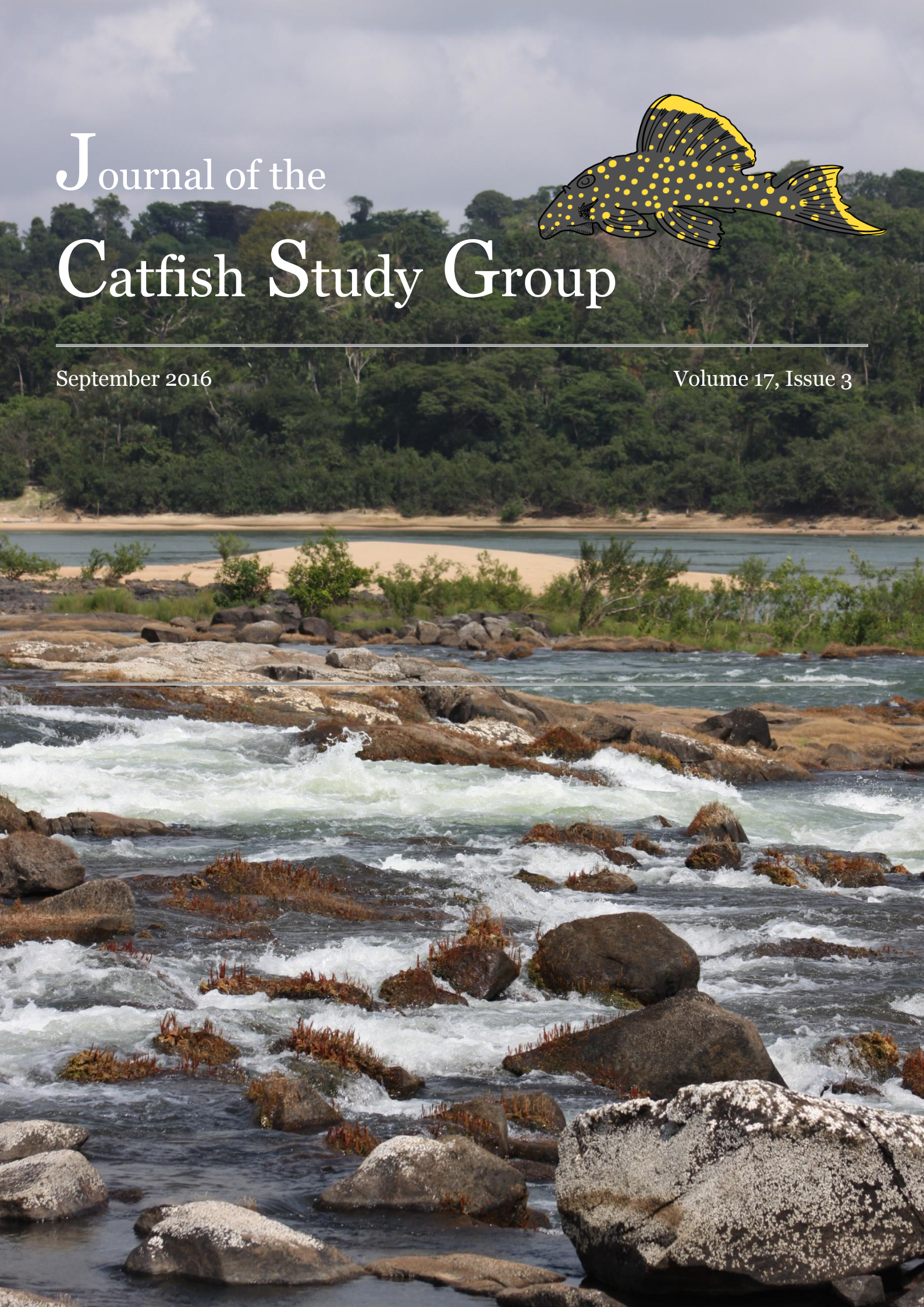

Journal of the Catfish Study Group

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Contents

Cover image: Small cataract and Podostomaceae in middle Xingu., Para, Brazil. Photo: J. Dignall

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Editorial

Welcome to the third issue of the 2016 journal. Many thanks to all our sponsors, subscribers and – especially – our contributors.

The Autumn issue includes the first installment of a 3-part epic concerning a recent trup the imperiled río Xingu by our very own Julian Dignall - a fantastic account of a very special place for all pleco fans . CSG Chairman Mark Walters has provided some thoughts on directions for the future of group meetings, an article detailing his experiences with the leopard frog *Peckoltia* and a glimpse into his secret life as a DIY plumber! CSG Treasurer and Chief raffle MC Danny Blundell has come across an interesting piece of Japanese folklore, and our correspondent in Kiel – Daniel Konn-Vetterlein – gives us the latest on the Brazilian list of catfishes that are currently (or soon to be) banned from export.

Nothing from me this month – I'm sure it's as refreshing for you as it is for me – but I've been busy analyzing some genetic data with Jim Kitchen (aka "Pseudasmart") that I hope to share with CSG subscribers in the coming months.

As always, welcome to our new subscribers and members. I hope you find something new and interesting in these pages, and that you recommend us to your friends and colleagues.

Michael

editor@catfishstudygroup.org

Chairman's report

On the face of it, the membership gains a great deal from the Catfish Study Group without needing to contribute much to the organisation. With a three-day convention, high-quality journal, informative website, annual open show, social media and up to eight other face-to-face meetings each year there is a lot to look forward to as a member.

Behind the scenes, all of this content is managed and delivered by a dedicated committee of six members with busy lives and other commitments. The committee care passionately about the values of the CSG and the quality of its output and service to members and other organisations. Your committee meets each month to deliver the CSG program as well as discuss ways to improve our impact and the experience of almost 500 members across the globe.

At the moment, three of our activities meet the needs of all members; our international convention, widespread distribution of the journal, and an active dialogue on social media. The fourth main activity is a monthly club meeting held in Darwen, Lancashire. Given the difficulties and cost of transport in the UK, we have unfortunately seen attendance of the Darwen meetings shrink to a core group of local members. Monthly meetings represent a significant cost in terms of CSG funds as well as the time that is freely given by meeting organisers and invited speakers.

Some members have pointed out that monthly meetings in a fixed location do little to serve the interest of members elsewhere, and the committee has sought to understand why some Darwen meetings are poorly attended. We have put lots of effort into promoting meetings on social media and among nearby aquarist societies. In spite of these efforts, only the auctions and open show (which includes an auction) remain well-attended events over the past few years. Attendance of summer lectures, table-top sales, workshops and meetings with a free hotpot supper has been mixed and rarely justified the time and funds necessary to deliver them. A specialist *Corydoras* event in May did see a welcome spike in attendance, but unfortunately we did not receive the same turnout for the fantastic summer lectures a month later.

While auctions provide members with a way to share captive-bred fish and meet their breeders, the committee does not believe that hosting monthly auctions is a sustainable approach to justify club meetings. The committee is taking steps to broaden its reach by supporting catfish events across the UK and offering to run some of its monthly meetings outside of its traditional base in Darwen. The committee is looking forward to 2017 and planning an event calendar that serves as many of its members as possible.

