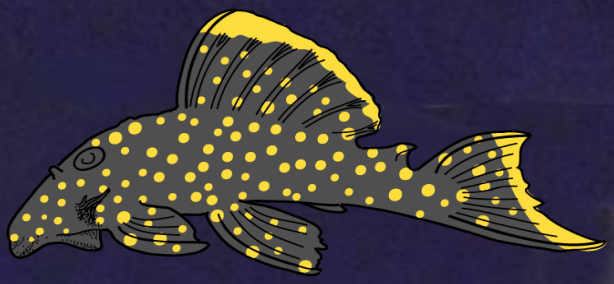
# Journal of the Catfish Study Group



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# Convention Sponsors

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*Contents*



Cover image: *Pseudacanthicus serratus*. Photo: Nick Ridout

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# AGM 2018 and no constitutional amendments!

It's that time of year again. Have you got the Brussels sprouts on the boil yet? And looking forward to some post-Christmas indulgence, January sees our Annual General Meeting take place and we are delighted to report that we do not have any ballots, constitutional amendments or other significant administrative matters to deal with for 2018. This reflects the stability and professionalism of your committee and how we are running CSG activities and programs. Recently, I've been able to spend some time improving our email communications to members and also getting our events diary confirmed along with helping organise the logistics of getting our fantastic array of speakers to us for your convention in 2018.

In the past, we've primarily held the AGM in a room at our main venue in Darwen, Lancashire with online conferencing facilities available for remote participants to join. Traditionally, the event is poorly attended as the subject matter under discussion can be rather dry. As we have no significant matters to deal with at the 2018 AGM, the primary venue will be the online conference. Members are welcome to join individually or as a group. Participation is via the Internet or a freephone telephone number. We've been using this facility for our monthly committee meetings for a couple of years now and it has allowed the committee to organize and develop the running of the group conveniently from smartphones, laptops and tablet PCs in three different countries.

As a CSG member, you will already have an email directing you to the agenda for the AGM. If you have any queries about it or would like the conference details – drop me a line on secretary@catfishstudygroup.org.

Merry Christmas and see you in 2018!

Cheers,
Jools

# Chairman's report

The last journal of 2017 provides an opportunity to reflect on the past year and look forward to the new!

The CSG presented a full diary of events in 2017, some of which were delivered entirely by the hard-working committee while others were supported by the CSG and hosted by others. The 2017 AGM was delivered with little fuss or significant change with the same personnel remaining in place for the duration of the calendar year (must be a first!).

We held three major aquatic auctions in February, September and November, each building on the success of the last with the result of record receipts to help the CSG deliver the Open Show and Convention without having to rely on external support and sponsorship, meaning we have more time and energy to serve the membership. Attendance of our core events has grown significantly – a welcome sign for the hard work and funds we invest in CSG activities and indication of a healthy hobby.

Behind the scenes, most of our efforts are directed towards delivering the three-day convention. Given that the CSG and its forerunners have a 40-year record of holding annual catfish conventions in the UK, it is an honour to be involved in the organisation of our flagship event which goes from strength to strength with speakers drawn from a global community. Many other societies around the world now host similar conventions which help to promote the hobby more widely and provide a platform for the wealth of speaker talent available. The 2017 convention was another great success and all arrangements for 2018 are in place, with a number of new speakers at the podium next year.

The CSG went on the road in May and our committee helped to deliver a meeting in southern England in conjunction with an online-club and CSG sponsor – Wiltshire Plecos. It was great to meet with so many of our members who struggle to make it to the usual meeting place in Darwen.

To give the committee some time to catch up, we support a number of other clubs who host catfish-related events. This year we supported the 'Cory-vention' event in Wigan, the Castleford Aquarist Society 'Catfish and Loach Show' and the 'L-number days' event in Hannover. In addition, I presented to the Preston and District Aquarist Society in February and our club Secretary presented at the Catfish Cataclysm event in Ohio, USA in October.

The diary for 2018 is filling up, with the usual auctions, show and Convention booked. We have also agreed to support a meeting in Staffordshire in May and are planning an event in Denmark in October – details to follow!

In addition to all the events, the CSG has produced its quarterly journal and online information for members. We have also recently re-launched our Research Support Fund to help young scientists studying catfishes. We expect to announce the recipients of the fund at our convention in March 2018. Please help us spread the word!

I'm looking forward to another successful year of catfish study and hope to see many of our members at the 2018 convention in March.

Cheers, Mark

# An undescribed *Hypancistrus* from the Rio Vaupés system, Colombia – The Black Phantasm

*By Steven Grant, Jacqueline Heijmen Bennett-Leaver and Haakon Haagensen*


*Hypancistrus* sp. "black phantasm". Photo: J. Heijmen Bennett-Leaver.

For some years now it has been accepted practice to class L102 and any other phenotype with pale spots and dark edges to the fins to be variants of *Hypancistrus inspector* Armbruster, 2002. Information has recently come to light that shows that this is an over-simplification.

In 2013, Rare Aquatics (no longer operating) imported some adult specimens as *Hypancistrus inspector* Armbruster, 2002. In 2014, Pier Aquatics obtained several specimens exported as L102, the code number thought to represent *Hypancistrus inspector*.

Examples of the 2013 specimens were purchased by UK aquarist Nick Ridout (NR) and the second author (JHBL) purchased some of the 2014 import. After NR spawned the 2013 import and JHBL spawned the 2014 import, it became clear that based on the pattern and size of both imports that they were not the same species. The first author (SG) has been able to find the locality of the 2014 import and also the probable locality of the exports from Brazil of L102. The third author (HH) and SG have been able to obtain a locality for specimens that appear to match the 2013 import. These localities when used with the visual differences of all three phenotypes have made it clear that there are two, possibly three different species being sold as *Hypancistrus inspector*.

### *Hypancistrus inspector*

The holotype and one paratype of *H. inspector* were caught in the Rio Casiquiare (Negro-Amazonas drainage) about 10 river km above the Rio Negro, below Solano, 1°58'N, 67°05'W, Departmento Casiquiare, Amazonas, Venezuela. These specimens have a dark base colour with pale spots on the head, body and all fins. The spots on the head are smaller than those on the body and the spots can sometimes be elongated (see paratype in Armbruster, Lujan & Taphorn, 2007). The dorsal and caudal fins have dark distal edges (Tan & Armbruster, 2016).

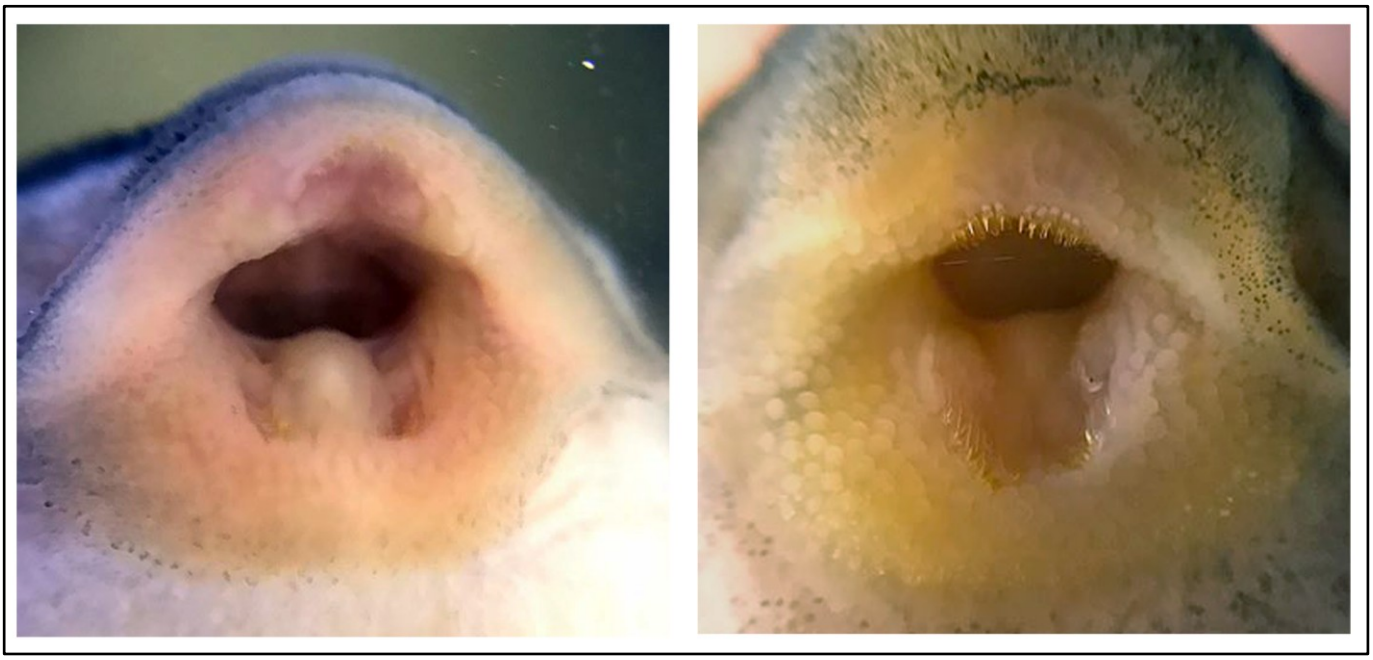
NR and JHBL have spawned these species and the latter has photographed the offspring at several growth stages to document how the pattern develops over time. At 5cm TL, the dark distal edges in the dorsal and caudal fins are absent, and the light markings in the caudal fins form almost solid bands. At 10cm TL, the dark distal edges are present and the light markings in the

Comparison of *Hypancistrus* sp. "black phantasm" (left column) with *H. inspector* (right column) at ca. 4–5 cm (top images), ca. 10 cm (middle images) and as adults at ca. 15–20 cm (lower images). Photos: J. Heijmen Bennett-Leaver, S. Grant and N. Ridout.

caudal fin have broken into spots. At almost 20cm TL, the pale body markings are mainly elongated and the dark distal edges to the dorsal and caudal fins are narrow and indistinct. SG has been informed by Oliver Lucanus that *H. inspector* exported from Colombia are normally caught either at the mouth of the Rio Atabapo (Orinoco dr.), or the mouth of the Rio Inirida (Guaviare dr.). HH has been able to find the location of almost identical specimens in the Rio Guainia, Colombia, near the Rio Negro. The Rio Guainia empties into the Rio Negro, upstream of the Rio Casiquiare. Based on these localities and the pattern it is clear that the Colombian specimens correspond to *Hypancistrus inspector*. The holotype and paratype are only 10cm and 8.6cm respectively and that can account for the differences between the size of the spots between the types and NRs large specimens. NR's 2013 specimens have grown very large, reaching almost 20cm TL.

