NEW SPECIES 2025

THE FRESHWATER FISH SPECIES DESCRIBED IN 2025

IUCN SSC Species Survival Commission

FFSG Freshwater Fish Specialist Group

CALIFORNIA ACADEMY OF SCIENCES

Shoal

ABOUT

SHOAL is a global ecosystem of partners and collaborators who work together to safeguard the health of Earth's freshwater habitats and conserve the most threatened freshwater species. As with a shoal of fish, the strength of the SHOAL lies with the number of partners all working together.

Stay up to date with our work or reach out to collaborate:
shoalconservation.org

The IUCN SSC FFSG has a mission of achieving conservation and sustainable use of freshwater fishes and their habitats through generating and disseminating sound scientific knowledge, creating widespread awareness of their values and influencing decision making processes at all levels.
freshwaterfish.org

Eschmeyer's Catalog of Fishes database was begun in the 1980s at the California Academy of Sciences by Bill Eschmeyer. It is the primary resource for current knowledge on the kinds of fishes, and is updated continuously as new species are described.

researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp

CREDITS & ACKNOWLEDGEMENTS

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Further reading:
1,000 Fishes Blueprint // New Species Reports // Forgotten Fishes Report

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CONTENTS

FOREWORD 1.

INTRODUCTION 3.

SPECIES

AFRICA
Rainbow Killi, Katemo-Manda's Killi, Marbled Killi, & Dubie Killi ..... 6.
Meet the Researcher: Béla Nagy ..... 13.
Armored Spine Killifish, Pectoral Spine Killifish ..... 19.

ASIA
Renny's Stiphodon..... 23.
Yang's Plateau Loach..... 26.
Sichuan Mountain Cave Loach..... 29.

EUROPE
Anatolian Minnow ..... 34.

NORTH AMERICA
Sicklefin & Apalachicola Redhorse..... 38.
Birmingham Darter & Gurley Darter..... 42.

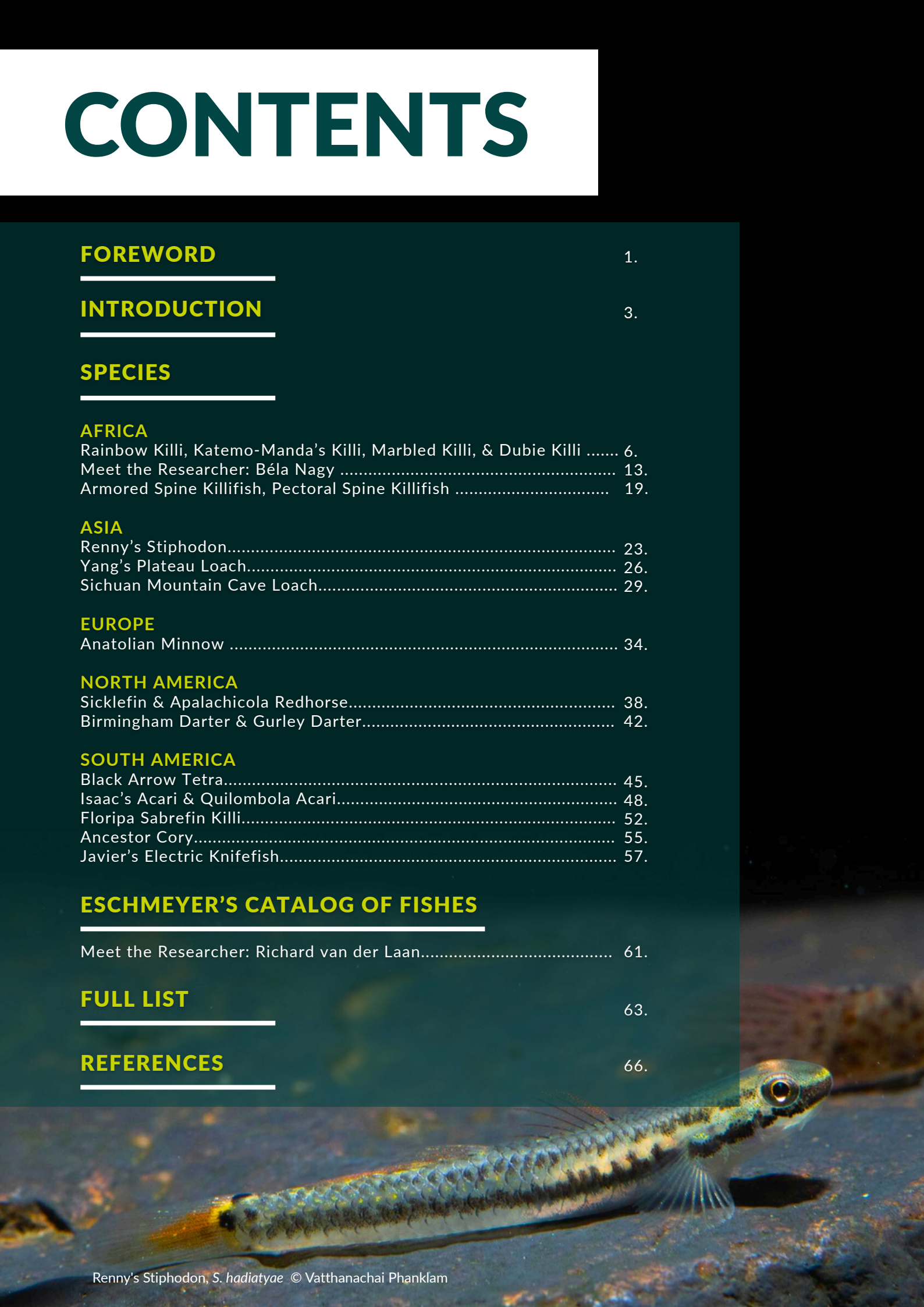
SOUTH AMERICA
Black Arrow Tetra..... 45.
Isaac's Acari & Quilombola Acari..... 48.
Floripa Sabrefin Killi..... 52.
Ancestor Cory..... 55.
Javier's Electric Knifefish..... 57.

ESCHMEYER'S CATALOG OF FISHES

Meet the Researcher: Richard van der Laan..... 61.

FULL LIST 63.

REFERENCES 66.



Renny's Stiphodon, *S. hadiatyae* © Vatthanachai Phanklam

FOREWORD
Mike Baltzer
Executive Director, SHOAL

A bumper year for freshwater fish descriptions!

Three hundred and nine new names added to the ledger of freshwater fish diversity. A staggering number really – nearly one 'new' species each day through 2025. It is the most in one year since 2017, and the third highest number since records began way back in 1758. From Asian karst caves and peat swamps to Amazonian rapids, African seasonal wetlands to Appalachian rivers, it is a reminder that freshwater biodiversity is still unfolding before us.

Across all the stories you will find in the coming pages, several themes emerge:

1. **Micro-endemism:** many of this year's new species are known from single drainages, individual tributaries, isolated wetlands, or solitary cave systems. Freshwater ecosystems fragment landscapes naturally. Over evolutionary time, a ridge or subtle shift in drainage is enough to isolate and diversify.

2. **Taxonomy is patient work.** It requires comparison across collections, careful measurement, genetic sequencing, and many years of accumulated field knowledge. Specimens sometimes sit on laboratory shelves for decades before they are described.

3. **Without a formal scientific description, a species cannot be assessed for the IUCN Red List.** It cannot be properly regulated in trade or embedded within legislation or management plans. It cannot be counted accurately in biodiversity assessments. A species without a name exists biologically but remains invisible institutionally.

Anatolian Minnow © Baran Yoğurtçuoğlu

Image: Marcelo, Alany and Nelson from *Baryancistrus* spp. discovery team © Douglas Bastos

Taxonomy therefore remains one of conservation's quiet foundations.

And it begs questions: how many species remain undocumented? And how many may disappear before anybody has had the opportunity to recognise them? New Species 2025 is a snapshot of a moving frontier. It reflects where taxonomic attention is focused, where biodiversity remains under-surveyed, and where evolutionary processes continue to surprise us.

Above all, it underscores a simple truth: freshwater life is richer than we fully understand.
The 309 names added in 2025 expand our knowledge of the living world. What happens next depends on whether that knowledge is translated into stewardship.

Mike Baltzer

INTRODUCTION

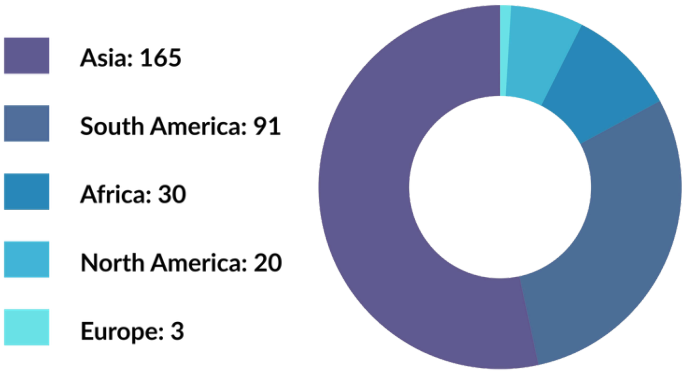
Baryancistrus isaaci © Douglas A. Bastos

In 2025, freshwater science once again revealed how incomplete our understanding of life beneath the surface remains. Across continents and climates, taxonomists described species that had lived unseen in caves, lingered unrecognised in museum collections, persisted in seasonal pools that dry to cracked mud, or flowed quietly through rivers thought to be well studied. New Species 2025 marks another remarkable year for freshwater discovery. In total, 309 freshwater fish species were formally described – the highest number since SHOAL began compiling these annual reports.

Among the standout species is Yang's Plateau Loach (*Triplophysa yangi*), a cavefish from Yunnan Province whose expanded swim bladder chambers protrude visibly from its body, giving the impression of a built-in lifejacket. Adapted to the perpetual darkness of karst rivers, it appears to hover motionless in the water column – an elegant solution to life where energy is scarce. In nearby Sichuan, another subterranean surprise emerged: the Sichuan Mountain Cave Loach (*Claea scet*), the first obligate cave-dwelling member of its genus. Pale, reduced-eyed and ghostlike, it extends the ecological boundaries of its lineage into a realm previously unrecorded. From the seasonal wetlands of the Democratic Republic of the Congo came four new *Nothobranchius* killifishes. These annual species hatch, mature and reproduce in temporary rain pools that may exist for only weeks. When the water disappears, the adults perish, but their drought-resistant embryos endure in the mud, waiting for the next rains. Each shallow depression can hold a species found nowhere else on Earth. In Brazil's Atlantic Forest, the Floripa Sabrefin Killi (*Campellolebias insularis*) survives in rain-fed pools on a single island increasingly transformed by development. Barely reaching 2.6 cm in length, it lives in wetlands so shallow and grass-covered they can appear dry to the untrained eye.

The Amazon basin yielded both beauty and intrigue. The striking Black Arrow Tetra (*Inpaichthys luizae*), known in the aquarium trade before it had a scientific name, was formally described in 2025 – a crucial step in ensuring it can be assessed and managed appropriately. Meanwhile, Javier's Electric Knifefish (*Microsternarchus javieri*) from the Negro River basin adds to the diversity of weakly electric fishes navigating tannin-dark waters through electric signals invisible to human eyes.

Javier's Electric Knifefish Habitat
© Carolina Escamila Pinilla



North America's discoveries remind us that biodiversity can remain hidden even in well-studied regions. Two brilliantly coloured darters, the Birmingham Darter and Gurley Darter, were distinguished from their relatives in Alabama streams. And two large river fishes long recognised but unnamed, the Sicklefin Redhorse and Apalachicola Redhorse, finally received formal descriptions after decades of careful work.

