Journal of the Catfish Study Group

June 2020 Volume 21, Issue 2

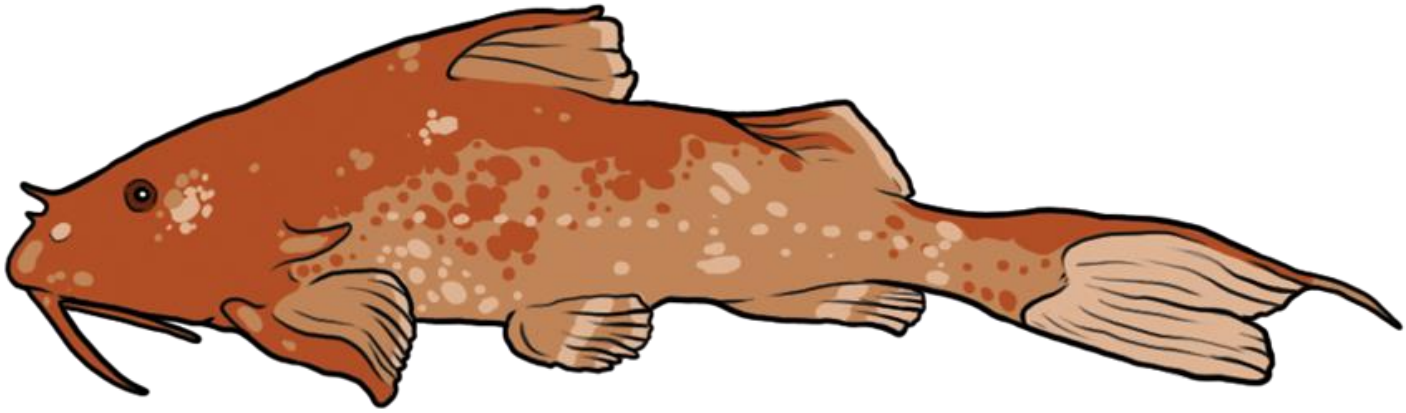
In this edition: Breeding *Scleromystax* sp. CW147, breeding *Parancistrus nudiventris*, breeding *Ameiurus natalis*, new Brazilian export regulations

Contents

Cover image: *Scleromystax sp.* CW147 male. Photo: Rob McLure

---

Convention 2020 logo – *Hara mesembrina* original artwork by Coral Vane Wright, courtesy of Catfishes of the World



- The Journal of the Catfish Study Group (JCSG) is a subscription-based quarterly published by the Catfish Study Group (CSG). The journal is available in print and electronic platforms. Annual subscriptions to JCSG can be ordered and securely paid for through the CSG website (www.catfishstudygroup.org).

- The JCSG relies on the contribution of content from its members and other parties. No fees or honoraria are paid in exchange for content and all proceeds from advertising and subscriptions are used to support CSG events and activities. At the end of the financial year, any remaining funds generated from subscriptions to JCSG are transferred to the CSG Science Fund. The Editor and other CSG personnel involved in the production of the journal do so voluntarily and without payment.

- Please support the CSG by contributing original articles concerning catfishes that might be of general interest to JCSG subscribers. Word processor files (e.g., .doc, .docx) and high-resolution images (at least 300 dpi and 8.5 cms wide) can be sent as email attachments to editor@catfishstudygroup.org. If necessary, the Editor will work with contributors to structure and polish text and format images for inclusion in the journal. The Editor reserves the right to edit submitted text and images to improve flow and comply with the layout and page limits of the journal. Any manuscripts that propose taxonomic or nomenclatural changes will be forwarded to a qualified professional for evaluation.

- None of the text or images contained in the JCSG may be reproduced (in whole or part) in digital or print media without the written permission of the Editor. Text and image copyrights remain with the author and original photographer, respectively. All rights are reserved. The CSG assumes no responsibility for the views or opinions expressed in contributed articles.

- The CSG gratefully acknowledges the generous sponsorship of the CSG by numerous aquatics manufacturers, retailers and private individuals.

If you would like to advertise in JCSG, here are the options we currently offer. All charges include 20% VAT and are used to support CSG events and activities. Please save advertisements as Portable Network Graphics (.png format), at least 300dpi and sized according to the table below. We can also help prepare your advertisement at no extra charge. Please contact editor@catfishstudygroup.org for further information.

Size (page)	*Approximate height × width (cm)*	*Colour*	*Black & White*
Full	26 × 18	£148.00	£50.00
Half	13 × 18	£80.00	£30.00
Quarter	13 × 9	£50.00	£20.00
Eighth	6.5 × 9	£30.00	£12.50
Sixteenth	3.25 × 9	£18.00	£8.00

Chairman's Report - Mark Walters

First of all, I hope you are keeping safe during these unprecedented times. Thoughts are with those friends and families who have been affected with illness or tragic loss associated with the Coronavirus pandemic.

Fishkeeping has provided a welcome distraction in the last 4 months, helping keep people occupied and in touch through social media with a safe hobby we can all carry on enjoying whilst in lockdown. The CSG will continue to support you through the availability of its social media outlet and Journal. The restrictions have seriously impacted businesses across the world, including of course the aquatic retail sector, which although allowed to continue to remain 'open' has suffered with a significant reduction in trade. I urge you to continue to support your local stores so that they can remain supporting us in the future.

On reflection, I realise how fortunate the CSG was to have delivered its annual convention in March, just one week prior to the lockdown in the UK. It was a great event and many have been basking in its success since. Our attention is now towards future events and whether we can deliver meetings in a safe way. We have not committed to any detailed planning for next year's Convention or the usual club meetings in September and November, until announcements are made on our ability to hold meetings of large numbers of people. We will provide as much notice as possible prior to planned events. As current restrictions stand, we are not able to host an Open Show or safely manage our planned CSG auctions maintaining reasonable distancing.

Back to the catfish, and I'm looking forward to reading the latest Journal along with the rest of the club members. Steve Grant has made a great start in his role as Editor, with his first Journal issued in March. Please continue to support the club with articles and other content; Steve will be happy to help with pulling relevant information into a suitable piece. I've been busy in lockdown with my fish house refurbishments, which are starting to bear fruit, with lots of recent fish spawnings including *Corydoras* CW009, *C. parallelus*, *Ancistrus* 'wabenmuster', *Pseudacanthicus* L065 and most exciting for me a first spawning of *Peckoltia* L076 / L099. This is my fifth *Peckoltia* species spawned and the fry are developing really well. I am documenting their development and hope to submit an article to Steve for the next Journal.

For now, keep in touch through our Facebook group, continue to stay safe and enjoy your fishkeeping.

Mark

Editorial

Welcome to my second issue of the Journal as Editor, which contains three catfish breeding articles, an explanation of the new export rules from Brazil, and a scientific discussion from me. I have been promised at least three more breeding articles for the next issue but if you have anything you wish to share, please send them to me.

Steve Grant

Breeding *Scleromystax* sp. CW147
Ian A. M. Fuller

CW147 male in breeding condition

In October 2017 while on a lecture trip to the USA, my good friend and fellow Cory enthusiast Rob McLure had been breeding the undescribed *Scleromystax* species CW147 commonly known as "The dwarf barbatus". Prior to returning back to the UK Rob gave me a group of 6 youngsters. These fish were around 25 mm TL, so I knew it would be a while before they would be large enough to determine their sexes, let alone be mature enough to breed.

The six fish survived the long flight home and were placed into a small well established 45 cm x 20 cm x 20 tank. The tank is fitted out with a full 4 cm thick matten filter at one end, with an extra uplift to create extra water flow. Other furnishings are, a few small beach twigs, one small Amazon sword plant and a few floating pieces of Indian fern. The temperature averages 22 C, other parameters are pH 6.2 and tds 120 ppm.

CW147 tank set up

The six young fish settled into their new surroundings very quickly, and almost straight away they were sifting in the sand looking for food. After letting them settle for a few hours I introduced a small amount of live grindal worm, which was quickly consumed. Like most *Scleromystax* species this species is fairly slow growing and it was another six to eight months before I could fully determine their sexes, in the meantime one specimen had decided to make a dash to the surface in one of the front corners of their tank only to jump straight out and on to the floor, to avoid such things happening again both corners were covered with pieces of sponge.

My feeding regime for the group consisted of a staple diet of Vitalis small catfish pellets and FishScience Corydoras tablets, supplemented with live white worm, grindal worm, and / or finely chopped earth worm.

By July 2019 it was possible to fully sex all five specimens and comprised of three males and two females. After watching their activity, it was obvious that the three males were continually squabbling when within close proximity to each other, but with no real damage resulting from these regular little skirmishes, their priority quickly changing when a small amount of live white worm are added to their tank.

It was while watching the group on one particular occasion, that I observed what I initially thought were the males squabbling, but it was in fact the three males pestering and trying to coax the two females into mating. The two very plump females were obviously carrying eggs, and between their squabbling and jockeying for supremacy, the males were very keen to get the females attention and mate. It was not many minutes before I witnessed a pair in the classic 'T' mating clinch.

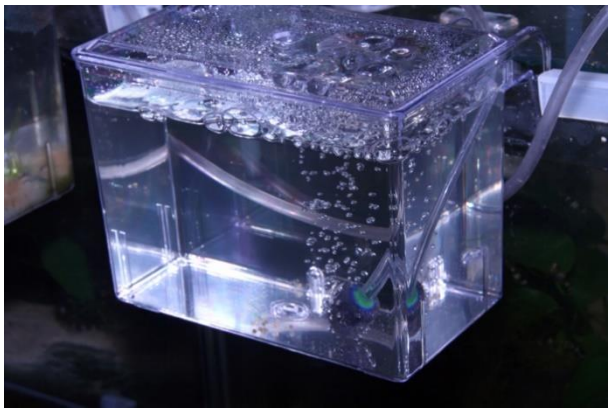
Unlike their larger cousins *S. barbatus* this species takes a lot longer to complete their spawning activity. This group continued spawning throughout the whole day, the two females probably laid in excess of 100 eggs between them, but one thing I did observe was each female spent many minutes making sure her eggs, usually two at a time, were deposited firmly on the glass, often returning to the site where she appeared to be testing the eggs making sure they were firmly attached. Any that were not firmly fixed came adrift and were promptly eaten, so without being able to observe and count every egg laid it was impossible to determine the exact number that were laid. The three males would also spend time passing closely over the eggs as if making certain they were all fertilised, and also mouthing them in the same manner that the females did, but none of the males were seen to eat any of the eggs. Another observation was where while one female was depositing her eggs the other one would be mouthing the others and attempting to steal the eggs that were being laid.