**The Black Phantasm – *Hypancistrus* sp.**

The 2014 import is hereby assigned the common name of Black Phantasm. The breeding of this species by JHBL has shown that even at 4cm TL the body and head has fewer spots than *H. inspector*, the spots can be pinkish or white (versus always white), there are fewer spots in the dorsal fin, most of it being just a black colour; the pectoral, ventral and caudal fins only have very few spots near the base with the rest of the fin rays being black and the membranes a paler black (versus black and white spots in the pectoral and ventral fins and bands in caudal fin). In adults, there are no spots at all in the caudal or ventral fins and only one or two on the pectoral fins. The dorsal has a few, very small spots and all the fins have thick dark distal margins. When stressed, diagonal dark bars appear on the body but when dominant the fish can become intensely black, particularly the dorsal and caudal fins. Small specimens have dark distal margins on the dorsal and caudal fins. Another difference is that mature males of *Hypancistrus* sp. "black phantasm" develop odontodes along the flanks. These are lacking or very much reduced in *H. inspector*.



Comparison of the mouths of *Hypancistrus* sp. "black phantasm" (left) and *H. inspector* (right). Photos: J. Heijmen Bennett-Leave and S. Grant.

In *Hypancistrus* sp. "black phantasm", the dentary teeth are fewer and appear smaller than those of *H. inspector*. *Hypancistrus inspector* can also be distinguished in terms of its more elongated body shape compared to *Hypancistrus* sp. "black phantasm", and the former also has a relatively taller dorsal fin and more emarginate caudal fin. Oliver Lucanus has confirmed that most specimens of *Hypancistrus* sp. "black phantasm" are collected in the rapids on the Rio Cuduiari where it meets the Rio Vaupés near Mitú, and also the rapids of the Rio Vaupés upstream from Yurupari and Mitú, Colombia.

*Hypancistrus* sp. "black phantasm" differs from *H. phantasma* Tan & Armbruster 2016 by the spots being black in that species.

JHBL has spawned *Hypancistrus* sp. "black phantasm". Water conditions were Ph 7, hardness 3° and conductivity around 300 µS. The spawning behaviour and fry care was typical for *Hypancistrus*. The native waters of *Hypancistrus* sp. "black phantasm" are fast-flowing blackwater with rains experienced every month washing topsoil into the water.

**L102**

L102 was originally exported from Barcelos, Brazil, which sugests it is from the Rio Negro or its tributaries. Until now it has not been possible to confirm the presence of L102 in Brazilian waters. In 2013, Rupert Collins purchased L102 from traders at Barcelos and thought that a possible origin was the Rio Demini.

SG has found specimens in the Californian Academy of Sciences, USA, that match L102 (CAS 6531 and SU 60618). CAS 6531 is almost 18cm SL and all three specimens have the same pattern as *H. inspector* although the white marks on the body all appear to be round versus some being elongated in *H. inspector*. These specimens were caught by Carl Ternetz in 1925 at "Rio Negro, Sao Gabriel Rapids", which is possibly the rapids on the Rio Negro near the confluence of the Rio Vaupés, upstream from São Gabriel da Cachoeira, Brazil. L102 is very similar in appearance to *H. inspector* but the more rounded body spots and over 160 miles' difference in distribution may point towards a different species. For now, this phenotype should be referred to as L102 instead of *H. inspector*.

## References

Armbruster, J. W., 2002. *Hypancistrus inspector*: a new species of suckermouth armored catfish (Loricariidae: Ancistrinae). *Copeia* 2002 (no. 1): 86-92.

Armbruster, J. W., N. K. Lujan and D. C. Taphorn, 2007. Four new *Hypancistrus* (Siluriformes: Loricariidae) from Amazonas, Venezuela. *Copeia* 2007 (no. 1): 62-79.

Tan, M. and J. W. Armbruster, 2016. Two new species of spotted *Hypancistrus* from the Rio Negro drainage (Loricariidae, Hypostominae). *ZooKeys* No. 552: 123-135.

# The shared colour patterns of *Corydoras* and other catfishes from the upper Rio Negro.

*By David D. Sands PhD*

*Corydoras adolfoi*. Photo: D. D. Sands.

In aquaria, it is likely that *Corydoras* behave more naturally when kept with members of their own species rather than mixed shoals of different kinds. When maintained in groups, they tend to be more active and forage in small shoals during the daytime as they would in the twilight period. Groups composes of a only few individuals will show a tendency to remain in and close to cover and rest more in the plants, as though they are wary about being out in the open. This is the key to understanding shoaling behaviour because, when an individual fish is part of a group, its risk of predation is spread across the many.

My research into *Corydoras* pigment-patterns and behaviour has led me to understand more about the way they shoal – like the rural sparrows (sadly declining) that gather in the hedgerow across the road from where I now live. In contrast, social catfishes congregate underwater in groups that exist more successfully together than they would as individuals.

When I started my formal studies, I initially focussed on my pre-concepts that some form of mimicry was an aspect of the mechanism involved in those species-pairs sharing the same pattern. My initial idea was that one species found it advantageous to look like another in the same habitat and that maybe there was an element of safety in numbers that would result when two shoals come together. The collective group is doubled in this situation and the large masses or shoals would make the predator's work more difficult. That thesis would go some way to explain why there are so many *Corydoras* species pairs, where long-snouted look-a-likes are found with a short-snouted twin with the same colour pattern.

I also considered another potential 'red herring' in that representatives of a genus of naked or scaleless catfishes, *Brachyrhamdia,* are often amongst *Corydoras* in aquarium imports (later I observed them alongside *Corydoras* in Brazil) and as if to complicate the issue further they share the same basic pigment patterns. *Brachyrhamdia* possess venom that

*Brachyrhamdia rambarrani* and *Corydoras adolfoi* photographed soon after collection in the Miuá river system. Photo: D. D. Sands.

is issued out of the pectoral spine pore and works as an anti-predatory mechanism. I learned about this nasty capability rather painfully in South America. I theorised at the time of my research that *Brachyrhamdia* and *Corydoras* formed what is known as a 'mimicry ring', like those discovered amongst poisonous and non-venomous snakes, ants and butterflies. I eventually abandoned the idea of mimicry being involved and examined the widely-held belief that the many *Corydoras* twins were just forms or phenotypes of the same species. This particular puzzle concerns the debate about what actually constitutes a biological species. Some might ask *'Aren't Corydoras all the same species anyway - just colour forms of a few basic types?"*

Those species in the mimetic ring share similar colouration in order to trick potential predators and I believed this phenomenon was evident in these catfishes. However, all the catfishes involved are armed with pungent spines. When corys are taken into the mouth of a predator, the sharp serrated spines locked into position to make the catfish a larger potential meal, would be enough to put off most of the common food-chain predators such as tropical kingfishers and fish-eating characins like *Hoplias*. It may still be revealed one day that some form of Batesian mimicry is involved but to prove that would take a great deal of field research.

While observing *Brachyrhamdia* repeatedly harassing *Corydoras* during feeding I wondered if the sharing of colour pattern was less about mimicry and more about these aggressive catfishes sneaking in amongst the passive *Corydoras* and maybe biting into fins and soft tissues for a meal.

Once dismissed, the mimicry-ring theory lost its appeal and I began to process another line of thought that was based on the idea that a particular pigment-pattern proved an evolutionary success in a shared habitat over millions of years. A review of the fossil records of Callichthyidae (the family *Corydoras* are placed in) by ichthyologist Roberto Reis, it is known that *Corydoras revelatus* based on Argentinian fossils and surrounding sediment confirms that these catfishes were around in at least 60 million years ago. I handled a fossil specimen of *Corydoras revelatus* at the Natural History Museum in the 1970s when I was secretary to an ichthyology course held there. I found that holding the fossil in my hand appeared to have the power to 'take me back' into pre-history in my attempt to understand my favourite fishes.

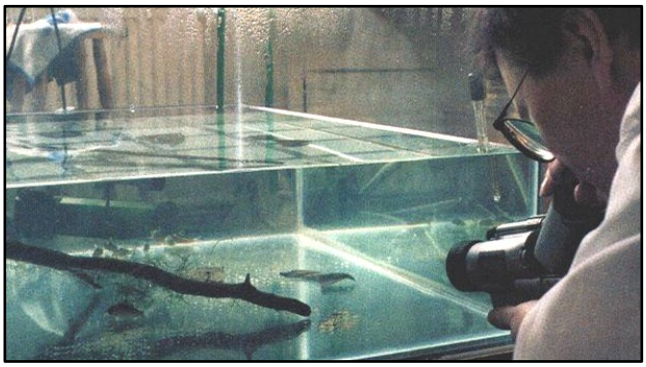
Crypsis in action: the cory (centre-left) is hard to detect on a substrate of white sand and leaf litter. Photo: D. D. Sands.

