

## Freshwater Crayfish

### Scope and nature of crustacean aquaculture.

A number of aquaculture practices are used world-wide in three types of environments (freshwater, brackish water, and marine) for a great variety of culture organisms. Freshwater aquaculture is carried out either in fish ponds, fish pens, fish cages or, on a limited scale, in rice paddies. Brackish water aquaculture is done mainly in fish ponds located in coastal areas. Marine culture employs either fish cages or substrates for molluscs and seaweeds such as stakes, ropes, and rafts. Culture systems range from extensive to intensive depending on the stocking density of the culture organisms, the level of inputs, and the degree of management.

These practices include:

- (i) freshwater pond culture;
- (ii) rice-fish culture or integrated fish farming;
- (iii) brackishwater finfish culture;
- (iv) mariculture involving extensive culture and producing fish/shellfish (e.g., oysters, mussels, cockles) which are sold in rural and urban markets at relatively low prices

### Marron and Yabbie.

**Marron** is a name given to two closely related species of crayfish in Western Australia. Formerly considered a single species, it is now recognised as comprising two species, the critically endangered *Cherax tenuimanus*, and the species that is outcompeting it, *C. cainii*. Marron are considered a luxury product and are the subject of a developing aquaculture industry in Western Australia and other Australian states. In Western Australia, recreational fishing for marron is tightly controlled, with a limited season, permits are required, and minimum sizes are enforced. Marron have been introduced to Kangaroo Island in South Australia, where they have been commercially farmed, and have established feral populations in local waterways. The **common yabbie** (*Cherax destructor*) also known as the yabby is an Australian freshwater crustacean in the Parastacidae family. It is listed as a vulnerable species of crayfish by the International Union for Conservation of Nature (IUCN), though wild yabby populations remain strong, and have expanded into new habitats created by reservoirs and farm dams. Other names frequently used for *Cherax destructor* include the **blue yabby** or **cyan yabby**. Its common name of "yabby" is also applied to many other Australian *Cherax* species of crustacean (as well as to marine ghost shrimp of the infraorder Thalassinidea). Yabbies occasionally reach up to 30 cm (12 in) in length, but are more commonly 10–20 cm

(4–8 in) long. Colour is highly variable and depends on water clarity and habitat; yabbies can range from black, blue-black, or dark brown in clear waters to light brown, green-brown, or beige in turbid waters. Yabbies specifically bred to be a vibrant blue colour are now popular in the aquarium trade in Australia. During a wet season, an Australian yabby can travel kilometres across land in search of new water in which to make its home. The word "yabby" comes from the Wemba Wemba, an Aboriginal Australian language. Dissemination

Yabbys are common in Victoria and New South Wales, although the species also occurs in southern Queensland, South Australia, throughout parts of the Northern Territory and even as low as Tasmania, making it the most widespread Australian crayfish. Yabbys are found in swamps, streams, rivers, reservoirs, and farm dams at low to medium elevations. Yabbys are found in many ephemeral waterways, and can survive dry conditions for several years by lying dormant in burrows sunk deep into muddy creek and swamp beds. Yabbys are primarily nocturnal detritivores, feeding primarily on algae and plant remains at night, but also opportunistically feeding on any fish or animal remains they encounter at any time of day. In Southern Australia, it is commonly accepted that yabbys are active and thereby available to catch during the warmer months. When temperatures fall below 16 °C (61 °F), they enter a state of reduced metabolic activity, or "partial hibernation". Yabbys are an important dietary item for Australian native freshwater fish such as Murray cod and golden perch.

### **Catching**

Catching yabbies, or "yabbing", in rivers and farm dams is a popular summertime activity in Australia, particularly with children. The most popular method involves tying a piece of meat to a few metres of string or fishing line, which in turn is fastened to a stick in the bank, and throwing the meat into the water. The string is pulled tight when a determined yabby grasps the meat in its claws and tries to make off with it. The line is then slowly pulled back to the bank, with the grasping yabby usually maintaining its hold on the meat. When the meat and the grasping yabby reaches the water's edge, a net is used to quickly scoop up both the meat and the grasping yabby in one movement. Other methods of catching yabbies involve various types of nets and traps. Local fishing regulations must be checked before using any nets and traps for yabbies; many types of nets and traps are banned, as wildlife such as platypus, water rats, and long-necked turtles can become trapped in them and drown. The common yabby is a popular species for aquaculture, although their burrowing can destroy dams. Yabbies can also be found in private property dams where permission to fish must first be obtained. Bag limits apply to yabbies in most states. For example, in South Australia it is illegal to catch over 200 yabbies a day. All females carrying eggs under their tails must be returned to the water.

### **Yabbies as food**

While less common than prawns and other crustaceans, yabbies are eaten in Australia much like crayfish in other countries. Usually, yabbies are boiled and eaten plain, or with condiments. They are also occasionally served at restaurants, where they may be prepared in

salads, ravioli, pasta, etc. Prior to cooking, it is advisable to 'purge' the yabby in clean salt water, this helps to clear the gut of any muddy flavour, resulting in sweeter tasting meat.