Elsewhere, the newly described Anatolian Minnow (*Phoxinus kottelati*) from Türkiye demonstrates how detailed revision can reveal that what once appeared widespread is, in fact, a mosaic of distinct local lineages. In Africa, two spine killifishes were described from museum specimens that had waited years for careful re-examination – a reminder of the hidden discoveries still resting in collections.

At time of publication, only one of this year's newly described freshwater fishes has been assessed for the IUCN Red List – *Nothobranchius sylvaticus* was assessed by Nagy, B., Watters, B. & Bellstedt, D.U. as Critically Endangered. Assessments take time, requiring population data, distribution mapping, threat analysis and expert review. But without assessment, we cannot clearly determine which species and habitats demand urgent conservation action. The more comprehensive the Red List data becomes, the more precisely conservationists can prioritise efforts, allocate resources and advocate for protection.

Together, these 309 species deepen our understanding of freshwater life: its adaptations to darkness and drought, its dazzling colouration, ancient lineages, and quiet persistence in overlooked habitats.

They remind us that discovery is ongoing. Beneath the surface of rivers, wetlands and caves, there is still so much left to learn.

Checking fish traps for *Nothobranchius* © Béla Nagy

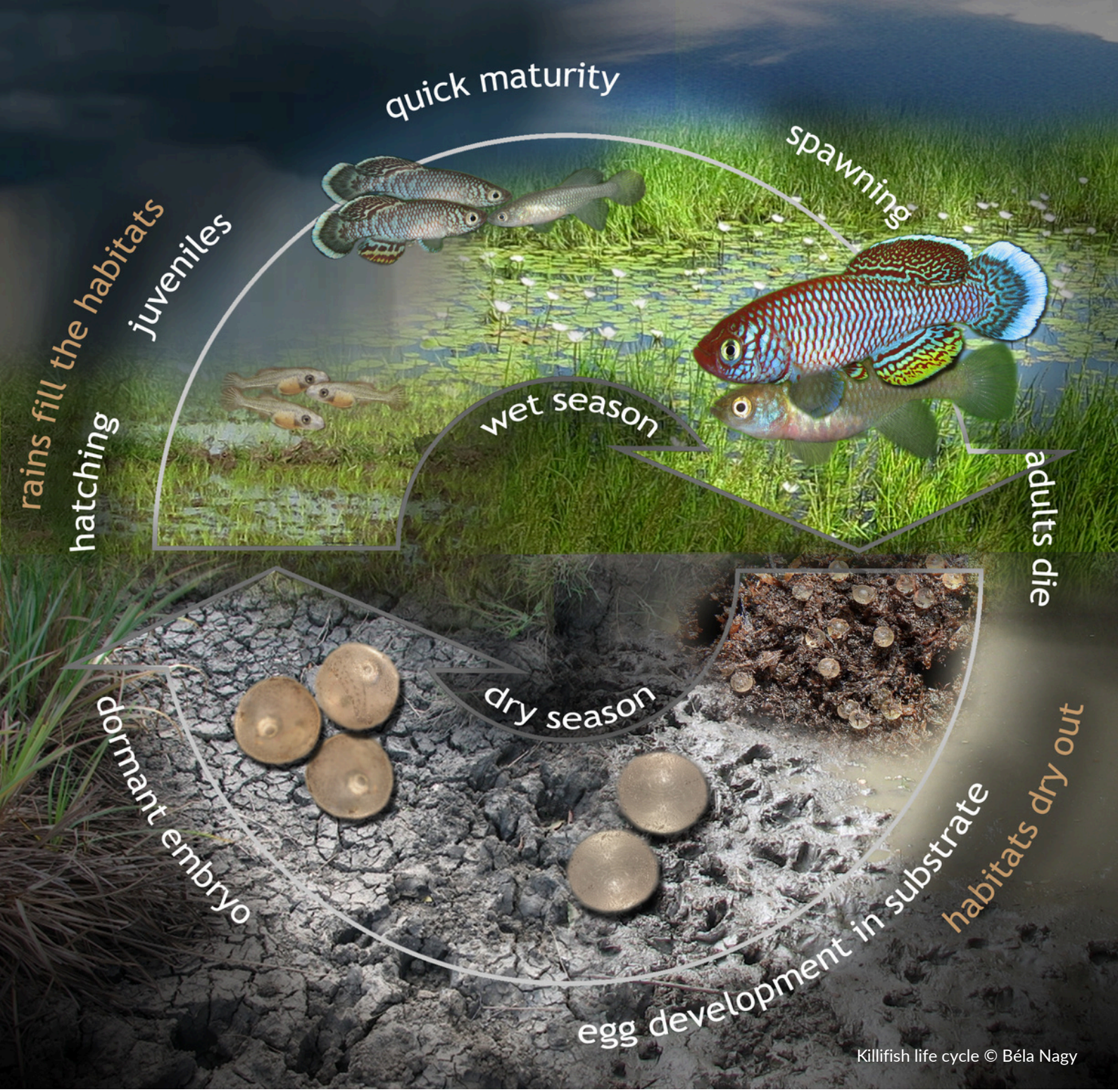
AFRICA

Rainbow Killi, Katemo-Manda's Killi, Marbled Killi, Dubie Killi, & Armoured Spine Killifish

Rainbow Killi (*Nothobranchius iridescens*)
Katemo-Manda's Killi (*Nothobranchius katemomandai*)
Marbled Killi (*Nothobranchius marmoreus*)
Dubie Killi (*Nothobranchius dubiensis*)

1: Katemo Manda's Killi male and female, and 2: Marbled Killi male and female. Both wild caught. © Béla Nagy

These four *Nothobranchius* species are linked by geography, a shared life strategy, and by being described by prolific killifish explorer Béla Nagy. They each highlight how new species can emerge from one of Africa's most challenging landscapes: the seasonal wetlands of the Democratic Republic of the Congo.



Killifish life cycle © Béla Nagy

Nothobranchius killifishes complete their entire life cycle in temporary pools that appear during the rainy season and vanish months later. Adults hatch, grow, mature and reproduce in a matter of weeks. When the pools dry, the adults die. Their eggs remain buried in the mud, waiting out the dry season in suspended development. To find them, you must have the right weather window.

“These are seasonal fishes,” Nagy told SHOAL. “You have only a few weeks each year to find them alive. And finding them is complex – if there are a lot of rains, you won’t find them. And if you miss the rains, you miss the species.”

This life strategy makes them evolutionary accelerators. Slight changes in drainage, such as low ridges, ancient river shifts, subtle watershed divides, are enough to isolate populations for millions of years. Over time, colour, pattern, and genetics diverge. In the Congo Basin, with its complex hydrology and vast under-surveyed areas, that process has produced a dense mosaic of narrowly endemic species.

Nagy has learned to read that mosaic like a map.

“If you show me any of the one hundred known *Nothobranchius* species,” he says, “I can tell you which drainage it comes from. Over time, you learn the typical colour combinations associated with each system. When you encounter a population with a pattern that falls outside those known combinations, you immediately know that something may be different.”

Nagy is the world’s prominent voice on *Nothobranchius.* He has built a remarkable level of knowledge over more than 30 African expeditions exploring remote and inhospitable regions in his mission to categorise *Nothobranchius* species.

Before each expedition, he plots known records against drainage systems and road access using GPS data and satellite imagery. Patterns and gaps emerge.

“You can see on satellite imagery a pattern of potential locations. If that is in an isolated and previously unsurveyed region, then there is a good chance that something undiscovered might be there – that is where to go.”

That logic led him repeatedly into southeastern Democratic Republic of Congo.

Béla Nagy in the field in Tanzania sampling for *Nothobranchius* in cattle drinking water! © Gábor Petneházy.


© Béla Nagy

The Rainbow Killi (*Nothobranchius iridescens*)

Nagy had identified the Kafila drainage back in 2013 as a promising site for new species discoveries, but marshy ground blocked vehicles from entering, and access ended kilometres short of the pools themselves, pausing his efforts to reach them. It was only in 2023, when conditions finally allowed access, that Nagy and colleagues were able to traverse the marshy stretch and reach the pools, guided by local villagers to the spot where fish were said to appear after the rains.

Initial collecting efforts produced nothing. A fish trap was then placed at a weak inflow entering the marsh, and after two hours it was checked. Inside were two males, and Nagy immediately recognised they had an unfamiliar colour pattern. They returned the next day to the same area and found more. His instinct that they belonged to a new species was right, with later morphologic and genetic work confirming the fieldwork.

The name *iridescens* reflects the species' striking, multi-coloured appearance, which stands out even within a genus known for visual excess.

Katemo-Manda's Killi (*Nothobranchius katemomandai*)


© Béla Nagy

During the fieldwork to find Katemo-Manda's Killi, recent local development opened access to an area that had previously been unreachable, meaning Nagy and his team could sample habitats that had until then not been surveyed by ichthyologists.

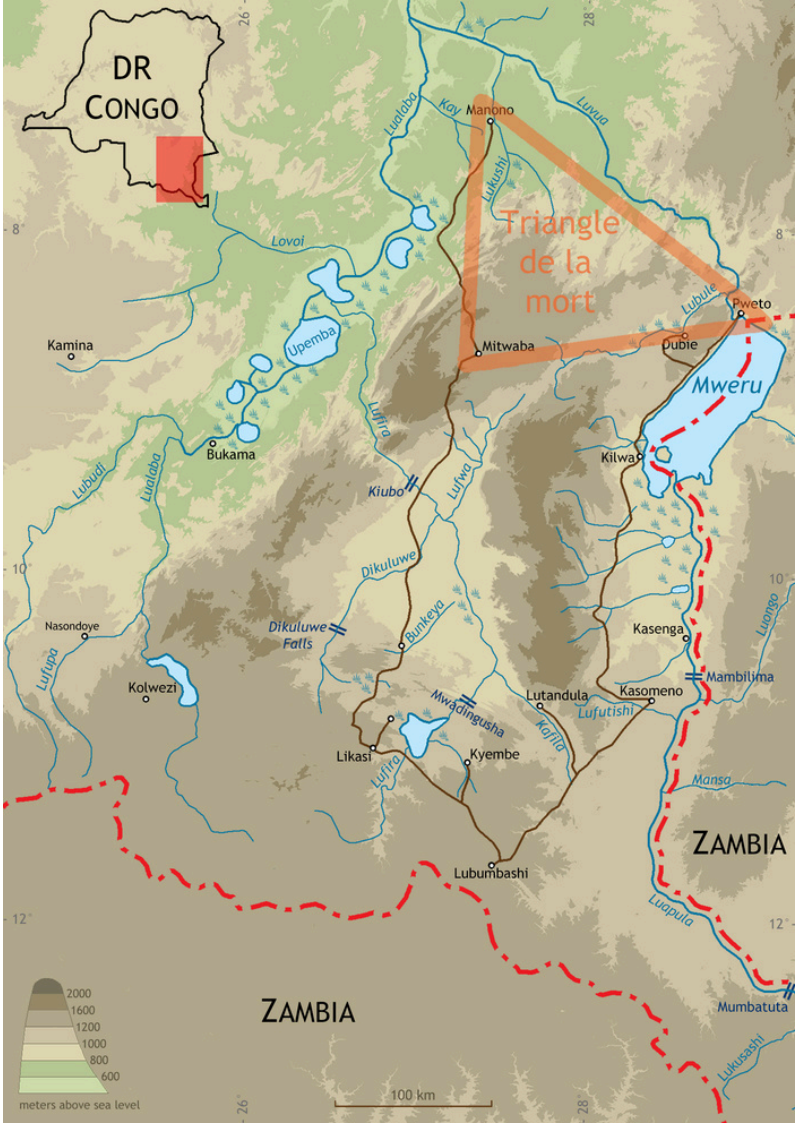
The species was named after Bauchet Katemo Manda (left), professor at the University of Lubumbashi, and discoverer of this species, for his dedication to the research of the ichthyofauna of the Democratic Republic of Congo. Nagy told SHOAL, "The exciting adventures and numerous challenges faced during joint research expeditions [with him] will always remain vivid memories."