I then began to research animal colouration and came across examples that possessed a cryptic pattern. Crypsis is a term used to describe an animal that has evolved a colour or pigment pattern that enables it to blend into its environment. Once I had reviewed existing examples of crypsis in other fishes, birds and mammals, I came to the conclusion that *Corydoras* patterns were cryptic in that they helped the catfishes to blend into the the predominant local substrate, be it decomposing leaf litter or bright sand. They have been around in South America for millions of years and so the pigmentation, protective spines and dermal plates must have proved successful for them to survive. The questions remaining were these. Why are there so many twins and are they really two separate species?

Research began into *Corydoras adolfoi* and *C. imitator* in 1989 at Liverpool University's department of Evolutionary and Environmental Biological Sciences, and about six years later my work formed the basis of a doctorate in ethology or animal behaviour. With the help of a friend and serious *Corydoras* enthusiast, Bruce Clarke, I managed to accumulate a large enough group of both species that I initially housed separately in aquaria to begin VTR filming and observing them.

At a later stage, a group of the 16 (8 of each of the two types) were housed together in a spacious open-top aquarium that measured 90 cm long x 45 cm deep x 90 cm wide. This aquarium was marked out on the outside of the glass base with black tape into thirty-six, 15 cm squares. I had one camera fixed above and one to record events from a side view. In this aquarium (filtered with a large power filter with a built in heater element), the water quality was superb and the catfishes were filmed for months foraging, feeding, spawning and competing. I have kept all the original tapes.

Natural light filtered through a room window. This provided regular dawn to dusk periods throughout my research and no additional form of lighting was used. The aquaria substratum consisted of a shallow layer of clean river sand. The cover offered was represented by sunken beech branches. Taken directly from the tree and stripped of bark, beech is non-poisonous and non-staining and therefore excellent for aquarium use providing the wood has not been collected from the ground. Dead wood, which has rotted on the tree and dropped to the ground, offers an ideal surface for fungal spores and growths that could pollute systems and be harmful to fish.



Developing a video-film protocol to observe and analyse cory shoaling behaviour. Photo: D. D. Sands.

Water temperatures varied little within 25–26 °C (although a fluctuation of +/- 3 °C could occur following partial water changes). A pH range of 6.6–6.9 and hardness of 30 ppm was maintained. Weekly partial water changes, using chlorine-free, aerated water prevented a build-up of $NH_3^-$ (nitrates) and other organic waste products. All the catfishes were offered a varied diet based on a rotation of flaked food, live or frozen chopped midge larvae (bloodworm), chironomid larvae, *Daphnia* species, and brine shrimp (*Artemia*).

Through a special Home Office license and inspection (covering research involving live animals), I conducted a number of experiments including exposing the catfishes to *Hoplias* (a known predator of *Corydoras* in nature) in a contained 'inner-aquarium' so they were protected and also a wooden model predator (superbly fashioned by Brian Walsh) that could be gently lowered directly into the test aquarium.

The first year of filming and observing *C. adolfoi* and *C. imitator* revealed large differences in behaviour that convinced me they represented two very different species. They foraged differently and at different times, they located extract of bloodworm at different speeds, there was a clear difference in the average clutch size (egg numbers) in a single spawning and in the frequency and method of spawning. This information revealed remarkable differences between *C. adolfoi* and *C. imitator*. They just

happen to have near identical markings; a situation that is not so rare in nature. There are many plants and animals that look the same but are known to be genetically isolated.

*Corydoras imitator* spawned twice in the year and produced hundreds of comparatively small eggs, placed close together and just below the water surface. In contrast, *C adolfoi* spawned dozens of times and placed single and pairs of their larger eggs around the aquarium, up to 20–25 at a time.

One of the most wonderful sights I have ever seen in thirty years of serious fishkeeping occurred during this period. I had been away and missed a couple of regular *C adolfoi* spawnings. I usually collected the eggs and counted them and then placed them in protective nets for hatching. On this occasion, the eggs must have hatched and as I began to take some still photography pictures, I noticed a group of *C. adolfoi* move out from the cover of a branch and onto a patch of sand with several juveniles in tow. That sight convinced me that given the water volume and space, good feeding and no other fishes as aquarium occupants, *Corydoras* eggs could hatch naturally and some would survive without the adults predating on them.

The complete story of colour-pattern pairing in *Corydoras* remains to be fully explained. My research suggests that the long-snouted *Corydoras* are more hydrodynamic than their round-snouted twins. According to my field observations in the Upper Rio Negro, the pointed head and elongated body of *C. imitator* appeared much better suited to swimming in the deeper water currents. I watched *Corydoras adolfoi* in the shallows of Muia stream and did not see another species alongside.

Whilst surveying the Upper Rio Negro, I was fortunate enough to find and identify several new *Corydoras* species. One of these was so similar to *C. adolfoi* that I named as the 'duplicate' *Corydoras*. The name *Corydoras duplicareus* was published in June 1995, and chosen to highlight the incredible similarity between this species and *C. adolfoi*. In this instance, they are two Upper Rio Negro species that do not appear to share the same river but are found close to each other. Obvious external

Municipality of São Gabriel da Cachoeira (delimited in red) in the Upper Rio Negro, home to many of the species studied in this project and site of field observations. Credit: Google Maps, 2017.

*Corydoras duplicareus*. Photo: D. D. Sands.

differences between adult specimens of both are that *C. duplicareus* has a much broader dorsolateral body stripe, about 10–20% larger than that of *C. adolfoi*. Other differences can be found in the more highly serrated pectoral spines of *C. duplicareus* and its higher scute count. *Corydoras duplicareus* has now been spawned and raised in aquaria by a number of aquarists, *C. adolfoi* and *C. duplicareus* have the distinctive orange fleck on the nape (a factor commonly seen in a number of *Corydoras* species from the region) that makes them so desired by aquarists.

The Upper Rio Negro region borders the Guiana Shield, an ancient rock formation that separates the Guianas from the Amazon Basin. The geology of the Precambrian Guiana Shield is formed from a combination of metamorphic gneiss, granites, quartz and crystalline schists and volcanic sediments. There is also known to be bauxite, various iron deposits and small quantities of precious metals such as gold. The Upper Rio Negro in northwestern Brazil borders eastern Colombia and southwestern Venezuela.

I made water chemistry measurements at the time using electronic pH and temperature meters with digital readouts. A series of tests was carried out on fresh water samples from a number of sites. With respect to these parameters, there proved to be significant differences between several tributaries and the Rio Negro proper. Analysis of water samples obtained directly at São Gabriel da Cachoeira measured pH 4.5–4.6, zero hardness. Temperatures were recorded around 28 °C (30 °C in the shallows) between midday and late afternoon. These measurements of the Upper Rio Negro were taken during the field survey in 1992, and fell within the known pH range (4.5–4.8) given for over 20 habitat sites detailed in Michael Goulding's research.

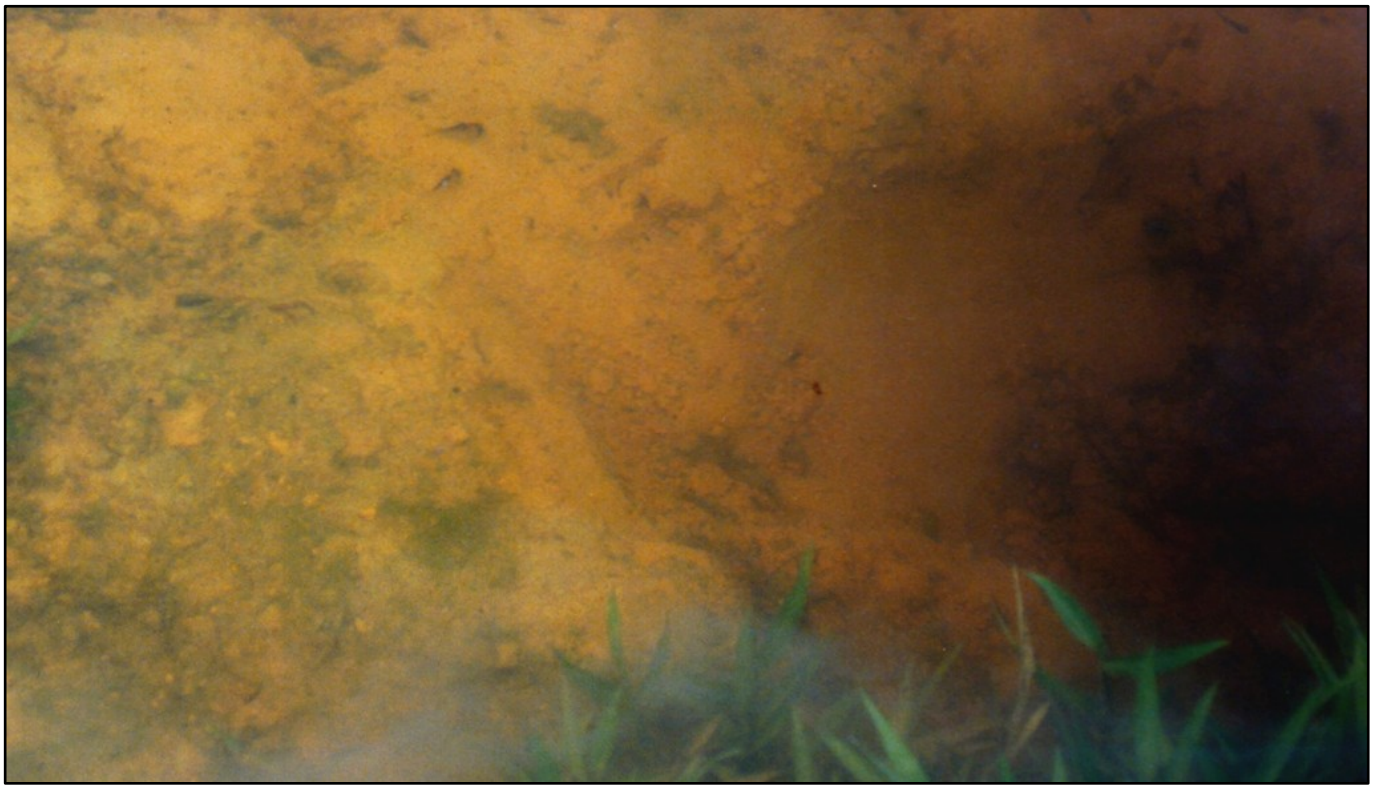
The Miuá system water samples, obtained from a site (possibly Igarape Uarinabe) several miles up the tributary and nearest to the Upper Rio Negro (Habitat 2), revealed a pH range of 5.5–5.9 and lower temperature of 25 °C. The pH and temperature readings from samples taken at a *C. adolfoi* and *C. imitator* habitat revealed a higher range, pH 6.2–6.5 and 23 °C, a marked difference from the Upper Rio Negro. This locality differed from the Negro in lesser water volumes, a slower flow rate, lower temperatures and a higher pH. There were also visible differences in humic levels, if the paler water colour was an indicator. These differing factors may act as an ecological barrier for certain fish species, such as *Corydoras,* which are usually recorded with a restricted distribution.

