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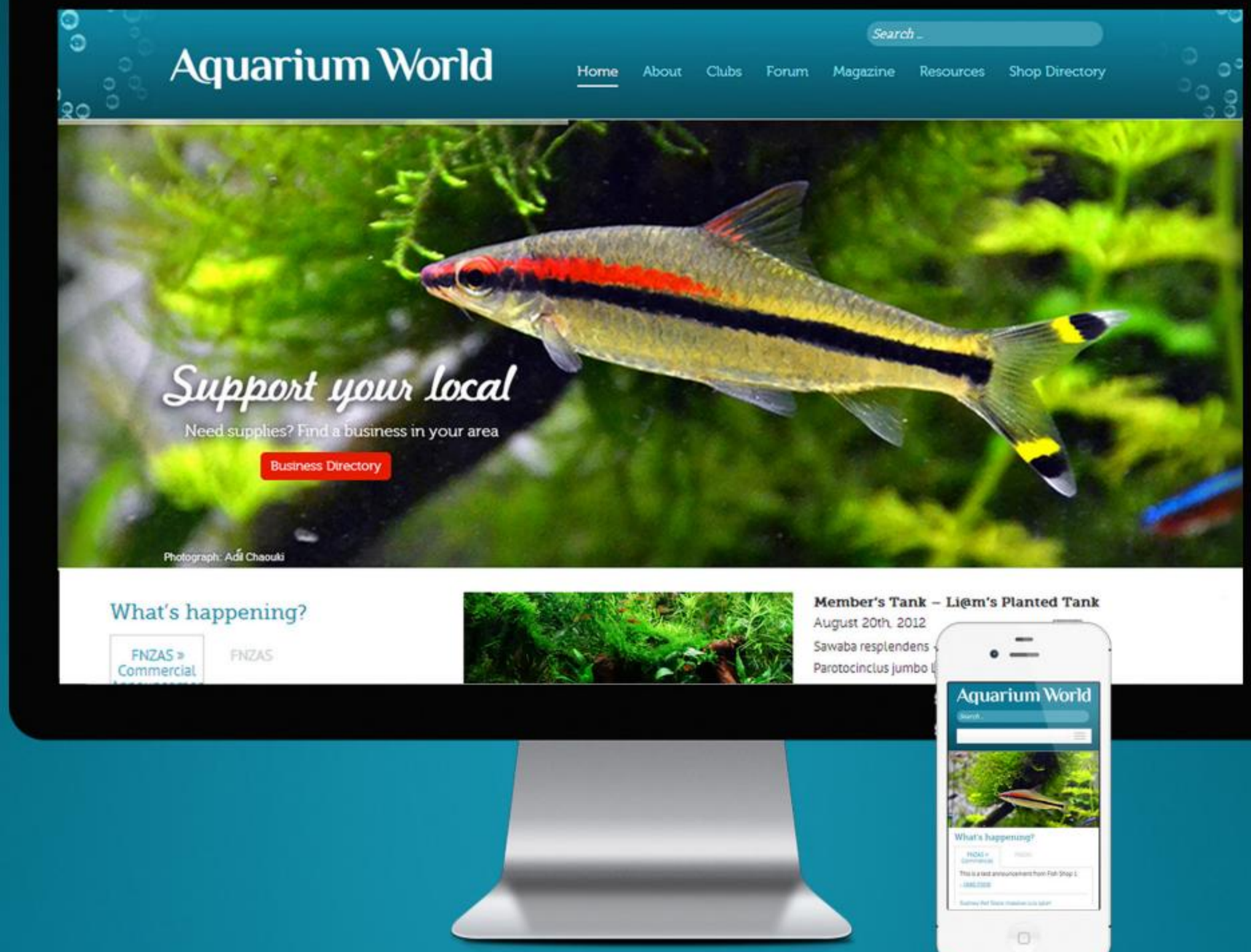

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COVER
Geophagus altifrons
Photo: David Rummery

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EDITORIAL

Hello all,

Welcome to a new issue of Aquarium World.

After a bit of chill to the end of winter, the weather is improving and summer is just around the corner. As the weather improves, the temperatures rise, the days get longer, and many fish species start to show some interest in breeding. Now is a good time to gear up for that long awaited fish breeding project.

In this issue we feature the impressive but often overlooked eartheaters. New Zealand has a limited range of these delightful cichlids but we do get a few nice species and they are a great option for a medium to larger tank, in particular a South American biotope.

New Zealand is a small and isolated market for aquarium fish. The importers bring in a great range of popular, attractive, and reasonably priced species; but not surprisingly, many expensive, rare or cryptically patterned species are seldom imported. In this issue I look at a couple of cryptically coloured plecos that were imported once and are quickly becoming very rare in New Zealand.

On the marine scene we have some interesting articles from keeping a highly entertaining octopus or a striking rabbitfish, to breeding the beautiful and popular banggai cardinalfish. Simon Lemin has also written a couple of great articles on how to how to remove those troublesome flatworms and for experienced marine keepers DIY aquarium dosing.

Darren

Darren Stevens
FNZAS Editor

Betta splendens at Redwood Aquatics
Photo: Robert McCracken

CONTRIBUTORS

David Rummery

David has had an interest in all things aquatic since childhood and has been keeping freshwater tropical fish for close to twenty years. Having dabbled in most areas of the hobby, and despite once suffering from chronic 'multiple tank syndrome', he now focuses on Amazonian cichlids and catfish and maintains a single large display of these in his home in Whangarei.

Shayne Mechen

Shayne runs a carpet cleaning business and is interested in computers/video editing, filming and DVD production, AV setups and running, and fish keeping. He has around 50 tanks housing a variety of angels, whiptails, corys and other catfish, fairy cichlids and plants.

Amelia Morris

Amelia is a Christchurch based 22 year old aquatics enthusiast with a particular interest in community and biotope tanks. Starting the hobby only 3 years ago, she has taken a keen interest in planted tanks and aquascaping. She currently maintains a South American cichlid tank, a South East Asian Biotope community and Tanganyikan shell-dweller tank..

Darren Stevens

Darren is a marine biologist who has worked for NIWA for about 20 years. He regularly participates in sea trips for research surveys having been around much of New Zealand as well as Oman, U.A.E and the Ross Sea, Antarctica. In his spare time he enjoys fishing, and is a particularly passionate pleco keeper. Darren is an active participant in his local clubs.

Caryl Simpson

Caryl has held various offices in the Marlborough Aquarium Club over 24 years. She was involved with the FNZAS as editor for 16 years, and archivist for 8, and is a founding member and global moderator in the FNZAS Fishroom forum. She currently has one tropical community 4ft tank and a pond.

Mark Paterson

Mark began fish keeping when he was a child, keeping live bearers and siamese fighters. He has worked for circus and zoo parks in NZ and overseas. For the last 28 years he has kept many species of aquatic life but NZ local marine is his keenest interest. Mark loves to share this passion & knowledge with fellow hobbyists and is currently running the marine systems at a local university & is also FNZAS President.

Alex Fleming

Alex has been keeping fish and aquatic plants for several years. She is constantly working to increase her knowledge about all things fish-related. Alex keeps several tanks including dwarf puffers, Siamese fighters, killifish, a Southeast Asian biotope and a South American biotope. Interests include Photography, Biology/Ecology and more recently Microscopy. She hopes to pursue a career in Freshwater ecology researching our native fish.

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AN OVERVIEW OF EARTHEATERS IN NEW ZEALAND

SO WHAT EXACTLY IS AN EARTHEATER?

Bear with me while we try to make sense of the taxonomic mess that surrounds this interesting and beautiful group of fish!

David Rummery

The term 'eartheater' is the literal translation of the word 'Geophagus' (Greek, gea = earth; phagos = to eat), and is often used to describe the large and diverse group of fish that were once classified under this genus, along with a few that weren't. The genus *Geophagus* once covered a large and varied range of South American cichlids, but now after years of revision it is much more strictly defined and (mostly) limited to the 'true' geophagine cichlids; all of which are morphologically very close to the type species *Geophagus altifrons*. There are still some misfits flouting the name, such as *Geophagus brasiliensis*, which has more in common with the robust and belligerent cichlids of Central America, but these will be reclassified in time. Some species previously included in the genus have been reallocated to *Gymnogeophagus* and *Satanoperca*, and still the hobby-driven demand for new and wild caught fish continues to yield more undescribed fish that may eventually be added to the genus at species or subspecies level.

Sadly for us here in NZ, there are only a handful of eartheater species on the allowable imports list. *Geophagus surinamensis* is the only true species of the genus listed, however the fish imported here under that name are almost without exception *G. altifrons*. This misnomer seems to be a world-wide phenomenon, and Thomas Weidner offers a possible explanation for this in his book South American Eartheaters. He recalls that the very first *Geophagus* imported into Germany were sold as *G. surinamensis* and they quickly became popular and highly sought after. Soon large numbers of *Geophagus Spp.* were being collected from all over the Amazon and sold under the name *Geophagus surinamensis* to meet the demand for this exciting new species. Eventually it became apparent that the vast

majority of fish being sold under this name were not actually *Geophagus surinamensis*; the species has a very limited range and is now almost never encountered in captivity as very little collecting takes place in that area, but by then the name had already become entrenched in the hobby. All over the world today you will still find importers, breeders and pet shops selling various species of *Geophagus* as "*surinamensis*". What was once known as the '*Geophagus surinamensis* complex' has been split into seven described species (*G. surinamensis*, *G. brokopondo*, *G. brachybranchus*, *G. camopiensis*, *G. proximus*, *G. megasema*, and *G. altifrons*), with an undetermined number of undescribed fish, all with a mid-flank spot of variable size and the same deep body and head, remaining to be classified and described.

In New Zealand, *Geophagus altifrons* (aka "*surinamensis*") is the most popular and commonly encountered eartheater, while the second most common species seems to have suffered a similar mix up in name; *Satanoperca leucosticta* is usually sold as "*Geophagus jurupari*". In my opinion, these two are the most attractive and interesting of the species available here, and therefore will be the main focus of this article. Other species of eartheater I have encountered here are *Acarichthys heckelii, Biotodoma cupido*, *Geophagus brasiliensis*, *Geophagus steindachneri*, and *Gymnogeophagus balzanii*.