In some places, yabbies can be sold live at some fish markets such as Sydney Fish Market. In other places, whole yabbies can be purchased cooked and ready to eat such like Queen Victoria Market.

### **Water Parameters**

The great thing about the Crayfish care is that they do well in most habitats. They're not particularly picky. Of course, you must keep the water within the recommended parameters. But as long as you don't let water maintenance fall by the wayside, you should have no problem keeping these invertebrates happy. Here are a few important water parameters to follow. Before introducing your fish into the tank, give the filter some time to cycle through and regulate temperature, hardness, and pH.

- **Water temperature:** 15°C to 24°F
- **pH levels:** 6.5 to 8.0
- **Water hardness:** 6 to 12 dKH

The lifespan of the Crayfish isn't very long. **They usually live for 1.5 to 3 years.**

**We will look at two other examples of the cray fish; the Dwarf crayfish and the spiny crayfish also known as the Euastacus**

### **THE DWARF CRAY FISH**

Like with any crustacean or freshwater fish, the lifespan of a Dwarf Crayfish depends on many factors. Poor living conditions and substandard water quality could shorten their lifespan significantly. These small invertebrae look like miniaturized lobsters! They have that iconic hardshell body with a sizable tail for swimming. Their heads are very protective. Not only are they hard, but these crayfish also have sharp horns that can do some damage! Jutting out from their heads are a set of antennae, which the critters use to smell for food and feel out their environment. They're accompanied by large beady black eyes. In total, Dwarf Crayfish have 5 pairs of legs! The first 4 pairs are used for walking on the bottom of the tank floor. The final pair is equipped with their chelipeds, which are more commonly referred to as pinchers or claws. Typically, crayfish and lobsters are capable of doing a lot of harm with their pinchers. That's not the case with Dwarf Crayfish. While it would certainly not feel pleasant to get pinched by these claws, they are far too small to do any real damage. This is great because it ensures that any other fish won't be harmed. While they normally crawl in the substrate, Dwarf Crayfish are perfectly capable of swimming. They have a sizable tail

with a large fin at the end. If you can take a close look underneath the tail, you'll see a series of tiny fins. Called swimmerets, these fins provide great control when the crayfish is swimming.

When it comes to colour, there's some variety between the various species. Most take on a greyish-brown colour that helps the invertebrate blend in with the surroundings. It may be accompanied by darker brown or black markings. When you purchase this species at a local pet store or fish provider, you're more likely to get an orange one (the Mexican Dwarf Crayfish). These crayfish take on a light orange hue. Their bodies are also slightly translucent. On top of their bodies, they typically have darker orange spots or stripes. Some even have some fiery red coloration.

### **Average Size**

The average size of a Dwarf Crayfish is between 1.6 and 2 inches long when they've reached full maturity. As you can probably tell from their name, this species is not very large. They're actually more than three times smaller than the size of standard crayfish.

### **Dwarf Crayfish Care**

Thanks to their hardy nature, Dwarf Crayfish care isn't a problem for most aquarists. They adapt well and will actually do a lot to keep your tank in good condition. That said, it's important to stick to established care guidelines. Like any fish or invertebrate, Dwarf Crayfish respond poorly to lacklustre water conditions and a substandard diet. Providing your crayfish with all the essentials will ensure that they stay thrive in your aquarium.

### **Tank Size**

The ideal tank size for Dwarf Crayfish is at least 10 to 20 gallons. This will give them enough space to live healthy and comfortable lives. While their small size makes nano tanks viable, the owners who have the healthiest Dwarf Crayfish usually keep them in tanks a bit larger. A little extra space goes a long way!

### **Potential For Disease**

Like most crustacean, Dwarf Crayfish are very healthy creatures. While they can suffer from certain ailments, their thick hard shells keep them protected from most issues. Plus, they can't suffer from common freshwater fish conditions like Ich.

The main risk with Dwarf Crayfish is something called **Crayfish Plague**. It's a disease caused by a water mould. It's highly contagious and can affect all other invertebrates in your tank. The good news is that it's only ever encountered when you introduce an infected crayfish into your tank. Stick to reputable breeders and never introduce a wild crayfish into an established closed environment. It's also important that you stay on top of water

conditions. Most health issues are a direct result of stress or poor water quality. If you maintain the habitat, your crayfish will stay healthy.

### **Food & Diet**

Dwarf Crayfish are omnivores that will eat anything they can find. They're considered "tank janitors" since they're great algae eaters and will also chow down on fish food leftovers. They do well on sinking pellets, algae wafers, and other commercial invertebrate food. Dwarf Crayfish also appreciate protein-rich live or frozen foods.

### **Behavior & Temperament**

The interesting thing about Dwarf Crayfish is that they're generally very peaceful. While you may encounter problems with larger standard-sized crayfish in a community tank, Dwarf Crayfish usually do just fine with fish. They spend their days exploring the tank and finding things to eat. These creatures also have very distinct personalities. They interact with other fish and may even acknowledge your presence! Many owners report these crayfish coming out of hiding with their claws up anytime they approach the tank. They'll also exhibit some quirky behaviours if kept in a group. They show off their claws, play fight, and scurry around the bottom of the tank, making them a joy to watch.