Samples of soil were taken and brought back to the UK for analysis. It was established that the sediment was made up of sand, silt and clay. A 20-gram sample (70% sand, 30% silt and clay) was identified as strongly fine-skewed (with an excess of fines in the grain size distribution). These sedimentary characteristics are described as typical of a tributary where silt-sand is deposited as particles falling out of suspension in a flowing stream.

**A stream survey of São Gabriel da Cachoeira**

Together with two local Amerindian fishermen, a translator and John Chalmers, the author attempted to survey the tributaries in which catfishes had been recorded. Our party employed two large canoes in order to enter tributaries from the Upper Rio Negro. Slow progress was made against the water flow beyond the tributary mouth, between twenty and thirty kilometres, until a suitable collecting area was found (Habitat 2).

*Corydoras imitator*. Photo: D. D. Sands.



*Corydoras adolfoi* (upper left of centre) in their natural habitat of shallow, warm, tannin-stained and sandy streams of the Upper Rio Negro. Photo: D. D. Sands.

Our group moored at a small beach to one side of the current and close to the stream bank. After obtaining water sample tests, we fished with a two-man seine and small dip nets in the shallows. Neither method resulted in the capture of *Corydoras* despite the fishermen identifying the habitat as suitable. The local fishermen suggested that night fishing would reveal them in catches and this proved to be correct. Photographs and video were taken to document fishes collected during daylight hours. Shoals of characins were clearly visible from the river bank. They, not surprisingly, were numerically dominant in each catch. The central channels and edges of the river were seined although the former revealed a poorer catch than the latter site because of difficulties using a two-man seine in deeper waters. Small unidentified cichlids were captured in the shallows shaded by palm leaves. A series of photographs was taken of examples of the contents of each catch which contained numerous small tetras. It continued to rain and this made photography and fish collecting increasingly more difficult. Once it had been established that *Corydoras* were absent from the immediate locality it was agreed to strike camp.

It was then decided to wait for nightfall to recommence fishing. A camp site was eventually established further upstream, within the rain forest, where hammocks could be strung between trees. The fishermen discussed the best stretches of the stream to collect *Corydoras* pointing to large fallen trees that lay submerged in the waters. Some species were said to be less active or tended to hide by daylight thus making them more difficult to capture. The fishermen suggested that the catfishes could be stunned by torchlight and captured individually at the edges of the stream. It was difficult to establish if all collecting was completed during the evening or at night or to know in what quantities the shoals could be found. The locals explained that shoals could move short distances and could be tracked one day but not the next.

Typical small stream habitat of the Upper Rio Negro. Photo: D. D. Sands.

Starting from our rainforest base under darkness, a fisherman and the author travelled upstream in a single canoe to undertake night collecting (Habitat 3).

By the light of the moon and torchlight it was possible to locate and observe large cichlids, characins and catfishes as they held positions on the edge of the river current within a metre from the over-grown river bank. The substrate at the stream edge shallows was densely littered with leaves and tree debris. Samples of leaves were taken from the locality the following day.

Small groups of *Corydoras* could be seen moving between the leaf litter which, upon capture, were misidentified in the darkness as *C. adolfoi* by the fisherman. On closer examination, the catfishes appeared remarkably similar to each other but were later recognised to represent two new species that I later described. A third new species was collected in marginally deeper waters. During examination of various fish collections made by the fishermen they expressed an opinion that all the *Corydoras* specimens captured in the São Gabriel da Cachoeira area represented one species. They identified all the catfishes as *C. adolfoi*.

**Leaf samples**

There are several hypotheses for the origin of the black waters of the Rio Negro and these have been extensively detailed (Goulding, *et al.*, 1988). Samples of whole dead leaves between 10 and 21 cm long, collected in the Miuá system were brought back to the UK and placed into a container of clear water in order to measure the approximate amount of staining caused by leaf litter. After one week the water was photographed against white card. Even at lower temperatures than the range expected for the Rio Negro the amount of tannin released was enough to deeply stain the water. This experiment suggests that the Negro colour is derived from rotting leaves of plants which have fallen into the water or are carried into the river by waters from its tributaries.

**Gravel sample analysis**

During the collection of catfishes at Habitat 3, a small gravel sample was retained and later used for analysis. The sample was scrutinized, using two distinctive analytical techniques at the Material Sciences Laboratories at Liverpool University to ascertain the nature of gravel. The


A sample of tetras, pencilfish and dwarf cichlids collecting alongside *Corydoras* in small streams of the Upper Rio Negro. Photo: D. D. Sands.

methods were based on standard techniques known as Energy Dispersive Analysis (EDA) and X-ray Diffractometry Analysis (XDA). A brief description of the two methods and the results follows:

**Energy Dispersive Analysis (EDA)**

This technique required that individual grains of the gravel were fixed onto aluminium studs using a graphite colloid. Five grains were individually mounted onto the studs and then separately inserted into a Cambridge S100 Scanning Electron Microscope (SED). This analytical technique requires that the X-ray spectrum, generated within the SED, is used to qualitatively identify the major elements present in each piece of gravel offered for sampling. Each peak present in the spectrum can be directly related to a known wavelength which is characteristic of the particular element present in the sample. The technique is confined to detecting those elements with atomic numbers greater than 12 and this limiting factor excludes a number of important elements such as oxygen, carbon and nitrogen. However, the technique offers relatively rapid results and provides a good indication of the major elements present in the sample.

Images and X-ray spectra obtained by the SED at 25Kv from the five grains are shown (Appendix A). The results show that the granules contain mainly silicon (quartz) with varying amounts of iron and aluminium.

**X-ray Diffractometry Analysis (XDA)**

This technique is complimentary to EDA in that it enables the specific crystalline chemical complexes to be identified based on the prior knowledge of some of the elements present. The XDA technique involves recording the X-ray diffraction pattern from a powdered sample. The method is confined to crystalline substances and cannot recognise amorphous materials. The X-ray pattern is recorded as a series of peaks at specific theta angular values and is then interpreted by assigning families of diffracted peaks to particular crystalline compounds by comparison with known patterns (Powder Diffraction Data).

The known patterns of crystalline compound diffracted peaks are stored on a computer data base which is used to make comparisons with samples.

This stage of the analysis required that part of the gravel sample was powdered using a pestle and mortar. The powder was then, supported by a medium of petroleum jelly (Vaseline), mounted and fixed onto a glass slide. The mineral complexes were identified as Quartz ($SiO_2$) and a small amount of Gibbsite $Al(OH)_3$. A number of smaller peaks were noted but while these remain unidentified they might possibly belong to an iron containing compound.

Sediment sample from typical Miuá stream. Photo: D. D. Sands.

**River and road access**

At daybreak, following the successful night collecting trip, an attempt was made to continue the canoe journey upstream towards the Igarape Nobuo Oba. After 15-20 kilometres, large granite boulders and a series of small water falls were encountered which prevented access by canoe. The waters picked up considerable speed at this point and prevented the continuation of the survey. The boulders and rapids would, in the author's opinion, have represented a considerable ecological barrier to *Corydoras* downstream and to other small sedentary species further upstream. This hurdle may explain the restricted distribution and populations of *Corydoras* species in the tributary.

After resting, the next day a vehicle was hired to journey along a dirt road (BR307) This route is used by vehicles transporting supplies. The dirt track road leads north from São Gabriel da Cachoeira to the northwest of the plateau, Pico

Neblina, and on to Cucui, on the borders of Brazil, Venezuela and Columbia. Using a reproduction of a published sketch map, the route was followed towards the type locality (Burgess, 1982). Streams were sampled for fishes at each bridge crossing. It was considered wise to avoid the first minor stream because of military activity on the bridge. The next two crossings bridged small streams which, when sampled, revealed few fishes of interest for our field survey. It was decided to continue and concentrate efforts on reaching the type locality which represented a 50-kilometre journey. The type locality for *C. adolfoi* was initially crossed without realising because a sign had been destroyed.

The next crossing was signposted as the Miuá (Habitat 1) and is where the author, on close inspection, observed a shoal of juvenile *Corydoras*. The shallows were visibly stained pale brown. Water samples from the habitat revealed pH 6.2–6.5. Large bushes of submerged marginal plant *Sagittaria lancifola* formed clumps that reached out from the shallows towards the edge of the current. Samples of this plant were taken for identification. This hard-leafed marginal plant could provide a spawning site for the *Corydoras*.

A further sample of an aquatic species taken from the biotype was later identified as *Alternathera reinecii*. The substrate in the shallows (Habitat 1 A) formed a mixture of clay, sand and organic debris which was sampled for later analysis.