In the aquarium *G. altifrons* and *S. leucosticta* have very similar requirements. *G. altifrons* can grow to 30cm in length, while *S. leucosticta* usually only reaches around 25cm max. Both species do best in clean, warm (26-30°C) water with low TDS and hardness. If your tap water has a high mineral content I would suggest collecting rain water to mix with the tap water to soften the water. Fortunately in NZ our air is clean enough to do this even in urban Auckland.

While not strictly schooling, it is best to keep these fish in groups to allow a natural hierarchy to develop and to spread the aggression directed at those lower down the pecking order. Six is a good number to start with, and although more is almost always better it is possible to maintain

smaller groups in some cases. Obviously six 20cm+ fish are going to require a good sized aquarium, and in this case footprint is just as important as overall size due to their bottom dwelling nature. My personal feeling is that a 5x2′ footprint is about the minimum size required to comfortably house a group of *G. altifrons*, while a group of *S. leucosticta* could be kept in an aquarium with a 4x2′ footprint. As with all cichlids, good mechanical and biological filtration is a must, as are regular water changes.

A fine sand substrate is essential in order for these fish to be able to carry out the behavior that derived their name. Regular

pea-sized gravel may present a choking hazard and will not allow the fish to feed naturally, and smaller sharp-edged grit should also be avoided. Hardscape of rocks and driftwood will help give a rough approximation of their natural environment. Live plants attached to the wood will usually be ignored, but those planted in the substrate will almost certainly be uprooted at some stage without some clever aquascaping. Leaf litter can make an interesting addition to their aquarium, so long as the keeper is vigilant with maintenance to prevent the fish burying it with their continuous digging.

To allow them to forage and sift the sand it is important to feed large amounts of fine (1mm or less) sinking foods. I offer my group of *G. altifrons* New Life Spectrum Cichlid Formula and Thera A in 0.5mm and 1mm pellets and NLS flake daily, along with occasional treats of meaty foods such

as frozen brine shrimp. I use a 50mm PVC tube suspended through an opening in the lids to allow the dry food to sink without being swept over the weir and into my sump. One advantage of keeping a good sized group of these fish is the ability to feed large quantities of food without having to worry if it will all be cleaned up. They will scour the substrate for hours after feeding searching for every last morsel!

While they are not predatory by nature, most eartheaters are opportunistic enough to occasionally pick off fish small enough to be swallowed whole. The smallest tetra species (such as Cardinal tetras) are not advisable tank mates, although I have had no trouble keeping adult *G. altifrons* with Lemon Tetras (*Hyphessobrycon pulchripinnis*) and other high-bodied tetras. At the other end of the spectrum, I have kept *G. altifrons* and *S. leucosticta* with adult Black Arowana (*Osteoglossum ferreirai*) and other large predatory (but not aggressive) species, the eartheaters do not seem at all worried by larger but peaceful fish. I would suggest avoiding tank mates that require hard water or those that cannot handle the higher temperatures these fish prefer, and definitely avoid the aggressive Central American cichlids or any species prone to nipping fins. My favourite Geophagus tank mates are other Amazonian fish of similar habitats; Loricariid catfish (plecos), cichlids such as angelfish, severum, uaru, festivum, and mid-sized schooling tetras.

Breeding either species isn't too difficult in the aquarium so long as you are able to

meet the requirements of the fish. When kept in large groups it is not unusual for spawning to occur in a community setting without any prompting from the aquarist. *Geophagus altifrons* is a substrate-spawning, ovophilous, (the parent mouth broods its fertilised eggs until they hatch) biparental mouthbrooder, and exhibits no sexual dimorphism outside of spawning. *Satanoperca leucosticta* exhibits similar behaviour, and reportedly, if offered, prefers to use submerged leaves as a spawning site.

While they may not have the same "wet pet" characteristics of their larger Central American relatives, both *Geophagus altifrons* and *Satanoperca leucosticta* can make an interesting focal point for medium to large sized aquaria, as well as having the advantage of allowing a much larger range of tankmates than their more belligerent cousins.

Brief notes on the other species seen in New Zealand;

Acarichthys heckelii: A large and beautiful cichlid, but often more aggressive towards conspecifics than other eartheaters. Not really a true "eartheater" in terms of feeding habit, but fairly similar to *G. altifrons* in most requirements. Can grow to 30cm. Sporadically available here.

Geophagus brasiliensis
Photo: Cezary Porycki

Geophagus brasiliensis: A larger and more aggressive member of the family, more in line with Central American cichlids in regards to their care; not fussy but prefers slightly harder and cooler water than true Geophagus. Can grow to 30cm. Easy to breed and an invasive species in many warmer countries (including Australia). Frequently available.

Geophagus steindachneri: Sometime sold under the now invalid name *G. hondae*, only grows to 15cm and is either incredibly beautiful or ugly as sin

Acarichthys heckelii
Photo: Dr David Midgley

Geophagus steindachneri
Photo: Хомелкау

depending on who you ask! Hailing from northern S.A. they don't require the same warmer temperatures of their Amazonian cousins. Sifts sand like a true Geophagus, but may well be removed from the genus in the future. Frequently available in recent years.

Gymnogeophagus balzanii: From southern Brazil and Uruguay this species requires cooler temperatures to thrive, and will benefit from a winter cooling period where the temperature can be dropped as low as 16-18°C. Dominant

Gymnogeophagus balzanii
Photo: David Rummery

males develop a large swollen forehead and can reach 20cm in length. A very interesting species and very worthy of their own set up to the dedicated keeper. Occasionally available.

Biotodoma cupido: Small but attractive species that was imported once about 4-5 years ago, and to the best of my knowledge hasn't been bred or available here since.

***Geophagus* Sp. 'Tapajos Orange Head'.** These recently appeared at a Christchurch retailer, and it is (to the best of my knowledge) the first time this attractive and slightly smaller species has been imported. Similar in care to other true *Geophagus* but without the larger size (18cm max), there is a good reason this species is very popular overseas. Hopefully it will be bred and firmly established in the hobby here.

There are many more beautiful and varied eartheaters not available here in New Zealand, from the stunning *Geophagus winemilleri*, to the goby-esque *Retroculus lapidifer*, and the understated-yet-pretty *Guianacara geayi*. I can't help but feel that this family of fish would have a much more passionate following, similar to that of their Rift Lake relatives, if only we had access to the wide variety of species available elsewhere. That said, the species we do have available are every bit as interesting and very attractive when housed correctly, and I still find them a pleasure to keep after many years.

David Rummery

Photos by David Rummery unless othewise noted

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NZ NATIVE

Mark Paterson

Keeping Octopuses 101

Often, when I share pictures or video of the octopuses I have kept, people are amazed by their personalities and intelligence and want to keep one in their home aquarium. While this is possible, and they can make wonderful interactive pets, they have some special requirements that must be met. Octopuses are the distant cousins of chitons, snails, slugs, clams and mussels and together with the squid, cuttlefishes and nautilus are members of the Cephalopodan class of animals. They have no bones in their body so are able to escape most aquariums with ease if they want to. Once they have settled to aquarium life they make wonderful interactive pets that can live out their life in captivity. However, you must be aware that their "entire natural lifespan" is quite short. For some species it can be as little as 8 months but the more commonly encountered New Zealand species generally lives for about 2 years. Although their water quality requirements are close to those of a reef aquarium, they also need a lot of hiding places with good water flow and, as most octopuses are nocturnal, even those that are active during the day prefer subdued lighting rather than intense lighting.

Housing an octopus

As octopuses have a fairly short lifespan they can grow quite rapidly so the minimum tank size I would use would be 400 litres with lids and a sump attached to aid filtration. Keeping an octopus contained can be difficult as they are very active predators with a high metabolism and amazing escape artists, so the tank needs to be fairly secured lid and outlets wise. The most success I have had with them is when I have managed to collect them when they are no bigger than the palm of your hand. At this size it seems they are more inclined to hide when first

put into the tank, and not try to escape, but this doesn't mean they won't try so a secure aquarium is a must. There are various ways of securing the lids but even a small octopus can lift a lid. I have found that having a sliding lid that has a frame to fit is the best. This can be achieved by attaching glass tabs with silicon above and below the tank bracing to create a slot the lid can slide into, or even duct taping the lids in place works well. An octopus, having a body made of muscle with no bones, can fit through any hole that its beak will fit through as it is the only hard part of their body, so any outlets to the sump in the tank must be covered with a small mesh screen, overflow comb or an open pore sponge. These must be secured if they can be pulled off easily.

Whatever you use must be of a size to allow sufficient flow but at the same time have gaps small enough to stop the octopus going through it, so you may need to trial gap sizes till you get it right.

Our local species of octopus need a temperature range of 15 to 22°C as a maximum with 18°C the medium so in our summers, or a warm room, a chiller will be necessary to provide the stability that is vital for the octopus to survive.

Lighting

Lighting the tank is fairly simple as most octopuses are nocturnal, and even those that are active during the day prefer subdued lighting rather than the intense lighting that your average reef tank provides. I usually use T5 fluorescent lighting in a blue and white tube arrangement on an eight hour light cycle. This will allow seaweeds to grow and provide a nice light to view the tank by.

Filtration

Good filtration is a key as octopuses have a high metabolism and are messy feeders so need very clean water with a high oxygen content. I achieve this with a sump system where I house the skimmer and return pump. A good skimmer is necessary to remove proteins from the water and polish it, while also aiding the dissolved oxygen in the water. Frequent water changes help to keep the water parameters more stable. I have always used natural saltwater on my octopus tanks as the cost of weekly water changes can be high if using artificial salt. I have found some phosphate removers detrimental to octopus health so I now no longer use them. Also octopuses, being invertebrates, are very sensitive to heavy metal poisoning, especially copper, so be careful with treating the tank with these. Maintaining the Aquarium at 18°C temperature and salinity from 1.022 to 1.027 is a must as this not only will meet the needs of the octopus but help with dissolved oxygen levels in the water.