CW147 in 'T' mating clinch

CW147 female depositing eggs

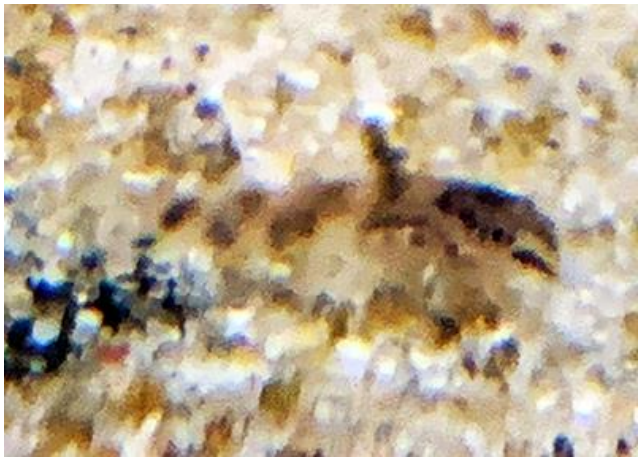
CW147 one female laying and the other mouthing eggs

All the eggs were deposited on the centre of the front glass between 10 and 40 mm down from the surface, right where the return flow from the filters two up lifters strike the front glass. A total of 82 1.2 mm diameter very sticky eggs, were removed from the glass and placed into a hatching container with water from the main tank. The fertility rate varies from one spawn to another, but is averaging out at around 90%, the hatch rate up until the time of writing has not been as good as was hopped for, with usually around a 40% hatch rate. The low hatch rate may have had a lot to do with the initial moving the eggs to the separate hatching container. Like other *Scleromystax* species, CW147 eggs are very sticky and take some effort to remove them from the glass, I use a clean craft knife blade to scrape the eggs of the glass, but this action may be causing damage to the eggs.



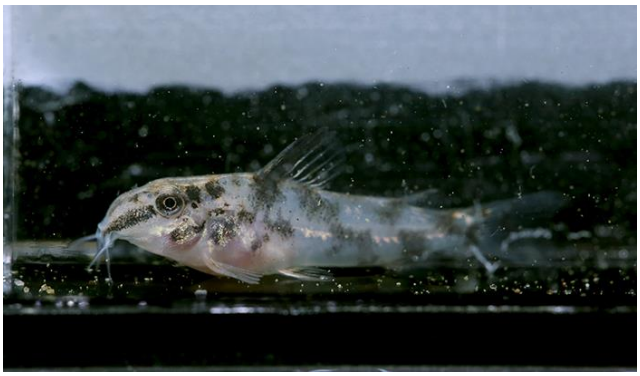
Hang-on egg hatcher

My next plan is to encourage the group to spawn onto a separate piece of glass place in line with the flow from the up lifts, which can then be removed without having to handle the eggs at all.



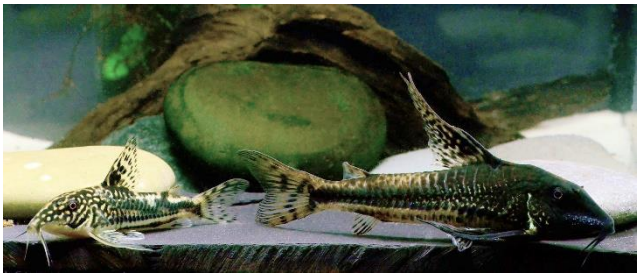
S. sp. CW147 fry at two weeks

S. sp. CW147 fry at one month



S. sp. CW147 fry at two months

S. sp. CW147 adult male. Image by Rob McLure



S. sp. CW147 adult male left, adult *S. barbatus* male right. Image by Rob McLure

My Fish Room – Part 1

Marc Wheeler

As soon as the number of tanks I kept started to increase, I'd been planning a fish room, the ultimate goal was ease of maintenance, with the nice side effect of having more tanks!

The chance came, when we had an extension to our house built, part of that was set aside to become the fish room. The initial goal of the fish room was to house a large tank to keep *Pseudorinelepis* sp. L095. With that in mind, I instructed our builders to pour a concrete floor capable of supporting the weight of multiple fish tanks, and ensure that every inch of the floor, walls, and ceiling were insulated as much as possible.

A key part of the planning involved reading about as many fish room builds as possible, as well as watching many YouTube videos. This allowed me to see a huge variety of designs and also issues people had encountered, so I could try to avoid them.

The Build

I had settled on using air driven filtration for several reasons, just one pump was needed for all the tanks, cutting down on power usage, allowing each tank to be separate avoiding disease transmission, and use mattenfilters to provide a large surface area for filtration.

After much research I settled on a linear piston air pump, I also have a smaller version as backup and full repair kits for each pump.

This is connected to a loop of pressure rated PVC via braided hose, to reduce vibration, with small brass lever valves at appropriate intervals to run regular airline tubing to the tanks.

Pressure rated PVC was used due to thick walls allowing the pipe to be drilled and the thread on the base of the valve to form a good seal. I used Class E (UK) similar to Sch 40 (North America).

The valves are small and easily adjusted, I have fitted far more than I thought I'd need, making it easy to add egg tumblers, additional sponge filters, air stones, etc. as needed.

I do have a bleed valve with muffler if I need to bleed off excess pressure, but I haven't needed to use it, so it remains closed.

The pump is rated to 60 litres per minute of air, and a maximum power consumption of 64 watts. Not bad power usage for the sole filtration of 16 tanks, a small pond, and various air stones in other tanks.

The tanks are all custom made, which turned out to be surprisingly good value, especially as I made the stands myself from 2x4 and 2x6 timber. I played around with a few layouts on paper to fit the tanks in most efficiently, once that was decided things started progressing.

After spending what felt like days travelling between builders merchants in my town searching for straight timber, I could finally start making the stands, I decided to leave the timber untreated and used decking screws for all the joins. With a dehumidifier running I was hopeful that the wood would remain in good shape, I try to avoid water spills and splashes as much as possible, and the wood is still like new almost two years later.

The racks hold either 3 or 4ft long tanks, all 18 inches deep and 12 inches high, with a handful of smaller 18x12x12 tanks for smaller fish or raising fry. In addition, there is the stand for the large tank, which is 8 feet long, 3 feet front to back and 2 feet high.

Once complete ¾ inch plywood is used for the shelves with polystyrene sheets between the tanks and plywood.

Partway through the build, the stands are coming together. Once the large tank was on the stand it gave me room to construct the final racks.

The tank under the stand, is the sump for the big tank, this is the only one which is not filtered using air power. The sump measures 5 feet long, 12 inches front to back and 18 inches high. It's filled with sheets of the same Poret foam used for the mattenfilters in the other tanks, as well as some additional bags of biological media transferred from old canister filters to get the tank up and running.

At this point most of the tanks are in place, the air ring is the top grey pipe, the lower grey pipe is for fresh water to return to the tanks. I'd also blocked up the back window with insulation, that is left in place year-round, the skylight has insulation in place over the winter, but once things warm up I remove it to allow sunlight in and more ventilation if it gets too warm.

Here you can see the small lever valves drilled into the PVC behind the rack, as well as the fresh water return with a valve at each tank, these valves now have a short length of hose attached to make filling tanks easier.

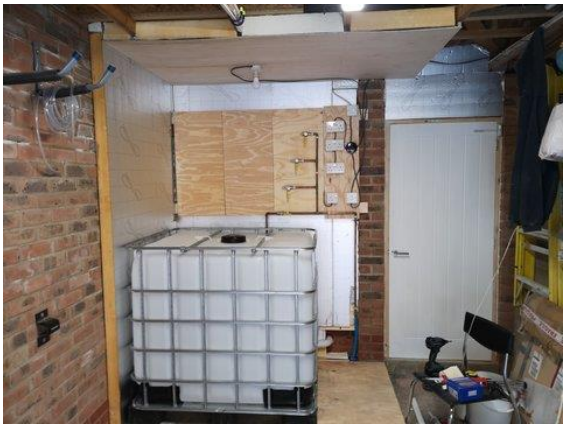
The white pipe around the base of the stands is 2 inch PVC to drain waste water from the tanks when performing a water change.

All connections for both the air and water were solvent welded to avoid leaks, and fixed to the wall at regular intervals. The fresh water pipe heads back through the wall into the garage, where I build an insulated room, for water storage/production.

The fish room is through the door in this picture, I began the construction of my water room by adding some insulation to the floor, as it gets cold in the garage. The blue pipe coming up through the floor is mains cold water used for RO production when we haven't had rain for a while.

All walls and the ceiling are also insulated to make heating the water more efficient before putting it in the tanks.

Here you can also see the IBC which I use to hold and warm water, as well as the additional power sockets and water taps which I added.



The final wall in place being insulated, I did the same for the right side, and also built my own door from 2x4 timber to ensure I could fit enough insulation in it, to keep things warm without wasting too much energy.

See Part 2 in the next issue.

Breeding *Parancistrus nudiventris*

Jacqueline Heijmen Bennett-Leaver **(photo comments by Steve Grant)**

My group of *Parancistrus nudiventris* came into my LFS as wild caught from the Xingu river in Brasil. At first the group was split up and went to two keepers, myself and a fellow aquarist. But a few months later the group was reunited in my fish house.

Tank, parameters & feeding

The fish are kept in a large system which contains 7 tanks and filtered by a central biological filter. I use tap water, no osmoses or rain water. Water changing is done ones a week for 80%. Temperature fluctuates a little, in winter around 28-30 degrees Celsius but in summer it can go up to 34 degrees Celsius on hot summer days. It stimulates a natural seasonal rhythm and works well for me. I never check my parameters but to give you some idea our tap water has a Ph of 7,2 and hardness Kh of 3. In the tanks this often goes down a little. The conductivity lies around 300 microsiemens.

I feed all my fish Repashy, even the smallest fry of every species. For the *Parancistrus nudiventris* I chose a herbivore diet and add just a little carnivore formula into it because my fish are a breeding group and need the protein to produce eggs. But be careful because they bloat easily. For the fry and juveniles, I only chose to feed a herbivore formula. Don't over feed and keep in mind that any rotting food will harm the water quality and will cause problems for their health.

Breeding

It was a group of 9 fish, never been sure about the ratio on males and females because it can be pretty hard to spot the difference. Shortly after they were reunited a pair formed and they started trapping. The first spawns weren't really a success. The eggs are extremely sensitive with thin egg cases which leak easily. Taking the eggs directly is not an option so I let the male keep them until day 4 and then I take the eggs from him. Firstly, because from that day he starts eating them which causes him to bloat. And secondly because from day 4 the eggs are well developed and only need another day before hatching starts.