### **Dwarf Crayfish Tank Mates**

Dwarf Crayfish have not been known to kill fish, so you can keep them in most community tanks. They do well with other peaceful fish species. It's best to stick with small fish. Avoid larger or aggressive fish at all costs. Cichlids, for example, have been known to eat these crayfish. Generally, aquarists will pair Dwarf Crayfish with fish species that stick to the top of the water column. Because the crayfish usually stay towards the bottom of the tank, there's no need to worry about territory issues. You may want to avoid smaller invertebrates as well. Smaller shrimp and snails could become targets for the crayfish. Amano Shrimp or Red Cherry Shrimp can work though. Here are some good Dwarf Crayfish tank mates to try:

- Neon Tetra
- Platies
- Swordtail Fish
- Chili Rasbora
- Sparkling Gourami
- Ember Tetra
- Harlequin Rasbora
- Hatchet fish
- Rummy Nose Tetra
- Guppies
- Congo Tetra
- Celestial Pearl Danio

## Breeding

In most cases, Dwarf Crayfish breeding occurs naturally. As long as you have a male and female in the tank, the two crayfish will more than likely spawn at some point. The breeding process is unique. Males will get on top of the females to deposit sperm. The female will then hold onto the sperm until she's ready to lay eggs. When she's ready, she'll lay between 20 and 60 eggs before fertilizing them herself with the male's sperm. Then, the female will place the eggs between her swimmerets under her tail. She'll create a thin mucous layer to protect them.

**From that point forward, the female will do all the heavy lifting when it comes to parenting.**

You can see her waving water onto the eggs, cleaning them, and more. The crayfish make great mothers and will protect the eggs until they are ready to hatch. This can happen 3 to 4 weeks after the eggs are laid. If you're worried about other fish eating the babies, you can move the mother to a separate tank. However, the tiny babies will usually stick with their mothers until they get big enough to fend for themselves. They'll even stay under her tail for a while. The babies may also take advantage of any hiding spots they can find. You don't have to worry about feeding the babies. They will scavenge the floor of the tank for food until they are big enough to eat what the adults eat.

## THE EUASTACUS (spiny crayfish)

*Euastacus* is a genus of freshwater crayfish known as "spiny crayfish". They are found in the south-east of the Australian mainland, along with another genus of crayfish, *Cherax*. Both genera are members of the family Parastacidae, a family of freshwater crayfish restricted to the Southern Hemisphere. *Euastacus* crayfish are distinguished from the smooth-shelled *Cherax* species by the short robust spines on their claws and carapace, and frequently, their larger size. Many *Euastacus* species grow to a relatively large size, with the Murray River crayfish (*Euastacus armatus*) being the second largest freshwater crayfish species in the world. (The largest freshwater crayfish in the world is the Tasmanian giant freshwater crayfish (*Astacopsis gouldi*), found on the Australian island of Tasmania, and the genus *Astacopsis* is now known to be a very closely related sister genus to *Euastacus*.) The genera *Cherax* and *Euastacus* continue a trend present in many Australian native freshwater fish genera of speciation into generalist lowland and specialist upland species. Generally, *Cherax* species inhabit lowland rivers at low to medium altitudes and swamps and ephemeral waters in inland areas of Australia including the Murray-Darling Basin. Conversely, *Euastacus* species are only found in permanent waters and generally inhabit upland rivers at medium to high altitudes in the Murray-Darling Basin as well as many easterly and southerly flowing coastal river systems. The partial exceptions to this are:

- the Murray River crayfish which was originally found along the entire length of the Murray River in addition to many upland habitats, and is still found in the middle reaches of the Murray River
- the Glenelg Spiny Crayfish (*Eustacus bispinosus*), found (or formerly found) in lowland areas of the Glenelg River system and Eight Mile Creek/Ewen Ponds system
- the Gippsland Crayfish (*Euastacus kershawi*), found in lowland areas of some streams in the Gippsland area.

Even when found in lowland habitats, these several more adaptable *Euastacus* crayfish are still highly dependent on reliable flows and good water quality, with good dissolved oxygen levels and low salinity. In contrast to *Cherax* (yabby) species, *Euastacus* species are unable to survive drying of their habitats. The genus *Cherax* has a far wider distribution than the genus *Euastacus*, and is found in many parts of Australia including south-western Australia. The genus *Euastacus* is restricted to the south-east of the Australian mainland. There is a high degree of endemism in *Euastacus* species in coastal river systems, with many species restricted to single river or creek catchment. *Euastacus* species occur in several upland reservoirs. *Euastacus* species are extremely slow growing, long-lived (possibly 40+ years in some species), and late to reach sexual maturity. These biological characteristics make *Euastacus* species vulnerable to environmental disturbances and essentially unable to support to catch-and-kill fisheries. There are about fifty known species of the *Euastacus*

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