A further addition I use is to add filter wool or a sponge to the sump as octopuses shed their skin on a regular basis. This helps trap the shed skin but they will need cleaning on a regular basis and a weekly clean of them is a good habit to get into to stop them releasing toxins back into the system.

Another piece of equipment I avoid using is power heads or flow pumps as some octopus are okay with them but others tend to stick their tentacles in them and lose the tips. I now rely on a good sized return pump to create good flow in the tank instead.

Substrate and rock work

As they are usually nocturnal, lots of hiding places are essential with plenty of rock work to dig under to create a cave. I use a sand bed of about 5 to 7 centimetres to allow the octopus a bit of digging room but be careful rocks or ornaments are firmly in place to stop them falling over. Tying them together with plastic cable ties can help avoid this. Using coral rock is better than rocks from around our coastline as they are more porous and have a greater surface area for the good bacteria to colonise. I collect sand from the beach at the low tide mark with a grain size of 1 to 2 mm.

Transport and acclimation

Acclimatising a new octopus is the same as for a new fish. I usually transport them in a large bucket, with a tight fitting lid to stop them escaping, and a piece of seaweed to make them feel more comfortable. I also bring in a large amount of new water when I collect an octopus and do a water change on the tank while at the same time adding tank water to the octopus bucket. I usually have the bucket one third full of water then over the period of half an hour introduce tank water to the bucket until it is three quarters full, by which time it is ready to introduce to the aquarium.

Tank mates and feeding your octopus

I will put these together as octopuses will eat most invertebrates and fish. The regular clean-up crew for a tank will be consumed in time, herbivorous snails, hermit crabs or any molluscs will be eaten. The only exceptions I have found so far are the humble sea cucumber and starfish which will help keep your sand clean and eat leftover food. I have also kept parore and spotty with octopuses but eventually all have been eaten. Collecting crabs from the beach or rock pools is a good pastime as well as supplying some entertainment for the octopus in hunting them down in the tank. Food can be purchased from most supermarkets or fish suppliers and frozen fish, prawns, mussels and cockles will be readily consumed.

Enrichment

Because octopuses are extremely intelligent predators they need extra stimulus to help alleviate the boredom that can set in with animals kept in what amounts to just a small box. We need to provide extra stimuli to help alleviate any chance of them developing abnormal,

repetitive or even suicidal behaviours. Some of the signs of this can be eating the tips of their tentacles, repeatedly swimming into the tank sides, constantly cleaning themselves by rolling the tentacles all over the body, dramatic colour displays usually used to scare predators and trying to escape from the tank or hiding all the time and refusing food. Your octopus will need entertainment or it may pull the rockwork apart or just sulk and die. As enrichment tools I have used jars with a screw lid and putting the food inside it, some octopus can work out quickly how to unscrew the lid while others need many goes at it. Live food in the form of crabs means the octopus has to hunt them down. One octopus I had loved ping pong balls and would trap one under a ledge or cave then push it out and chase it as it bobbed to the surface then repeat the action. An empty bottle or bits of Lego joined together will provide entertainment. Whatever you do, it is important to remember that the more time you put into your octopus the more interactive it will become and the better its short lifespan will be with you.

Sadly, old age usually sets in at around the two year mark with our local species and signs like unusual behaviour and cloudy eyes may be seen. I have usually found that females will hide in a cave and refuse to feed, same as they do in the wild when guarding their eggs, whereas males can tend to try and escape out of the tank.

Well I hope I have covered the basics of housing an octopus and maybe whet your appetite a little. If you are serious about trying to keep an octopus there are many sites on the internet for further information and research. Just remember you are basically dealing with a 2 to 3 year old child locked in a small room and, if you get it right, will have an extremely rewarding experience.

Photos and article - Mark Paterson

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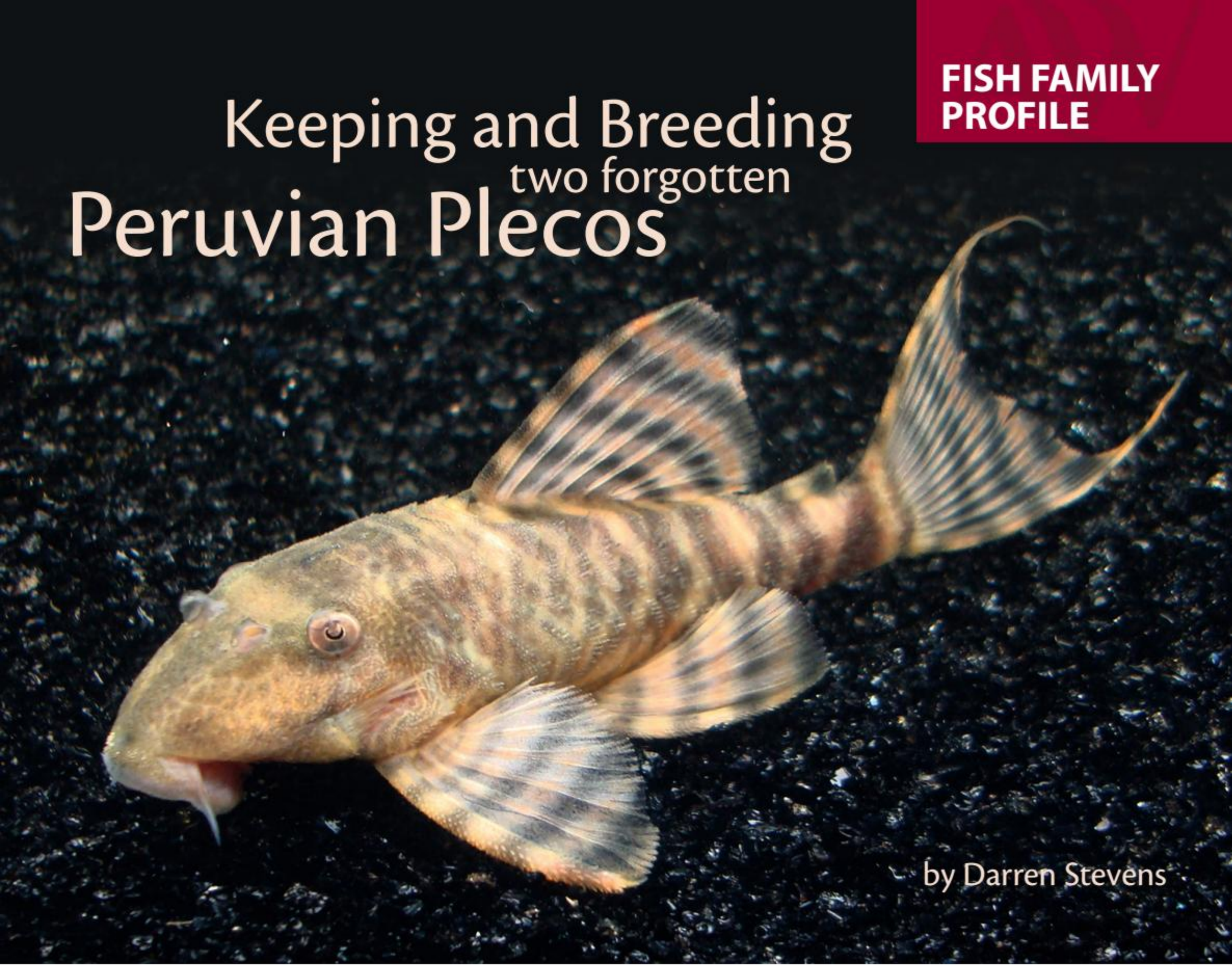
FISH FAMILY PROFILE