With that in mind, your committee wants to hear about what you want from the CSG moving forward. Ultimately, the committee is entrusted to act responsibly on behalf of all members with the limited resrouces at its disposal. If we continue to deliver activities which only meet the needs of a few but consume the funds created by the many, the committee is failing the membership. Unless we receive a compelling reason to renew the annual agreement to hold 10 monthly meetings at the venue in Darwen, the committee will look carefully at the 2017 diary and identify where it can best deliver value to its members and act accordingly.

All members have a right to reply on any CSG matters. Please send any comments to the Chairman or Secretary or open up a discussion on our Facebook page. It is also that time of year to consider any necessary changes to our ways of working through the AGM in January 2017. If you have any items to be considered, please submit proposals to: secretary@catfishstudygroup.org.

Mark

chairman@catfishstudygroup.org

Observations on *Peckoltia compta* de Oliveira, Zuanon, Py-Daniel and Rocha, 2010

By Mark Walters

Fig. 1. Phenotypic variation in a spawning group of *Peckoltia compta*. Photo: M. Walters.

I landed on two of the most desirable plecos in 2007 when I picked up groups of *Hypancistrus zebra* and the undescribed at the time 'leopard frog pleco' or 'L134'. I was only planning on investing in the zebras, but the seller showed me his wild caught L134 and suggested he was willing to part with them. I went home with a group of six, which I hoped would develop into a breeding group.

As is often the case, the group of fish remained in the fish house for the next five years, slowly growing, eating and surviving. They were meeting two of the fundamentals of life – to eat and survive, but not the one I was most interested in – reproduction! In theory, there is no reason why some fish don't breed in captivity – reproduction is a natural instinct necessary to perpetuate their species and given a decent environment it should be next on their list of things to do after a good feed.

As we all know, in practice it's not so simple. They need the correct balance of food and careful conditioning after which the right triggers need to be in place before spawning is on the agenda. Quite what goes on day-to-day in the río Tapajos is beyond my comprehension, but I bet it's more complicated than what goes on in a 30 gallon tank. All I can do is fill a space with water, populate it with some suitably-sized caves and bogwood and try and keep water quality as high and stable as possible. I don't subscribe to the idea that aquarium decor is a critical factor, but the water no doubt is along with the interaction of species in confined aquaria.

After regular water changes I witnessed some unsuccessful trapping as the fish matured plus a couple of fatal interactions between rival males (distinguished by their posterior flanks loaded with odontodes), desperate to establish territories in the limits of the aquarium. However, my patience became strained over time and I decided to offer the group to an aquarist who had an established leopard frog community to give them a chance elsewhere. The obvious female of the group, more rotund with odontode-free flanks, had reached 14cm TL, akin to other medium-large *Peckoltia* species.

What's in a name?

During this time, the species was formally described as *Peckoltia compta* by R. R. Oliveira and colleagues (2010). I don't think too many aquarists disputed their classification in *Peckoltia*, sharing many similarities with other species in the genus. Although morphologically similar, the striking high-contrast pattern of *P. compta* is an obvious difference between this and other *Peckoltia*. Etymologically, *compta* is derived from the Latin 'comptus' meaning ornamented or adorned, and refers to the bold colour pattern.

The common name was coined at an earlier juncture by Julian Dignall, of Planet Catfish fame, who viewed and photographed some of the first specimens to come into the hobby. The fish had already been given an 'L' number after collection and reporting through the aquarium magazine DATZ. Jools's discussions with friends in the US led him to note similarities between *P. compta* and North American leopard frog (*Lithobates pipiens*). It seems the name stuck despite some raised eyebrows!

From the original description (Oliveria *et al.*, 2010): this species is distinguished from all of its congeners by the following characters: a clear stripe inside the dark brown bars running from snout tip to anterior margin of eyes (vs. absence of the clear stripe and a mottled appearance in *P. vittata*, and a mix of vermiculations and spots on the head of the other congeners); except from *P. bachi*, by the presence of small dark brown spots only on fin rays, rarely reaching the inter-radial membranes (vs. dark spots on interradial membranes or dark stripes covering the whole fin or plain); except from *P. bachi* by the interorbital distance, 31.1–32.9 (vs. 51.5–71.0% HL); except from *P. bachi*, *P. braueri*, *P. brevis*, *P. cavatica*, *P. lineola* and *P. vittata* by its larger cleithral width 32.3–34.6 (vs. 20.8–32.4% SL), except from *P. cavatica*, *P. snethlageae* and *P. sabaji* by its smaller head depth 57.8–62.2 (vs. 63.5–87.7% HL).

Spawning triggers

Back to my association with the species, and in November 2015 I came across an on-line post

Fig. 2. Rio Jamanxim at Novo Progresso, Para, Brazil and (inset) namesake of *P. compta*,the Northern leopard frog (*Lithobates pipiens*). Photos reproduced under Creative Commons license (Credits: Guto 1992 and B. Gratwicke 2011 [inset]).

Fig.3. Female (above left) and male (below right) *P. compta*. Photo: M. Walters.

advertising the sale of a large breeding group of *P.compta* by an aquarist not too far from me. The usual frantic decision-making ensued, and I embarked on a 140-mile round trip resulting in a group of 18 adult fish. The owner had enjoyed great breeding success, evident by hundreds of juvenile leopard frog plecos ready for sale. Quite simply he was ready to try something different. Despite cash changing hands, I ended up virtually part-trading with the guy, who a few weeks later picked up my adult pairs of *Panaqolus* sp. L397. Before I left, I had a good opportunity to glean some tips for breeding the species, which were summarised by good food (supplemented by whiteworm and bloodworm) and very regular and large, water changes.

I have had reasonable success breeding *Peckoltia*, and managed to spawn and raise fry from L211, L038 and *P. lujani*. I had high hopes for maintaining this success by following the advice of the former owner and placed the group in a 30 gallon set-up with enough caves for each fish, and plenty of bogwood and flow. After a few weeks, I started a routine of 50% water changes every few days, using warmed rainwater and a couple of weeks later spotted the first youngsters emerging from their caves. I hadn't noticed the actual spawning event but this didn't diminish my joy at seeing lots of little leopard-frog plecos hopping around every corner of the tank.

I decided after a few days to retrieve some of the youngsters and emptied the cave from which they appeared, only to find a second batch of

Fig. 4. Recently hatched and 10-day old fry (above) and 28-day old fry (below). Photo: M. Walters.

recently-hatched young. The eager male had managed to brood a second clutch of eggs before the youngsters from the first clutch had left his care. The young were simple to raise in a floating trap and were ready to be passed on to other aquarists after only 10 weeks. Youngsters that remained in the main tank survived and grew at a similar rate to those that were removed and raised in a dedicated grow-out tank. All of my experiences with *Peckoltia* have shown the males to be excellent brooders, with no need for intervention on my part.

Leopards or Tigers?