As with many *Nothobranchius*, the species is known from a single area, and its recognition rests on a combination of colour pattern, morphology, chromosomal and genetic distinctiveness. The name recognises Katemo Manda's contribution to taxonomy, acknowledging how much of it depends on local knowledge.

Fishers with fish traps near Lake Mweru in Democratic Republic of Congo © Béla Nagy

Marbled Killi (*Nothobranchius marmoreus*)
The Marbled Killi has a precarious history. It was first encountered in 2016 on the road to the region known as the "Triangle de la Mort" (Triangle of Death) due to it being a focal point in the ongoing Katanga insurgency. The initial specimens were in poor condition. A fungal infection had swept through them rapidly, and all died within hours of capture. For years, the species existed only as a question mark.

When Nagy returned to the same area in 2023, conditions were different. Healthy fish were found, collected successfully, and analysed. Morphologic and genetic work confirmed that the species was indeed distinct, with unique chromosomal structure, and live individuals were eventually established in captivity, where they proved robust once removed from the stresses of transport.



Dubie Killi (*Nothobranchius dubiensis*)
The Dubie Killi was also discovered under demanding conditions in a vast marshy area in forest savannah. Fieldwork took place in remote areas where logistics were stretched thin, and food and water were limited. Local fish traps, set by villagers for subsistence fishing, became key tools for sampling. By dividing efforts across multiple sites, the team collected enough material to recognise that the species inhabiting the swampy area around Dubie village did not match any known member of the genus.

As with the others, confirmation came through careful comparison and genetic analysis. The name *dubieensis* reflects the locality, anchoring the species to a specific place within the vast Congolese landscape.


Type locality of Katemo-Manda's Killi © Bauchet Katemo Manda

> "These pools look insignificant," Nagy says. "But each one can hold a species found nowhere else on Earth."

Documenting the catch under curious eyes © Gábor Petneházy

Seasonal killifishes are inherently vulnerable. They depend on intact wet–dry cycles and the structural integrity of small wetlands. Disrupt the hydrology, and the entire life cycle collapses.

Of the 100 *Nothobranchius* listed on the IUCN Red List, more than one quarter are included on SHOAL's list of Priority Species for conservation, and nearly three quarters are threatened with extinction. Against that backdrop, the 2025 descriptions feel urgent.

Nagy's *Nothobranchius* expeditions have contributed to roughly one third of the known species. His Congo journeys are documented in his books Rough Road into the Deep Unknown and Return to the Land of Rains, which recount motorcycle crossings, impassable mud roads, stuck vehicles, and negotiations with local chiefs before sampling even begins.

According to the researcher, "There is no other place in Africa with this level of adventure".

But behind the adventure is a craft honed over decades: reading landscapes, predicting isolation, recognising divergence at a glance.

"It is not luck," he says. "It is pattern."

The Rainbow Killi, Katemo-Manda's Killi, Marbled Killi and Dubie Killi are markers of how much remains undocumented in one of Africa's least surveyed regions, and how quickly the window to describe them can close.

In seasonal wetlands, time is compressed. Life unfolds in weeks, and extinction can unfold silently between one rainy season and the next.

"Without a name," Béla says, "a species can disappear between the rains."

Top: Rainbow Killi, wild-caught male, Bottom: Marbled Killi wild-caught male © Béla Nagy

"Without a name, a species can disappear between the rains."

-Béla Nagy

Nagy in the field in the Democratic Republic of the Congo © Gábor Petneházy

MEET THE RESEARCHER

Béla Nagy

Hungarian ichthyologist Béla Nagy has spent decades venturing into some of the most remote and politically unstable corners of Central Africa, documenting the dazzling, short-lived killifishes of the genus *Nothobranchius* before their ephemeral habitats vanish. His recent work describing multiple new species from the Democratic Republic of the Congo both expands our understanding of this remarkably diverse lineage, and underscores how much freshwater biodiversity remains hidden in overlooked, temporary pools.

The field environments you work in are challenging – malarial, and hot, with dense undergrowth, wild animals, and political unrest. What led you to these places, and what makes you continue to return?

What led me there originally was curiosity. The more I worked with *Nothobranchius*, the more I realised how little we truly understood about their diversity and ecology. These fishes live in isolated seasonal systems, and if you want to understand species richness, drainage structure, and evolutionary patterns, you cannot do it from a laboratory. You have to go to the pools themselves.

Over time, the motivation became deeper. Many of these regions remain biologically under-surveyed. Each expedition has the potential to add meaningful information. Not only new species, but ecological context, distribution data, and a clearer picture of how these seasonal systems function.

Collaboration is central to that work. The recent species described from the Democratic Republic of the Congo were the result of close cooperation with colleagues from the University of Lubumbashi. I am deeply grateful to local researchers who know their regions intimately. Even in areas that are scientifically unsurveyed, they are accustomed to working in those landscapes. The most successful discoveries come from combining their local knowledge with my specialised experience in seasonal killifishes.

As for returning: once you begin to understand the patterns, you want to complete the map. There are still many blank spaces. And in seasonal wetlands, time is limited. If we do not document these species while their habitats remain intact, we risk losing them without ever knowing they existed.

What draws you to killifish?
It began with a sense of wonder. As a teenager, I found an old aquarist guide, and in it I encountered African seasonal fishes for the first time. What struck me was not only their colour, but their life cycle. These fishes live in temporary pools that disappear for most of the year. The adults die when the water evaporates, and their eggs remain buried in dry mud, surviving months of drought before the rains return.

That strategy fascinated me. It is a complete biological response to instability: growth, reproduction, and extinction compressed into a few weeks. In evolutionary terms, it creates isolation, rapid divergence, and extraordinary diversity across drainage systems. The genus *Nothobranchius* embodies that dynamic. Each pool can hold a lineage shaped by subtle biogeographical history. To me, they represent resilience, adaptation, and the hidden complexity of small, easily overlooked habitats. What began as fascination became a lifelong effort to understand how such fragile systems generate so much diversity, and how quickly it can disappear if we fail to document and protect it.

How many have you discovered and/or described?
To date, I have described more than thirty species, primarily within the genus *Nothobranchius*, though not exclusively.

Over time, I developed a secondary research focus on other members of the order *Cyprinodontiformes*, particularly lampeyes in genera such as *Lacustricola* and *Micropanchax*. The connection is ecological. While seasonal *Nothobranchius* complete their entire lifecycle within temporary wetland pools, lampeyes often enter these habitats during peak flooding to breed. As water levels recede, some populations become trapped in shrinking pools. As a result, both groups frequently occur in the same seasonal systems.

Working in these habitats therefore provides opportunities to document multiple components of the fish community. I have described several lampeye species as well, and additional material collected during recent expeditions is currently under study. Fieldwork in remote regions often yields research questions that take years to fully resolve.

Lacustricola gemma, wild-caught male, a new lampeye species that was found together in the same habitat with Katemo Manda's Killi. © Béla Nagy

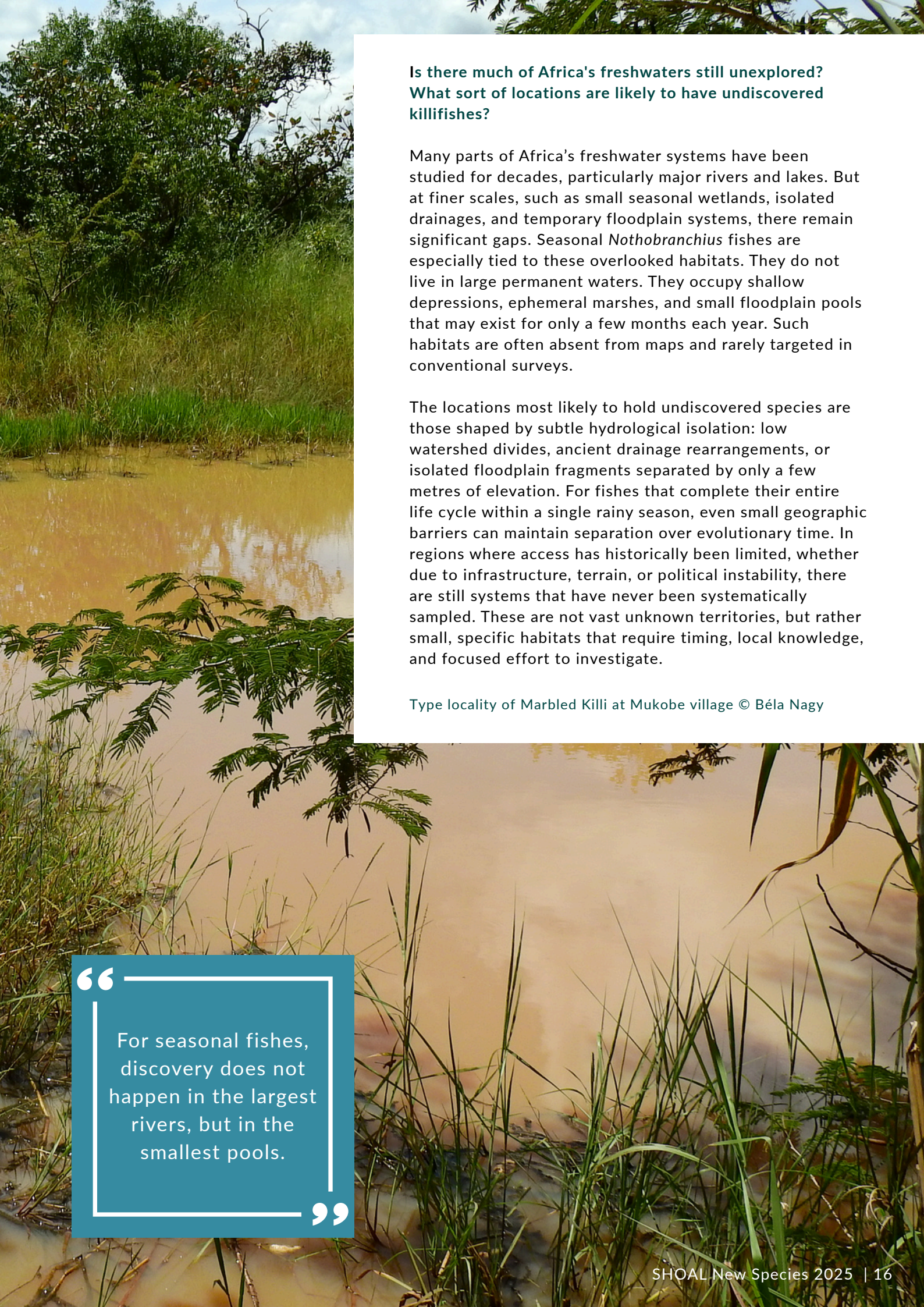
Top: *Nothobranchius brieni*, wild-caught male, Bottom: Habitat of *Nothobranchius brieni* in the village of Bukama, Democratic Republic of the Congo © Béla Nagy

Can you describe a particularly memorable expedition?