Keeping and Breeding two forgotten Peruvian Plecos

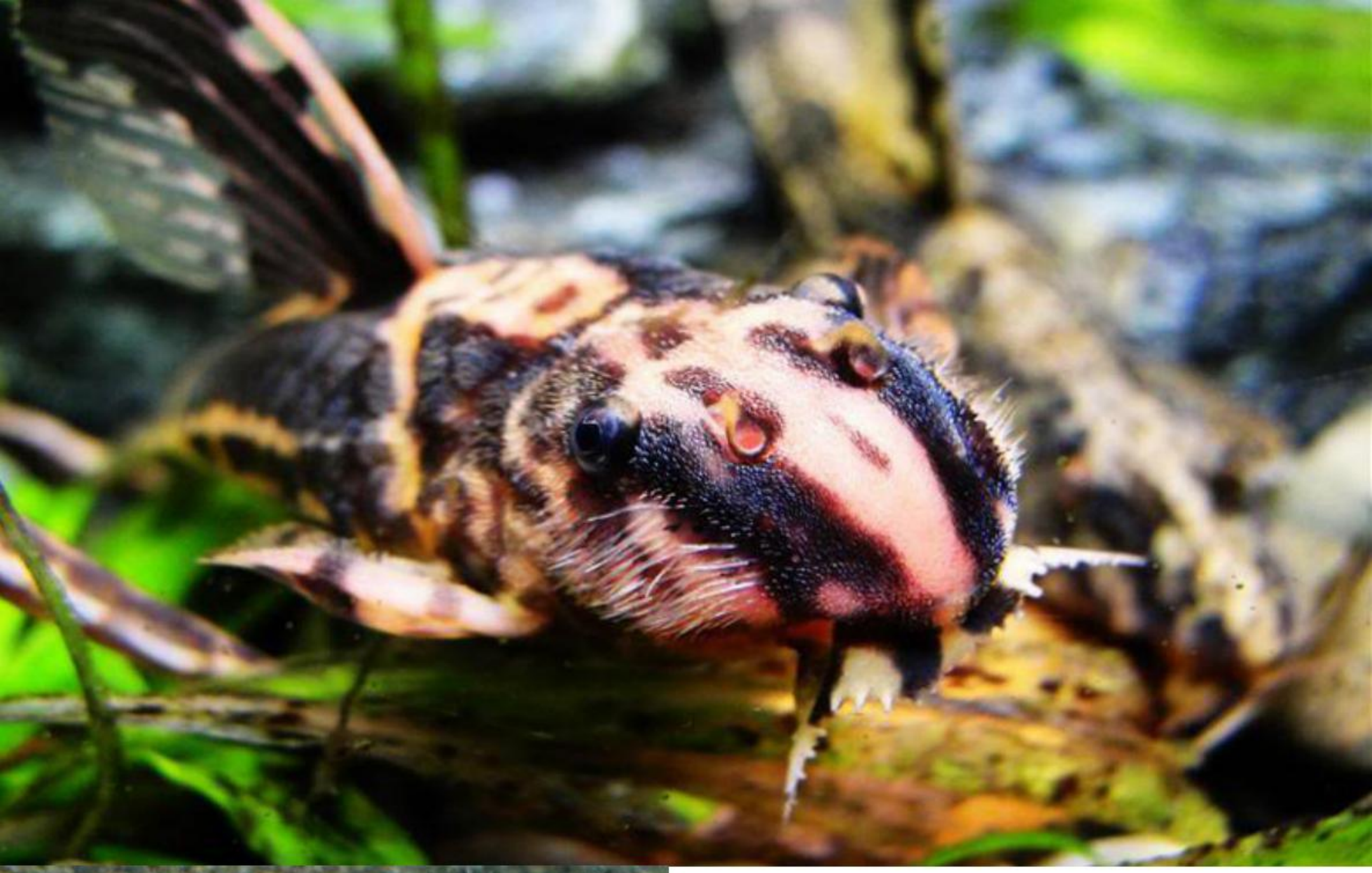
by Darren Stevens



Panaqolus changae, L226 - Iquito Tiger Pleco
Photo: Darren Stevens

In the world of fancy plecos we are spoilt by choice with a large variety of strikingly patterned, often colourful species available in the hobby. Even in New Zealand's small and isolated market, the importers still bring in a number of impressive pleco species. However, not surprisingly, the rarer or more cryptically coloured plecos are seldom imported, and there is rarely any location data, which can be a great help in identifying some species.

In 2006, Phill Collis imported a number of wild caught tropical fish direct from Peru, including several Apistogrammas, some nice angels, and a range of catfish including corys, whiptails, and plecos. For New Zealand aquarists this was a unique opportunity to purchase wild caught Peruvian fish with location data. In this article I will look back at some of the imported whiptails and plecos, in particular two subtle coloured and largely forgotten plecos which are still occasionally available in New Zealand.



Above: Black Whiptail
Photo: Aakash Sarin

Left: Pinnochio or Knob Nosed Whiptails - *Hemiodontichthys acipenserinus*
Photo: Phill Collis

Right top: Flash or Peru Striped Pleco - *Panaqolus alvicermis,* L204
Photo: Darren Stevens

Right bottom: Mustard Spot Pleco - *Panaqolus albomaculatus,* LDA31
Photo: Darren Stevens

Phill imported some stunning whiptails including the 'black' whiptail, likely a dark form of the lanceolate whiptail, *Hemiloricaria*/ *Rineloricaria lanceolata*, the 'white' whiptail, (*Hemiloricaria* sp. "white" or "Peru"), and the spectacular mouth brooding pinnochio or knob-nosed whiptail (*Hemiodontichthys acipenserinus*). All of these whiptails are now very rare or have died out in New Zealand.

On the pleco front, Phill's shipment included the striking flash pleco or Peru striped Panaque (*Panaqolus albivermis*, L204) and the rare but equally impressive mustard spot pleco (*Panaqolus albomaculatus*, LDA31).

He also imported a small species of sailfin pleco, likely *Pterygoplichthys weberi*, which unlike its larger red spot and gold spot cousins, only grows to about 25 cm. For fans of large plecos, a few 'Papa Panaques' were also imported. These were listed as L090 but proved to be titanic plecos, L203, which have since been given the scientific name *Panaque schaeferi*. As their name suggests titanic plecos are one of the pleco giants and can grow to 60 cm. I haven't seen one for a few years but if they are still around they will be getting pretty impressive. With the exception of flash plecos which are still imported occasionally, these plecos are now very rare in New Zealand.

Above: Juvenile *Pterygoplichthys weberi*
Photo: Phill Collis

Below: Titanic Pleco - *Panaque schaeferi* L203
Photo: Mattwa

Phill also imported two pleco species with more subtle colours: the Iquitos tiger pleco (*Panaqolus changae*, L226) and the spotted Peckoltia (*Peckoltia brevis*, L205). Both species were bred a few times in New Zealand and at times they were relatively freely available and reasonably priced. However they are now becoming rare and given their more cryptic colouration they are probably unlikely to be imported anytime soon. I have a soft spot for these two peaceful species and are fortunate to keep small colonies of each. I have been keeping Iquitos tigers for 5 years and L205's for just over a year, and I have had limited success in breeding them.

Iquitos tigers are a small (to about 10 cm) light grey to tan pleco with broad dark grey bands on the tail section, thinner irregular bands on the trunk (body section), and very fine lines on the head. They are a similar pattern to the familiar clown pleco *Panaqolus maccus* (L104, L162, LDA22) but they have more dark bands on the trunk (6–12, often 8, in *P. changae* vs. 3–7, often 4, in *P. maccus*). As with clown plecos, flash plecos, and other *Panaqolus* species, Iquito tigers are highly specialised wood and algae eaters, and not surprisingly wood is an essential part of their

Above left: Mature *Pterygoplichthys weberi*
Photo: Phill Collis

Below: *Panaquolus changae,* L226
Photo: Darren Stevens

diet. They are generally peaceful and they are a nice choice for medium sized community tanks, but they do need plenty of cover, in particular bogwood. They also like feeding on plants and as such are not always suitable for planted tanks.

My Iquitos are housed in a 75 x 50 x 50cm aquarium furnished with a fine dark gravel substrate, a selection of caves (mainly bamboo and a couple of PVC pipe caves), and topped with a pile of bogwood. Lighting is a single T8 fluorescent tube and I currently have a Fluval 4 plus internal filter for filtration. pH is 6.5–7.0, TDS are 110–140, and temperature is 25–27 °C. I feed my Iquito tigers on JBL NovoPleco and Repashy Soilent Green, small quantities of JBL NovoTab and a Repashy Soilent Green/Bottom Scratcher mix, and the occasional courgette.

My Iquitos tigers had two successful spawns before the heater failed and I lost the parents. Thankfully I kept juveniles from both batches in a separate tank and two years later they are now mature. I intend to start trying to spawn these again shortly.

Above: *Panaquolus changae*, L226 at 7 days old
Below: *Panaquolus changae*, L226 at 6 months old
Photo: Darren Stevens

Above right: *Peckoltia brevis,* L205
Photo: Phill Collis

Spotted Peckoltia's (*Peckoltia brevis*, L205) are a small tan pleco (to about 12 cm) with fine brown spots on the head and belly, brown bands on the fins and tail, and irregular brown bands and spots on the body. Some fish keepers regard L205 as a separate species while others group it with *Peckoltia brevis*. The two forms are separated geographically and in adult *Peckoltia brevis* the spots on the head generally do not pass much beyond the gills while in adult L205 the spots on the head extend through to beyond the base of the dorsal fin. Spotted Peckoltia are omnivores and will take a variety of foods. They are generally peaceful and don't tend to nibble on aquarium plants so they are ideal for planted tanks. They don't need good water flow but appreciate lots of aeration.

I keep my spotted Peckoltia in another 75 x 50 x 50 cm aquarium with similar furnishings and filtration to the Iquito tigers but with a selection of clay caves. pH is 6.5–7.0, TDS are 110–140, and temperature is 26–28 °C. I use a powerhead occasionally to try and increase water flow and trigger breeding. I feed my spotted Peckoltia on JBL NovoTab, a Repashy Soilent Green/Bottom Scratcher mix, and small quantities of JBL NovoPleco, along with the occasional courgette.

To date I have had a single unexpected spawn which resulted in four juveniles. Hopefully more juveniles are on their way.

If you are lucky enough to own one of these rarer Peruvian species then you may want to consider trying to seek out other specimens and trying to breed them. While you'd be hard pressed to breed titanic plecos or *Pterygoplichthys weberi*; Iquitos tiger plecos, spotted Peckoltia and the whiptails have all been bred in New Zealand. Many of these unique catfish are unlikely to ever be imported again and it would be a shame if they are lost to New Zealand aquarists.

Thanks to Geoff Haglund for reading through an earlier draft of this article.

Darren Stevens

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Above left: *Peckoltia brevis,* L205 at 1 month old
Bottom left: *Peckoltia brevis,* L205 at 6 months old
Photo: Darren Stevens

Threadfin Rainbowfish

FISH MINI PROFILE

The threadfin rainbowfish - Iriatherina werneri is found in slow-moving streams, freshwater swamps, lagoons, and billabongs in northern Australia and Papua New Guinea. It is a small (to 30-40 mm) lively, shoaling species that does best in a group of at least 6 specimens. It is very peaceful and not suitable for the general community aquarium since it's easily outcompeted for food and the long fins of mature males may be nipped at by other species. It is best maintained alone or with other small peaceful species. Ideally much of its diet should comprise live foods although small/crushed floating dried foods are also accepted. Photo Robert Beke

Eradicate WATER HYACINTH & SALVINIA from New Zealand

by Caryl Simpson

Two plants that have caused major problems overseas are also in NZ. Found mostly in Auckland, Northland and Waikato regions, it is unfortunate that fish pond owners are one of the major sources of these unwanted plants.

Eichhornia crassipes - Water hyacinth
Photos: Paul Champion

Water hyacinth, *Eichhornia crassipes*, is a major problem as an invasive species outside its native range. One of the fastest growing plants known, also able to clone itself, each one can produce thousands of seeds per year and these seeds can remain viable for over 28 years. In South east Asia, some water hyacinths can grow 2 – 5 metres per day and the common variety can double its population in two weeks.