One seemingly confusing aspect for those keeping leopard-frog plecos is the reference to different 'types' based on variation in pattern and colouration. Colouration appears to range from yellow with brown stripes/spots to white with black stripes/spots. There is also a 'Rio Jamanxim' (a tributary of the the Rio Tapajos - type locality of *P. compta*) variety which has more spots than typical *P. compta*.

In my experience, the bands and stripes of young leopard-frog plecos gradually break to become spots with age, and discussion of the different varieties becomes increasingly difficult to follow, given that the same fish can be one variety when young but another one when older. However, some leopard-frog plecos have spotty patterns before others from the same clutch. The cynic in me suspects that some unscrupulous exporters might separate spottier individuals and sell them as 'Rio Jamanxim' at a higher price than those with more typical patterns.

Similar to spots vs. stripes, individuals varying in contrast (i.e., brown/yellow vs. black/white) can spring from the same population. The previous owner of my group reported a smaller number of black and white juveniles, which he kept back for further breeding. Selective breeding might help fix this

variation although few breeders in Europe are actively seeking to do this or create exaggerated phenotypes. It is also interesting that individuals of some populations appear to remain smaller than others, my current group comprises adults up to 10cmTL, noticeably smaller than my previous group.

Fig. 5. Chromatic variation observed for *P. compta*. Photos: B. Nichols (top) and M. Walters.

Finally, specimens offered by Pier Aquatics, Wigan UK, in 2013 were exhibited on a dark substrate and showed a striking white/black pattern.

The species is now well established in the hobby and continues to be a very popular 'L number'. Reports have been made recently that it has joined other Brazilian plecos on a list of species banned for export, which increases the responsibility for aquarists to breed this species in captivity to ensure it remains available to other hobbyists.

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Oliveira, R.R. de, J. Zuanon, L. Rapp Py-Daniel and M.S. Rocha, 2010. *Peckoltia compta*, a new species of catfish from the Brazilian Amazon, rio Tapajós basin (Siluriformes: Loricariidae). *Zootaxa* 2534:48-56.

CATFISH STUDY GROUP

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Julian Dignall

Intro to L-numbers

@1230

Mark Walters

Breeding L-numbers

@1430

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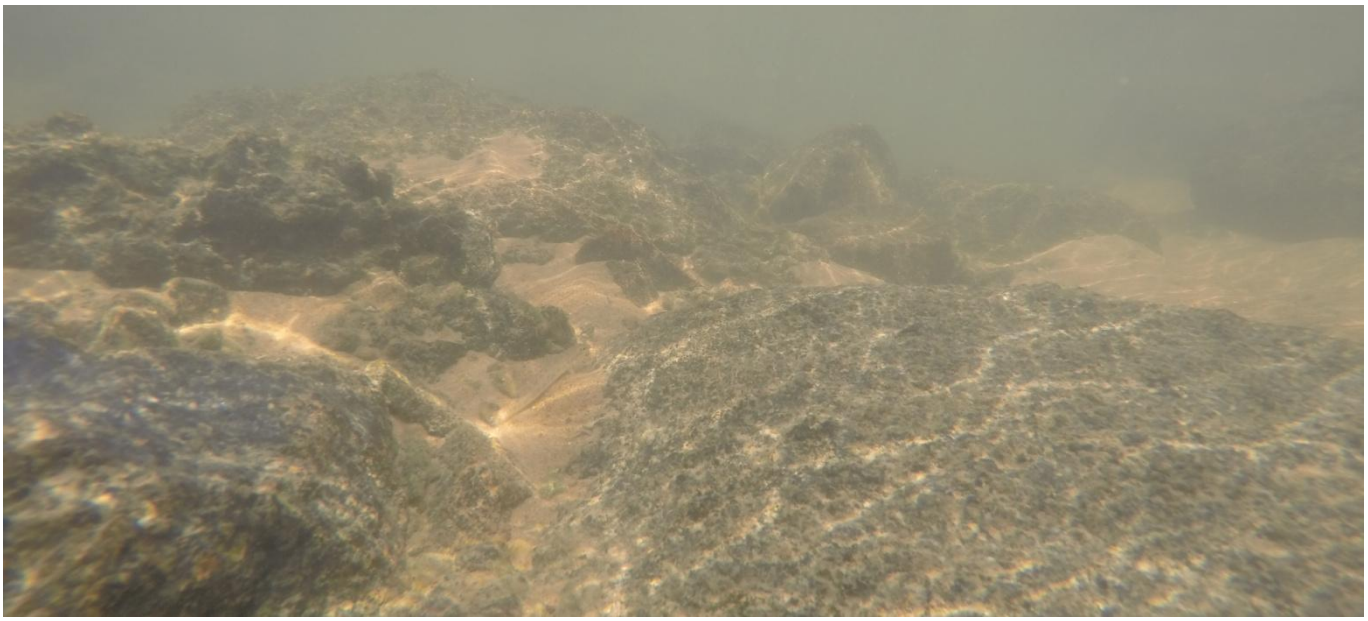
Catfish collecting in the río Xingu

By Julian Dignall



Typical shallow-water habitat in the Xingu; sculptured bedrock containing sand-detritus pockets. Photo: J. Dignall

Some readers may be familiar with the work of Douglas Adams who, before his untimely death in 2001, wrote a series of satirical science-fiction novels which have been made into successful radio and TV programmes, movies and computer games. Adams's delightfully British dark humour can also be found throughout one of his lesser-known books, "Last Chance To See". In essence, it's a travel book but one where Adams along with fellow traveler and naturalist Mark Carwardine, recounts his meetings with several species at the front of the queue heading into the extinct section of the Earth's bestiary. It's a great read: sobering and funny – I highly recommend it.

I have a lot of places I'd like to see on my so-called "bucket list". I must confess that visiting the río Xingu in Brazil was high on mine, not top of the list, but certainly high on the places I'd like to see that don't require hitchhiking across the galaxy. Thus I ended up prioritising the Xingu (pronounced shin goo) in my thoughts because it seemed that, with the construction of a hydroelectric mega dam on the river, that my last chance to see its habitats and fishes in their unadulterated state was rapidly diminishing.

Serious aquarists have been aware of the dam threat facing many of the species we have enjoyed keeping and breeding for a long time. While captive-breeding programmes may help sustain the more attractive and easier to breed species in the hobby, their natural habitats and more obscure compatriots may no longer exist. My motive was a better understanding of the river in order to simulate it in my aquaria but also to document what I could while it still remained.

In 2013, I started a fundraising campaign which ultimately provided technical and camera equipment used by researchers studying the fishes and their watery homes. By working with ornamental fishermen, local scientists have made significant progress understanding the river and how its fishes live and reproduce. Amazing plecos and well over 400 other species have been exported from Altamira since the 1980s. The place has been calling me since then and I finally got my chance to travel there in 2015.

My travel to Brazil was uneventful. On the way out I passed through Amsterdam, São Paulo and then on to Brasilia where I was to overnight. There are only a few flights to Altamira each week, so I wanted to ensure I did not miss mine.