I have undertaken many expeditions, often in difficult terrain, including Chad, Sudan, and the border region between Uganda and South Sudan, among others. But one that immediately comes to mind was my first journey to the Democratic Republic of the Congo in 2013. I was searching for *Nothobranchius brieni*, a species originally collected in 1937 and named after its discoverer. The preserved museum specimens had long since faded, and only brief descriptions remained. No one knew what the living fish truly looked like. The only reliable information was that it had come from Bukama village.

Reaching that locality was far from straightforward. After two days of travel on extremely degraded roads, our vehicle broke down, and we spent the night inside it. The final stretch of about forty-five kilometres I completed by motorcycle. It remains one of the most physically demanding journeys I have undertaken in the field.

But once I reached the village swamps, the uncertainty disappeared almost immediately. The species was there. For the first time since its original discovery, I was able to observe and document its true live colouration. That visit to a single location during the expedition, travelling from the campus to the site, confirming the population, and returning safely with documentation and specimens, required an entire week of effort. It was worth every hour. Resolving a question that had remained open for decades was deeply satisfying, and it reinforced an important lesson: sometimes one small, isolated wetland holds answers that no museum drawer can provide.



Is there much of Africa's freshwaters still unexplored? What sort of locations are likely to have undiscovered killifishes?

Many parts of Africa's freshwater systems have been studied for decades, particularly major rivers and lakes. But at finer scales, such as small seasonal wetlands, isolated drainages, and temporary floodplain systems, there remain significant gaps. Seasonal *Nothobranchius* fishes are especially tied to these overlooked habitats. They do not live in large permanent waters. They occupy shallow depressions, ephemeral marshes, and small floodplain pools that may exist for only a few months each year. Such habitats are often absent from maps and rarely targeted in conventional surveys.

The locations most likely to hold undiscovered species are those shaped by subtle hydrological isolation: low watershed divides, ancient drainage rearrangements, or isolated floodplain fragments separated by only a few metres of elevation. For fishes that complete their entire life cycle within a single rainy season, even small geographic barriers can maintain separation over evolutionary time. In regions where access has historically been limited, whether due to infrastructure, terrain, or political instability, there are still systems that have never been systematically sampled. These are not vast unknown territories, but rather small, specific habitats that require timing, local knowledge, and focused effort to investigate.

Type locality of Marbled Killi at Mukobe village © Béla Nagy

> For seasonal fishes, discovery does not happen in the largest rivers, but in the smallest pools.

Have there been many changes to the wild environments you have visited throughout your career?

Yes, very much so. Over the course of my career, I have seen many habitats change, including type localities and, in some cases, the only known sites for certain species. Together with my colleague Brian Watters, we have analysed approximately five hundred habitats where we personally confirmed the presence of *Nothobranchius*. More than three hundred of those sites were either formed or significantly modified by human activities. Seasonal wetlands are often shaped by roads, drainage ditches, agriculture, and urban expansion. While some artificial habitats can temporarily support populations, they are rarely stable over time.

One of the several instructive examples is *Nothobranchius interruptus*, a coastal Kenyan endemic known from only a few localities near the Indian Ocean. Its type locality, a seasonal marsh near Kikambala north of Mombasa, supported viable populations for decades. However, since around 2020, rapid urban development, road expansion, and the construction of a permanent reservoir have altered the marsh's hydrology and buried critical clay substrates required for egg survival. Portions of the wetland have been lost entirely, and invasive non-seasonal fishes now pose additional pressure. The species persists only precariously, and its conservation status reflects that decline.

What is striking is that the habitat still appears to exist on the landscape. But subtle hydrological disruption can undermine the entire life cycle of a seasonal fish. These systems are highly sensitive. Small changes in drainage, substrate, or connectivity can have irreversible consequences.

Across Africa, such transformations are becoming more common. The changes are not always dramatic at first glance but for species confined to a single wetland, they can determine survival or extinction.

How have populations of the killifishes you have discovered and described changed over time?

Populations of seasonal killifishes are naturally dynamic. Because they depend entirely on annual rainfall patterns, their abundance can vary dramatically from year to year. In favourable wet seasons, populations may be dense and widespread across a floodplain. In drier years, they may be restricted to only a few depressions. That fluctuation is part of their biology.

However, beyond natural variation, I have observed clear long-term changes at some sites. In several localities that once supported strong populations, habitat modification, such as drainage alteration, urban expansion, agricultural levelling, or substrate disturbance, has reduced the functional integrity of the wetlands. In such cases, populations become smaller, more fragmented, or disappear entirely.

One challenge is that seasonal systems are rarely monitored systematically over long periods. Because these fishes live only a few weeks each year, absence during a survey does not automatically mean extinction. But when suitable substrate is buried or polluted, hydrology altered, or invasive predators introduced, the probability of recovery declines sharply.

In some regions, populations appear stable where wetlands remain intact. In others, particularly near expanding infrastructure or coastal development, contraction is evident. The most vulnerable species are those confined to a single drainage or even a single marsh.

Overall, the pattern is mixed, with natural fluctuation layered on top of increasing anthropogenic pressure. That combination makes documentation and timely conservation action particularly important.

Is there anything else you'd like to add?

In parts of southeastern Democratic Republic of the Congo, among Luba communities, there is a long-standing legend that fish fall from the sky with the rain. From a scientific point of view, we know that the eggs of seasonal fishes survive buried in dry mud for months. But when the rains return and small depressions suddenly fill with water, colourful fish appear within weeks in places that were dust for half the year. To anyone watching, it truly looks as if life has arrived with the storm.

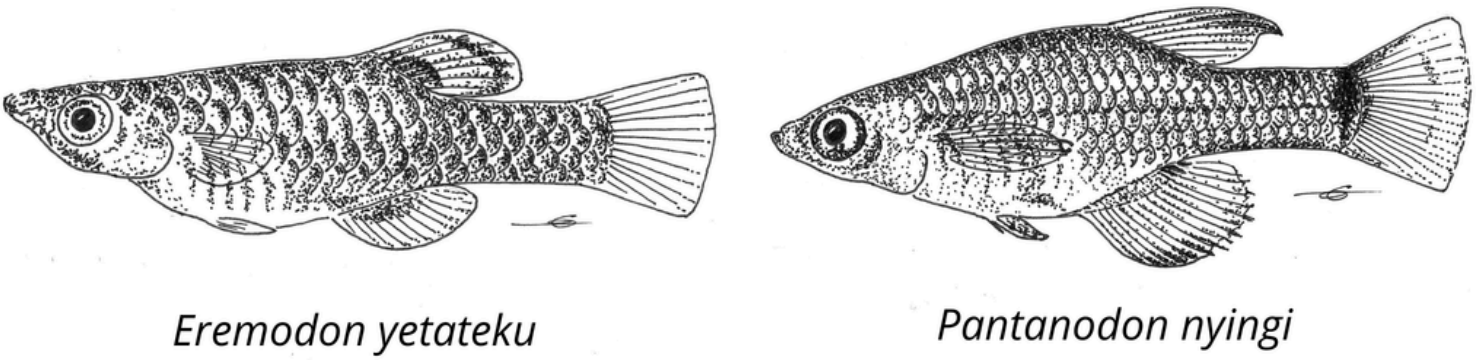
That sense of wonder is part of what continues to motivate me. Seasonal killifishes compress existence into a narrow window between drought and flood. They are reminders of how life adapts to instability and how fragile those adaptations can be when landscapes change.

Beyond scientific publications, I have tried to share these experiences more broadly in my books, Rough Road into the Deep Unknown and Return to the Land of Rains. They recount the field expeditions behind the discoveries: the persistence, collaboration, unexpected setbacks, and the remarkable people encountered along the way. While the scientific papers document species and data, the books aim to convey the human and environmental context in which those discoveries take place.

Image: Local community help with collecting at the type locality of *Nothobranchius milvertzi* near Chienge at the Lushiba Marsh in northern Zambia in April 2012 © Finn Milvertz

> If there is one message I would emphasise, it is that many of the world's most extraordinary biological stories unfold in small, easily overlooked habitats. Protecting them requires not only research, but awareness – and sometimes simply taking the time to look into a temporary pool after the rain.

Armored Spine Killifish (*Eremodon yetateku*) & Pectoral Spine Killifish (*Pantanodon nyingi*)



New Pantanodontidae courtesy of Eduard Meinema

Researchers: Huber, J.H. & Meinema, E.
Location: Armoured Spine Killifish: Meki stream, close to Lake Ziway in Ethiopia.
Pectoral Spine Killifish: Salines at Gongoni," south of Malindi in Kilifi County, Kenya.
Highlight: Retrieved from badly degraded vial specimens.

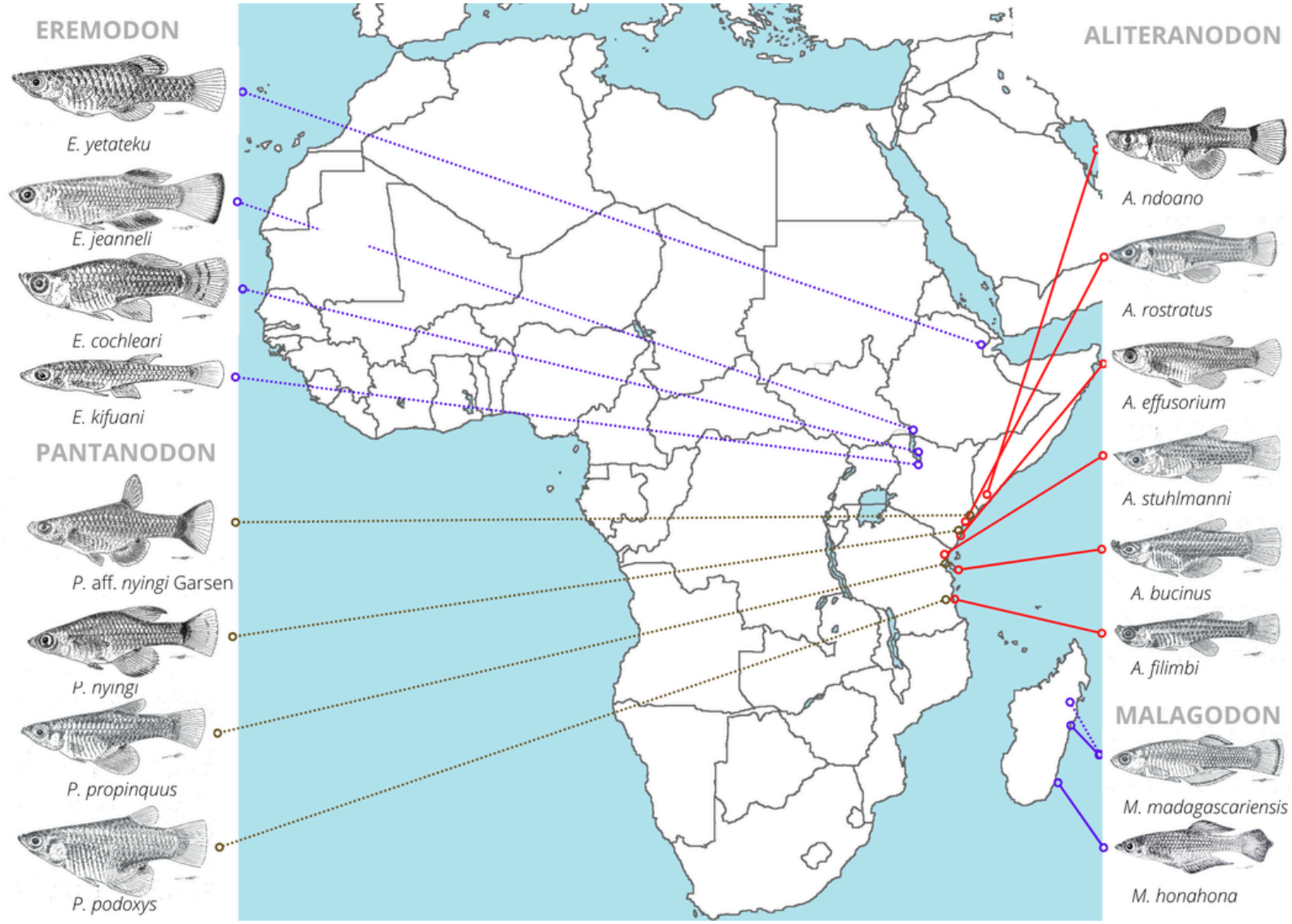
Some new species arrive with the romance of expedition field notes: mud-splattered boots, remote headwaters, a fish seen alive for the first time in a sunlit pool. But the Armored Spine Killifish and Pectoral Spine Killifish come from a story rooted in museum shelves, overlooked jars, and specimens in poor condition that still had a scientific surprise to give.