Development

When the fry hatch they are a little premature. I keep them in a fry ring and add some snails as a cleaning crew. In the first 24 hours the fry grow strong and the next day they look great. There are no issues raising them the first 10 days. Giving them some small slate hideouts and small pieces of wood. When their yolk sack has

dissolved it can get a bit difficult, as I found out that the small juveniles bloat easily. I found the solution in not feeding them after a water change. The fry do not compete well with other species of fry so it's best to keep them separate.

1. Juvenile *Parancistrus nudiventris* starting to colour change on the postemporal-supracleithrum and pectoral fin spine, similar to the pattern of change reported by Grant (2019)

Changing colours, parents and siblings

The adults colour morph frequently. Grant (2020) referred to this as "Chronic Recurrent Colour Change". Some stay mostly yellow, some keep some of their spots and others just stay normal coloured. There is no reason found why some do and others don't change. The same goes for the juveniles. I raise them in two separate tanks. The ones that are in the adult tank have all changed to yellow, the juveniles in the other tank have only just started to morph. I have noticed that the individuals that have changed colour also have no pigment in the eyes. They are a little different in behaviour, in that they are not as scared. When I caught the morphed juveniles out of the tank for their photo session, I could just pick them up with my hands. Yes, they tried to escape but they didn't notice my hand was going to catch them. This makes me believe that they are, at least partially, blind. The normal coloured juveniles are much faster and not easy to catch by hand. The colour morphed juveniles are also very slow growing. The morphed ones are now one year old, measuring about 4-6cm. While the normal coloured ones are 5-6cm but almost half the age. The ability to feed better and visibility could be a reason for the normal coloured fry to grow faster. The colour morphed ones would probably not survive long in the wild. The observation that they appear blind or, at least partially blind, lends weight to the conclusion by Grant (2019) that the colour change is probably a defect rather than an adaptive reaction.

2. Another juvenile *Parancistrus nudiventris* colour changing, including the eye. Note the clear patch on and around the postemporal-supracleithrum, and on the pectoral fin spine, similar to the pattern of change reported by Grant (2019)

3. The same specimen in fig. 2. Note the clear patch on the frontals and the parieto-supraoccipital, similar to the pattern of change reported by Grant (2019)

Reference

Grant, S., 2019.

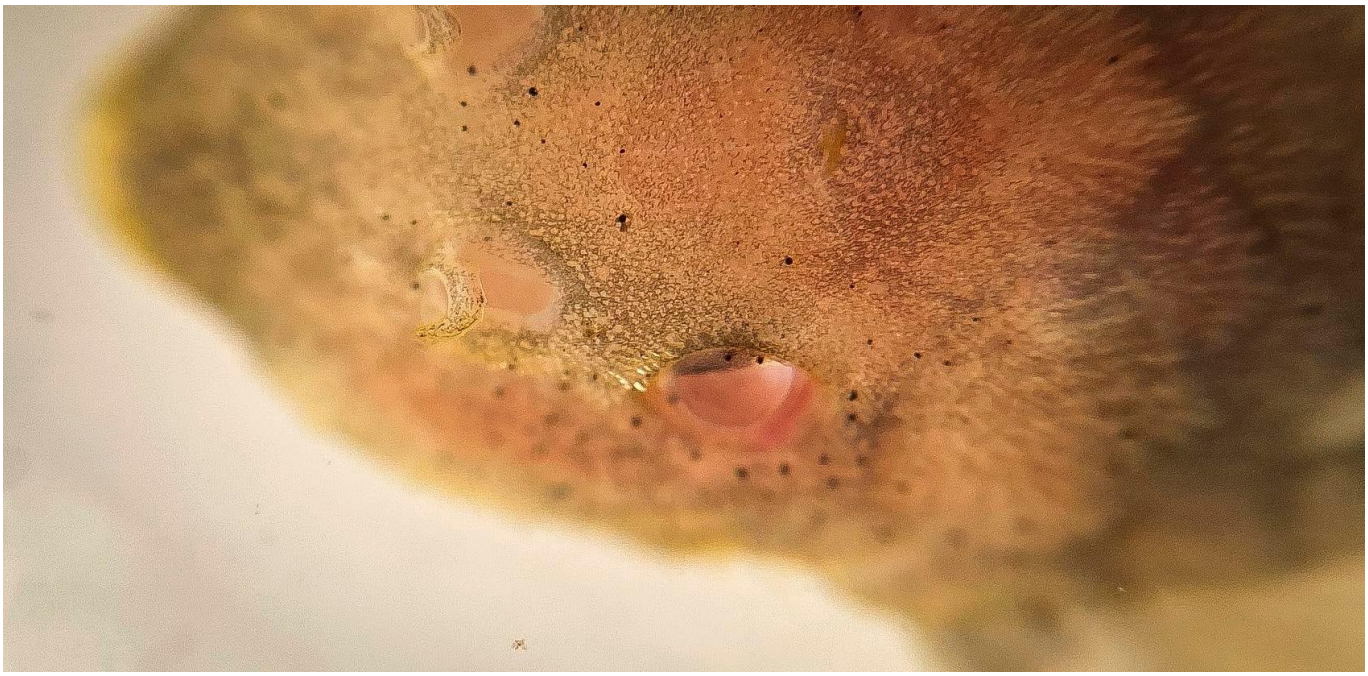
Chronic Recurrent Colour Change in Hypostominae (Loricariidae).

Journal of the Catfish Study Group, Vol 20, Issue 2, June 2019, pp 11-20.

4. Another specimen going through colour change. Note the almost fully morphed head including the eye, and the pectoral fin spine. Also note the bluish colouration of the markings that would normally be white (and much smaller).

5. The same specimen in fig. 4

6. The same specimen in figs. 4 and 5.



7. Dorsal view close-up of the colourless eye of the specimen in figs. 4-6.

Brazil's new export regulations for fish: the negative list

Fabian Deuschle

Until recently, it was the case for Brazil that only fish that were on the positive list of the fisheries authority IBAMA were allowed to be legally exported. That has now been changed fundamentally.

On the 17th of April 2020 the Brazilian Secretariat of Aquaculture and Fisheries published in the official journal of the federal government of Brazil (Diário Oficial da União) its Normative Instruction (Instrução Normativa) No 10 which came into effect 1st May 2020.

It stipulates that from now on fishing, transport and trade of all living specimen of all types of fish are basically permitted in Brazil. Excepted from this rule are species fall in one of the following categories (unless they have a specific permission):

- Species that are on the official list of endangered species.
- Species listed in the CITES appendices.
- Species which have specific characteristics that require planning measures with regard to its use.

- Specimens caught off oceanic islands or in estuaries.

To find out what influence these exceptions have on the export of fish from Brazil, it is worth taking a look at Brazil's red list. This list fills a 1232 pages long book, called Livro Vermelho da Fauna Brasileira Ameaçada de Extinção, which is published by the Chico Mendes Institute for Biodiversity Conservation (ICMBio). It lists the following endangered catfish species:

Genidens barbus, G. planifrons, Potamarius grandoculis, Sciades parkeri, Hassar shewellkeimi, Kalyptodoras bahiensis, Rhynchodoras xingui, Aguarunichthys tocantinsensis, Bagropsis reinhardti, Conorhynchos conirostris, Pimelodus

halisodous, P. joannis, P. stewartii, Steindachneridion amblyurum, S. doceanum, S. melanodermatum, S. parahybae, S. scriptum, Lophiosilurus alexandri, Microglanis robustus, Chasmocranus brachynemus, Heptapterus multiradiatus, Pimelodella kronei, P. spelaea, Rhamdia Jequitinhonha, Rhamdiopsis krugi, Taunayia bifasciata, Glaphyropoma spinosum, Ituglanis bambui, I. cahyensis, I. epikarsticus, I. mambai, I. passensis, I. ramiroi, Listrura camposae, L. costai, L. nematopteryx, L. tetraradiata, Microcambeva draco, Trichogenes claviger, Trichomycterus crassicaudatus, T. dali, T. igobi, T. itacarambiensis, T. mboycy, T. novalimensis, T. paolence, T. papilliferus, T. paquequerensis, T. rubbioli, T. santaeritae, T. triguttatus, T. tropeiro, Corydoras (Scleromystax) lacerdai, Scleromystax macropterus, Ancistrus cryptophthalmus, A. formoso, A. minutus, Baryancistrus longipinnis, B. niveatus, Corumbataia britskii, Delturus parahybae, Harttia depressa, H. dissidens, Hemiancistrus megalopteryx, Hemipsilichthys gobio, Hopliancistrus tricornis, Hypancistrus zebra, Isbrueckerichthys saxicola, Lamontichthys avacanoeiro, L. parakana, Leporacanthicus joselimai, Lithoxus lithoides, Loricaria coximensis, Microlepidogaster perforatus, Neoplecostomus botucatu, N. selenae, Otothyris juquiae, Parancistrus nudiventris, Pareiorhaphis mutuca, P. nasuta, P. scutula, Parotocinclus spilurus, Peckoltia compta, P. (Ancistomus) snethlageae, Pogonopoma obscurum, P. parahybae, Pseudotocinclus juquiae, P. tietensis, Scobinancistrus aureatus, S. pariolispos

Those who have taken the trouble to read this long list in its entirety will have seen species known in aquarist circles such as *Lophiosilurus alexandri, Corydoras (Scleromystax) lacerdai, Scleromystax macropterus, Peckoltia compta* and *Scobinancistrus aureatus*.

If you are now worried that you will not be able to get the L-numbers "L 14", "L 48", "L 134", "L 141", "L 264", which are widely distributed in the hobby, you can breathe a sigh of relief. The following plecos from the Rio Xingu and Rio Tapajos named in ordinance (Portaria) No. 10 are excepted to this rule:

Leporacanthicus joselimai, Parancistrus nudiventris, Peckoltia compta, Peckoltia (Ancistomus) snethlageae, Scobinancistrus aureatus and *Scobinancistrus pariolispos*.

This means that since 1st May 2020 all species whose trade is not explicitly prohibited may be legally exported. So hopefully we can look forward to some new or so far rarely imported species from Brazil in the next months and years.

Parotocinclus jumbo will again be legally exported from now on.

Species like *Scobinancistrus aureatus*, *Leporacanthicus joselimai* and *Parancistrus nudiventris* will still be legally exported from Brazil, even if they are endangered species.