## Soil sample from the Miuá stream shallows

Samples of soil from Habitat 1 A were taken for analysis and it was established that the sediment was made up of sand, silt and clay. A 20-gram sample (70% sand, 30% silt and clay) was identified as strongly fine-skewed (with an excess of fines in the grain size distribution). These sedimentary characteristics are described as typical of a tributary where silt-sand is deposited as particles falling out of suspension in a flowing stream.

Using an ignition method, the organic content (loss on ignition at 850 °C) was calculated at 4.20% and the initial moisture content (air drying at 105 °C) was established as

Dense swaths of *Sagittaria lancifola* provided ample cover for small fish such as *Corydoras* at Habitat 1. Photo: D. D. Sands.

0.59%. Sequential iron analyses indicated that 448 µg/g of iron was bound to the organic ligands present in the sample. A measure of 234 µg/g was resident in the amorphous iron and manganese oxyhydroxides, 3173 µg/g resident in the crystalline oxides, and 518 µg/g is present in the residual iron minerals. The organic and amorphous phases could be considered those most easily mobilised by interstitial water.

## Habitats 1 and 4

The catfishes were distinctly orange-headed and could be observed as they foraged at the edge of the water. With the use of dip nets, juveniles and adults, identified as *C. adolfoi* were captured. The catfishes grouped between the clumps of *Sagittaria* and a natural bowl within the clay, silt and sand at the edge of the water. The plant grew as a marginal within the shallows at a water depth of 10–60cm. It was possible to disturb the stream substrate at the edge of the shallows and, after a minute, watch the shoal swim into the settling cloud of silt in order to forage.

The samples of captured specimens represented *C. adolfoi* including juveniles and adults. *Corydoras imitator* was not found in the shallows during the afternoon collecting period.

Three complete seine sweeps were also made of the centre current (Habitat 1 B) but dragging the stream and catching proved difficult because of the greater water depth. Each net contained a few assorted characins that appeared common to the river system. The final sweep of the seine in the deeper, stronger water flow resulted in the capture of five *Corydoras* specimens identified as *C. imitator*. This group was found 10 metres away from the shallows where *C. adolfoi* had

been captured earlier. A quick sweep of the nets was also made of a still pool area alongside the shallows. When sampled, this water proved to contain only huge aggregations of tadpoles. The water appeared to be even darker stained than the Miuá stream.

At this time the light was quickly fading and therefore it was agreed to sample the next stream before returning back to São Gabriel da Cachoeira with our catch safely bagged in fresh stream water and placed into a rucksack.

**Habitat 1B**

As darkness developed, a tentative seine sweep was made of the next stream, known as Igarape Poranga (or Puranga) (Habitat 4). Six specimens were collected together in the flowing water. Three of the four specimens have formed the type material of two new *Corydoras* species.

Two other catfishes represented a heptapterid, *Brachyrhamdia rambarrani* Axelrod & Burgess, 1987, originally recorded from the Rio Ununi and hitherto unreported from the Miuá river system. It is striking that all three species share the same basic black-lined colour pattern. Complete darkness prevented any further fishing and so the species captured were individually bagged and taken to São Gabriel da Cachoeira. Priority was given to returning to the UK with live collections because of the limited sample of original study material. Our group returned quickly to Manaus and then to England to ensure the safe transport of live material.

**Venomous defence in *Brachyrhamdia***

*Brachyrhamdia* are scaleless catfishes from the South American family Heptapteridae. They attain a length of about 10 cm and are known to aquarists as 'false *Corydoras*'. The most documented species is the type species, *Brachyrhamdia imitator* Myers 1927, sympatric with *Corydoras delphax* Nijssen & Isbrücker, 1983 in the Orinoco system, Venezuela. The two catfishes share a common pattern but their ecological relationship remains to be clarified Lundberg & McDade, 1986). Brazilian and Peruvian species, *Brachyrhamdia meesi* Sands & Black, 1985 and *Brachyrhamdia marthae* Sands & Black, 1985 have been available in commercial imports (Sands, 1983).

Whilst re-bagging *Brachyrhamdia rambarrani* in preparation for the journey onwards, the author handled the catfishes in order to gently transfer the live specimens into a new bag containing fresh water. A dorsal spine pierced the tip of the index finger. The spine was firmly embedded which meant that the catfish remained attached to the fingertip despite removal from the water. The catfish was detached carefully as the minute, but painful wound bled initially. The injured finger became heated although other fingers on the same hand remained cool. These symptoms suggest that a type of venom had affected blood circulation. The catfish had either released venom into the wound or the skin puncture had stimulated an immediate allergic reaction. All pain subsided the following day although the affected finger remained numb and this condition continued for about a week. Several weeks later the index finger nerve endings remained partially numb. This account is the first record of the species from the genus *Brachyrhamdia* proving to be venomous.

**References**

Burgess, W. E. 1982. *Corydoras adolfoi*, a new species of catfish (Siluriformes, Callichthyidae) from the upper Rio Negro, Brazil, near São Gabriel da Cachoeira. *Tropical Fish Hobbyist* 30: 15–16.

Goulding, M. M. Leal Carvalho and E. G. Ferreira. 1988. *Rio Negro: Rich Life in Poor Water*. SPB Academic Publishing. 200 pp.

Lundberg, J. G. and L. A. McDade. 1986. On the South American catfish *Brachyrhamdia imitator* Myers (Siluriformed: Pimelodidae), with phylogenetic evidence for a large intrafamilial lineage. *Notulae Naturae* (Philadelphia). 463: 1–24.

Sands, D. D. 1983. *Catfishes of the World. Vol. 1. Callichthyidae* – Corydoras *and Related Species*. Dunure Enterprises. 118 pp.

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# Breeding *Parancistrus* aff. *aurantiacus* (Siluriformes: Loricariidae).

*By Jacqueline Heijmen Bennett-Leaver*

*Parancistrus* aff. *aurantiacus*. Photo: J. Heijmen Bennett-Leaver.

In its golden form, the chubby pleco *Parancistrus aurantiacus* (Castelnau, 1855) is one of the most admired species in the hobby. However, it is also found in a brown form and, like a few other plecos (e.g., *Hypostomus luteus*), this species has the remarkable ability to change colour.

*Parancistrus* is an interesting genus currently comprising two species: *P. aurantiacus* (Ucayali?, Xingu and Tocantins) and *P. nudiventris* (Xingu). It's difficult to establish the exact distribution range, because it's huge and apparently separated into two distinct areas. The type locality of *P. aurantiacus* is Rio Ucayali (Peru) but there has not been a single record of this species being exported from there since. All the specimens in the trade originate from the Rio Araguaia-Tocantins, but this species also occurs in the Rio Xingu. If the type locality of *P. aurantiacus* (Rio Ucayali, Peru) is correct, this species represents another strange example of a small pleco with a large and disjunct distribution in streams of the Brazilian shield, and an isolated population in the upper Amazon.

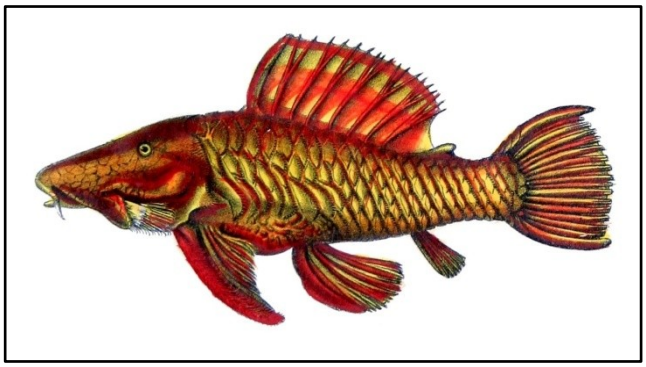
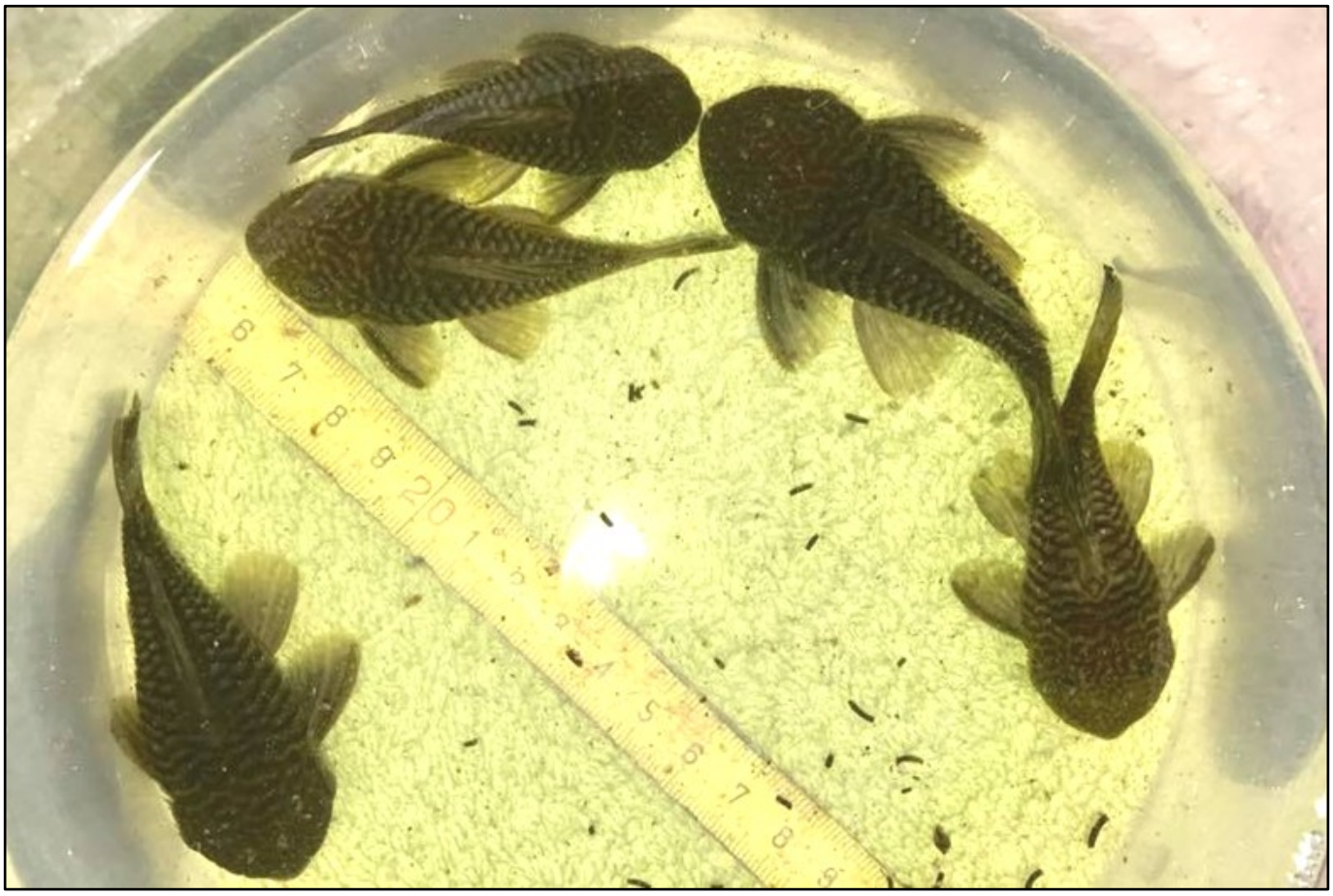