UFPA Fisheries laboratory and research collection (inset). Photo: J. Dignall

I woke up in Brazil with my mind gushing with thoughts of finally seeing the Xingu and my stomach reminding me I hadn't eaten a proper meal for nearly 48 hours. After a few practice runs, I order room service. I enquire if the person on the other end of the line can speak English (*Voce fala engles?)* and the response is a polite… *nao*. I order *café del manhã* which is a simple breakfast and manage *oyto zero tres* for my room number. I end the call with an *obrigado* which is very easy to say if you have a Scottish accent. Indeed, much is around these parts. It was worth the effort, the breakfast that arrived would have fed a family of four. This is not a country with a shortage of natural resources, indeed it has them in abundance.

I fly from Brasilia to Altamira, where the airport is little more than a runway of packed red dirt alongside what looks like a large petrol station. It's tricky to get to Altamira from Europe in a day, my trip took two – for the aquarist it is useful to consider that fish from the river travel first to Belem or Santarem before crossing the Atlantic, and have a considerably longer journey through customs checkpoints before they make it to European importers and your local shop. Consider this when buying them, and don't expect them to immediately do well in a bustling tank unless you know they've been well acclimated to life in captivity.

Beyond the airport, Altamira is a dusty collection of buildings that are either half-finished or half-demolished. The company building the dam is obliged to install infrastructure and sanitation in Altamira, and the mainly dirt roads are made worse by being torn up for sewage pipes. I glimpse the river from the road which amplifies my anticipation. People are happily going about their business as we drive to the university – I am a guest of Professor Leandro Melo de Sousa, a pleco expert and speaker who is well-known to CSG conventioneers. The university grounds have some new single-storey buildings which house Leandro's lab and fish collection. This will be our base for the next few weeks and I unpack.

Off the side of Leandro's office is a large room containing racks filled with jars of preserved fishes, many of which are undescribed. I wonder if it is the largest collection of new ichthyotaxa in the world. It might just be. There is a smaller room where recent collections are processed and studied. Most of the Xingu species are represented here, but I am naturally drawn to the catfishes. We spend time looking at the collection, talking about what we know of the species I recognize. To the aquarist, the sight of so many dead fish in alcohol may seem morbid, but it's a vital part of the scientific process. Biological collections form the foundation of biodiversity research, and without them the understanding and management of natural systems would be impossible.

The research collection and aquarium facility are funded by the Belo monte dam project. It seems incredibly ironic that the recent progress in our knowledge of the fishes of this area has, in part, been paid for by a project that will most likely wipe many of them out.

Before we head to the river, let me give you a little geography. The Xingu is one of the Amazon rivers main right-bank tributaries. It flows north and joins the Amazon main channel a few hundred km from its mouth. Some authors split the Xingu into lower, middle and upper sections according to the location of major rapids and cataracts that pose upstream or downstream limits to boats and fishes alike.

Middle Xingu. (Retrieved and modified from Google Earth).

The upper section is some two thirds of its total length and the lower one sixth. It is a helpful to discuss the middle Xingu when talking about my trip and the fishes commonly exported from Altamira. The downstream end of the middle Xingu is the small town of Vitoria do Xingu and the upstream limit approximately corresponds to its confluence with the lower Iriri. Altamira is at the heart of the middle Xingu and sits upstream of the *Volte Grande* (or big bend). This remarkable hydrographic feature plunges rapidly through a hair-pin bend over a few tens of kilometers, making it an ideal location for a hydroelectric plant. But why this river, what makes this a special place? I can answer that in one word, rocks. You can't go anywhere on the river and not be surrounded by them. And they are as odd as they are abundant. Obsidian laterite containing yellowish orange quartz and brown or black granite intermingle and have likely shaped the evolution of the local fishes. Over the millennia, the highly-seasonal flow of the Xingu has worn and polished the rocks to create a unique and extreme freshwater environment, totally different to any other I've encountered in South America. It's all about fast, warm and crystal-clear water roaring over, under and often through the reef-like rock formations. It is hard to find any aquatic vegetation and the habitat is made up of weathered or sculptured rock from the size of a marble up to the size of a detached house rounded by the ages in very weird ways. We find vertical tubes or bowls formed by a hard rocks spinning in the current and drilling into a softer rock year in, year out. Particularly when the river is low there are islands and rocky outcrops everywhere. They make it hard to visualise the banks of the river, often you think you're looking

Rock formations, sculpturing and cataracts seen in the middle Xingu. Photos: J. Dignall

Cachoeira Grande on the Iriri: view downstream (above), side-channel pool (below left) and exposed cobble detailing the habitat of many plecos (below right). Photos: J. Dignall

at one side of the river only to go there, disembark and then realize you are in one of main braids that comprise the middle Xingu as it splits and reconnects over the desperately hard and dark bedrock of the Brazilian Shield. We finish packing for our first trip - which is to be our furthest upriver to where the Xingu meets the Iriri. It is now night time and we head out to dinner where the food is delicious - especially the fish nuggets (*Cichla* sp.) The others have meat dishes, with fries or beans and a little salad. There are no sauces on any of the meat. We drink bottles of beer served in ice buckets, sitting at a long table on the pavement and the conversation is excellent, light hearted, the stuff of travellers getting to know eachother. We walk back to the university, delighting in the warm tropical air, the sound of crickets. Turning in, I set the alarm for 0630 and my mind drifts off to the Iriri and the fishes we might find there.

I first encountered the Iriri in the Aqualog l-numbers book. It seemed an incredibly exotic place, home to some of the most amazing l-numbers we knew about at the time. As it

happens, I think much of that was a marketing strategy applied by the exporters. It's a long trip from Altamira to the Iriri by boat, so not one frequently made. For the fishermen, making the trip would need to be worthwhile and good fishing spots are only kept that way by being rarely visited – so I could understand it if locality information was less-than accurate at first. A classic example of this is the 1991 scientific description of the zebra pleco. In it, the type locality of the amazing new black and white pleco is given as "about one-hour journey by speedboat downriver" from Altamira. Actually, it was one hour upriver!

My alarm clock gets me up and ready but not much happens while we gather for a couple of hours culminating in a two-minute drive to the dock laden with collecting gear and supplies. We load our things onto two boats and wait a while more. There are *Brycon* and *Geophagus* swimming around the boats. The water is warm and wading in it is pleasant. Finally, we get going. Two boats, the first with several barrels of fuel, tech equipment, four of our party, a fisherman and a river pilot. I travel with my friend Peter Petersen of Blue Planet Aquarium in Denmark and Nate (a fisherman), the cook (who apparently doesn't like cooking) and the pilot. The boats are long and narrow but can sit three abreast. As with most riverboats, they do not sit high in the water. Ours has a 115bhp outboard engine on the back, they can go pretty quickly which is good as we are heading upriver for three or four hours.

The river has so many different islands and areas. Variously we pass rocky outcrops, riffles, sandbanks and light rapids. The rocks are either black or dark brown and often set in light brown sand. Brush grows on some islands, others are barren. The most impressive aspect of travelling upriver is the pilots expertise navigating the channel and avoiding the rocks while dealing with torrential currents. Other sections were shallow and must be passed through slowly to avoid grounding – with the drivers occasionally jumping out to walk the boat through especially shallow sections.