Both species were revealed during research on undetermined material held in the collection of the Alexander König Museum in Bonn, Germany. The fishes had been deposited there by the heir of the late German ichthyologist Lothar Seegers (1947–2018), leaving what the authors describe as a posthumous legacy: two undescribed species of spine killifishes.

Eduard Meinema, one of the taxonomists who, along with Jean Huber, described the species, told SHOAL that Huber and he, "knew a *Pantanodon*-like fish had been caught in Ethiopia, but we couldn't determine where the specimens had been deposited. When we finally found them [in the Alexander König Museum], we were shocked by their condition.

Fortunately, the key features (the hooks and claws on the pelvic fins, details of 1 - 2 mm) were still preserved and sufficient to demonstrate that this was not only a new species, but also a very special one," adding "We can't wait for these fish to be imported live in the future."

Jean Huber (l) and Eduard Meinema (r) in front of the Muséum national d'histoire naturelle © Eduard Meinema



Distribution extant Pantanodontidae courtesy of Eduard Meinema

Armored Spine Killifish
According to Eschmeyer's Catalog of Fishes, the type locality for the Armored Spine Killifish is the Meki stream, around 100km south of Addis Ababa, close to Lake Ziway in Ethiopia.

In the Killi-Data Series abstract, Huber & Meinema flag the species as notable because it represents the most northerly distributed recent member of *Pantanodontidae*, and because it shows "unique armored scales" on the snout, positioned in front of the eyes, plus horizontally placed teeth on the upper jaw.

FishBase summarises diagnostic traits in more detail: a small, slender-bodied species (max length listed as 2.9 cm standard length), with particular tooth arrangements (including horizontally positioned upper jaw teeth), and head squamation that includes the snout in front of the eye. There's an important note of scientific caution embedded in the original abstract: the Ethiopian vial contained "badly conserved specimens," and the authors state that, based on pelvic-fin modification, and until new live collections are available, the species is "herein considered a member of *Eremodon*."

Pectoral Spine Killifish

Eschmeyer's Catalog of Fishes gives the type locality for the Pectoral Spine Killifish as the Salines at Gongoni, south of Malindi in Kilifi County, Kenya. In the abstract, the standout feature of the species is the multiple modified fins, described as having hooks and claws on the pelvic, pectoral, and anal fins. The authors emphasise that this suite of modifications is unique within *Pantanodontidae*. FishBase notes distinctive anal-fin markings, including a clear dark fringe and a second darker band, and describing the posterior portion of the anal fin as "frayed with small filaments including hooks."

Meinema's own blog post about the discovery spells out the meaning behind the name: nyingi is Swahili for "multiple," chosen specifically because of these multiple modified fins.
The abstract also flags a useful genus-level clue: the presence of a posterior spot in the male anal fin is confirmed as distinctive for all Pantanodon species, and not found in other pantanodontid genera. That might sound like a small detail, but in killifish taxonomy, these repeatable pattern elements can be incredibly informative.

As of FishBase's listing (drawing from IUCN Red List versioning), both species are "Not Evaluated," with a formal assessment requiring fieldwork. The most striking part of this story is that these fishes were not described from a flourishing population seen alive in the wild, but from badly degraded vial specimens that sat unidentified in a museum collection. This is both exciting and sobering: exciting, because it shows how much freshwater diversity still waits to be properly recognised. Sobering, because it underlines how easily a species can slip through the cracks – unknown, unassessed, and unprotected – until someone finally gives it a name.

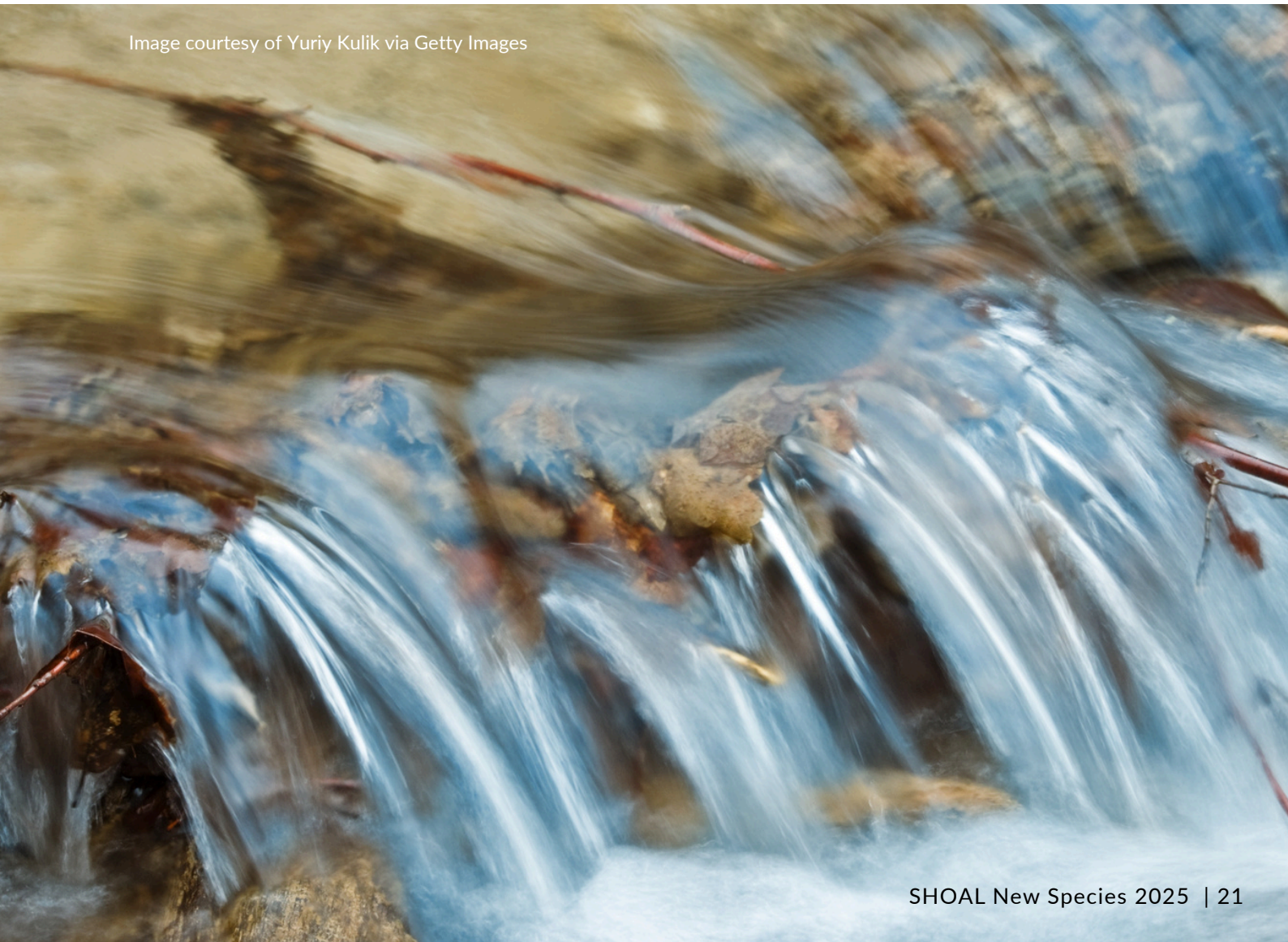


Image courtesy of Yuriy Kulik via Getty Images

Sichuan Cave Exploration Team member in *Claea scet* habitat © Zhou Jiajun

ASIA

Renny's Stiphodon, Yang's Plateau Loach, & Sichuan Mountain Cave Loach

Renny's Stiphodon
Stiphodon hadiatyae

Stiphodon hadiatyae male © Vatthanachai Phanklam

Researchers: Nurjirana, Gustiano, Haryono & Wibowo
Location: Malakoni Village, Enggano Island, Bengkulu Province, Sumatra, Indonesia.
Highlight: Migrates from sea to river, climbing up waterfalls hundreds of times their length to reach headwaters to spawn. Only known from one tributary.

Stiphodon gobies are among the most captivating freshwater fishes of Southeast Asian and Pacific islands. These small, often brightly coloured gobies inhabit swift, clear streams flowing to the sea and are famous for their amphidromous life cycle: adults live and breed in rivers, larvae drift to the ocean, and juveniles swim back upstream to grow and reproduce. The genus is rich with species displaying a bewildering variety of colours, fin shapes and microhabitat preferences, many of which are restricted to single islands or river systems. Prior to 2025, some 34 species were recognised globally, with Indonesia itself home to multiple endemic members of the group.

Renny's Stiphodon, is distinguished from all its congeners by a unique combination of morphological traits, notably its filamentous fourth spine on the first dorsal fin, scale counts, and patterns of body proportions and fin lengths.

The holotype and a series of paratypes of Renny's Stiphodon were collected from shallow, swift rainforest streams on Enggano Island, a remote offshore island southwest of Sumatra in Bengkulu Province, Indonesia. These small streams are typical Stiphodon habitats: clear, shaded waters over sandy or rocky substrates where gobies cling to rocks and graze on algae.

The species epithet *hadiatyae* honours Renny Kurnia Hadiaty, a pioneering Indonesian ichthyologist whose work advanced understanding of Southeast Asia's freshwater ichthyofauna.

Like all members of the subfamily *Sicydiinae*, Renny's Stiphodon inherits the extraordinary anatomical adaptation of a highly developed suction disc formed by the fusion of the paired pelvic fins. This feature defines the entire group and is a key part of their success in the fast-flowing, rocky streams they inhabit. In many fish, pelvic fins are used simply for steering or stabilising in the water. In *sicydiine* gobies, however, the pelvic fins are tightly fused and flattened into a functional adhesive disc. This disc generates suction through negative pressure, allowing the fish to grip onto smooth rocks and submerged surfaces even in torrents of current.

Stiphodon hadiatyae © Vatthanachai Phanklam

In the wild, amphidromous gobies must complete remarkable upstream migrations after their oceanic larval phase, often having to scale steep rocky cascades and waterfalls tens to hundreds of times their own body length to reach headwater spawning and feeding habitats.

Different *Sicydiinae* species can exhibit impressive climbing feats based on this adhesive system. Some Pacific island gobies use “inching” behaviours, alternately attaching and releasing suction with their pelvic discs (and sometimes even their mouths) to crawl up waterfalls. Others employ a “powerburst” style, rapidly undulating their bodies and re-anchoring their pelvic discs to make progress against gravity.