It is listed in the NZ National Pest Plant Accord which means it cannot be propagated, distributed or sold here. In large water areas in many countries it has become a serious pest. Left to grow, water hyacinth can totally cover entire lakes. The result being reduced water flow, lack of light reaching native plants and a lack of oxygen which results in the death of fish and other organisms. Mosquitoes love breeding in it, as does a snail species known to host a flatworm that causes disease. It has also been blamed for starving subsistence farmers in Papua New Guinea. It can stop shipping (it clogs propellers) and causes problems blocking intakes at hydro electric dams.

Water hyacinth Classed as a Notifiable Organism, Unwanted Organism, National Interest Pest Response, National Pest Plant Accord
Scientific Name: *Eichhornia crassipes*

Origin: South America, Amazon basin, western Brazil

Type: Weed

Plant Life-form Type: Free-floating

Taxonomy: (Mart.) Solms-Laub.

Presence: Locally naturalised, subject to a national eradication programme since 1950's, first record from Rotorua in 1950

Habitat: Still and slow flowing water bodies in warm areas

Temperature (°C): 20 - 26

pH range: 6.8 - 7.2

Hardness (ppm): 30 - 150

Light: Low - High

Height: 200mm

Notes: A major weed in many warm temperate and tropical countries. Now universal in most temperate & tropical waterways. A pest plant. Not suitable for indoor aquaria. Should not be held by aquarists.

Propagation: Older stolons between individual plants decay to release young plants. Also spreads by seed.

Features: Free floating perennial herb. Plants are stoloniferous with daughter plants often attached. Leaves are bright green, often with a spongy inflated petiole. Roots are long and finely divided, and are bright purple when young before becoming black. Flowers are large (7 cm in diameter) in a spike of up to 10 flowers. They are blue-purple with a central yellow eye surrounded by a dark ring on the uppermost petal.

Source: TIFBIS

Regional: Regional Pest Management Strategy: NTL, AUK.

Salvinia is related to other water ferns, including *Azolla* and there are twelve recognised species. Like water hyacinth, it causes major problems in ponds and lakes, choking off the water by forming dense mats on the surface.

Salvinia Classed as a Notifiable Organism, Unwanted Organism, National Interest Pest Response, National Pest Plant Accord

Scientific Name: *Salvinia molesta*

Origin: South America, southeastern Brazil, and northern Argentina

Type: Weed

Plant Life-form Type: Free-floating

Taxonomy: Mitchell

Presence: Locally naturalised, subject to a national eradication programme since 1983, first record from Western Springs, Auckland in 1963.

Habitat: Still and slow flowing water bodies in warm areas.

Temperature (°C): 18 - 30

Notes: A major weed in many warm temperate and tropical countries. A small free-floating fern with dense roots. Coffey & Clayton heartily condemns this invasive weed. Three species are pest plants: *Salvinia auriculata*, *S. molesta*, & *S. roundifola* are pest plants.

Propagation: Spreads rapidly by fragmentation and producing plantlets from the old end of the horizontal axis, and can grow from a singe node. *Salvinia molesta* is apparently a sterile hybrid.

Features: Free-floating fern. Salvinia has a horizontal stem with paired aerial (above the water) leaves. Adult leaves are folded, whereas young leaves are flat. Aerial leaves have hairs shaped like egg-beaters. Lower submerged leaves look more like roots and can be up to 30 cm long.

Source: TIFBIS

Regional: Regional Pest Management Strategy: NTL, AUK.

MPI will pay for full removal and destruction of these weeds from any site.

Caryl Simpson (Marlborough Aquarium Club)

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Salvinia
Photo: Caryl Simpson

Pothos

Epipremnum aureum

by Shayne Mechen

A few years ago I was talking with a fellow fish keeper and we started to talk about things that would be useful to have in our fish rooms. During the conversation he talked about a plant called devils ivy, well that was the name I could remember. He was unable to find it so off I went searching and I only took a day to track it down. It is called devils ivy but also pothos plant (*Epipremnum aureum*) so I ordered it in and when it arrived I set it up in my fish tanks.

The reason I wanted to get hold of pothos plant was, from what he said and I then read and researched, was that it would act like a filter and remove nitrates and extra nutrients in the tank water. During my research a number of people suggested that you put it as part of your hang on filter but I found hanging it on the edge of the tank worked just as well. I used a glass pane so I could easily sit it in the middle of the tank. I noticed that with having the plants in different tanks there was less green water and when I added the plants to new tanks they would also start clearing green water up. Pothos plants seem to take a large

amount of the nitrates out of the water from my test results. Having it in my fish room is good for the tanks but not the pets of the household as there are reports of it being toxic to the four legged family members of your household.

The roots are what allows the plant to absorb nutrients from the water so therefore a bigger root mass should increase nitrate absorption. While it can be grown at the surface of the display tank it can be easier to manage in a sump, or some other separate chamber (maybe screen off a corner with some Poret foam?) where the plant can grow without being pruned by any vegetation eating fish you have. Pothos, like many plants, will root readily from cuttings placed in water and is very hardy and can withstand quite a bit of neglect. In some countries it is considered to be an invasive species as it can compete with native plants. Even though they are hardy they do need lighting to promote growth so an 8w energy saver bulb over them will be a minimum requirement but the more light equals more growth which in turn can mean less nitrates.

Plants can be sourced from other aquarists or you can purchase a plant from your favourite nursery or garden centre. When making cuttings select a section of stem on the end of a vine, and cut off a section that has at least to 3 nodes (points where roots and leaves grow from). Remove a leaf or two but not on the end where all new growth is occurring. Place your cuttings in your tank or sump making sure that the cut ends are covered with water, it will only take a few days to see roots forming on your cuttings.

Article and photos by **Shane Mechen**

References:
https://en.wikipedia.org/wiki/Epipremnum_aureum

A Spiking Convict

The convict julie, *Julidochromis regani*, is the largest and least aggressive of the 6 species of *Julidochromis*, reportedly growing to 30 cm in the wild, although it rarely reaches 15 cm in aquaria. All Julies (*Julidochromis* species) are endemic to Lake Tanganyika and are therefore best kept in tanks with plenty of rock work and hard alkaline water (a pH of 8.5-9.0). As with many other African lake cichlids, convict julies are often stroppy and territorial so are best kept with other cichlids to help defuse their behaviour. Julies will freely hybridise if given the chance so only keep one species in the same tank. Convict julies are secretive substrate spawners and often form strong pair bonds. Photo: Seth Garden

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RABBITFISH

by Darren Stevens

Siganus magnificus
Photo: Karelj

Rabbitfishes, spinefoots, and foxfaces (Family Siganidae) comprise 29 species found in shallow coastal waters of the Indo-Pacific, although two species *Siganus luridus* and *S. rivulatus* have become established in the eastern Mediterranean Sea by migrating through the Suez Canal. All species are currently placed in the genus *Siganus*, although the foxfaces – species with prominent face stripes, were formerly placed in the genus *Lo*, which has been relegated to a sub-genus. The largest rabbitfish species, *S. javus*, is reported to grow to 53 cm, but most species are smaller, growing from 25 to 35 cm.

The common name rabbitfish is thought to be due to their large, dark eyes and small, protruding, vaguely rabbit-like mouths.

Some cartilaginous chimaeras (Order Chimaeriformes) are also sometimes called rabbitfish.

Rabbitfish (Siganidae) are mainly herbivorous, grazing on fine algae, seaweeds, encrusting algae, and small organisms on rocks and corals. Some species will eat sessile invertebrates such as sea squirts, sponges and corals. Rabbitfish help prevent reefs from being covered by algae.

All rabbitfish species should be handled with care as they have venomous dorsal and anal fin spines which can cause severe pain. If you are unlucky enough to be envenomated by a rabbitfish, immerse the

Above: *Siganus vulpinus*
Photo: Dr Dwayne Meadows NOOA NMFM OPR

Below*: Siganus vulpinus* - showing night colouration
Photo: André Fonseca

affected area in hot water (as hot as you can handle but not hot enough to burn) – the high temperature will break down the venom's proteins and help with the pain. You should then seek medical attention in case of a secondary infection or severe allergic reaction.

All rabbitfish species can dramatically alter their appearance to help blend in with the environment, typically they fade or become mottled. They typically do this when sleeping at night or when stressed e.g. poor nutrition or water quality, cramped conditions, or troublesome tank mates.

Some rabbitfish species are popular food fish with the FAO reporting 15,700 to 25,800 tonnes of Siganidae being caught between 1990 and 1995.

Siganus magnificus
Photo: Darren Stevens

A few of the more colourful species are popular in tropical marine aquaria and six species are allowed to be imported into New Zealand: foxface, *Siganus vulpinus*; magnificent foxface, *S. magnificus*; bicolored foxface, *S. uspi*; blackeye rabbitfish, *S. puelloides*; two barred rabbitfish, *S. virgatus*; and barred spinefoot, *S. doliatus*. The first 3 species are the most commonly imported into New Zealand.

Foxface - *Siganus vulpinus*

The foxface rabbitfish is a striking fish with a black and white head and chest and a bright yellow body. It is found in the western Pacific and grows to about

Siganus uspi
Photo: Ross Robertson

25 cm. It is very similar to the one spot foxface, S. unimaculatus, and may be the same species. Both forms have virtually the same patterning and coloration but *S. unimaculatus* has an additional large black blotch on the body and it is also slightly smaller (to 20 cm).

Magnificent foxface - *Siganus magnificus*

The magnificent foxface is a largely white species with a dark brown to black band through the snout, eye and nape, a dark saddle like marking over the back, and some yellow on the margins of the pectoral, anal, caudal (tail), and often the pectoral fins. It grows to about 24 cm and is found in the eastern Indian Ocean.

Bicolored or Fiji foxface - *Siganus uspi*

The bicoloured or Fiji foxface is a largely dark purplish brown fish, except for the pectoral fins and the posterior part of the body and fins which are bright yellow. A white band may be present extending from the lower nape to below the eye and lips. It grows to about 24 cm and is found only in the waters around Fiji, although stragglers sometimes reach New Caledonia.