By mid-afternoon we had entered the Iriri and continued travelling as far as possible. The water quickened as we came to the *Cachoeira Grande*. Here, the water tumbles several meters over rocks adorned with river weed (Podostemaceae) moistened by the spray of the crashing water and boasting a beautiful purple flower – it is a beautiful scene. The fishermen set about the fastest current with snorkels and cast nets. As we are here to observe and not to fish ourselves, I go snorkelling in the waters above the cataract. The water here is clear, warm and full of rocks. As you might expect just above a waterfall, the main channel is going at quite a lick. It is deep too, hauling myself over rocks, I can only get 3 metres down because you have to hold on the rocks going down and back up again. Out in the main stream I see *Leporinus* but the current is too strong to reach them. However, many side pools and channels exist with lesser or no current and it is in these that I start

The peppermint pleco, *Spectracanthicus punctatissimus* Photo: J. Dignall

searching in cavities and under rocks for plecos and other catfishes. Within minutes I've seen a lot of different plecos but identifying fishes in the wild as they scoot off into the distance takes a bit of practice. In the middle Xingu it's made even more challenging, even with just plecos, by a high level of biodiversity. We are used to seeing fishes side on in an aquarium while in the stream they're in 3D and their colours and sizes are often different to those we are more accustomed to. All of the plecos encountered are exported as aquarium fishes – so what did we find?

Commonly found anywhere in deep or shallow Xingu waters with light to strong current is *Spectracanthicus punctatissimus*. Commonly sold as the Peppermint pleco due to the unusual blue tinge of their white spots, it's unclear if L016 (which has a taller dorsal fin) L030, a numberless form with no spots on the head and *S. punctatissumus* represent forms of the same species, or distinct species in their own right. Regardless of their systematics, they are all omnivores and very successful fishes in this rocky biotope. Together with the peppermint pleco, we also find *Parancistrus nudiventris* or L031 (also L176, L300 and LDA04). Here in the Iriri, this species is found in arguably its most attractive form with well-placed spots. A widely distributed population containing lots of subtle differences has given rise to several l-numbers being assigned to the different varieties of these species as hobbyists and scientists alike grapple with their diversity and description. In the ever changing waters of the Xingu, this is one heck of a conundrum even for just one species – understanding them all could take a lifetime or two.

Parancistrus differs from *Spectracanthicus* in that the former has larger gill openings and a broader head. *Spectracanthicus* (sometimes referred to as *Oligancistrus* – a genus created in 1989 which following more recent scientific work in 2014 we may now have seen the end of) is more slightly built. Other external features are similar – so use the gill shape when identifying them.

Both of these species are easy to keep. They are omnivores that munch through the thin layer of aufwuchs found on rocks and aquatic invertebrates living on the rocks. In the aquarium they will eat most things and do well when fed a few times a day. Although secretive, their daily routine is to patrol the rocks. An aquarium with a several rounded rocks placed so as to give plenty of nooks and crannies will make them feel at home. Although a warmer temperature is preferred, they are adaptable to slightly lower (to around 77 °F).

Chief amongst the fishes exported only from the Xingu is the gold nugget pleco, *Baryancistrus xanthellus* (L018, L081, L177). They are everywhere; while snorkelling it is common to encounter larger ones of about a foot in length. These armoured and spiny adults do not have much to worry about other than humans seeking a tasty dinner. As an aside, I did eat the local speciality of gold nugget pleco boiled whole in a tasty broth. Texture wise the meat is similar to monkfish and is delicious. In doing so, one inserts a fork or similar about two thirds of the way down the underside of the fish, prise open the armour and the trunk muscle comes out in lovely chunks. Some report it is more of an acquired taste, but I think it's down to the broth and especially the cook – ours was both modest and excellent and I think she enjoyed seeing me munch my way through two whole ones.

Indeed, gold nuggets are perhaps a better food fish than one for the aquarium. They are exported and popular because of their colouration but they are hardcore detritivores. You can see large areas underwater where they have razed the aufwuchs with their wide bands of fine teeth. This isn't algae but a biofilm which is poor in nutrients, so the plecos have to eat constantly to obtain the nutrition they need from an abundant but low-value food source. As they can be found in even just a couple of feet of water, the presence of the adults is suggested by tell-tale mini pyramids of pleco faeces dotted around the place. In the aquarium, smaller specimens will eat most foods but many aquarium foods can be too rich for their incredibly long intestines that are built for bulk processing of biofilm and so they are prone to bloating. Furthermore, to get them to grow well food needs to be more or less always present. This is hard to achieve in closed-system aquaria. Gel based foods are your best bet, but this requires some dedication on the part of the

Baryancistrus xanthellus typical habitat covered with biofilm (upper left), fresh grazing scars (uppercentre), a young individual on clean rock (upper right), subadult (lower left) and adult (lower right). Photos: J. Dignall

aquarist. For the majority, there are many just as attractive or even prettier plecos from the Xingu that are easier to house, grow more readily and can reproduce without much effort.

In the rounded cobble biotope above *Cachoeira Grande* we found *Ancistrus ranunculus*, the Medusa Pleco. This is a remarkable bristlenose with the flattest body and widest head of any *Ancistrus*. Although adult males sport an astonishing array of fleshy head tentacles and, unusually for the genus, the females also have these appendages but to a lesser extent. Scientists theorise this is to mimic newly hatched fry, to make alpha males look like the good fathers they are and so to attract more females to the spawning caves. This fits with observed *Ancistrus* behaviour in the aquarium, although it doesn't quite explain the oddity of the bearded female medusa plecos. I had several "eureka" moments in the Xingu where I understood something more about a fish because I saw how it lived in the wild. The first was finding out why this pleco is so flat. It, and other flat species such as *Hopliancistrus* sp. (L017) and *Pseudancistrus asurini* (L067) live in cracks in rocks. I should explain the cracks. These are not holes or gaps between rocks, these are where one particular type of granite found through the Xingu splits. It is a fissure, you can see this readily above water, below, it forms a specific habitat for many fishes and is where they live during the day free from the attention of hungry predators.

To my eyes, the most attractive species we found in this habitat (and remember there were lots of cichlids, characins, freshwater rays and other catfishes – I am only discussing the plecos found commonly in the biotope and exported) was *Spectracanthicus zuanoni* (L020, L354). L354 is a larger blotched form found in this area of the Xingu, L020 is the more commonly exported form from the waters around Altamira. Its base colouration is olive green, but with large pale spots or blotches which cover more of the body than the base colour. There is a burnt red band in the otherwise obsidian eyes which are relatively large adding to the character of the fish. Intriguingly it shares the unusual green-and-large-spots pattern with a species of *Baryancistrus* (L019) with which it is both found in the wild and can be mixed with in exports. Perhaps this is a "strength in numbers" strategy, but I think it more likely that this patterning offers camouflage to both species that feed during the day in shallow and clear water. The two species do not compete directly for food resources as the smaller *Spectracanthicus* is after insect larvae and meatier morsels with the larger growing *Baryancistrus*, as I've mentioned, spending its time grazing biofilm.