Although Renny's Stiphodon itself has not been observed scaling waterfalls (detailed behavioural ecology awaits dedicated field study), its membership in *Stiphodon* and close affinity to other *Sicydiinae* suggest it possesses the same specialised adhesive anatomy that allows these gobies to master some of the most challenging freshwater environments on oceanic islands.

While the type series came from Enggano Island, lead researcher Jiran Nurjirana shared with SHOAL that Renny's Stiphodon also occurs on nearby Mentawai Islands and even on the adjacent mainland of Sumatra (though comprehensive survey data remain lacking). This broader insular distribution fits a wider pattern seen in sicydiine gobies, whose amphidromous larvae can disperse among islands via ocean currents.

Interestingly, Renny's Stiphodon had already made a name for itself among aquarium hobbyists before its scientific description, as it has been sold widely in Asian aquarium shops under the informal name “Pink Neon Goby” due to its appealing colouration and slender form. Nurjirana notes that ornamental fish collectors in Indonesia captured adults extensively for export to Southeast Asian markets, where demand and prices for novel gobies can be high.

Nurjirana also mentions the species faces pressure from the ornamental trade. She told SHOAL, “Based on my personal observations, this species has a high exploitation rate, as its post-larvae are caught monthly when migrating to rivers for consumption, while adult fish are caught massively for export to various countries as ornamental fish, due to high demand, resulting in a rather fantastic price for this fish.”

Nurjirana, lead researcher of the team that described Renny’s Stiphodon © Nirjirana

© Vatthanachai Phanklam

These pressures, alongside pollution, habitat conversion, and barriers like dams without fish passages, combine to threaten this and many other endemic Indonesian freshwater fishes.

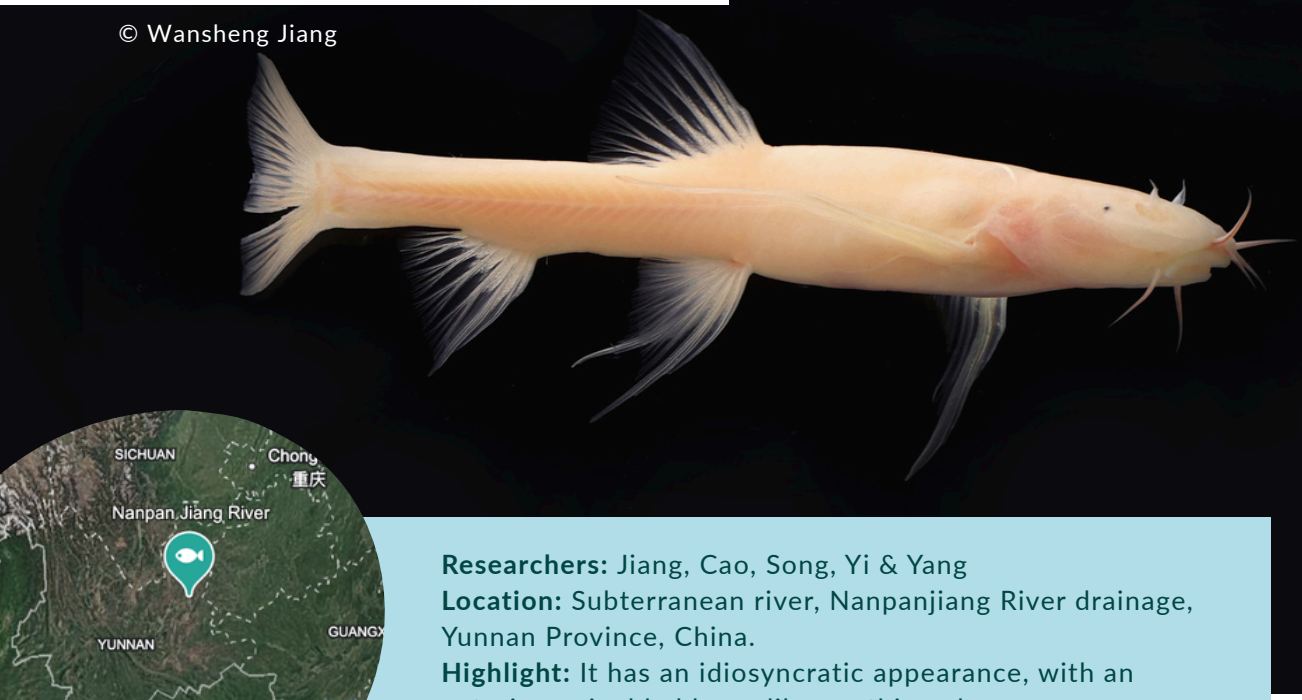
Renny's Stiphodon has not yet been evaluated for the IUCN Red List. Its known lifecycle of amphidromous migration between rivers and the sea makes it particularly sensitive to habitat fragmentation, water quality changes, and exploitation during both larval and adult stages. Further field study is urgently needed to assess population trends, ecological needs, and conservation priorities.

The formal recognition of Renny's Stiphodon adds to a growing legacy of freshwater fish discoveries from the Sundaland region, a global biodiversity hotspot where island isolation and dynamic geological history have fostered rich, often micro-endemic faunas.

For aquarists, the species' prior appearance in trade underscores how science and hobbyist communities can intersect and how both sectors can contribute to awareness of freshwater biodiversity.

Yang's Plateau Loach
Triplophysa yangi

© Wansheng Jiang



Researchers: Jiang, Cao, Song, Yi & Yang
Location: Subterranean river, Nanpanjiang River drainage, Yunnan Province, China.
Highlight: It has an idiosyncratic appearance, with an anterior swim bladder unlike anything else.

There's something wonderfully unsettling about a cavefish that looks as though it's wearing its own lifejacket.

Yang's Plateau Loach is a newly described freshwater loach from the karst subterranean rivers of Yunnan Province, southwest China. The creature is shaped by permanent darkness, and defined by a swim bladder unlike anything else documented for Chinese cavefishes.

The authors – Jianhan Cao, Shuang Song, Wenjing Yi, Hongmei Xiang, Hongfu Yang, Jie Li and Wansheng Jiang – described the species in the Zoological Journal of the Linnean Society, along with a second new species, *Triplophysa wenshanensis* discovered in the same Yunnan cave system, which is part of a landscape famous for cave biodiversity. Their phylogenetic analysis placed both new species within the hypogean ("cave") group of *Triplophysa*, increasing the number of recognised cave-adapted *Triplophysa* species reported in that study from 39 to 41.

Like many obligate cavefishes, Yang's Plateau Loach shows classic troglomorphic features such as loss of pigmentation and eye reduction – in this case, reduced but still discernible "eye dots". But what makes the fish instantly memorable is its silhouette. The species has bilaterally expanded anterior swim bladder chambers that protrude from enlarged bony capsules, distending the body wall and becoming externally visible – a striking trait in live specimens. It also has highly developed pectoral and pelvic fins with filamentous extensions, giving it a slightly otherworldly, delicate look – quite a contrast to the hard, mineral world it inhabits.

"When I first saw *Triplophysa yangi*, I was deeply attracted by its unique appearance," recalls Prof. Wansheng Jiang. "The two protruding sacs are like an encircling lifebuoy, paired with enlarged pectoral and pelvic fins that help maintain balance in the water. It doesn't move much, likely to conserve energy, appearing like an 'aircraft' hovering in the middle of the water."

The authors highlight that the expanded anterior swim bladder chambers may represent an “innovative stygomorphic trait” among Chinese cavefishes, hypothesising that they function as a unique, energy-saving buoyancy mechanism. In the food-limited environment of an underground river, the ability to remain suspended with minimal effort could be a decisive advantage.

“Among all known cavefish, whether in China or other countries, such a distinctive morphology has never been observed,” Jiang explains. The team therefore proposed that the sacs may function like a buoyancy device, potentially allowing the fish to hover in the upper and middle water layers, where floating food particles drift past, while minimising energy expenditure. “Indeed,” he reflects, “cavefish never fail to surprise us.”

A 2025 genetics study on the species further explores evolutionary implications within the genus, adding genomic context to this remarkable morphology. Jiang notes that further genomic work is ongoing, led by his doctoral student Jianhan Cao, as part of a broader effort to deepen understanding of Chinese cavefish evolution.

Yang's Plateau Loach is a small, elongate, scaleless loach with diagnostic characters centred on their distinctive swim bladder configuration, alongside fin development and reduced eyes. Key features include: absence of scales, reduced but discernible eye dots, pectoral fin reaching the pelvic fin origin, pelvic fin tip reaching the anus, and expanded anterior swim bladder chambers protruding beyond the bony capsule.

The species epithet *‘yangi’* honours Dr Junxing Yang, a prominent Chinese ichthyologist at the Kunming Institute of Zoology, Chinese Academy of Sciences (KIZ), Jiang’s doctoral supervisor. “It was under his guidance that I first began studying cavefish,” Jiang says. “During my doctoral studies, I often discussed topics such as eye degeneration and skin albinism with him. When I observed this fish’s unique appearance and hovering posture, the idea immediately came to me to name it after Dr. Yang. This is a tribute to him, and I hope that through the study of *Triplophysa yangi*, more interesting scientific questions will be discovered, and research on Chinese cavefish will be carried forward from generation to generation.”

Collecting the species was no small task. Jiang explains that his collaborator, Hongfu Yang, and his assistant had to descend dozens of metres from the cave entrance to reach the underground river. A simple pathway built by local villagers during dry seasons made access somewhat easier, but it also revealed a tension: human extraction of water from these systems poses a threat to the fragile subterranean habitat. As early as 2013, Jiang and colleagues published a letter in Science highlighting drought and risks to China’s cave species. “We do not want to see new species of cavefish – especially unique ones like *Triplophysa yangi* – go extinct due to habitat destruction before they are even discovered,” he says, adding that, “protecting cavefish and mitigating conflicts with human development are key efforts we are currently engaged in and will continue to prioritise in the future."

© Hongfu Yang

“We do not want to see new species of cavefish – especially unique ones like *Triplophysa yangi* – go extinct due to habitat destruction before they are even discovered.”

Top and bottom © Hongfu Yang

Sichuan Mountain Cave Loach
Claea scet

© Zhou Jiajun

Researchers: Lei, He, Huang, Zhou & He
Location: Taojin Cave, subterranean tributary of the Dadu River, Yangtze River basin, Sichuan Province, China
Highlight: The only Claea species that has adapted to cave-dwelling traits, with reduced pigmentation and eyes.

In 2023 and 2024, members of the Sichuan Cave Exploration Team (SCET) clipped into their ropes and rappelled approximately 50 metres into the darkness of Taojin Dolomite Cave in Sichuan Province, southwest China. Down in the cool darkness, they wound their way 300 meters through twisting passages before reaching an underground river. The cave stretches to approximately one kilometre in explorable length, and SCET had surveyed it many times before.

“Squeezing through narrow vertical shafts or plunging into icy subterranean rivers feels like opening a gift box that has been sealed by time,” Zhou Jiajun of the Zhejiang Forest Resource Monitoring Center told SHOAL, “One that no one has ever opened before. In that isolated darkness, finding a life form never before described by science brings a thrill that makes all the hardships worthwhile. This is not just about discovering a new species; it is about holding a silent conversation with an evolutionary marvel that spans millions of years.”