Illustration of *Parancistrus aurantiacus* provided in Castelnau (1856). Credit: Wikimedia Commons.

In my opinion, there are at least two different forms of *P. aurantiacus*. One has a darker almost black colour (*P. aurantiacus*) and the second form is lighter grayish-brown sometimes with a green tinge (*P.* aff. *aurantiacus*). Furthermore, *P.* aff. *aurantiacus* is more lightly built than *P. aurantiacus* of the same length, and the former does not change colour. Both occur in the Tocantins but are not found together in imports. Populations of *P. aurantiacus* in the Xingu should be compared to those in the Tocantins.

While the ability to change colour is fascinating, I fell in love with the bulky body shape and broad head of *Parancistrus*. In the brown form, they are plain and simple, something of an underdog in a hobby that shines most of the spotlight on fancy *Hypancistrus*.

When visiting the 2016 CSG convention, I spent time wandering around Pier Aquatics, which is probably one of the most wonderful fish shops in the world! Some small brown *Parancistrus* (reportedly from the Rio Tocantins near Cameta) caught my eye, and I hand-picked a group to take back to the Netherlands. The fish were only 5–6cm, perfect for traveling and a good size to begin a long-term breeding project.

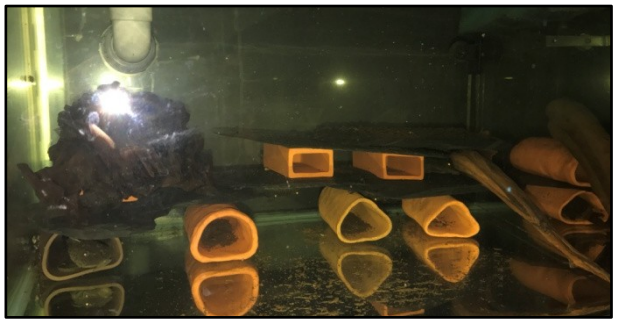


Spawning group of *P.* aff. *aurantiacus* soon after purchase and arrival in Holland. Photo: J. Heijmen Bennett-Leaver.

Selecting male and female fish was difficult but I tried my best. Once home, the fish settled in quickly and took to the food very well and started to grow. I kept them in a 175L meter-long aquarium, together with some juvenile *Ancistrus* sp. L159 and *Tatia dunni*. They were peaceful fish and didn't cause any problems. Shortly after moving house I set them up in their own tank in my main breeding system. This system contains seven connected tanks comprising roughly 1500L of water filtered by a large biological filter in a sump. I keep them in normal tap water (pH 7, 3 degrees general hardness, conductivity ca. 300 µS with a temperature around 29 °C). In their old tank, they were always breathing rapidly, but once they were transferred to the main breeding system that slowed down considerably and is probably the result of the higher amount of oxygen in the water. It is something I became aware of, to make sure there is a good flow to the tank or through the filter system which provides with high oxygen levels. It is something these fish really need.

The set up of their tank is quite simple; some caves of different shapes and sizes wedged under slate pieces and some bogwood. I like to provide my fish with lots of dark hiding places. Also, the lighting is low and only on for a few hours a day, just because it looks nice and mostly for my own convenience. After the lights go out at night I do not disturb the fish unless I really need to.

Before I let them go into their new tank I tried to see what the male:female ratio was in my group. By now, the fish had grown to 8–9cm but it was still difficult to sex them because both males and females show heavy odontodes on their pectoral-fin rays and have a robust body shape. Judging by their size, the larger two were males and the four smaller ones were females. Only time would tell.



Spawning aquarium arrangement for *P.* aff. *aurantiacus*. Photo: J. Heijmen Bennett-Leaver.

Incompletely transformed (from black to gold) *P. aurantiacus*. Photo: M. Chumachenko, Creative Commons 3.0.

It was during an evening feeding that I suddenly spotted two fish in the same cave. There was no typical pre-spawning behavior; no vibration or fanning. The male was just sitting there. I didn't immediately think anything of it but I secretly hoped for the best. And sure enough, the next morning I had the first eggs from my young group of *Parancistrus* aff. *aurantiacus*. I can't really say I did anything to trigger the spawning; I just do my normal routine of water changing and feeding. Nothing fancy, I believe in keeping things simple. At that time I was also incubating *Panaqolus albivermis* eggs which spawned just five days earlier. Things were going well in the new fish-house!

For the sole purpose of gathering information about egg development of *P.* aff. *aurantiacus*, I decided to take the eggs from the male and incubate them artificially. This way I could learn about the sensitivity of the eggs and the growth rate of the fry. The eggs from *Parancistrus* aff. *aurantiacus* are large (5mm), almost orange in colour and the spawn consisted of at least 11 eggs. I lost a few along the way due to fungus but managed to hatch six fry from this first spawn. The fry grew at a steady pace and absorbed their yolk sacs in about 12 days.

Male *P.* aff. *aurantiacus* incubating eggs (lower left). Photo: J. Heijmen Bennett-Leaver.

The juveniles share a fry trap (Gerd kastte) with the *Panaqolus albivermis* fry and are feeding on Repashy herbivore formula. Compared to the *Panaqolus* fry, *Parancistrus* grow at a rapid rate, measuring 2.5cm at seven weeks. The juveniles already show the characteristics of the species with robust and broad body shapes.

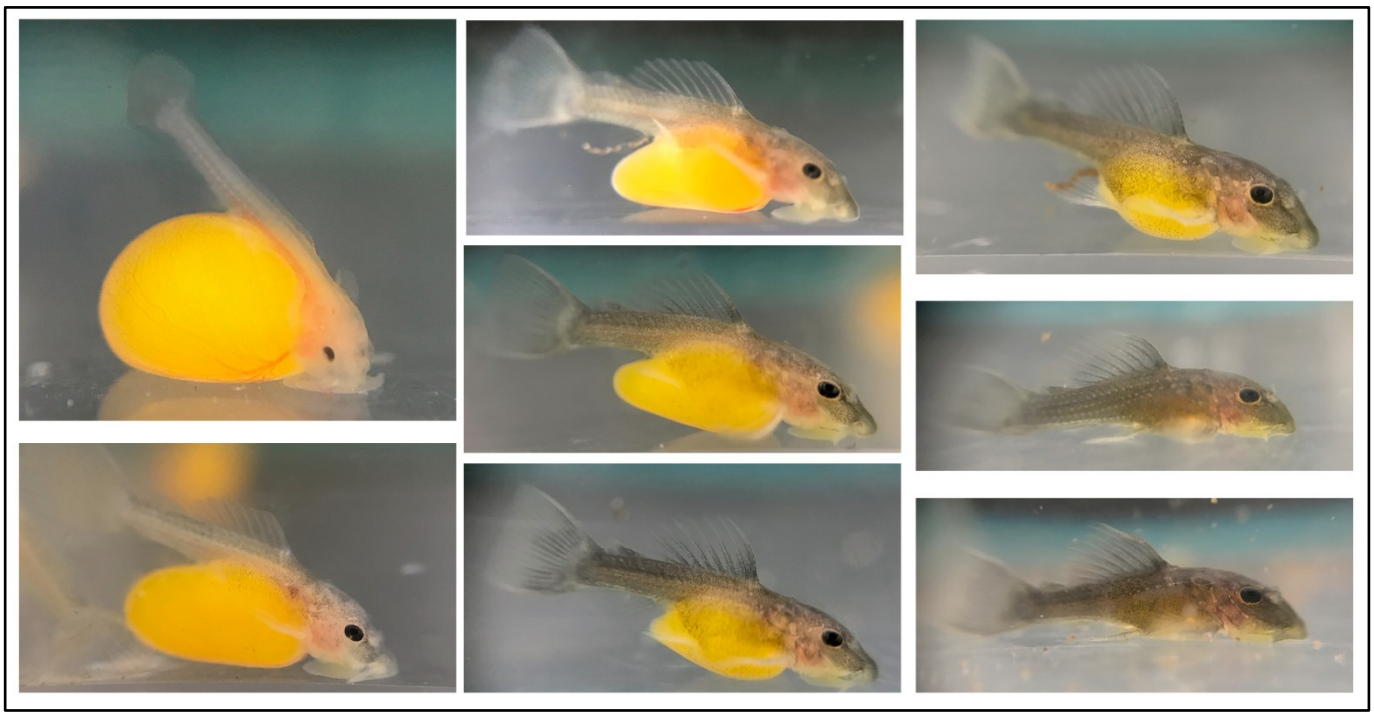
About five weeks after the first spawn, I noticed the male was in his cave again. One of the females looked to be ready and was hanging around the cave. I'm guessing it was the same

Egg development sequence for *P.* aff. *aurantiacus*: top = ca. 24h, middle = ca. 48h, bottom = ca. 72h. Photos: J. Heijmen Bennett-Leaver.

female as the first spawning, but cannot be sure. The next day the pair was trapping, this time the male was showing much more effort in stimulating the female and was vibrating and fanning. The following morning the male was guarding his second batch of eggs. This time I let him take care of them, and after six days the eggs hatched without any problems and he is still taking good care of them as I wrote. One of the fry escaped the cave during hatching but is being ignored by the other adult fish.