While fishing for rays using cast nets in remarkably fast water, the fishermen collected one of the stand out plecos of the Xingu, *Pseudacanthicus* sp. L025. This cactus pleco is not commonly collected at a small size and specimens from around 12cm up to massive

A selection of the fantastic plecos collected in the Iriri and Xingu. Photos: J. Dignall

45cm behemoths are collected in this fashion from the strongest current. I was amazed to see polka dot stingrays (*Potamotrygon leopoldi*) being fished from the same fast water too. The fishermen explained they live here (not in the open current, but sheltering under rocks) during the day and only head to slower moving waters to feed under the cover of darkness.

In amongst the other larger plecos the fishermen caught L017 and L048. On the face of it, two medium sized (30cm) plecos that are black with light spots. L017 is a species of *Hopliancistrus*. There is only one described species in the genus and that is *Hopliancistrus tricornis* from the Tapajos, and it doesn't have the same heavy spotting as L017. Its specific name refers to three hooked spines found in the gill area of all members of this genus. In an adult fish [such as that pictured] these are formidable defences indeed and something the aquarist and ichthyologist needs to be wary of. If everted while in the net, chances are you will need to destroy the net to avoid injuring the fish. For the pleco veteran, moving such fish by hand can be easier for both parties, but it is an acquired skill and not to be undertaken lightly. L017 is a flatter species than *H. tricornis*, placid as plecos go, omnivorous and relatively easy to keep as long as you adhere to warm water, good water quality and plenty of current. Consider keeping it with some robust tetras that can handle the current such as *Moenkhausia*.

L048 however is a larger, heavier and more imposing species. It is a species of *Scobinancistrus* closely related to *Scobinancistrus pariolispos* (L133) from the Tocantins. We also see L253 from the Xingu which, when younger, has yellow in the fins and when older is more heavily spotted. L048 however is more commonly available at a range of sizes and its high-contrast and well-defined polka dot patterning makes it instantly appealing. Better yet, it is a straightforward pleco to keep because it is a carnivore. In the aquarium it will eat most things offered but smaller fishes (less than 15cm) are most successfully grown on by feeding bloodworm or similar and adults like nothing more than munching their way through prawns or mussels. Such regular treats can be fed in addition to a staple diet of sinking catfish tablets. Again, a high temperature is required and although a strong current isn't mandated, heavy aeration and circulation improve their wellbeing.

One can't mention the plecos of the Xingu without discussing another species of *Scobinancistrus*, the sunshine, goldie pleco *Scobinancistrus aureatus* (L014). It's one of those flagship l-numbers that helped spawn a new tribe of highly dedicated and specialist aquarists. Like other *Scobinancistrus*, this species can grow to a bulky 30cm or a little more but it is when they are smaller that *S. aureatus* shines the brightest. Pictured is a beautifully coloured individual just seconds after it was removed from a fisherman's net.

While the Iriri is a fascinating biotope in its own right and the day I spent there will live in my memory forever, it is just one part of an incredibly complex river.

Having returned from our three-day expedition upstream to the pleco-filled *Cachoeira Grande* with a touch of sunburn, a rash of insect bites and ear-to-ear smiles; a slow morning in Altamira had me considering what other memories awaited as I worked with those already stored in my camera. I had learned that the Xingu had so many facets to it that while I could describe it, the vast scale and seemingly endless variability of the river was a struggle to

Sharp and powerful evertible cheek odontodes of *Hopliancistrus* sp. (left) and *Parancistrus aurantiacus* (right) help defend plecos from predators and rivals alike Photos: J. Dignall

comprehend. Across the channel from Altamira, the Isla do Arapujá was struggling too. Today, this river island was in the final stages of being bulldozed and much of the vegetation already uprooted was ablaze. This effort being carried out to minimise the amount of vegetation that would be submerged when the Pimental diversion dam began operating and creating a large reservoir to feed the turbines at Belo Monte. Submerged vegetation decomposes to produce a lot of methane, but I couldn't help thinking that burning it was not much better. As the flames rose, up to several meters in places, we also lost the habitat of *Plesiolebias altamira*, a killifish endemic to the island. This denuding of islands within the huge range of the proposed dam reservoir is being carried out without any wildlife rescue. This includes the endemic fishes.

This and other instances during the trip left me with mixed emotions; the delight of seeing such a dazzling array of amazing species we've enjoyed for decades as ornamental fish and which have supported local families was soured by witnessing the point of no return. Future generations will not be able to experience this place as I and others before me have because of the irreversible impact of Belo Monte.

Deforestation of Isla do Arapujá in preparation of flooding. Photo: J. Dignall.

In the next installment of this series, we continue downstream to sample some slackwater sites and the unique habitats and fishes of the part of the Xingu that will be most impacted by the dam and its supply reservoir.

Construction of a centralised filtration system.

By Mark Walters

For aquarists with one or two tanks of small-medium sized catfishes, filtration is relatively straightforward and consists of external power filters supplemented by an internal power head or 'wave maker', satisfying most fishy needs.

But for some aquarists, it seems that there are never enough aquaria and there's always room for one more. As the number of tanks increases, separate filters for each becomes a headache and the fun and satisfaction we get out of our hobby is replaced by weekends spent cleaning and repairing filters, and many aquarists with this problem often look for a more convenient solution.

Hamburg-matten filters (HMF) driven by a suitable air supply fit the bill for lower stocking densities of species that appreciate more quiet tanks with low flow, and are an ideal for multiple tanks of Corydoradinae, for example. However, HMF is less than ideal for larger plecos, especially those that eat wood and enjoy more turnbulent flow rates in warm water of exceptionally high quality.

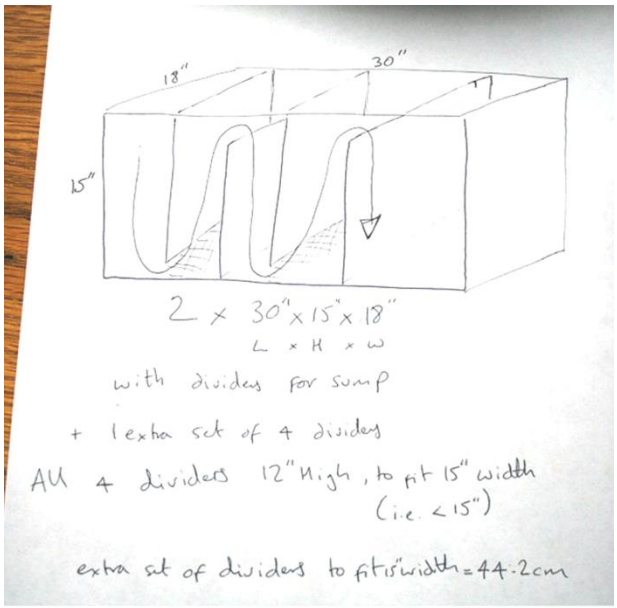
Many fish-house owners take inspiration from marine aquarists that employ dedicated sumps to maintain water quality in mini-reef systems, the advantage being that all the filtration is out of sight, easily maintained, and any additional equipment can be added without disturbing the aquarium and its arrangement. I admit to once dipping a toe into the weird and wonderful world of marine aquaria, and was fascinated by the notion of a sump made out of an an old tank with silicone baffles and a variety of media performing a series of steps in the nitrogen cycle.