References

2020 Secretaria de aquicultura es pesca: Instrução Normativa Nº 10. Diário Oficial da União, 158 (75):5. (Online: http://pesquisa.in.gov.br/imprensa/jsp/visualiza/index.jsp?data=20/04/2020&jornal=515&pagina=5&totalArquivos=223).

2018 ICMBio: Livro Vermelho da Fauna Brasileira Ameaçada de Extinção. Volume VI - Peixes. Brasilia: ICMBio.

2018 Ministério do Meio Ambiente: Portaria Nº 130, Diário Oficial da União, 156 (82):108. (Online: http://pesquisa.in.gov.br/imprensa/jsp/visualiza/index.jsp?data=30/04/2018&jornal=515&pagina=108&totalArquivos=210).

PlanetCatfish

FishScience

Unique Formula with Insect meal

FishScience Catfish Foods

Recreates the natural insect based diet that most tropical fish would eat in the wild

Mini Algae Wafers contain essential roughage to allow effective digestion

Environmentally friendly and sustainable

Naturally enhances the colour of your fish using Spirulina algae, paprika and krill.

Contains garlic to support a healthy immune system

... and the fish really like it!

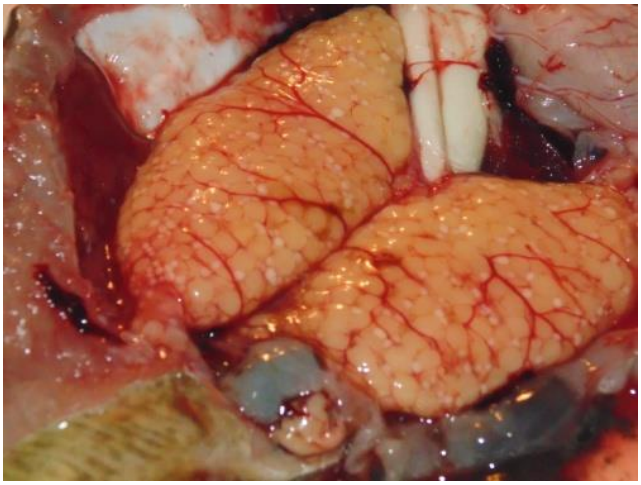
www.fishscience.co.uk

Spawning *Ameiurus natalis* (Lesueur, 1819)
James E. Burgess SSG (Ret), Citizen Ichthyologist

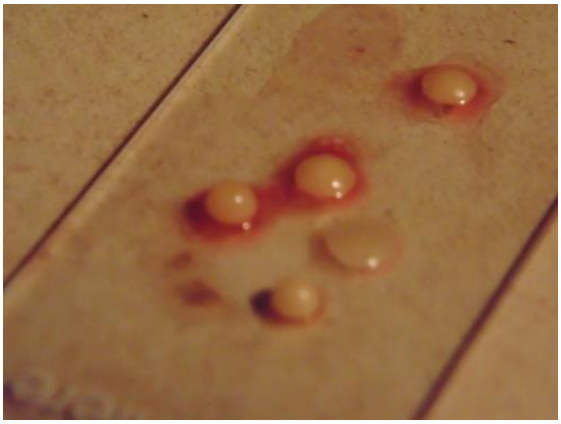
Introduction

I have always wanted to be able to boast to others that I spawned something other than Platys, Swordtails, or Guppies, but had never been able to. I never really had the separate tanks or the right conditions to even chance it, but the times were not right either. My envy for those aquarists that could spawn their fish on cue it seemed was making me green. Last year (2019) changed my life and my perspective on spawning. I was able to witness, not the actual courtship and spawning, but rather the afterwards of it. And so, with that; I will begin my tale.

Throughout my many years of keeping and studying fish; I had always wanted to become one of the elites by spawning *Ameiurus natalis*. For those many years; I was always disappointed with my efforts. I would have several adult specimens that would become ripe with roe, but that is about as far as it went. The adults were ripe and a couple of times looked like nesting was beginning, but did not have the follow through.



Roe of dissected *Ameiurus natalis*



Individual unfertilised eggs on microscope slide

I only wish that I could take credit for the final step that produced favourable results but I was just a facilitator.

There is a significant amount of literature depicting how *Ameiurus natalis* spawns, the hatching of the eggs, and even the fry growing, but only a single small book had anything leading up to the act. The Hobbyist Guide to Catfish and Loaches by Dr. Loiselle and Dr. Pool gave the one piece of information that I had been missing from the spawning equation. On page 57 of that text talking about the North American Catfishes; Drs. Loiselle & Pool state that:

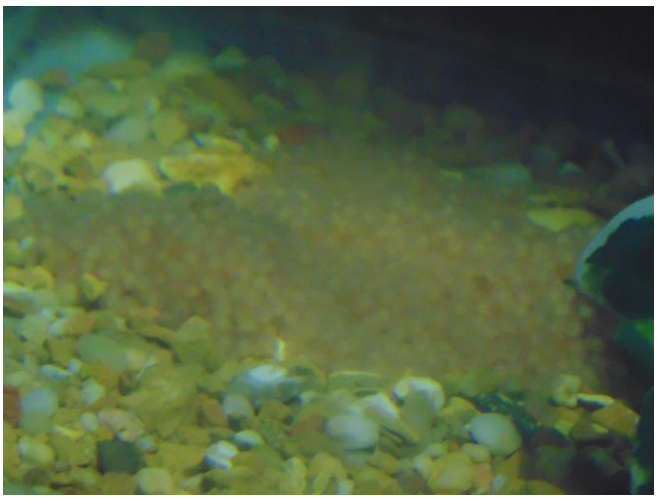
"Although they will survive without a winter resting period, ictalurids are unlikely to experiences normal gonadal development unless exposure to water temperatures below 10*C (c. 50*F) for a few months each year. Ictalurid catfishes spawn in the spring. A period of exposure to lower water temperature appears to be a prerequisite of normal reproductive activity to these catfish."

Well with that information in my toolbox; arrangements were made with a friend of mine to place a few adult *A. natalis* in his pond over the winter. They were released and swam off to the deep dark crevices of the pond never to be seen again. I am not sure what happened them, but after setting out traps; the adults or any fry were never caught.

During the spring of 2019; my wife and I decided to do some fishing at the local waterway known as Drake's Creek. It is one of my favourite fishing spots especially at night to collect *Ameiurus natalis* specimens by hook and line. This one night each one of us landed a single *A. natalis* specimen. Naturally; they were brought home and placed in a quarantine tank. Within a few days of capture; these specimens were observed in the process of scooping out what appeared to be a nesting site.

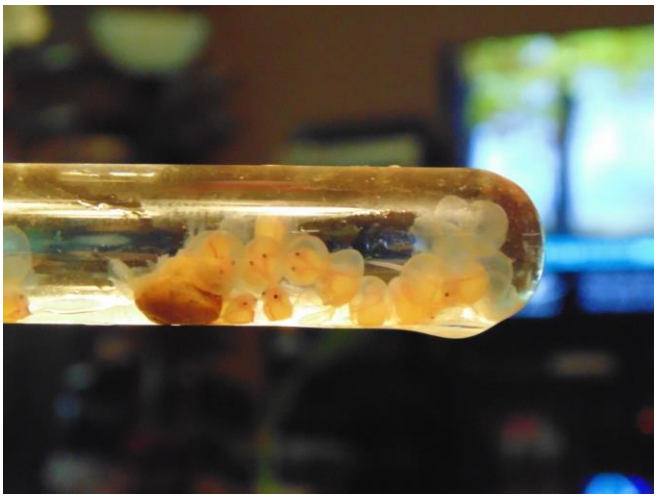
Now at this point with my disappointed experience at spawning; I did not hold out for much positive results at this time. I did wrap a solid red plastic tablecloth around the tank and installed an aquarium heater. Even though there had been disappointments in the past; I am forever the optimist. I figured that it couldn't hurt. I raised the temperature of the tank to 80*F and then left on a collection trip to southern Georgia.

With my trip complete; came back home late on the 24th of May. On the 25th of May; I checked on the two specimens. I was elated to discover a very nice cluster of yellowish eggs resting nicely on the bottom of the tank being guarded by the male. To add to my excitement was the fact that no spawning catalyst was used. The spawning was completely unassisted and natural. Not knowing how viable the eggs were; I took a small sample to view under the microscope.



Cluster of eggs from *Ameiurus natalis*

The best experience of my life came as I was looking at the sample of eggs. They actually were hatching as I was looking at them. It was so amazing to witness these tiny, egg yolk sac living beings coming to life right before my eyes. I took one of those tiny packages and placed it on a microscope slide to further investigate how they develop.



Sample of eggs and larvae in test tube

Hatching eggs in petri dish

Now the kicker to this whole experience was when Dr. Jonathan Baskin sent me a message on ResearchGate. He asked me if I would provide Dr. John Lundberg and himself specimens from my spawning to use in their research. At first, I was under the impression that he meant the message to go to someone else as I had never had a successful spawning before, but I replied affirmatively. This started a series of samples being taken, put in preservative, and shipped off to the American Museum of Natural History in New York City.

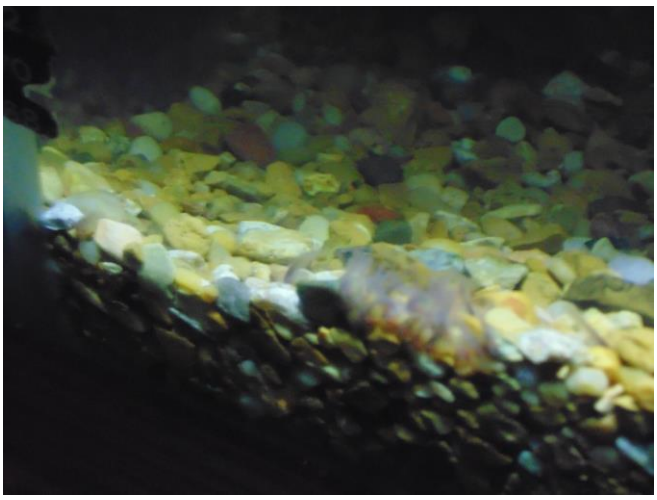
Preserved fry about to be sent to Dr. J. Baskin at AMNH

The eggs were hatching and the fry were swimming around, and every few days I would take another sample of a few specimens. I would add another specimen to the microscope slide. As I am looking at these fantastically small beasts; I am constantly amazed at how they develop. I took a video of one such time of when a specimen was being viewed under the microscope alive and breathing.