Habitat: Most rabbitfish are found in shallow waters, often over reefs and in depths of less than 15 metres. Juveniles are

generally found in large schools while many species, including those mentioned in this article, pair off as adults.

Aquarium Size: Due to their large adult size an aquarium of at least 400 litres is recommended but juveniles can be kept in a 275 litre aquarium.

Maintenance: Once acclimated, rabbitfish are regarded as hardy and disease resistant compared to most species kept in tropical marine aquaria. They are also great at consuming marine algae, including hair algae, and they are generally reef safe, providing they are well fed, but may nip soft and hard coral polyps and clam mantles.

Water Conditions

Temperature: 22 – 26°C

pH: 8.1 – 8.4

Specific Gravity: 1.020 – 1.025

dKH: 8 – 12

Diet: Rabbitfish feed primarily on algae in the wild and they will also graze on algae in the aquarium. Not surprisingly, they need a mainly plant-based diet and vegetarian flake such as spirulina, pellets, and fresh vegetables are all good options. Dried seaweed is also good but make sure it has no preservatives or additives. Small quantities of meaty foods such as brine shrimp, zooplankton, fish, etc. will also be appreciated.

Behaviour and Compatibility: Rabbitfish can be aggressive towards their own kind or similar looking species so unless you have a very large tank it is best to only keep one in a tank. However they are generally compatible with most other species.

Reproduction: Rabbitfish are not known to have been bred in aquaria.

Darren Stevens

Siganus doliatus
Photo: Leonard Low

Siganus virgatus
Photo: Amanda44

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MARINE

BREEDING BANGGAI CARDINALFISH

Pterapogon kauderni

Four day old *Pterapogon kauderni* after a feed of baby brine shrimp
Photo: Mark Paterson

Cam Purches from Whakatane

The very first time I saw that little black and white striped fish that resembles the X Wing fighters out of a Star Wars film I fell in love with it.

This is a small tropical cardinalfish in the family Apogonidae and is the only member of its genus. This attractive fish is popular in the aquarium trade. It is among the relatively few marine fish to have been bred regularly in captivity, but significant numbers are still captured in the wild and it is now an endangered species.

I was lucky to be given a pair that had bred a few times before by and have been breeding banggai cardinalfish for a few years now. My current pair I have are the great grandchildren of the originals.

The hardest part is obtaining a good pair as they are difficult to sex and it takes about 6 months at least of growth to be able to sex them visually. I have found the line on the bottom jaw is straight on the females and more rounded on the males, and the males are slightly wider in

the head when looked at from front on but it is not an exact science. As younger fish kept in a group they are easier to sex as the dominant ones will pair off and sit apart from the rest usually chasing others away. Once paired, banggai can be very aggressive to others of their species often killing them so just buying one to pair up with the one you have often ends up badly. The young I have raised have done their first spawning at approx. 12 months old. Luckily banggai cardinals are mouth brooders with the male holding the eggs for up to 27 days and I haven't observed them eating in that time so keeping the male well fed ensures a positive outcome. My original male had six spawns in a year so had a long time of no food. Whilst holding eggs the male will sit at the back of the tank while the female will guard him and the area they are in acting aggressively to push other fish away, other than that they are a peaceful fish in a mixed reef.

I have found them once paired easy to spawn if they are well fed and good food also ensures strong eggs and fry's survival. When spawning the female follows the male around the tank and once he stops she

Male *Pterapogon kauderni* holding eggs
Photo: Mark Paterson

swims alongside and starts shaking/ vibrating, this carries on for a while until she pushes salmon coloured eggs from her ovipositor which by now is extended. The male then quickly fertilises them and takes them into his mouth. For a young pair the first few times can result in the eggs being eaten as they weren't fertilised properly or the male was inexperienced or not ready as he will hold those eggs for between 23 and 29 days.

4 month old *Pterapogon kauderni*
Photo: Mark Paterson

Once he has a mouthful of viable eggs he stops eating and as time progresses his mouth will look fuller and he will yawn more frequently as he rolls the eggs around in his mouth, sometimes the eggs can be observed if you watch closely.

Rearing the fry

Just before expelling the fry it looks like he is having trouble holding the fry in his mouth and usually this

is when I net him and move him to a holding tank that is set up with water from the main tank. He will release in the main tank but then you will spend hours of sitting and watching to spot the fry and try to net them out. Interestingly I find them floating in my anemones for protection the same as clownfish do seemingly impervious to stings. Once I net him I transfer him to a plastic container underwater as often he will spit the babies if lifted out of the water or swallow them. The holding tank I usually set up with a piece of live rock and some plastic plant for the fry to shelter in. Once the male has released the fry I return him to the main tank and his partner and a good feed, usually she has started to fill with eggs again and spawning will take place within another 3 weeks so feeding the male up is essential to prepare him for the next round. If you are lucky you will then have 10 to 27 fry to raise.

Now Dad has done his job it is time to do yours, the fry are tiny short finned replicas of their parents and some may have a yellow yolk sac remaining depending on release age. They will start feeding straight after release and I ensure I have baby brine shrimp (BBS) hatching and ready to go a couple of days beforehand. I feed at least three times a day with BBS that are at the most five hrs old as this is when they are the most nutritious. After five hours I start feeding the BBS with phytoplankton to fortify them. I have used Selcon or Spiruina powder also. I have found this necessary to avoid what is known as Sudden Fright Syndrome (SFS). If the young don't receive enough fatty acids it can be fatal as the essential fatty acids are used for building nerve function and without it a sudden fright even lights turning on can cause an internal short circuit and you have dead fry on the tank floor. I have also found this helps correct another problem in the fry which affects the swim bladder where fry are unable to maintain a steady position in the water and exhibit a dipping motion all the time which interferes with feeding. After four to eight weeks of feeding out BBS you can slowly introduce frozen Brine shrimp, finely crumbled flake or mysid shrimp into their diet.

I hang onto them until about four to six months old to ensure they will survive well in a community reef set up.

I have bred four generations from the original pair but sadly lost the original pair last year to possibly old age as they were estimated to be probably 12 years old so a good innings for a little fish.

Mark Paterson

DO IT YOURSELF

CALCIUM - MAGNESIUM - ALKALINITY POTASSIUM - CORAL SNOW

Simon Lemin

Always test before you dose. NEVER dose something you haven't tested for. These instructions are assuming you know what you are doing and familiar with dosing to attain the correct levels in your aquarium

ALKALINITY, 7-11dkH

(Baking Soda $NaHCO_3$)

Weigh the baking soda first. Bake the baking soda, spread out on a tray at 200-300 degrees Celsius for an hour. (You can't over bake this stuff so leaving it in longer, if you have a thicker layer on the tray, is recommended).

Baking this changes its chemical compound to Washing soda (Na_2CO_3), removing the carbon dioxide and water in the baking soda.

When it comes out of the oven (Warning, very hot), add straight into half the RODI water and dissolve. It will heat up the water enough to dissolve it. Then add the rest of the RODI water to make the desired amount. (1900meq or 5300dkh per Litre)

157 grams of unbaked baking soda makes 1 litre of solution

157g = 1L

470g = 3L

785g = 5L

1570g = 10L

Dosing

Start with:

1ml/1L of tank volume (heavy demand SPS dominated tanks)

0.5ml/1L of tank volume (mixed SPS & LPS reef)

0.3/1L of tank volume (low demand mixed reef)

0.2ml/1L of tank volume (fish only or new tanks with a few corals

To raise your low alkalinity level. Try to aim for 8-9dkH.

(Calculate as required for your tank, e.g. multiply the following by 5 for a 100L tank.)

0.3mls will raise 20L of water 0.1dkH

1.5mls will raise 20L of water 0.5dkH

3.7mls will raise 20L of water 1.0dkH

7.5mls will raise 20L of water 2.0dkH

CALCIUM, 380-450ppm

(Calcium Chloride Dehydrate $CaCl_2.2H_2O$)

Heat the RODI water first to help it dissolve. Add to half the RODI water to dissolve and then add the rest of the RODI water to make the desired amount. (9775ppm per Litre)

132 grams of Calcium Chloride Dehydrate makes 1 Litre of solution.

132g = 1L

396g = 3L

660g = 5L

1320g = 10L

Dosing

Start with:

1ml/1L of tank volume (heavy demand SPS dominated tanks)

0.5ml/1L of tank volume (mixed SPS & LPS reef)

0.3/1L of tank volume (low demand mixed reef)

0.2ml/1L of tank volume (fish only or new tanks with a few corals)

To raise your low calcium level. Try to aim for 420ppm.

(Calculate as required for your tank, e.g. multiply the following by 5 for a 100L tank.)

5.4mls will raise 20L of water 10ppm

10.8mls will raise 20L of water 20ppm

27mls will raise 20L of water 50ppm

Magnesium, 1250-1350ppm

(Epsom Salt (Magnesium Sulfate $MgSO_4$) and Magnesium Chloride Hexahydrate $MgCl_2.6H_2O$)

Heat the RODI water first to help it dissolve. Add to half the RODI water to dissolve and then add the rest of the RODI water to make the desired amount.

Magnesium isn't dosed as much as alkalinity and calcium. If you do regular weekly or fortnightly water changes, chances are your tank won't need magnesium levels replenished. Only when water changes are pushed out to 4 weeks or more will your magnesium be used up.

Imperial

3cups of magnesium chloride hexahydrate + 5cups of Epsom salts will make 1 gallon of solution.

Metric – 1cup = 236.58mls, 1gallon = 3.785Litres

187mls of magnesium chloride hexahydrate + 312mls of Epsom salts will make 1 Litre of solution. 561mls of magnesium chloride

hexahydrate + 936mls of Epsom salts = 3 Litres

935mls of magnesium chloride hexahydrate + 1560mls of Epsom salts = 5 Litres

1870mls of magnesium chloride hexahydrate + 3120mls of Epsom salts = 10 Litres

Dosing

This solution has to be added differently to the other two. After dosing 3.785L (1 gallon) of both alkalinity and calcium solutions, add 610mls of the magnesium solution. Add all at once or drip it in, depending on your tank setup.

