemical balance of the body, from regulating the blood to waste disposal.

Mandibular groove: This marks the attachment point for the powerful mandibles or jaws underneath.

Other useful stuff

Cervical groove: This marks the end of the head and the beginning of the thorax.

www.mytriops.com: This has to be my favorite website dedicated to these fascinating little crustaceans - loads of

info from the latest discoveries, serious scientific references and pictures.

Triops - a very unusual creature:

Dr. Helen Pashley. This is apparently the only book in the world dedicated to Triops!

Arkive is one of the most useful web resources for anyone into any animal and it doesn't disappoint when it comes to our little crustacean friends either. See the page dedicated to 'the big one' Triops cancriformis here - www.arkive.org/tadpole-shrimp/triops-cancriformis/

Microscopy UK - Has a great page exploring the Triop life-cycle through some seriously high powered magnification - check this out. www.microscopy-uk.org.uk/mag/artjul00/dwtriops.html