Having worked in several aquatic retailers, I noticed how similar systems were also used in pond keeping and it struck me that they could certainly be employed as the main filter of a centralized system of connected tropical freshwater aquaria. These days, centralised filtration is the norm for many aquatic retailers, and amateur aquarists have also honed their plumbing skills to install ingenious systems that process, purify and recirculate water from numerous tanks via a single circulation pump and heater.

My fish house has evolved over the last six years to now comprise of over 30 large aquaria ranging from 100 to 500 litres. This compares to the larger number of smaller tanks I maintained a few years back when Corydoradinae were my main interest. The cory tanks were all maintained separately with air driven sponge filters fed by a high-output airpump. The tanks are split across three sides of the fish house, and have now been connected to form three centralised systems. Each system contains 6–14 aquaria that make up about 1500 l.

The systems

Most of my aquaria were in good condition, so I decided to order three sumps from a local



Sketch of sump flow plan, measurements and completed sump. Photos: M. Walters

manufacturer. Each sump measured 30”x15”x18” (wide) and was divided by four glass baffles that hold the media in place as the water moves through the sump. The baffles were fixed in place with aquarium silicone and after I was happy with the configuration and spacing between compartments, I made sure that there was plenty of capacity in the final compartment (where the pump would be housed) in the event of a power outage or pump failure that would bring about an emptying of the outbound circuit, which can contain a surprising volume of water.

The three sumps are positioned side-by-side on the bottom tier of one of the banks of tanks, with plumbing routed to feed into each. Filter media comprises coarse sponge in the first chamber, followed by lava rock and suspended bio-balls.

The final chamber comprises a heater and circulatory pump which is rated at around 4000l/hr. I currently have three different makes and models of pump (Eheim, Aqua One, Aqua Medic), each of which performs well. The return is via 25mm flexible hose, connected to rigid plumbing pipe and valves to each tanks. Waste is via overflow from each of the drilled aquaria, to 32mm waste pipe, and back to each sump.

Back to the holes I drilled! The larger hole has been plumbed as a simple overflow. I have experienced sumps overflowing if the circulation pump becomes blocked, or power cuts out, which can usually results in a flood. Not a major issue in a fish house but not ideal either. The main issue is the penultimate filtration compartment overtops which can flush out the media.

Equipment and technique for drilling holes in glass aquaria. A standard drill/driver, C-clamps, a diamond-coated glass hole cutter, and plywood jigs to prevent wandering of the cutter. Breakage and cracking of glass adjacent to hole is minimsed by bracing with plywood. It is important to drill at low speeds and with plenty of water to help cool the cutter and glass during cutting. Photos: M. Walters.

Sump with filter media installed and filled with system water. Photo: M. Walters.

I have also started taking advantage of the overflow for lower-maintenance water changing – simply running a hose from my water butt into a tank (to try to trigger breeding) and leaving the overflow to do its job. The second hole was drilled to take a top-up water feed and I have installed cistern devices to each sump to regulate the level of the final compartment – see a previous article I wrote on automatic top up devices.

Lessons Learned

As with all great adventures in DIY, one is always wiser after the fact, and the following things are worth keeping in mind if you try this yourself:

- Cutter diameters are external measurements, but pipe diameters are often internal!
- Buy high-quality pipework – I bought armoured pond pipe from an online retailer and it has sprung a few leaks since!
- Use a larger diameter pipe for your waste water return – remember the water is draining via gravity so tanks can back up and overflow if your drain is too small!
- Don't overstock your tanks too quickly after installing a sump – remember it still has to mature just like any other filter.
- Install a back-up filter. I have added an air-driven foam filter to each tank, in-case the circulation system stops due to pipe blockage or pump failure.
- Don't be scared to have a go. I find as much enjoyment my plumbing endeavours, as I do from the fishkeeping itself. Drilling your first hole in glass is a bit worrying but after a few dozen it's second nature.

Separate sumps for each of three centralised systems. Photo: M. Walters

Catfish implicated in Japanese earthquakes: *Namazu* and *Kashima*

By Danny Blundell

While visiting the Natural History Museum, I came upon this interesting piece of catfish folklore. A Japanese legend tells of how a giant catfish or *Namazu* lives in the earth beneath the islands. There, it is kept in check by the powerful god *Kashima*, who wields a stone or a sword.

Frequent earthquakes in Japan were attributed to the catfish getting free of *Kashima* and thrashing about to disturb the land until exhausted and being brought back under control.

While earthquakes could be devastating, builders and labourers held *Namazu* in high regard as the bringer of renewal and, more importantly, paid work!

The museum exhibited a dried specimen of *Plotosus canius* (inset, main picture) as the type of catfish they believed the legend to be based on. *P. canius* is native to the west Pacific and Indian Ocean. Recently, *P. japonicus* was described from coastal waters of Japan, and it seems likely the legend traces to this species.

Changes in the Brazilian fish export ban and how it affects you

By Daniel Konn-Vetterlein

During the first week of July 2016, rumours began circulating that some very popular loricariids were soon to be added to the so-called "red-list" of Brazilian ornamental fishes carrying an export ban, i.e., *Listas das Espécies da Fauna Brasileira Ameaçadas de Extinção*. Brazilian exporters began informing their customers all over the world about how the new changes would affect their list of species available for sale. The news took most by suprise, and even now some people refuse to believe that species such as *Peckoltia compta* and *Leporacanthicus joselimai* were or could be banned from export although they have been on the red-list for some time.

*Leporacamthicus joselima*i. Photo: D. Konn-Vetterlein.

The export of ornamental fish species from Brazil has been regulated via a positive list (i.e., what species *can* be exported) for years, and first came to the attention of aquarists in 2004 when *Hypancistrus zebra* and later some *Pseudacanthicus* spp. and other *Hypanistrus* were no longer allowed to leave the country due to the perception that their collection for the aquarium fish industry was threatening their populations. The current version of the positive list was issued in 2012 and it still includes all the recently banned species. However, since 2012 the terms of export regulation have changed and a new positive list was generated in December 2014. The restrictions were supposed to activate much sooner, but an ongoing legislative action postponed the date due to the huge impact it woud have had on the ornamental fish industry. The list follows the formalities of the IUCN (International Union for Conservation of Nature and Natural Resources) and can be downloaded on the ICMBio webpage.

It is important to keep in mind that we are not talking about L-numbers here, but species names. The authority that has generated the list (ICMBio) uses scientific names to refer to all populations that have that name applied to them explicitly or as "aff.", which denotes that the fish is similar to the species but is somewhat distinct and may represent a cryptic species, and ignores L-numbers as they are not recognized as valid taxon labels by the International Code of Zoological Nomenclature.