To raise your low magnesium level. Try to aim for 1320ppm.

(Calculate as required for your tank, e.g. multiply the following by 5 for a 100L tank.)

5.4mls will raise 20L of water 10ppm

10.8mls will raise 20L of water 20ppm

27mls will raise 20L of water 50ppm

POTASSIUM, 350-400ppm

(Potassium Chloride KCl)

Potassium is only dosed in heavily stocked SPS reef tanks where an ultra-low nutrient environment is required. In the ULN environment, potassium is removed faster by corals and heavy skimming.

A typical mixed reef tank will not likely be using potassium.

To raise 10ppm, dose 2g of KCl for 100L of tank volume

To raise 10ppm, dose 10g of KCl for 500L of tank volume

To raise 10ppm, dose 19g of KCl for 1000L of tank volume

Mix with 0.5-1L of RODI water. Drip dose over a few hours. Do not raise more than 10ppm per day.

CORAL SNOW

(Calcium Carbonate $CaCO_3$)

This is used to clean your water clear by removing particulates. The result of regular use of Coral Snow is just as if we were using activated carbon and an organic adsorption resin.

Add to RODI water in a bottle to make the desired amount. The calcium carbonate doesn't dissolve so needs to be shaken/ mixed before every use.

115grams of Calcium Carbonate powder makes 250mls of solution

Dosing

Shake the bottle or container before use as the calcium carbonate settles. Add 1ml/100L or tank water daily or asrequired. Because this won't dissolve in the tank water it can be slightly over dosed. This will result in a cloudy tankfor a few hours or more, depending on how much you add. When it clears, from skimming or mechanical filtration, your water will be noticeably clearer. This allows better light penetration and your corals will respond by opening bigger than usual.

Photo and article by Simon Lemin

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HOW TO

IDENTIFY FLATWORMS IN MARINE AQUARIA

by Simon Lemin

Amakusaplana acroporae
Photo: Simon Lemin

Acropora Eating Flatworm -
Amakusaplana acroporae

Redbugs/Commensal Flatworms/Rusty Flatworms - *Convolutriloba retrogemma*

Polyclad Flatworm - *Polycladida*

I've heard of a few people now saying they think they might have Acropora eating flat worms (AEFW) lately. In the photos you can see flatworm bite marks up the coral (left), AEFW (above), and egg clusters laid on the base of the dying coral (right).

Left - *Acropora* showing bite marks from flat worms
Photo: Simon Lemin

Amakusaplana acroporae eggs
Photo: Simon Lemin

The coral (*Acropora*) will lose polyp extension and colour, usually turning brown or pale, and slowly die off. Where the coral tissue starts to die off at the base, the AEFW will lay its eggs in yellow/tan coloured clusters.

I have successfully removed these from my tanks by dipping each Infected SPS colony in a Coral RX dip for a few minutes and blasting the FW off with a turkey baster. Also I scraped off any visible eggs. I then treated the tank with Flatworm Exit and dipped the corals every 4-5 days for 3 weeks. Some SPS were too infected with eggs so I just binned the coral. Sometimes it is a small sacrifice to make in order to save the rest of your corals.

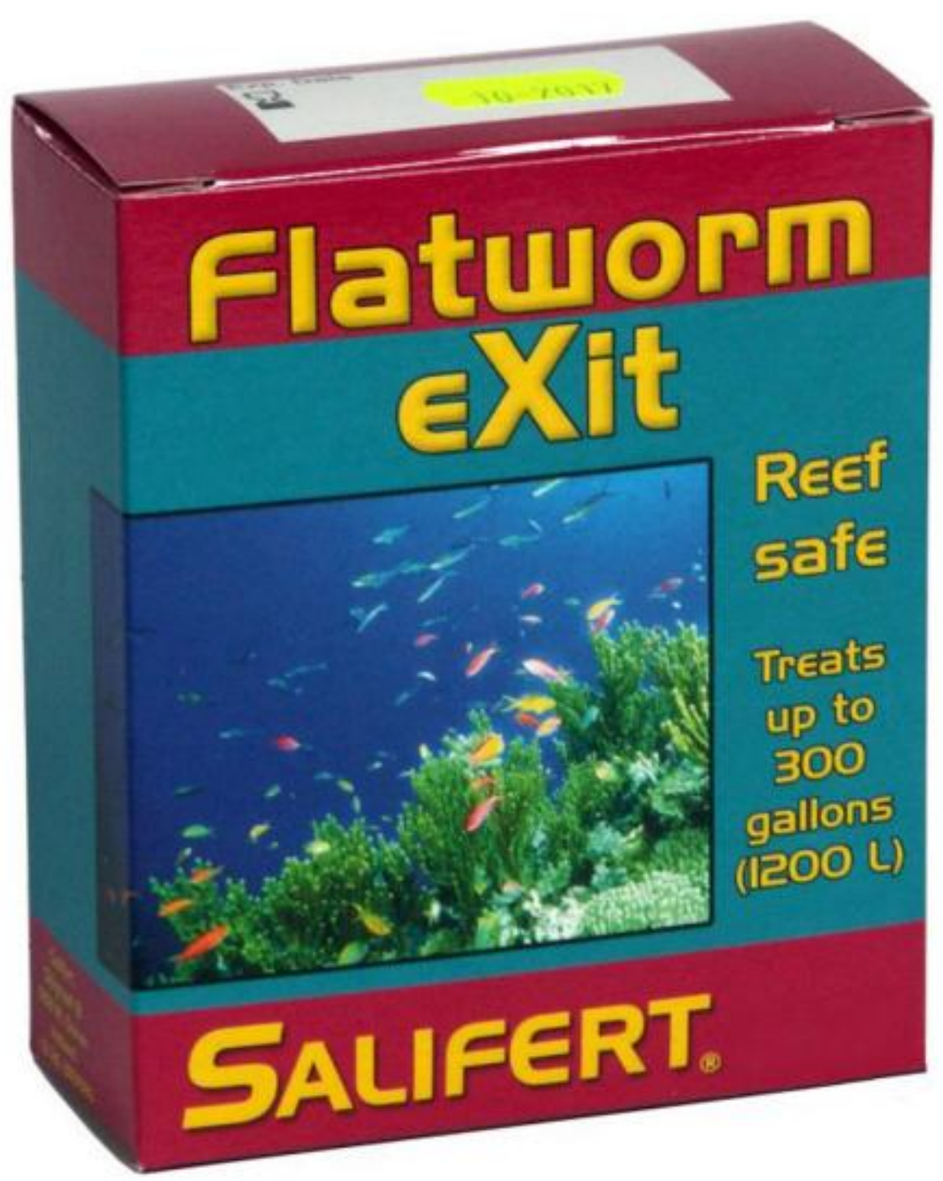
I did miss some eggs and I had to keep an eye on the few infected coral colonies for signs of stress (polyp retraction and colour loss). I dipped them straight away, scraped off more eggs and used a follow up treatment 4-5 days later. These products don't seem to kill them quickly, only agitate them into moving so you can see them and remove them. They definitely don't kill the eggs.

A more common type of flatworm that can infect your tank is the rusty flatworm (Red Planaria Flatworms). These cover your glass, rocks and sometimes corals. They don't harm your tank but they can get out of control to a point where they are unsightly and smother corals which may then die from lack of light and water flow.

An appropriate product, such as Flatworm eXit by Salifert, is good for dosing the tank to kill them. You will need to dose it 2-3x the recommended dose to have any real effect. The worms will eventually fall of the rocks and float around the tank to be removed by mechanical filtration and water change. You can also blast the rocks and corals with a turkey baster to get them off. It is recommended to siphon out as many FWs as you can before dosing the tank. This will reduce the amount of toxins released by the FWs when they die. A 20-30% water change will need to be done 15-30mins after dosing Flatworm eXit. Add activated carbon in a high flow area to soak up any remaining toxins. All of this will depend on the level of infestation you have. If you have a LOT of flatworms then a bigger water change may be needed.

Polyclad flatworms are one of the largest types of flatworms, and are mainly seen out at night.

Convolutriloba retrogemma
Photo: Simon Lemin



Polycladida
Photo: Simon Lemin

They eat snails and clams. These will need to be removed manually when you see them as the dosing products don't seem to kill them, only agitate them as they don't like it. They are very slimy and fragile so care is needed when picking them up. They breed under flat things and inside rocks, laying hundreds of eggs in big clusters. If you notice a decline in snail populations then you could have these worms. Have a look in your tank at night, around corals and between rocks. Getting your hands wet and lifting up rocks may be the only way to find them.

To prevent getting any flatworms, or any unwanted pests, you should always dip your corals before adding them to your tank and look over them thoroughly for any eggs.

Another option to battle flatworms is a ZEOvit product called Flatworm Stop. This is dosed daily to prevent flatworms breeding out of control.

This should not be used to kill the flatworms and completely rid your tank of them, but used as means of control to prevent the pests from taking over.

Simon Lemin

INTERESTING IMPORTS

Asian Rummynose
Photo: TheManOnTheStreet

After reading our feature article, if you are inspired to try an eartheater or two, *Geophagus altifrons* (generally sold as "*Geophagus surinamensis*"), *Satanoperca leucosticta* (generally sold as "*Geophagus jurupari*") and *Geophagus brasiliensis* are on the importers' lists. If you have a smaller tank and want to try a small eartheater rellie then Bolivian rams (*Mikrogeophagus altispinosus*) and ram cichlids (*M. ramirezi*) (in blue, golden, veiltail, and electric blue and golden balloon varieties) are also available. Other relatively peaceful small cichlids on the lists include standard and albino kribensis, keyhole cichlids, orange chromides, and African butterfly cichlids (*Anomalochromis thomasi*). If you have a medium sized community tank and are after something a little different then elegant corys or the golden form of the panda cory are nice options as are yoma danios or Asian rummynose (*Sawbwa resplendens*). For barb fans, clown barbs (*Puntius everetti*), rhombo barbs (*Desmopuntius*, formerly *Puntius*, *rhomboocellatus*), melon barbs (*Haludaria*, formerly *Puntius*, *melanampyx*), and lined barbs (*Striuntius*, formerly *Puntius*, *lineatus*) are attractive generally peaceful options.