In my experience, *P.* aff. *aurantiacus* is a peaceful and interesting species for the aquarium and they deserve more of our attention. I hope this breeding report will inspire more people to keep and even try to breed this beautiful brown fish.

I wish you all happy and successful fish keeping!



Fry development sequence for *P.* aff. *aurantiacus*: top left = day of hatching(dh), lower left = dh+3days, top centre dh+4d, middle centre = dh+5d, lower centre = dh+6d, top right = dh+ 7d, middle right = dh+10d, lower right = dh+12d. Photos: J. Heijmen Bennett-Leaver.

Captive bred sub-adult *P.* aff. *aurantiacus* at ca. dh+6 months. Photo: J. Heijmen Bennett-Leaver.

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# *Use it or lose it* - support your local aquatics retailer!

*By Mark Walters*

I like nothing more than arriving at one of my favourite fish shops (yes, I have more than one!). The anticipation that builds for the days before, and the trip along the motorway are almost as exciting as the visit itself. Most of my preferred stores are a fair few miles away from my home in West Yorkshire, but always well worth the effort to get there.

I also tend to travel with friends, often on the way to another aquatic event, which of course adds a social element to the trip but usually means an even earlier than normal start to the day, and unfortunately, more time away from my family. The decision to visit a shop could just be convenient due to other plans on that day – or, as is often the case, because there has been a new species imported which interests me or my friends.

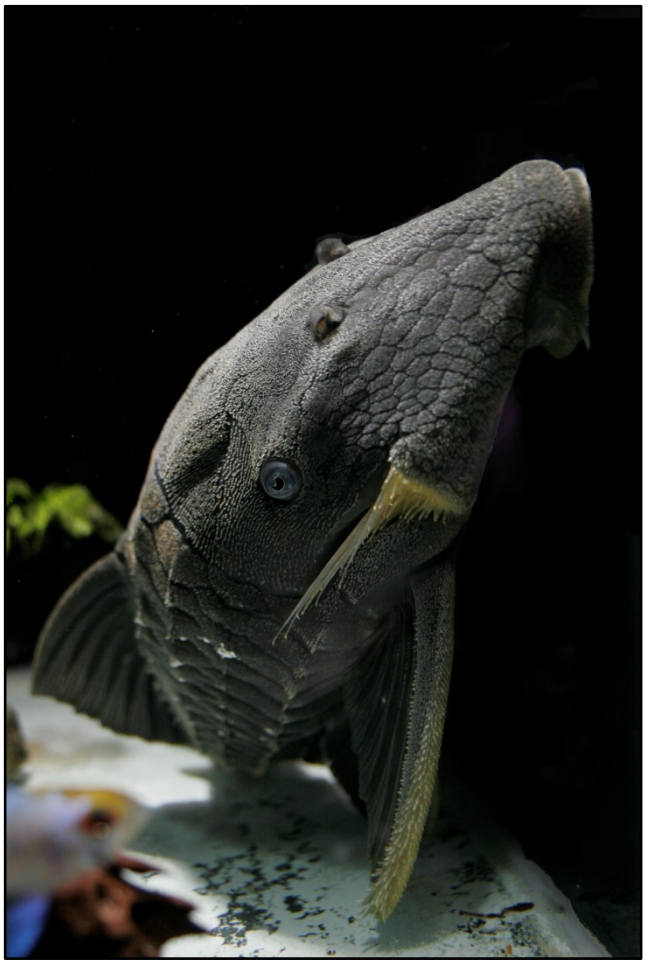
It probably seems to the owners of the shops that I am a rare visitor – maybe popping in only 2 or 3 times a year. Believe me, if I was more local to some of the stores I would be there every week on the off-chance that something new has arrived which encourages me to add to my menagerie. In hindsight, it is probably not a bad thing that I live just far enough away to not be able to visit more often – which also helps my bank balance and prevents my tanks bulging at the silicone seams.

I will also usually only visit a store if I intend to purchase fish (rather than a casual browse), which is not always a given. I understand the frustration that proprietors will have with people who view their shops as free public aquaria, especially those who regard it as a nice Sunday day out to see the lovely fishies – with absolutely no intention of supporting the shop in any financial way, the same people often don't even keep fish. Maybe a natural habit in a garden centre aquatic retailer, where families are no doubt also visiting Santa's grotto or buying some geraniums, but those who specifically visit an aquatic-only retailer to entertain their kids would truly make my blood boil!

I may visit, but won't usually shop a few months before a long holiday. I certainly wouldn't want to buy fish if I didn't have the

tank space and equally will go into fish-house-triage if there is any disease or other major issue to contend with. The times I do visit can often be a rushed affair, with a tight window of opportunity between shop opening time and the aquatic event I may also be attending. Usually, when I do have the luxury to satisfy my favourite form of retail therapy I spend a bit – and make it worthwhile to the shop I visit.

The fact that I will likely be away from home for a good 8-10 hours will also play a part in my fish-buying plans, although I have only ever had one issue with maintaining fish in a poly box for over 6 hours – a *Corydoras sterbai* poisoning event, which probably would have happened after 30 minutes anyway (lesson learned for me but always bag large corys individually – they can release toxins into the water when stressed which can kill them). Shops are usually great in bagging larger fish individually, or smaller fish in larger bags, and some will even provide a box if you haven't taken your own. For a long day, especially in the winter, I will add an extra bag to the box containing warm water to keep the



*Panaque suttonorum* (Loricariidae). Photo: M. Hardman

temperature in check – making sure the fish bags aren't in direct contact. The extra water (assuming its de-chlorinated) can also come in handy if you need to change some of the bag water during the day.

Of course, the main advantage of purchasing fish from a reputable aquatic retailer is the wide choice on offer, especially from some of the more specialist stores. Over many years, they have established worldwide networks of exporters from all corners of the globe who can source hard-to-obtain species which seem to be most desirable in the hobby. Because of the strong relationships with foreign suppliers, the retailers know they can rely on good quality and usually ethically-sourced stock, complying with local and international export regulations – it simply isn't in the interest of good retailers to flout laws in place to protect species and habitats. The best retailers will have appropriate quarantine facilities and disease-control measures to protect you and I from tank wipeouts – although the purchaser also has significant responsibilities in this respect.

This is in contrast to the numerous hobbyist enterprises that regularly appear on social media, often operating from a garage or large fish house, attempting to present themselves as bona fide professional retailers. Yes, they may be able to source desirable fish at cheaper prices but at what expense? Firstly, they are in direct competition with established retailers who have legal overheads (tax), staff, and appropriate licences to operate as livestock retailers. Secondly, many appear to operate on a basis of *'stock arrives on Friday, available for sale on Saturday give me a call to arrange a visit'* – do I need to explain? In addition, there is unlikely to be much in the way of a relationship between the seller and customer, which most people will agree is the bedrock of retail service. Thankfully, most of these pop-up shops are quite short-lived, but there seems to always be someone new to replace the last person for whom it was an un-mitigating disaster of an enterprise.

The main reason I wanted to take the time to support aquatic retailers is quite simple. They are always managed and run by really nice people who like you and me are fish-crazy at heart, and have often turned their passion into their livelihood. They have worked hard to develop a great place for us to visit, meet other fishy friends and view rare creatures from across the world.

I feel privileged to be allowed into their businesses to have a look around, with no obligation to pay and will always receive a welcome unlike any other retail establishment I know – apart from my local pub of course! The advice on offer knows no bounds, having worked in fish shops myself I know how much time is spent talking and giving advice – for no return. Often staff are tied up on long phone calls giving a service that solicitors would charge £500 an hour for.

This amazing service can sometimes be thrown back in the face by customers who walk out without buying anything, expect a discount if they do buy something, or a few extra fish or to be able to return the fish if they don't want them after a few months, or simply don't treat the staff with the same respect offered. Remember also, aquatic stores don't survive on livestock sales alone – these are the things which entice us to go back again and again but there is limited

profit in the fish when the many overheads are considered. Make sure you also purchase your equipment and food from the store, rather than going online to save a couple of quid. You are likely to get better after-sales service, advice and a smile!