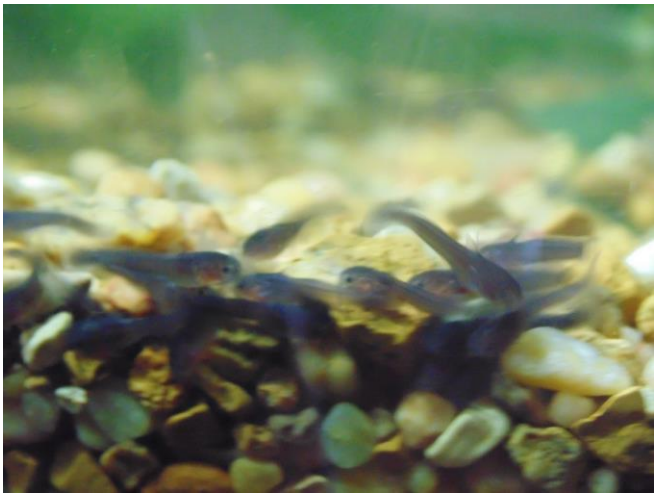
The first couple of samples that were sent off to the AMNH were no good. I either did not keep them in the preservative as long as I needed to, or did not package them for shipment like they should of. Either way; Dr. Baskin finally got a few shipments of viable specimens that they could use in their research.

To investigate the notion that the male is relentless in his duty of guarding the fry; I placed a juvenile specimen *Ameiurus natalis* into the spawning tank. The male immediately set forth a fury chasing the juvenile away from his babies. Almost as soon as he started the onslaught; I recognized that the juvenile had better come out to live. So, the stories of the male guarding the nest and fry is so very true. He was like an angry dad going after someone that was trying to hurt his kids. It was amazing to watch the performance.

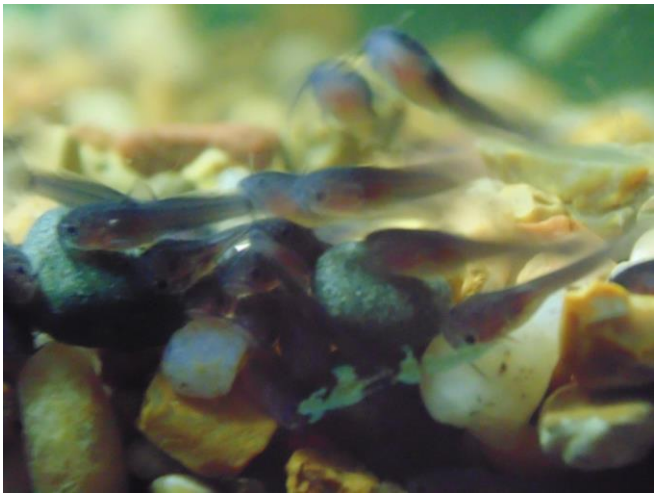
As the fry were developing and after the yolk sac had been absorbed; the question of what to feed them was next. I purchased some shrimp pellets and added a few to the tank knowing that the pellets would come apart and be small enough for their tiny mouths to partake in. The *Ameiurus natalis* fry mimicked their parents in their feeding habits. They ate with their mouths down, tails up, and foraging while shaking their bodies side to side.



Fry eating in the tank



Closeups of fry in the tank after the yolk sac was absorbed



Closeups of fry in the tank after the yolk sac was absorbed

Slowly; the amount of fry started dwindling. A couple of explanations arose. One was that the male had gotten a little hungry in between eating the minnows that were provided. The other was the small samples that I sent away, but it had to be that the father was a cannibal.

The total downsizing took place when I had placed the remaining fry into a breeding net and attached it to the inside of the 75-gallon tank. I had gone back to Georgia on another collection trip, but when I came back; the water from the tank had evaporated and the breeder net had dried up specimens in it. I was definitely a sad day, but lessons were learned for the next time.

Another try at spawning is underway at the time of this writing with high hopes of positive results. Maybe more babies to look at and admire on their growth and development.

For access to the videos that were mentioned in the article please email James Burgess at catfishresinst@gmail.com and I would be glad to make them available.

All photos are by the author.

Reference

Loiselle, P. V. & D. Pool, 1993.

Hobbyist Guide to Catfish and Loaches, Tetra, 144 pp.

Probable rediscovery of the holotype of *Rhinobagrus dumerili* Bleeker, 1864; and comments on the identity, familial placement and validity of *Tachysurus sinensis* Lacepède, 1803

Steve Grant

Image by Zhou Hang

Introduction

Tachysurus dumerili (Bleeker, 1864), (Chinese Longsnout or Bullhead Catfish) and previously referred to as *Leiocassis longirostris* Günther, 1864 or *Pseudobagrus* longirostris (Günther, 1864), is a rare species in the wild and the hobby. As it gets to large sizes (over 76cm and 2kg) and is reported to taste very good, it is used as a food fish. It is considered as a delicacy in China. Yang Shen of the Ming dynasty (1368-1644) once referred to it as "sheep in water" to praise its delicious taste, and one of the major poets of the Song Dynasty (960-1127), once wrote a poem celebrating the fish.

Unfortunately, this led to its extinction in the Korean Peninsula and wild populations in China being rare (also due to pollution). Farming of specimens from China has also meant that it is once again present in Korea, and has also been showing up in some aquarium settings. However, a problem familiar to aquarists has also occurred due to farming this fish: hybridisation. It is being hybridised with *T. vachellii* (Richardson, 1846) and also with *T. fulvidraco* (Richardson, 1846) to produce hybrid vigour. This is because during the breeding process, *T. dumerili* is highly susceptible to bacterial haemorrhagic septicaemia, which can cause great economic loss for farmers.

1. Young Chinese Longsnout Catfish. Image by Jong Hoon Kim

2. Farmed adult Chinese Longsnout Catfish. Image by Jong Hoon Kim

The nomenclature of this species and the genus to which it currently belongs is probably even more fraught with problems. In this article the probable rediscovery of the holotype of *T. dumerili* and a discussion on the usage of *Tachysurus* is provided.

Nomenclatural history

From 1864 until 2013, *Leiocassis longirostris* Günther, 1864 or *Pseudobagrus longirostris* (Günther, 1864) was the name usually (but not always, see below) given to the long-snouted catfish from China and the Korean Peninsula.

The name completely changed when Kottelat (2013) followed earlier authors who had found that a purported synonym of Günther's species: *Rhinobagrus dumerili* Bleeker, 1864 had been described two months earlier than Günther's species, making *dumerili* the valid species name. To make the situation even more complicated, Ng & Kottelat (2007) decided that the type species of *Tachysurus* Lacepède, 1803 (=*Tachysurus sinensis* Lacepède, 1803) was not a member of the Ariidae (Sea Catfishes) as had been a prevailing view for many years, but a member of the Bagridae, and represented a species similar to the Tawny Dragon, *Pelteobagrus fulvidraco* (Richardson, 1846). Ng & Kottelat (2007; 2008) designated a neotype for *Tachysurus sinensis*. The effect of the neotype designation is the name for all *Pelteobagrus* and *Pseudobagrus* species is now *Tachysurus*. This is discussed further on in this paper.

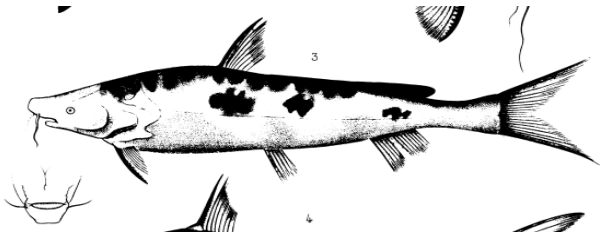
***Rhinobagrus dumerili* Bleeker, 1864**

Bleeker described this species from one specimen 321mm TL among the MNHN specimens reported from China by Mr Simon. André Marie Constant Duméril of the Natural History museum in Paris had asked Bleeker to identify the Simon specimens. He used the 321mm specimen to describe his new species, and named it after Duméril. Ferraris (2007) could not list the location of the holotype. The author checked the database of the MNHN collection-Paris and found three lots of single specimens of bagrids donated by Simon in 1864, from China. Whilst the author could not physically examine the specimens, photographs and measurements of each one were provided by Philippe Keith, Jonathan Pfliger of MNHN and facilitated by James Maclaine of BMNH. MNHN IC 0000 2071 and MNHN IC 0000 2707 are clearly conspecific with *L. longirostris* Günther, 1864 but are too large to match Bleeker's holotype. MNHN IC 0000 2051 is said to measure 309mm TL. Whilst this is 12mm short of Bleeker's measurement for his holotype, the upper caudal lobe of MNHN IC 0000 2051 is bent over and has some damage, which possibly accounts for the difference. The description in Latin by Bleeker of the merisitics and morphometics of the holotype seem to match MNHN IC 0000 2051, although it is difficult to be completely certain having not physically examined the specimen. On the basis of the collector, date, locality details, information in the description about the holotype but also that it came from the MNHN, the author considers that MNHN IC 0000 2051 is probably the holotype of *Rhinobagrus dumerili* Bleeker, 1864. A comparison with the holotype of *L. longirostris* (BMNH 1862.11.1.1) confirms they are conspecific and the author follows Kottelat and earlier authors in *R. dumerili* being the senior synonym and valid species name.

3. MNHN IC 0000 2051 - probable holotype of *Rhinobagrus dumerili* Bleeker, 1864. Image by MNHN collection-Paris

Wu (1930) and Uchida (1939) used the species name *dumerili* rather than *longirostris* so perhaps they were aware of it being the senior synonym, but from at least Wu *et al.* (1963) *longirostris* was the prevailing usage until Lee & Kim (1990) stated that Bleeker's description predated Günther's.

The author considers *Adelopeltis angusticeps* Dabry de Thiersant, 1872, which was described from the "Yang-tsee-kiang" (Yangtze River, China), to be a junior synonym of *R. dumerili*. The drawing of the holotype and the description matches *R. dumerili*, which can exhibit pale and dark patches (and in some cases turn completely white due to leucism).