But on these occasions, something unknown flickered in the beam of their headtorches.
The fish they netted was pale, almost translucent, with markedly reduced pigmentation and eyes, and did not resemble the surface-dwelling loaches known from the region.

Prior to 2025, the genus *Claea* comprised a small and little-known group of loaches from surface waters in southwest China. None were associated with subterranean life. The Sichuan Mountain Cave Loach changes that.

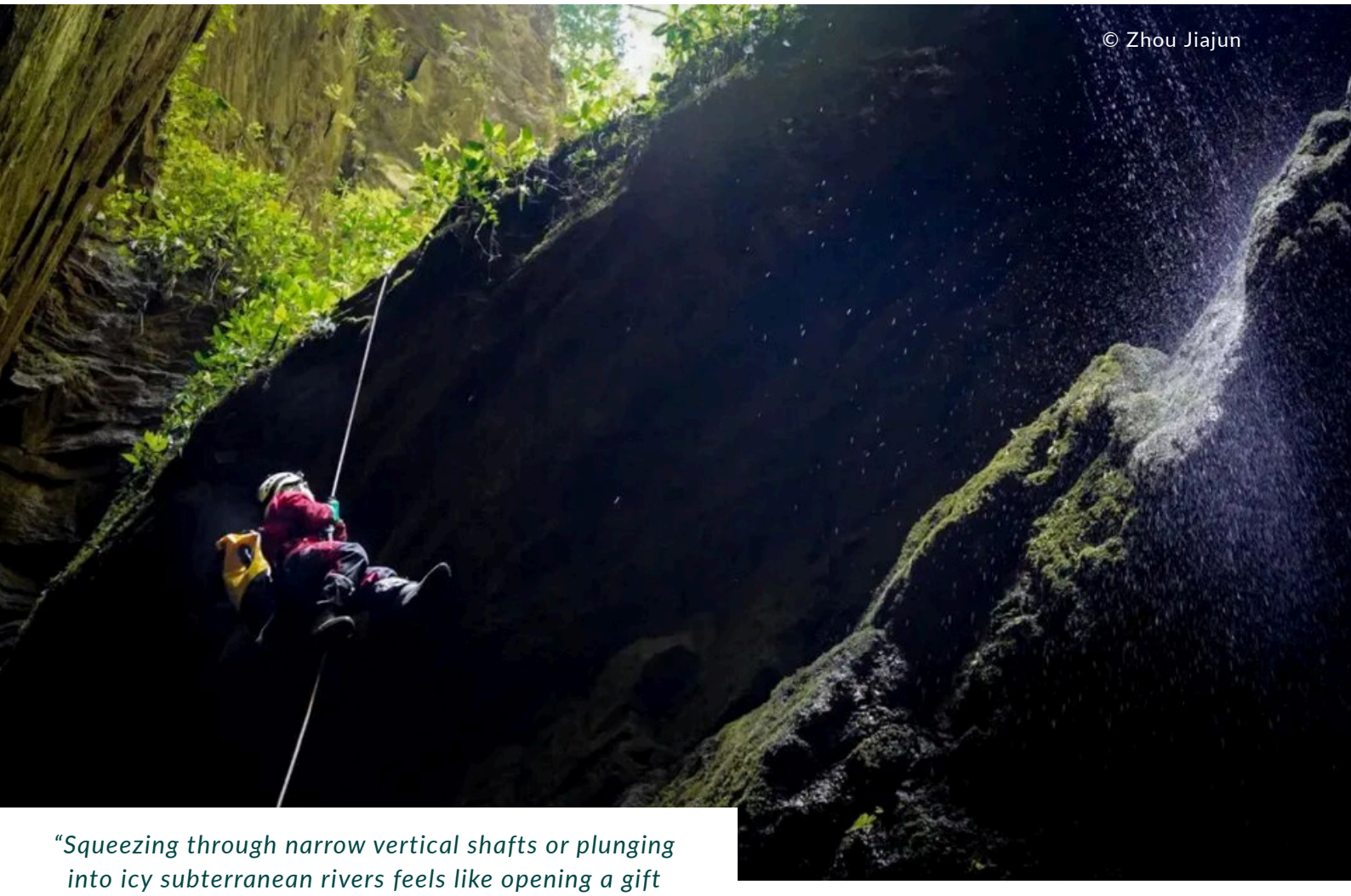
It is the first known obligate troglobitic species in the genus – the only Claea species fully adapted to life in caves. Unlike its congeners, which retain normal pigmentation and functional eyes, the Sichuan Mountain Cave Loach exhibits the classic hallmarks of cave evolution: loss of body colour, reduction of the eyes, and a ghostly appearance that immediately sets it apart.

Evolutionarily it belongs to a lineage not previously associated with subterranean habitats. The discovery therefore expands not just the known diversity of cave fishes, but also the ecological breadth of its entire genus. According to Zhou, other loaches occasionally wash into the cave from surface waters during floods, citing *Misgurnus anguillicaudatus* as an example. Though no other resident fish species are known.

The cave itself hosts bats and specialised cave insects, including blind ground beetles (*Jujiroa duqianae*) and blind rove beetles (*Domene lizeyui*). In this lightless ecosystem, the Sichuan Mountain Cave Loach appears to occupy a predator-free niche; Zhou notes that it has no natural predators in the underground river. Details about the species' life cycle, diet and behaviour remain unknown. Like many cave fishes, it is extremely localised and currently known only from its type locality.

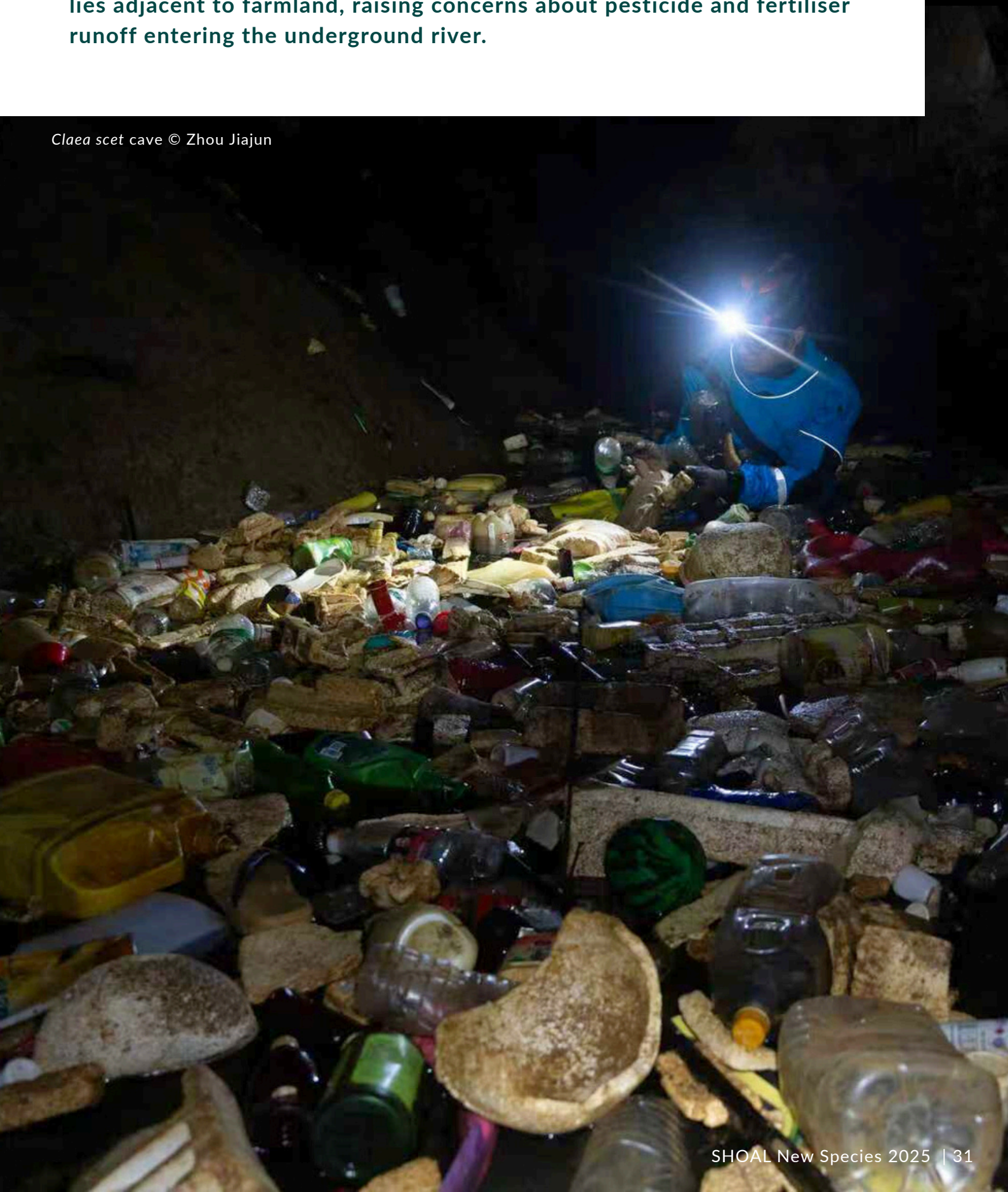
He Li, a member of SCET, first discovered the species. Genetic analyses were conducted by Jun-Hao Huang and De-Kui He at the Chinese Academy of Sciences, confirming its distinctiveness, and Lei Haotian, the paper's lead author, wrote up the full description.

The species name reflects this collaborative story. *Claea* is named for the Oreiad nymph of a sacred cave on Mount Kalathion in Messenia. The specific epithet '*scet*' honours the Sichuan Cave Exploration Team (SCET). Similar recognition was given to the explorers who discovered a cavefish from Chongqing, *Triplophysa rosa*, which was named in 2005 after the British Red Rose Exploration Club.



"Squeezing through narrow vertical shafts or plunging into icy subterranean rivers feels like opening a gift box that has been sealed by time"

Although the cave is remote, it is not isolated from human activity. The entrance functions as a sinkhole, and during flood seasons significant quantities of household waste are washed into the system. The cave also lies adjacent to farmland, raising concerns about pesticide and fertiliser runoff entering the underground river.



Claea scet cave © Zhou Jiajun

Zhou, a member of the IUCN SSC China Species Specialist Group, suggests that while the species has an extremely narrow distribution, it has not yet reached the threshold to be considered threatened under IUCN standards. That said, its confinement to a single cave system possibly puts it in a precarious position.

Potential conservation actions include organising clean-up expeditions to remove household waste from the cave and promoting the use of lower-toxicity agricultural chemicals near the site. China's karst landscapes have already yielded a remarkable asortment of cave-adapted fishes (see Longhorn Cavefish – New Species 2023 and Karstsinnectes Cave Fishes – New Species 2024). The Sichuan Mountain Cave Loach demonstrates that even well-surveyed caves can still hold evolutionary surprises. It represents an entirely new ecological direction for its genus.

Cave expedition for *Claea scet* © Zhou Jiajun

EUROPE

Anatolian Minnow

Male (top) and female (bottom) Anatolian Minnow © Cüneyt Kaya

Anatolian Minnow
Phoxinus kottelati

Researchers: Bayçelebi
Location: Stream Koca in the neighbourhood of Kalkım, Çanakkale Province, Türkiye.
Highlight: Beautiful sexual dimorphism and a demonstration that there are new species hidden behind species-wide ranges.

The genus *Phoxinus* has been steadily increasing the number of minnow species across Europe and West Asia for decades. What was once treated as a handful of widespread species is now increasingly understood as a patchwork of local lineages, sometimes separated by only a valley or two, but distinct enough to be separate species.