People have asked me if both known populations of L134 were banned; the striped one from Tapajós and the more spotted one from the Jamanxim. Both were banned because they are considered to be forms of the same species (*Peckoltia compta*). Worse still is that *Scobinancistrus pariolispos* was on the list and which is a name applied to L48 and L253 (Xingu), L133 (Tocantins), and L362 and L368 (Tapajós); all but L133 are currently considered aff. *pariolispos*. Since *S. aureatus* (L 14) was banned as well, there were no *Scobinancistrus* left for export for a short while. The same is true for *Baryancistrus niveatus* (L 26), also a fish that is not often traded in comparison to the popular L 142 which is regarded as aff. *niveatus*.

Every species on the red-list is considered threatened. However, massive industrial projects such as the construction of hydroelectric powerplants and the conversion of primary forest to agricultural land pose far more profound and permanent threats to fish stocks than part-time ornamental fish collectors. For quite a while, *H. zebra* was the only well-known loricariid on the list. Unfortunately, being red-listed will offer little protection to *H. zebra* as its unique and delicate habitat is either flooded or drained by the Belo Monte hydroelectric dam.

A species cannot simply be regarded as threatened, studies need to be done in advance

Scobinancistrus pariolispos as currently considered by the red list. L133 (Tocantins) left, L48 (Xingu) centre, and L368 (Tapajos). Photos: D. Konn-Vetterlein.

and based on the results every species becomes assigned to one of seven categories, which are: LC (least concern), NT (near threatened), VU (vulnerable), EN (endangered), CR (critically endangered), EW (extinct in the wild), EX (extinct). All categories are subdivided and depending on the expected population change of the species it is assigned three more cyphers: A–E, 1–4 and a–e.

This is where it gets a little complicated, so let's have a look at the status of *H. zebra*, which is CR-A3c. CR means the species is critically endangered, the A means it is threatened because of an expected population decrease, the 3 defines it a little more and means the decrease will be ≥80% in the next ten years or three generation cycles. Due to the loss of habitat, noted by the c.

Depending on the main category the meaning of a single cypher can change. For example, *Parancistrus nudiventris* had the status VU-A3c, but in this case the 3 doesn't stand for a decline of ≥80%, but of 30%. To get an understanding and a better picture of what this means, it might help to mention that *Ursus maritimus* has the same status of *P. nudiventris*.

Scleromystax lacerdai was also on the red-list. Photo: D. Konn-Vetterlein.

The most threatened species after the list was *Baryancistrus longipinnis* with the status CR-A4c. This is a species that is not in the hobby at all, and little is known about it in general. Personally, I am not convinced *B. longipinnis* and *B. niveatus* are distinct species. Theoretically, every species can be removed from the red-list be made available for export again, but in practice it seems unlikely this will ever take place since habitat destruction is increasing every day and the restoration of a complex and highly integrated environment such as the middle Xingu is near-impossible once destroyed. Although some salmon runs are being restored by dam removal in the United States, these streams are much simpler and species-poor in comparison to large tropical rivers.

Sunshine plecos (*Scobinancistrus aureatus*, L14) were banned for several weeks. Photo: D. Konn-Vetterlein.

The updated Brazilian red-list contained 407 freshwater and marine fish species when it went into effect on 01 July 2016. It listed which 36 loricariids. Shortly afterwards, a meeting took place involving ornamental fish exporters and legislators and the ban was lifted by the courts after having been in effect for only two months (01 July –31 August). The new plan is to create a less extensive list that will take effect in March 2017. Hopefully, this list will protect the threatened species while taking into account the diversity, distribution and health of the various populations or L-numbers that are currently identified as that species or a close relative. A

renewable industry based on a natural resource is important to tens of thousands of Brazilian families that live along the rivers of Brazil, and a supportive government coupled with responsible behaviour by politicians and developers will help secure their future and the catfishes we all love.

List of catfishes that were banned for export from Brazil until recently (invalidated 31 August 2016):

Loricariidae

Ancistrus
- *cryptothalmus*
- *formoso*
- *minutus*

Baryancistrus
- *longipinnis*
- *niveatus* including L 142, loss of habitat of 80% due to the Santa Isabel power plant

Corumbataia
- *britksii*

Delturus
- *parahybae*

Harttia
- *depressa*
- *dissidens*

Hemiancistrus
- *megalopteryx*

Hemipsilichthys
- *gobio*

Hopliancistrus
- *tricornis* including L 17 and L 212: loss of habitat of 50% due to the São Luiz power plant; construction plans rejected 05 August2016

Hypancistrus
- *zebra* loss of habitat of 80% due to the Belo Monte power plant

Isbrueckerichthys
- *saxicola*

Lamontichthys
- *avacanoeiro*
- *parakana*

Leporacanthicus
- *joselimai* decrease of the population by 30–50% in the next 15 years due to the São Luiz power plant

Lithoxus
- *lithoides* including L 256

Loricaria
- *coximensis*

Neoplecostomus
- *botucatu*
- *selenae*

Otothyris
- *juquiae*

Parancistrus
- *nudiventris* decrease of the population by 30% in the next 25 years due to the Belo Monte power plant

Pareirorhaphis
- *mutuca*
- *nasuta*
- *scutula*

Parotocinclus
- *spilurus*

Peckoltia
- *compta* decrease of the population by 50% in the next 15 years due to the São Luiz power plant

Peckoltia (=*Ancistomus*)
- *snethlageae* decrease of the population by 50% in the next 25 years due to the São Luiz power plant

Pogonopoma
- *obscurum*
- *parahybae*

Pseudotocinclus
- *juquiae*
- *tietensis*

Scobinancistrus
- *aureatus* decrease of the population by 30% in the next 35 years due to habitat deterioration
- *pariolispos* including L 48, L 253, L 362 and L 368

Callichthiydae

Scleromystax
- *lacerdai*
- *macropterus*

Doradidae

Hassar
- *shewellkeimi*

Kalyptodoras
- *bahiensis*

Rhynchodoras
- *xingui*

Heptapteridae

Chasmocranus
- *brachynema*

Heptapterus
- *multiradiatus*

Pimelodella
- *kronei*
- *spelaea*

Rhamdia
- *Jequitinhonha*

Rhamdiopsis
- *krugi*

Taunayia
- *bifasciata*

Pimelodidae
Aguarunichthys
tocantinsensis
Bagropsis
reinhardti
Conorhynchos
conirostris
Pimelodus
halisodous
joannis
stewartii
Steindachneridion
amblyurum
doceanum
melanodermatum
parahybae
scriptum

Pseudopimelodidae
Lophiosilurus
alexandri
Microglanis
robustus

Trichomycteridae
Glaphyropoma
spinosum
Ituglanis
bambui
cahyensis
epikarsticus
mambai
passensis
ramiroi
Listrura
camposi
costai
nematopteryx
tetraradiata
Microcambeva
draco
Trichogenes
claviger
Trichomycterus
crassicaudatus
dali
igobi
itacarambiensis
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novalimensis
paolence
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