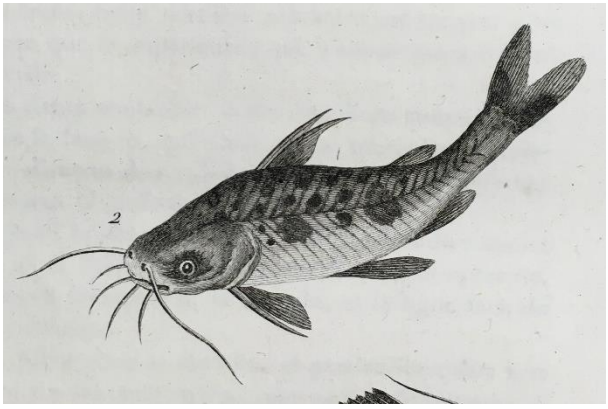
4. Original drawing of *Adelopeltis angusticeps* from Dabry de Thiersant (1872)

5. A pale adult Chinese Longsnout catfish. Image by Zhou Hang

A. angusticeps colour was described as "colour of the back dark green, grey flanks with green plates, symmetrically following the lateral line, silver belly, grey fins". It was also described as a tasty fish. MNHN-IC-0000-5935 is possibly the holotype as it was collected by Dabry de Thiersant in 1869 from "yang tse k., Chine". The genus *Adelopeltis* Dabry de Thiersant, 1872 is a junior synonym of *Tachysurus* (based on the neotype of its alleged congener, *T. sinensis*, but see below).

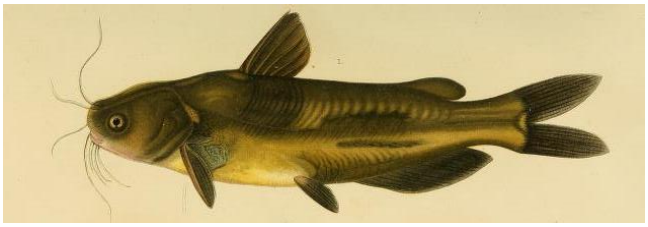
Tachysurus Lacepède, 1803 and *Tachysurus sinensis* Lacepède, 1803 (and its unneeded replacement name *Pimelodus tachisurus* Valenciennes, 1840)

Ng & Kottelat (2007 and 2010) summarise the history of the description and subsequent usage of this genus and species. As no holotype for the species was preserved (it was described from a painting) and the written description is therefore sparse, it has not been possible to say what this species and therefore genus definitely represents. It had predominantly been considered to be a member of the Ariidae, but a smaller number of authors stated that it appeared to represent a member of the Bagridae.



6. Original reproduction in Lacepède (1803) of an earlier painting, used to described *Tachysurus sinensis*

As discussed above, the neotype designation using a specimen similar to *P. fulvidraco* (Richardson 1846) (and possibly representing *Silurus calvarius* Basilewsky, 1855 and *Pseudobagrus wittenburgii* Popta, 1911) was intended to settle this issue.



7. *Silurus calvarius* Basilewsky, 1855, which may be the same species as the specimen chosen by Ng & Kottelat as the neotype of *Tachysurus sinensis*.

This change of name for most of the bagrid catfishes of China, Japan, Taiwan, Korea, Vietnam and Russia has not been accepted by some authors e.g. López et al. (2008), Zhang et al. (2019). The latter despite the ICZN (Opinion 2274, 2011, Case 3455) ruling not to suppress the names. The thrust of the application to suppress the genus *Tachysurus* and species *T. sinensis* by López et al. (2008) was that the use of the name *Tachysurus* in reference to Southeast Asian freshwater bagrid catfishes then referred to *Pseudobagrus* would create significant confusion in the literature. This request was refused by the commission in 2011. The continued usage of *Pseudobagrus* by some authors would suggest the issue has not gone away. The neotype designation has moved a problematic issue from Ariidae, albeit where the nomenclature and usage were stable, into Bagridae and caused instability in a group of fishes from a large geographical area which generally had stable usage.

Perhaps, the application by López et al. (2008) or anyone else still of that opinion should have been based on the contention that *T. sinensis* is not a bagrid; that the qualifying condition in ICZN article 75.3.5 that evidence that the neotype is consistent with what is known of the former name-bearing type from the original description was not correct or adequate? An alternative is to reject the neotype designation as invalid on those grounds and designate another, as is the case (but for different reasons) in Angrizani & Malabarba (2020) for *Rhamdia quelen* (Quoy & Gaimard, 1824).

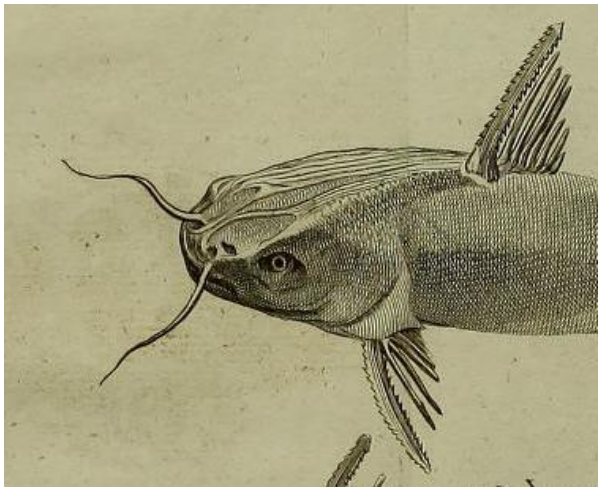
Wheeler & Baddokwaya (1981) and Ng & Kottelat (2007 and 2010) set out their evidence but there is other, direct evidence from the drawing that would lead to a conclusion that it shows an ariid catfish:

1. There are no nasal barbels on the drawing (I agree with Ng & Kottelat that the long barbels that originate near the nostrils are maxillary barbels – see point 3). Ng & Kottelat explain this by suggesting that the nasal barbels are easily overlooked, so were probably missed off. The most obvious and plausible answer is that there were no nasal barbels on the fish. Whilst it involves different artists, contemporary drawings show nasal barbels in each of the fishes in Bagridae; e.g. the drawing of *Hemibagrus guttatus* (Lacepède, 1803) on the same plate. They are not difficult to see, in dead or live specimens. Absence of nasal barbels would rule out Bagridae and only rule in Ariidae.

2. The appearance of one large nostril on each side and not being tubed– Wheeler & Baddokwaya correctly state that there are always two nostrils on each side in Siluriformes. Ariids usually have large nostrils, and in some genera e.g. *Arius* Valenciennes, 1840, the nostrils are placed close together and only separated by a narrow septum, with the posterior nostril (sometimes partly covered) with a flap or valve, but not tubed. This can easily give the appearance of one large nostril on each side (see fig. 8). The nostrils in *Pseudobagrus* are usually small, and in the neotype and its conspecifics the anterior one is tubed, and the anterior and posterior nostril are widely separated with the posterior one placed immediately behind the nasal barbel, and on the dorsal surface of the head.

8. *Arius* sp. Image by Jean-Francois Helias

3. The origin of the maxillary barbel being close to the anterior nostril – In some ariids, e.g. *Arius maculatus* (Thunberg, 1792), when viewed laterally, the maxillary barbel originates relatively high on the maxillary and relatively close to the anterior nostril (as is depicted on the original drawing of *A. maculatus* – see fig. 9). In the neotype the maxillary barbel is placed relatively low on the maxillary and relatively distant from the anterior nostril.



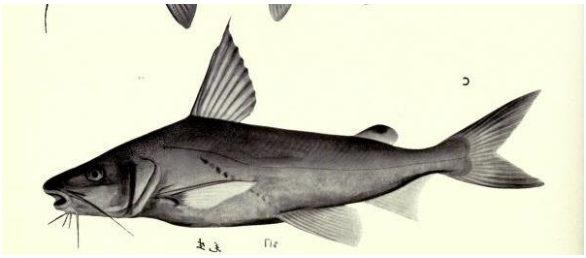
9. *Arius maculatus* (Thunberg, 1792) showing maxillary barbel originating near anterior nostril

4. Red hues on the ventral, anal, and caudal fins – It is very common for ariids to have red fins. This appears to be uncommon in *Pseudobagrus*.

5. Valenciennes (1840) appears to have had sight of the painting and in his description of the unneeded replacement name *Pimelodus tachisurus*, he clearly allies it with what he described as *Pimelodus nella*, an ariid catfish currently named as *Plicofollis nella* (Valenciennes 1840).

The factors below were used to explain why it was considered not to be an ariid (quotes are from Wheeler & Baddokwaya):

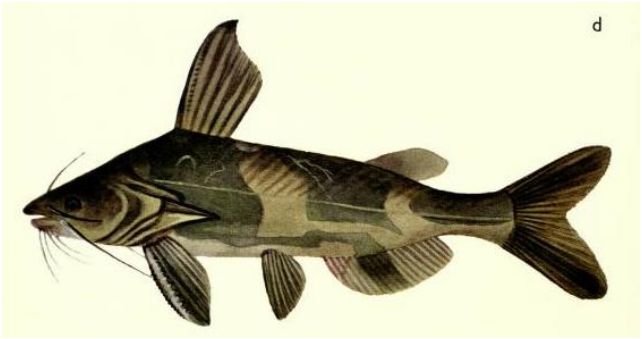
1. "The ossified area between the head and the origin of the dorsal fin which forms a distinctive feature of ariids is not represented. Indeed, muscle blocks are clearly shown in this region and the back is elevated in a way which is atypical of an ariid." If one looks at a clean image of the drawing (fig. 6) one can see that the area is drawn as ossified, with the first muscle block being below where the outline and degree of ossification of the ossified area would match *Arius* and *Netuma* sp. (Chu *et al.*, 1999). As for the elevated back, the same elevation and wide mouth on the painting of *T. sinensis* can be seen in a Chinese drawing from 1828-30 of which was later described as *Bagrus crinalis* Richardson, 1846 (see fig. 10) and is currently a synonym of an *Arius* sp.



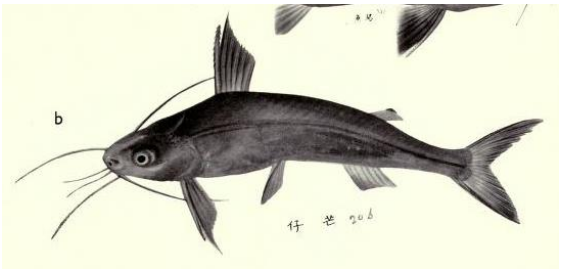
10. The drawing from which *Bagrus crinalis* Richardson, 1846 was based

2. "The lower lobe of the caudal fin is rounded which is an unusual feature in an ariid." This is generally correct but is rounded in some ariids e.g. *Galeichthys ater* Castelnau, 1861, *Neoarius paucus* (Kailola, 2000); and also, in specimens where the lower lobe has been rounded due to damage. The reverse argument can be deployed to state it is not a bagrid or *Pseudobagrus*. Most, if not all, Chinese *Pseudobagrus* do not have the upper lobe pointed (Chu *et al.*, 1999).