Good aquatics retailers are prepared to import rare, spectacular and specialist catfishes for advanced aquarists. Clockwise from upper left: *Cetopsorhamdia phantasia* (Heptapteridae), *Pseudacanthicus spinosus* (Loricariidae), *Hemisorubim platyrhynchos* (Pimelodidae), *Corydoras weitzmani* (Callichthyidae). Photos: M. Hardman

# *Cryptarius* Kailola, 2004 (Siluriformes: Ariidae).

*By Steven Grant*

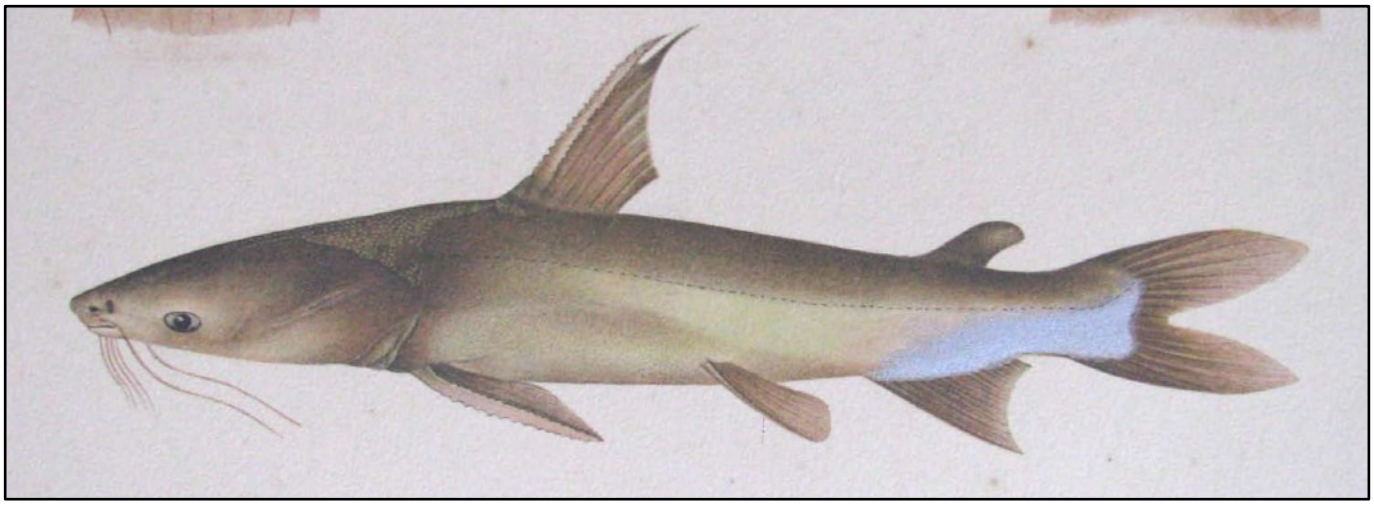


Illustration of *Cryptarius daugueti* (Chevey , 1932) provided in original description.

A catfish family that tends to get overlooked in the hobby is the Ariidae, or Sea Catfishes. This may well be because of their tendency to live in marine, brackish and freshwater habitats that are more difficult to simulate in aquaria, but may also be because of their pelagic nature. Another issue may be their colour pattern, with most being plain silver.

One genus that is sometimes offered in the trade, albeit rarely, is *Cryptarius* Kailola, 2004. This genus is noteworthy for aquarists in that it can often exhibit a golden, yellow or greenish colouration, sometimes with reddish fins and mouthparts which make it stand out against other ariids, although this could be due to diet or trauma related to capture.

In Thailand and Cambodia, the native names are translated as spear, spear-head, and spear-handle (Smith, 1945), presumably because of the long and narrow head and body. The etymology of the genus name is from *kryptos* (Greek) meaning hidden or secret (Brown 1956) and *Arius* in reference to the unique combination of characteristics in the genus having been ignored for such a long time (Kailola, 2004). The characteristics mentioned mainly relate to the osteology of the head and teeth and are of little use to aquarists, but the following can help identify this genus:

- the origin of the specimens (where known)
- the golden, yellow or greenish colour, sometimes with reddish fins
- the long dorsal fin spine with prominent serrations on both edges
- the long and narrow head and body
- the ventral fins inserted roughly parallel with the end of the shortest dorsal fin ray, and rounded caudal-fin lobes in larger specimens

There are two valid species, one being uncertain with respect to its validity and placement in the genus.

*Cryptarius truncatus* caught in the lower Indragiri River, Riau, Sumatra. Photos: B. Harianto.

*Cryptarius truncatus*. Photo: K. Udomritthiruj.

*Cryptarius truncatus* (Valenciennes, 1840) is found in brackish waters (e.g., estuaries, mangroves and mouths of coastal rivers) but is also reportedly from freshwater, in Thailand (Bay of Bangkok area), Indonesia (Java, Sumatra), and Malaysia (Peninsular and n. Borneo). Reports from Cambodia may be the other species (see below). *C. truncatus* is the one known to have been in the hobby and is reported to reach 45cm TL for females and 40cm for males. *Hemipimelodus cochlearis* Fowler, 1935 is currently considered a junior synonym.

*Cryptarius daugueti* (Chevey, 1932) was described from Cambodia. Eschmeyer *et al.* (2017) list the type locality as "Indo-China". The description seems to be based on a single specimen (26cm) from "Snoctrou" which is now Chhnok Tru "on the doorstep of the Great Lake" which is Tonlé Sap in Cambodia. However, Chevey also stated that he caught the fish at Phnom Penh, and it is unclear if one or more than one specimen was used in the description. The type specimen (or specimens) is reportedly at the Vietnam Academy of Science and Technology in Hanoi. Either way, it appears to be from the Tonlé Sap river, which is a tributary of the Mekong. This could be a synonym of *C. truncatus* but Chevey stated that there were no teeth on the palate, which would make it different to *C. truncatus*. If the type specimen(s) cannot be traced, Cambodian material from Battambang (Tonlé Sap) at the University of Michigan's Museum of Zoology (UMMZ 181176) should be examined as they may represent *C. daugueti* (not *C. truncatus* as listed by Marceniuk & Menezes, 2007).

Chevey also described the colour as "greenish-brown on the back, yellow-green on

*Cryptarius truncatus*. Photo: B. Harianto.

the sides and abdomen, with silvery reflections on the caudal peduncle; pinkish yellowish fins".

**Ecology**

Pang (1990) studied *C. truncatus* in Sarawak (Malaysia) and in 177 stomachs there was a high percentage occurrence of Crustacea. Among the crustaceans, the most commonly observed food items included crab, mantis shrimp and shrimps. Pang also found gastropods, worms, and fish. In captivity, a suitable diet would be prawns, fish pieces, and earthworms but smaller specimens would likely take frozen bloodworm and shrimp.

Giovanni Putra successfully kept his specimens of *C. truncatus* between 26 and 28 °C (pers. comm.). Pang and Ismaili (1988) recorded the pH of the mangrove estuary in Sarawak as ranging from 7.5 to 8, temperature between 28 and 29 °C, salinity between 24.7 and 27.6 ppt. The type locality for *C. daugueti* has a pH of around 7.5 and a temperature of between 29 and 31 °C and is freshwater (Yen et al, 2007).

Nothing specific is known about their method of reproduction but the ariid catfishes are known to produce few, large (to 20 mm diameter) eggs which the male incubates in his buccal cavity after fertilisation until the young hatch and the yolk sac is resorbed. Pang showed that for *C. truncatus* the peak maturation season occurred around December to January, although the maturation process may have started in the month of August. The male seems to mature at a shorter length (30.5 cm) than the female (32.5 cm).

They are caught as food by way of trawls, seines, traps and hook and line. Pang stated that their flesh is wholesome, tasty and that in Sarawak they are marketed fresh, dried, smoked or salted and fetch a good price. They are "Not Evaluated" for CITES so it is not known whether their numbers are threatened in any way, but Pang stated that in 1988 they were abundant in the mangrove estuary (and caught over 340 specimens). Giovanni Putra has advised me that the fishermen in the Indragiri River in Sumatra do not find large numbers of *C. truncatus* and that fisheries there and in Java are suffering due to Palm oil plantations.

**Acknowledgements**

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**References**

Chevey, P., 1932. Poissons des campagnes du "de Lanessan" (1925-1929). Ire [1re] partie. *Travaux de l'Institut Océanographique de l'Indochine Mémoire* 4: 1-155, Pls. 1-50.

Eschmeyer, W. N. and R. Fricke, and R. van der Laan (eds). 2017. Catalog of Fishes.

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.

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.

Marceniuk, A. P. and N. A. Menezes, 2007. Systematics of the family Ariidae (Ostariophysi, Siluriformes), with a redefinition of the genera. *Zootaxa* No. 1416: 1-126.

Pang, S. C. and B. P. Ismaili, 1988. A study of the fisheries significance of the Sungai Salak Mangrove Estuary in Sarawak, Malaysia. *Buletin Perikanan*, No. 54, 22 pp.

Pang, S. C., 1990. Some aspects of the biology of *Arius truncatus* (C. & V.) and *Arius caelatus* (Val.) (Osteichthyes, Tachysuridae) in the Sungai Salak Mangrove Estuary, Sarawak, Malaysia. *Buletin Perikanan*, No. 63, i-vii, 1-28 pp.

Smith, H. M., 1945. The fresh-water fishes of Siam, or Thailand. *Bulletin of the United States National Museum* No. 188: i-xi + 1-622, Pls. 1-9.

Yen, N. T. H., K. Sunda, S. Oshi and K. Ikejima, 2007. Tonle Sap ecosystem water quality index development and fish production. *WIT Transactions on Ecology and the Environment*, Vol. 102.



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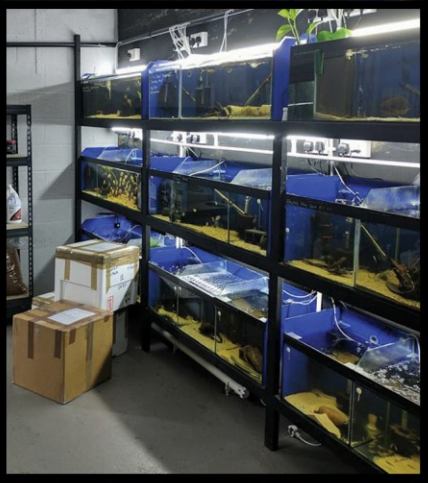

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To continue to enhance the role that the CSG plays in supporting research into catfishes and to foster a closer relationship between scientists and aquarists, the committee is delighted to announce a Research Support Fund (RSF). The RSF will provide 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.

***Who is eligible to apply?***

Initially, we will open this to students and junior researchers that are subscribing members of the CSG. 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.).

***How do I apply?***

Applicants will complete 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. In the event that 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.


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