Bolivian Ram
Photo: Adrienne Dodge

Bumblebee Goby
Photo: Robert Beke

Clown Knifefish
Photo: Bedo

For brackish water enthusiasts, figure eight puffers (*Tetraodon biocellatus*), green puffers (*T. fluviatilis*), silver scats, mono angels (*Monodactylus argenteus* and *M. sebae*), and bumblebee gobies are on the importers' lists. Freshwater or dwarf puffers (*T. travancornicus*) are also on the list and make a great subject for a small heavily planted species only tank.

And finally, for those fish keepers with very large tanks who are after a special display fish, there are a number of arowanas on the importers' lists. Pearl arowanas which are also known as gulf saratoga (*Scleropages jardinii*) and silver arowanas (*Osteoglossum bicirrhosum*) are more reasonably priced; while red tail gold and high back golden Asian arowanas (*Scleropages formosus*) are stunning but expensive. Other large fish for large tanks include slender hemiodus, banded leporinus, Siamese tigerfish, clown knifefish, royal spotted knifefish, and redhook myleus. Just to do your research though as not all these fish are compatible.

The editorial team

Figure Eight Puffer
Photo: ColdmachineUK

Royal Knifefish
Photo: Peter Potrowl

Auckland Adventures: From Kokopu to Goldfish

The Mahurangi Technical Institute

On the 23rd of July, the Auckland Fishkeepers Association (AFA) and the Waikato Aquarium Society (WAS) teamed up to make a trip to the Mahurangi Technical Institute (MTI) – and to say it was "pretty cool" is an understatement.

Greeting us was the fantastic David Cooper and Paul Decker, along with two jars of "pre whitebait" galaxiid larvae, one with 2 week old larvae and one with 6 week olds, a preserved giant kokopu female, and an array of reading material. Now, before you panic, MTI didn't just go out and catch some whitebait for us – instead, they went through the effort of breeding them! Okay, so it wasn't just for us, but we felt pretty special to see their awe-inspiring setup.

The Goldfish Farm
Photo: Dave Wilcox

All about whitebait

"Whitebait" is comprised of five different species in the *Galaxias* genus: inanga (*G. maculatus*), shortjaw kōkopu (*G. postvectis*), banded kokopu (*G. fasciatus*), giant kokopu (*G. argentus*) and koaro (*G. brevipinnis*). Although inanga is the most commonly found whitebait species, the featured species of this visit was the giant kokopu (considered "*Vulnerable*" by the IUCN). The reason for this species is both an act of conservation and aquaculture – the giant kokopu can yield ten thousand + eggs from one female and spawn every year for 20 odd years, therefore once breeding stocks numbers are reached, this allows for millions of fry.

Although whitebait is typically eaten at 12 weeks of age, MTI has no shortage of adults with thousands of adult fish in their facility. Like many of our native fish, the journey of breeding the giant kokopu has been a long one, however the hope is that through the efforts of MTI and local buyers, we can reduce the strain on native populations by purchasing sustainably sourced whitebait.

MTI were happy to give away some of their trade-secrets, encouraging conservation to all. We heard an array of both technical aspects of their breeding techniques, along with some of the less conventional methods. Whitebait species are fantastic climbers (as they need to be to navigate our waterways), with the concave water indicating to fry that the rearing tanks were perfect to climb out of. A bit of Kiwi ingenuity and surf wax helped to make the meniscus convex, and worked brilliantly for some time. However, after reaching a certain age, the juveniles decided the wax made for a good food source,

Above: Shortjaw Kokopu - *G. postvectis*
Below: Giant Kokopu - *G. argentus*
Photos: Charles Fryett

leading to gummed up mouths (starvation and death) - therefore wax removal at the right time between reducing climbing losses and gummy mouths is imperative.

However, on the more technical side, we were shown the amazing setup of equipment – skimmers, sumps, fluidized sand beds – you name it, they had it – just about ten times the usual size found in your local fish store! Technical equipment isn't my forte, but I can promise it was impressive to even the top fishkeepers in our group.

After being introduced to the wonders of raising giant kokopu, our groups went out for lunch and then split up – some making the long trip back to Waikato, some checking out the local sights (aka. local fish stores), and the rest of us then made our way to the goldfish farm of Dave Wilcox – which, much like MTI's setup, was on a scale no one was expecting.

The Goldfish Farm ponds
Photo: Dave Wilcox

The goldfish farm

Those of us who went to visit the goldfish farm cared for by Dave Wilcox were not expecting what we saw. The first sight was around five large ponds and a breeding setup – if it wasn't so cold on the day, I'd have thought I travelled to Southeast Asia and was viewing Arowana breeding ponds.

Measuring around 50 x 25 metres and totalling to 24 ponds altogether, I'd be surprised if this wasn't the biggest (most dedicated) setup in New Zealand. It's difficult to describe the sheer scale of the setup, so this is a case where pictures speak a thousand words.

We were shown a number of different types of goldfish, with high quality established lines and even some new lines being worked on. I was also, personally, pretty excited to see all

of the hitch-hiking invertebrates living on the farm, and was generously given some to take home to photograph!

Although their niche may be goldfish, I got to see a range of inverts – daphnia, backswimmers, caddisfly larvae, dragonfly nymphs, mosquito larvae, aquatic mites – it was an entomologist's (or photographer's) dream.

My heart always feels a bit fuzzy when I meet a fishkeeper with similar views – the farm is all about providing ethical environments for their fish, including recommendations of keeping goldfish primarily in ponds rather than the small bowls/tanks we are starting to move away from as a community. Along with

The Goldfish Farm ponds
Photos: Alex Flemming

this, the filtration systems were a great mix of mechanical, biological and riparium filtration, which was more than suitable for their setup!

I personally have to thank both the Mahurangi Technical Institute and Dave Wilcox for allowing us to view their setups and for giving us such thorough, informative tours (although I could have spent several hours longer at both). I can definitely recommend checking out both of these places (conveniently close to each other) if you ever get the chance.

Written by Alex Fleming / Director of Fishwise Ltd / Executive for the FNZAS / Secretary for the Auckland Fishkeepers Association.

Redwood Aquatics

21 Hussey Road
Harewood
Christchurch
03 359 6936

Hours: 11am - 6pm Saturday - Thursday
Closed Fridays and Public Holidays

Nestled away on Hussey Road just a stones-throw from Willowbank Wildlife Reserve you will find Redwood Aquatics - a haven for marine, tropical and pond enthusiasts alike! Redwood Aquatics has evolved from small beginnings in a garage in 1974 to the well-respected specialist business we know today. It was the first licensed quarantine import facility in the South Island, purpose-built in the 1980s at the location they still occupy to this day. The store adjoins the original quarantine facility, surrounded by immaculately maintained pond and garden displays.

The shop is tidy and the tanks themselves are always clean and never overcrowded. A full wall of tropical tanks greets you to your right as you enter the store as well as numerous other tanks scattered throughout - over 100 sales tanks in total! A large area at the back of the store is dedicated to filters, tanks and other equipment and even features a basic pet supply section. A separate room houses the reptile section and Redwood's resident Arowana. Several display tanks can be found to the rear of the store including an impressive reef display tank, an African cichlid tank and a planted community tank teeming with crypts. The store is very well stocked with a wide range of competitively priced products, right though from dry goods, medications and test kits to lighting solutions, filtration and marine equipment. The small team of staff are as knowledgeable as they are friendly and the store has the welcoming atmosphere of a family-run business. They offer

outstanding customer service and are always happy to offer advice and answer any questions you may have, or just stop for a chat!

Redwood is a real all-rounder and its versatility is one of the qualities which makes it a destination store for all kinds of enthusiasts - tropical, cold-water, marine, reptile and pond. It boasts an extensive range of high quality tropical stock ranging from standard community species and cichlids to the more unusual and specialist species. Betta breeders and plec-junkies will not be disappointed and the store is often a hive of activity after news spreads of a new shipment release! Their ability to import their own livestock gives them the flexibility to stock a range of species which often can't be found elsewhere. They stock a good range of tropical plants as well as anything you might need for a planted aquarium. Cold water keepers and pond fanatics are also catered to with an extensive range of pond plants, cold water fish


SALE
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and pond keeping supplies. Turtles, frogs and even bearded dragons are available here seasonally, as well as everything required to keep them.

Redwood Aquatics is well worth a visit or even a day-trip for out-of-towners. It is a one-stop-shop foraquarium, pond and reptile hobbyists and I guarantee there will be something for everyone, from beginner's right through to advanced aquarists.

Amelia Morris
Photographs by **Robert McCracken**

Rank	
Tropical fish	★ ★ ★ ★ ★
Catfish	★ ★ ★ ★
Cichlids	★ ★ ★ ★
Oddballs	★ ★ ★ ★ ★
Coldwater fish	★ ★ ★ ★
Marine fish	★ ★ ★
Marine inverts	★ ★
Marine corals	★ ★ ★
Display tanks	★ ★ ★ ★ ★
Pond plants	★ ★ ★ ★
Tropical plants	★ ★ ★ ★
Dry goods	★ ★ ★ ★ ★
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The Federation of New Zealand Aquatic Societies is a group of aquarists dedicated to supporting and promoting fishkeeping as a hobby, both in our local communities and globally with regard to conservation of aquatic species and their environments. The organisation is dedicated to the improvement of the aquarium and fishkeeping hobby and it has a 60 year history of representing aquarium societies in New Zealand.
There are currently 12 affiliated aquarium clubs around New Zealand:

AUCKLAND FISHKEEPERS ASSOCIATION
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