3. "The back and upper sides are shown with rounded dark blotches. Most ariids are plain coloured, dark above and with silvery sides and belly. Again, this is not an addition of the engraver as the description refers to darker green blotches." The description of the painting states a "general green colour, with spots of a darker green. Red hues on the ventrals and fins of the anus and tail." What isn't described is the small darker pigment that one can see on the upper edge of the adipose fin. *A. maculatus* can exhibit some darker hues on a paler background which could explain this pattern (see the figure of a junior synonym of *A. maculatus*: *H. atripinnis* Fowler, 1937, and a discussion further below). I am not aware of any *Pseudobagrus* that has dark green spots, and certainly the neotype does not; in fact, it has large blocks of dark colour, outlined in a pale colour on the body and some fins, something that would surely have been picked up in the *T. sinensis* painting, like it was in the painting in the Reeves collection on which original description of *P. fulvidraco* was based (see fig. 11).



11. The drawing from which *P. fulvidraco (*Richardson, 1846) was based



12. The drawing from which *Pimelodus mong* Richardson, 1846 was based

On the basis that arguably the holotype (not preserved) that was painted and later named *T. sinensis* (fig. 6) was an ariid (notwithstanding the neotype), what known species could it represent? There are species described or known from rivers or estuaries of China that appear to match the colour and general morphology (long post anal fin body, short adipose, relatively short anal fin), of the painting:

1. *Arius falcarius* Richardson, 1845 – this is currently deemed a junior synonym of *A. arius* (Hamilton, 1822); see Kailola (2004) but this needs further clarification as *A. arius* has a distinct black spot on the adipose fin (versus just tipped with black in *A. falcarius*) and a dorsal fin ray extension in adults (so *A. arius* may be a junior synonym of *A. maculatus* (Thunberg, 19792)). The colour pattern was described as "The colour of the back is shining oil-green or bronze, with blackish specks on the casque, and a row of black scratches above the fore-part of the lateral line. The under parts are bluish. The dorsal and adipose fins are tipped with black, the pectorals and edges of ventrals are aurora-red, the anal pale ochre-yellow, and the caudal disc yellowish-brown." This has similarities with *T. sinensis* and the short anal fin originating almost opposite to the adipose fin also matches. *Pimelodus mong* Richardson, 1846 is probably a junior synonym of *A. falcarius* and the Reeves illustration of the specimen on which this was described (fig. 12), has many similarities with that of *T. sinensis*. Colouration described as "The back of the fish is bluish or greenish-gray, the other parts being more or less brightly silvery. The fins have a similar tint to the back, and there is a small black mark on the edge of the adipose fin."

2. *Arius maculatus* (Thunberg, 1792) (and its junior synonym *Bagrus crinalis* Richardson, 1846, and possibly *A. arius* (Hamilton, 1822)) – This species can exhibit a greenish or bluish base colour. The colours of the old painting of *B. crinalis* were described by Richardson as "The top of the head, nape and back is sap-green, with fine parallel streaks of a deeper tint, bent en chevron near the dorsal line, and disappearing at the lateral line ; the sides and belly are silvery with a purplish reflexion. There are some crimson tints round the mouth, and purplish ones at the union of the gill-pieces and on the breast; also a greenish-yellow border round the end of the tail embraced by the caudal. The dorsal is celandine-green, with darker rays tinged with crimson at the base. The adipose fin is yellow, with a black spot on the edge. The pectorals and ventrals have crimson-coloured rays and buff membranes. The anal is sulphur-yellow and the caudal a dingy wax-yellow." Again, there are some remarkable similarities with Lacepède's description of the painting of *T. sinensis*. This species has an extension to the dorsal fin in adults and has a distinct black mark on the adipose fin which is not present in *T. sinensis*. *A. arius* has the dorsal fin extension and the large black mark in the adipose fin (see Hamilton, 1822:170) both appearing to be present in mature specimens of *A. maculatus* (Kailola, 2004:117). Kailola (1999) separates *A. arius* and *A. maculatus* on the shape and placement of palatal tooth patches, but Wang *et al.* (2005) found that these were sexual differences. Reports of *A. arius* in China are possibly *A. maculatus*.

3. *Arius sinensis* Valenciennes, 1840 and *Arius arenarius* (Müller & Troschel, 1849) – *A. sinensis* was described on the basis of a small specimen from Da Nang, Vietnam. The author has probably located the holotype in the MNHN although has

not physically examined it. MNHN-IC-B-2620 has the same collectors and exact wording of the type locality given in the description, and was caught in 1837. The dorsal and anal fin ray counts are low for an *Arius* but this could be due to damage. Based on the eye placement and two large grooves on the dorsal surface of the snout, it may be a young specimen of *Arius gagora* (Hamilton, 1822).

13. MNHN IC B 2620 - probable holotype of *Arius sinensis* Valenciennes, 1840. Image by MNHN collection-Paris

Both *A. sinensis* and *A. arenarius* have no extension to the dorsal fin and no large black spot on the adipose fin, so they are similar in appearance to *A. falcarius*, but they both have a bluish or leaden colour rather than green in *A. falcarius*. The only morphological difference one can note without physically examining the type specimens is that in the possible syntypes of *A. falcarius* the fontanels and supraoccipital processes are different to the syntype of *A. arenarius* and the probable holotype of *A. sinensis*. If *A. sinensis* Valenciennes, 1840 and *T. sinensis* Lacepède, 1803 were ever placed in *Arius*/*Tachysurus* together, the former would be a junior secondary homonym. If *A. arenarius* is the same species as *A. sinensis* then the former species name is available.

Summary

It is the author's opinion that based on all the above, the specimen (the unpreserved holotype of *T. sinensis*) painted and then described as *T. sinensis* was a member of the Ariidae, and more specifically an *Arius* sp. Some other Chinese authors also considered it to be an *Arius* sp. (see Fricke et al., 2020; and Zhuang, 2014), as well as earlier authors e.g. Eigenmann & Eigenmann (1890), Jordan & Richardson (1909), Fowler (1932, 1941), Smith (1945), Jayaram & Dhanze (1978), Mai (1978). If it was an ariid one can see why recent authors of that family would want to remove it from that family as *Tachysurus* predates *Arius*. However, all that has happened is that it has removed the problem from Ariidae into Bagridae, *Arius* into *Pseudobagrus*.

The author considers it was a specimen of what was later described as *Arius falcarius* Richardson, 1845, which is the same conclusion reached by Chu et. al. (1999), Nguyen & Nguyen (2005), and tentatively by Günther (1864). Absent the neotype this would make *T. sinensis* a senior synonym of *A. falcarius* (and possibly *A. sinensis* and *A. arenarius*), and *Tachysurus* a senior synonym of *Arius*.

If *A. falcarius* is a junior synonym of *A. maculatus* (Thunberg, 1792) (possibly not based on the presence of the distinct black mark on the adipose fin and the dorsal fin extension in adults on the latter) then the unpreserved holotype of *T. sinensis* would be a junior synonym of *A. maculatus*.

Lacepède stated (although it is unclear how he knew) that *T. sinensis* was found in freshwater. *A. maculatus* is known from freshwaters as well as marine and brackish (Fowler, 1935; Mat Shazwan personal communication, who found and photographed two specimens at 4.292963, 100.898354, in freshwater, over 100km by river from the sea), so it is likely that *A. falcarius* is too. Li (2018) reports an *Arius* sp. in the Pearl River, and Zhuang (2014) in the Yangtze River.

However, whilst the neotype is in place or not replaced by another, it is a bagrid, and one has to respect the decision made by Ng & Kottelat and the Commission, even if one does not agree with it. Even if, despite the points discussed above, it is truly was a bagrid species, the author finds it unlikely that a fish (the unpreserved holotype of *T. sinensis*, reproduced in fig. 6) with:

• a green body base colour with darker green patches and some fins being reddish, could be a fish (the neotype) with large blocky patches outlined in a paler colour on the body and some fins (see figs. 7 and 11);

• the anal fin when adpressed relatively distant from the origin of the proximal caudal fin rays (as in the *Arius* species discussed above; and the etymology for the *Tachysurus* was because of the 'agile, long and loose' tail in *T. sinensis*), could be a fish where the adpressed anal fin is close to the origin of the proximal caudal fin rays (see fig. 7).

Footnote

Whilst searching the MNHN collection-Paris the author found details of MNHN-IC-B-0055, which listed as *Leiocassis* sp. collected by Dabry de Thiersant in 1874, in China. This could be the holotype of *Pseudobagrus nitidus* Sauvage & Dabry de Thiersant, 1874 but needs further investigation.

Acknowledgements

Thanks to James Maclaine, Fish Curator, Natural History Museum, London for assistance with photographs of MNHN specimens. To Philippe Keith and Jonathan Pfliger, Muséum national d'histoire naturelle de Paris for the images and measurements of the MNHN collection-Paris specimens. Mat Shazwan for information on the *Arius* sp. found in freshwater. Biodiversity Heritage Library (https://www.biodiversitylibrary.org/) and Eschmeyer's Catalog of Fishes (https://www.calacademy.org/scientists/projects/catalog-of-fishes) for their excellent resources. Jong Hoon Kim for the use of his photographs and information on Korean stocks. Jean-Francois Helias, Zhou Hang for their photographs and Allan James of scotcat.com for facilitating it.

References

Angrizani, R. C. and L. R. Malabarba, 2020.
Genetic diversity and species delimitation in *Rhamdia* (Siluriformes: Heptapteridae) in South America, with a redescription of *R. quelen* (Quoy & Gaimard, 1824).
Zootaxa, 4801 (1): 085–104.

Basilewsky, S., 1855.
Ichthyographia Chinae borealis.
Nouveaux mémoires de la Société impériale des naturalistes de Moscou v. 10: 215-263, Pls. 1-9.

Bleeker, P., 1864.
Rhinobagrus et *Pelteobagrus* deux genres nouveaux de Siluroïdes de Chine.
Nederlandsch Tijdschrift voor de Dierkunde v. 2: 7-10.

Chu, X., Zheng, B., Dai, D., 1999.
Fauna Sinica. Osteichthyes. Siluriformes. National Natural Science Foundation of China: Beijing.

Cuvier, G. and A. Valenciennes, 1840.
Histoire naturelle des poissons. Tome quinzième. Suite du livre dix-septième. Siluroïdes. v. 15: i-xxxi + 1-540, Pls. 421-455.

Dabry de Thiersant, P., 1872.
Nouvelles espèces de poissons de Chine. In: Dabry de Thiersant, P. (ed.), La pisciculture et la pêche en Chine. G. Masson, Paris. 178-192, Pls. 36-50.

Ferraris, C. J., Jr. and M. C. C. de Pinna, 1999.
Higher-level names for catfishes (Actinopterygii: Ostariophysi: Siluriformes).
Proceedings of the California Academy of Sciences v. 51 (no. 1): 1-17.

Fowler, H. W., 1935.
Zoological results of the third De Schauensee Siamese Expedition, Part VI.--Fishes obtained in 1934.
Proceedings of the Academy of Natural Sciences of Philadelphia v. 87: 89-163.

Fowler, H. W., 1937.
Zoological results of the third De Schauensee Siamese Expedition. Part VIII,--Fishes obtained in 1936.
Proceedings of the Academy of Natural Sciences of Philadelphia v. 89: 125-264.

Fricke, R., Eschmeyer, W. N. & R. van der Laan (eds) 2020.
ESCHMEYER'S CATALOG OF FISHES: GENERA, SPECIES, REFERENCES
(http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp) Electronic version accessed 10 Mar 2020.

Günther, A., 1864.
Catalogue of the fishes in the British Museum. Catalogue of the Physostomi, containing the families Siluridae, Characinidae, Haplochitonidae, Sternoptychidae, Scopelidae, Stomiatidae in the collection of the British Museum. v. 5: i-xxii + 1-455

Kailola, P. J., 1999.
Family Ariidae. In: Carpenter and Niem, 1999. Species identification guide for fisheries purposes. The living marine resources of the western central Pacific. Batoid fishes, chimeras and bony fishes part 1 (Elopidae to Linophrynidae). FAO, Rome. v. 3: iii-vi + 1398-2068, I-IV.

Kailola, P. J., 2004.
A phylogenetic exploration of the catfish family Ariidae (Otophysi: Siluriformes).
The Beagle, Records of the Museums and Art Galleries of the Northern Territory v. 20: 87-166.

Kottelat, M., 2013.
The fishes of the inland waters of southeast Asia: a catalogue and core bibliography of the fishes known to occur in freshwaters, mangroves and estuaries.
Raffles Bulletin of Zoology Supplement No. 27: 1-663.

Lacepède, B. G. E., 1803.
Histoire naturelle des poissons. v. 5: i-lxviii + 1-803 + index, Pls. 1-21.

Li, G., 2018.
Fishes of the Pearl River.
1-328.

López, J. Andrés, Zhang, E, Cheng, Jian-Li, 2008.
Case 3455 *Pseudobagrus* Bleeker, 1858 (Osteichthyes, Siluriformes, bagridae): proposed conservation.
The Bulletin of Zoological Nomenclature 2008 v.65 no.3, 202-204.

Mai, D. Y., 1978.
Identification of the fresh-water fishes of North Viet Nam. Ha Noi, Scientific & Technology, Publisher. v. 1: 1-340, Pls. 1-48.

Mori, T. and K. Uchida, 1934.
A revised catalogue of the fishes of Korea.
Journal of the Chosen Natural History Society No. 19: 12-33.

Morris, P.J., H.M. Yager, [programmers] and M.H. Sabaj Pérez [editor], 2006.
ACSImagebase: A digital archive of catfish images compiled by participants in the All Catfish Species Inventory. [WWW image Database] URL http://acsi.acnatsci.org/base

Müller, J. and F. H. Troschel, 1849
Horae Ichthyologicae. Beschreibung und Abbildung neuer Fische. Berlin. No. 3: 1-27 + additional p. 24, Pls. 1-5.

Ng, H. H. and M. Kottelat, 2007.
The identity of *Tachysurus sinensis* La Cepède, 1803, with the designation of a neotype (Teleostei: Bagridae) and notes on the identity of *T. fulvidraco* (Richardson, 1845).
Electronic Journal of Ichthyology, Bulletin of the European Ichthyology Society. v. 2: 35-45.

Ng, H. H. and M. Kottelat, 2008.
Confirmation of the neotype designation for *Tachysurus sinensis* La Cepède, 1803 (Teleostei: Bagridae).
Ichthyological Exploration of Freshwaters v. 19 (no. 2): 153-154.

Ng, H. H. and M. Kottelat, 2010.
Comment on the proposed conservation of *Pseudobagrus* Bleeker, 1858 (Osteichthyes, BAGRIDAE) (Case 3455; see BZN 65: 202–204).
The Bulletin of Zoological Nomenclature 67(1), 68-71.

Nguyen, H. D. and V. H. Nguyen, 2005.
Ca Nuoc Ngot Viet Nam. Tap II. [Freshwater fishes of Vietnam]. v. 2: 760 pp.

Opinion 2274 (Case 3455), 2011.
Pseudobagrus Bleeker, 1859 (Osteichthyes, Siluriformes, bagridae): conservation by suppression of a senior synonym not approved.
The Bulletin of Zoological Nomenclature 68(2), 152-153.

Popta, C. M. L., 1911.
Ueber Fische von Wladiwostok und von Blagoweschtensk a. Amur, gesammelt von Herrn Dr. P. v. Wittenburg.
Jahreshefte des Vereins für Vaterländische Naturkunde in Württemberg v. 67: 333-353.

Richardson, J., 1846.
Report on the ichthyology of the seas of China and Japan.
Report of the British Association for the Advancement of Science 15th meeting [1845]: 187-320.

Sauvage, H.-E. and P. Dabry de Thiersant, 1874.
Notes sur les poissons des eaux douces de Chine.
Annales des Sciences Naturelles, Paris (Zoologie et Paléontologie) (Sér. 6) v. 1 (art. 5): 1-18.

Thunberg, C. P., 1792.
Tvånne Japanske fiskar.
Kongliga Vetenskaps-Academiens Handlingar, Stockholm v. 13 (for 1792): 29-32, Pl. 1.

Uchida, K., 1939.
The fishes of Tyosen (Korea). Part I. Nematognathi, Eventognathi. 1-8 + 1-458, Pls. 1-2 (color) + Pls. 1-47.
Bulletin of the Fisheries Experiment Station of the Government-General of Tyosen, No. 6.

Wang, D., Y. H. Zhao and C. G. Zhang, 2005.
Revision of *Arius arius* (formerly *A. sinensis*) in China and its sexual differences (Siluriforms: Ariidae).
Acta Zoologica Sinica, 51 (3): 431-439.

Wheeler, A. & Baddokwaya, A., 1981.
The generic nomenclature of the marine catfishes usually referred to the genus *Arius* (Osteichthyes-Siluriformes).
Journal of Natural History 15: 769–773.

Whitehead, P. J. P., 1970.
The Reeves Collection of Chinese fish drawings.
Bulletin of the British Museum (Natural History) Historical Series v. 3 (no. 7): 191-233, Pls. 1-29.

Wu, H.-W., 1930.
On some fishes collected from the upper Yangtse Valley.
Sinensia v. 1 (no. 6): 65-86.

Wu, H.-W., G.-R. Yang, P.-Q. Yue and H.-J. Huang (eds), 1963.
The economic fauna of China. Freshwater fishes. Science Press, Beijing. 1-159.

Zhang, C.-G., J.-X. Yang, Y.-H. Zhao and X.-F. Pan (eds.), 2019.
Fishes in the Jinsha Jiang River basin, the upper reaches of the Yangtze River, China. Science Press, Beijing. 1-607.

Zhuang, P., 2014.
Native and Exotic Fishes of the Middle and Lower Yangtze River. 1-389.

Pier Aquatics, Great George Street, Wigan, WN3 4DL

https://www.facebook.com/pieraquatics/

01942 236661

One of the UK's leading suppliers of freshwater and tropical fish to both trade and general public

CATFISH STUDY GROUP
Research Support Fund

To enhance the role that the CSG plays in supporting research into catfishes and to foster a closer relationship between scientists and aquarists, the committee proposed a Research Support Fund (RSF) be established in 2018. The RSF will provide small sums (e.g., £500) to students and other researchers to support fieldwork, museum visits, laboratory work and page charges in peer-reviewed journals. Award recipients will agree to provide two articles for the CSG journal OR present their research at a CSG event via poster or talk. Like any new program, the RSF is a work in progress and we welcome the input of subscribing members. Email us at: secretary@catfishstudygroup.org

Where does the money come from?

RSF awards will be drawn from journal subscriptions, advertising revenue, member and corporate contributions, back issue purchases, donated auction lots and other fund-raising activities.

How often will we make awards?

We will invite applications on an annual basis in September, with the successful applicant(s) being announced via social media and at our annual convention the following March. Closing date for applications is end of February. Application form: https://www.catfishstudygroup.org/rsf/index.php

Who is eligible to apply?

Open to students and junior researchers. The committee discussed opening the competition to advanced aquarists, and we may try this in the future. But for now, we will invite applications from those enrolled or working with catfishes in a registered school, university, research institute or natural history museum. Applicants must be at least 18 years old at the time the award is made.

What items, services or expenses should the award be used for?

Awards will be used to offset travel costs for fieldwork (e.g., specimen collecting, museum visits or environmental measurements), equipment purchases (e.g., nets, meters, cameras, lenses, aquaria, lab consumables, software licenses, etc.), services (e.g., DNA sequencing and genome assembly, page charges in journals) and possibly the purchase of specimens (e.g., for observation, DNA samples, etc.).

What do we need in an application?

The application will involve completing an electronic form available from the CSG website. The form will include a brief description of the intended research project or trip, an itemized budget and a brief explanation for how the award will enable or enhance the work.

How will applications be judged?

The committee and invited reviewers will independently review applications and assign scores on the basis of their merit, feasibility and appeal to CSG members. Scores will be assigned, and the highest ranked application(s) will be funded in full or to the maximum amount available. None, one, or more than one application may be funded during each cycle. If no applications are received or less than the maximum amount is awarded, the RSF will transfer funds to the next cycle and increase the number or size of awards accordingly. Finally, in order to receive the award, the successful applicant must agree to provide two articles for the CSG journal describing their project, its results, and how the award helped them in their work, or a talk or poster to be presented at a future CSG event.

G.B.W
Products & Services

THE GUILD OF MASTER CRAFTSMEN
CERTIFICATE OF QUALITY AND SERVICE

High Class Joinery
Furniture
Wood Carvings
Commissions Undertaken

Contact
Brian Walsh
Tel: (01254) 776567
Mob: 07977 428 788
Email: g.b.w@live.co.uk