In June 2025, ichthyologist Esra Bayçelebi added another piece to that puzzle: *Phoxinus kottelati*, the Anatolian Minnow, a newly described species from Türkiye, currently known from just a few streams draining to the Black Sea and the Marmara Sea.

Based on the material examined in the original description, the Anatolian Minnow is presently known from three named streams: the Koca Stream (in the drainage of Lake Manyas, Marmara Sea basin) and the Uludere and Akgüney streams (Black Sea basin).

The holotype (49 mm standard length) was collected in Türkiye's Çanakkale Province, in Koca Stream near Kalkım. Paratypes were collected from the same system and from the Uludere and Akgüney streams.

Bayçelebi's study combined morphometric, meristic, molecular, and qualitative characters to confirm that this lineage represents a distinct species. The formal diagnosis emphasises that the Anatolian Minnow is separated from other regional *Phoxinus* species by a combination of features. Key traits highlighted include:

- **Breast scaling pattern in males**: the underside of the chest is covered in scales, but with a small bare patch at the front – a subtle but consistent difference from several closely related minnows, where this area is either fully scaled or patterned differently.
- **Spawning-period colour pattern in males:** the species shows a striking breeding palette, including a light green stripe, sides that become distinctly green, and a yellowish line from the pectoral region towards the anal-fin origin.
- **A blue spot between the eye and the mouth in males, plus a white spot in front of the anal and pectoral fins:** both noted as absent in some close relatives.
- **Scale count and body shape:** it has more scales along its sensory "lateral line", typically 77–90, compared with 60–69 in one close relative, and a noticeably slimmer tail base, giving the fish a more streamlined profile.

One of the joys of *Phoxinus* is that they can look like completely different fish at different times of year, especially the males in breeding condition. For the Anatolian Minnow, Bayçelebi documents preserved coloration (browns and greys with 13–16 broad, dark-brown rectangular bars along the lateral line) and then contrasts it with the vivid live colours seen in spawning males: greens across much of the flank, red at the bases of several fins, orange tones towards the rear, and that characteristic blue facial spot.

The paper also explicitly links this seasonal transformation to chromatophores – specialised, pigment-containing cells or organs found in cephalopods, fish, reptiles, and amphibians that produce rapid colour changes for camouflage and communication – being "triggered" during the breeding season.

From the currently known sites, the Anatolian Minnow is reported from cold, high-oxygen waters, occurring in large lowland rivers and swift-moving mountain streams. Bayçelebi told SHOAL, "Species like the Anatolian Minnow depend entirely on clean, cold, and free-flowing streams. Even small-scale habitat degradation can have serious consequences, which makes long-term monitoring and habitat protection critical for its survival."

The specific epithet *kottelati* honours Maurice Kottelat, one of the most influential ichthyologists of the modern era, recognised for his contributions to knowledge of Eurasian fishes. See New Species 2022 to read an interview with Dr. Kottelat.

Cüneyt Kaya, who collaborated with Bayçelebi on the fieldwork, said, "The discovery of *Phoxinus kottelati* was a reminder that freshwater fishes remain among the least visible components of biodiversity. Careful fieldwork and comparative studies revealed a species restricted to just a handful of streams, making its conservation especially urgent."

The Anatolian Minnow has not yet received an assessment for the IUCN Red List.

© Baran Yoğurtçuoğlu

> The discovery of *Phoxinus kottelati* was a reminder that freshwater fishes remain among the least visible components of biodiversity. Careful fieldwork and comparative studies revealed a species restricted to just a handful of streams, making its conservation especially urgent.

Anatolian Minnow habitat © Baran Yoğurtçuoğlu

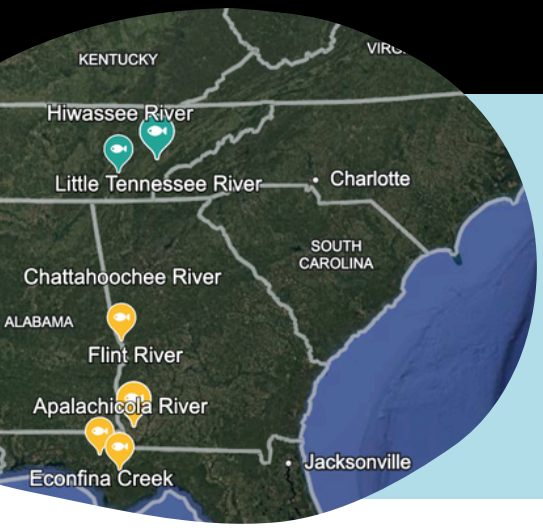
Birmingham Darter & Gurley Darter research team © Chase Brownstein

NORTH AMERICA

Sicklefin Redhorse, Apalachicola Redhorse, Birmingham Darter & Gurley Darter

Top: Appalachicola Redhorse © D. Werneke, Bottom: Sicklefin Redhorse © S. Fraley

Sicklefin Redhorse and Apalachicola Redhorse
Moxostoma ugidatli and Moxostoma antelunare



Researchers: Jenkins, Favrot, Freeman, Albanese & Armbruster; and Akin, Jenkins & Armbruster
Location: Apalachicola, Chattahoochee and Flint River systems, Florida, Alabama, and Georgia; and Econfina Creek, St. Andrew's Bay drainage, northwestern Florida; and upper Hiwassee and upper Little Tennessee River drainages, Tennessee River basin, North Carolina and Georgia, U.S.A.
Highlight: The Sicklefin Redhorse is perhaps the largest truly new North American species discovered in the last century.

In 2025, an unexpected milestone was achieved in ichthyology in North America: the formal scientific description of two freshwater fish species from the Catostomidae family that had long been in plain sight. Known to enthusiasts and biologists for decades, these large, muscular suckers are now officially recognised species of redhorse, a culturally and ecologically significant group of river fishes. Their recognition is a reminder that even in some of the most intensively studied regions of the United States, freshwater biodiversity is still being clarified: species may be familiar, but formal taxonomy takes time, patience, and resources, and decades may pass before a species gets a formal name.

A Southern Appalachian Giant: Sicklefin Redhorse (*Moxostoma ugidatli*)

Growing to half a metre or more and living for over two decades, the Sicklefin Redhorse stands out not just in morphology but also in the lore surrounding it – the researchers who described it suggest the species is "perhaps the largest truly new North American species discovered in the last century."

The species is perhaps one of the most remarkable ichthyological discoveries from the continental United States in recent history due to it living for decades under the noses of scientists in the rivers of the southeastern Appalachian Mountains. Known to local communities and admired by fish biologists for its striking form, it was only formally described in Ichthyology & Herpetology in early 2025 as *Moxostoma ugidatli*.

Found only in a small network of rivers in southwestern North Carolina and northern Georgia, the Sicklefin Redhorse inhabits parts of the Hiwassee and Little Tennessee river basins, which are home to one of the most biodiverse temperate freshwater faunas in the world. Its name *ugidatli* derives from the Cherokee language, meaning "wearing a feather," a nod to the fish's most distinctive feature: a tall, sickle-shaped dorsal fin that can resemble a feather cutting through water. In life, the fish have an olive-brassy body, with dusky lower fins that shimmer yellow or orange, and a reddish tail that that gives redhorses their common name. Growing to half a metre or more and living for over two decades, the Sicklefin Redhorse stands out not just in morphology but also in the lore surrounding it – the researchers who described it suggest the species is, 'perhaps the largest truly new North American species discovered in the last century.'

Despite its size and uniqueness, the Sicklefin Redhorse's journey to recognition was long. Robert E. Jenkins, a pioneer in sucker fish taxonomy, first noted its distinctiveness in 1992. More than three decades of careful morphological work followed before its status as a distinct species was formally confirmed.

Historically, the Sicklefin Redhorse was a staple species for the Eastern Band of Cherokee Indians, harvested during seasonal runs much like salmon in the Pacific Northwest. Large stone weirs built by Indigenous peoples can still be found in these mountain rivers, silent reminders of a time when redhorses were a significant source of protein and cultural practice.

Today, pressures from dams, habitat loss, and water quality degradation have confined the species to fragmented reaches of its former range. Although not yet federally protected, it is considered endangered in Georgia and threatened in North Carolina, reflecting the vulnerability of freshwater specialists with restricted distributions.

Slough off of the Chipola River where Dan Akin sampled the Apalachicola Redhorse © Dan Akin

A River Icon from the Gulf Coast: Apalachicola Redhorse (*Moxostoma antelunare*)
While the Sicklefin Redhorse was nailed down by taxonomists, another redhorse had been waiting in scientific limbo for even longer: the fish now known as the Apalachicola Redhorse, *Moxostoma antelunare*. Officially described in Zootaxa in late 2025, it had been informally recognised for more than half a century. The groundwork had been laid decades earlier by the late Robert "Bob" Jenkins, a towering figure in North American ichthyology. Jenkins compiled notes and measurements as early as 1969, convinced he was looking at a distinct species. But progress stalled.

"Bob Jenkins was a huge figure in North American ichthyology," says Daniel Akin, who ultimately completed the description. "He had really high standards for himself. He felt he had nearly finished collecting the data multiple times, but he wanted the description to be precise." When Jenkins' health declined, he passed his materials on. Akin, then a graduate student working under John Armbruster, took up the challenge.

"Bob had it pretty well described back in 1969," Akin says. "But I ended up re-measuring around 200 specimens to make sure everything was consistent for the type material." This species inhabits the Apalachicola River drainage – a broad network spanning through Georgia, Alabama, and Florida – as well as Econfina Creek in the St. Andrew's Bay system of Florida. Within this basin, identification is relatively straightforward.

Top: Apalachicola Redhorse © D. Werneke
Bottom: The Late Robert 'Bob' Jenkins © S. Fraley

> "Bob Jenkins was a huge figure in North American ichthyology, he had really high standards for himself. He felt he had nearly finished collecting the data multiple times, but he wanted the description to be precise."

“Within the Apalachicola drainage it’s super easy,” Akin says. “The Greater Jumprock is more slender-bodied and has more of a horse’s head. The Apalachicola Redhorse has more of a bulldog head.” Across basin boundaries however, and things become more complicated. Species in the genus *Moxostoma* are mobile and capable of hybridising, making relationships within the group notoriously difficult to untangle. It is only through careful morphological comparisons, including gill raker counts, lateral-line scale patterns, and detailed skeletal features, that the Apalachicola Redhorse could be definitively separated from its relatives.

The species name *antelunare* – ‘before the moon’ – reflects the idea that the species existed well before it was formally recognised, and long before humans first set foot on the moon.

“The biggest thing I really wanted the name to drive home,” Akin explains, “is that we’re not discovering species, we’re describing them. A species is a species whether or not we describe it.” Choosing the name was not simple. The team considered honouring Indigenous language roots and explored several alternatives, but none felt entirely right. “The naming is probably the thing I agonised over the most,” Akin says. “It’s not trivial.”

At present, Akin does not see immediate cause for alarm regarding the Apalachicola Redhorse’s survival.

“For now, I think they’re secure,” he says. “Florida and Georgia have pretty good monitoring programmes along the river, so I don’t think we have reasons to be overly concerned just yet.” Dams remain a significant pressure on river systems, and expanding metropolitan development in some tributaries could affect habitat quality. But even so, formal recognition already makes a practical difference.

“Managing fisheries is hard,” Akin says, quoting a line from well-known fisheries biologist John Shepherd. “It’s like managing a forest, in which the trees are invisible and keep moving around.” Freshwater fishes are harder to observe than terrestrial wildlife. Their diversity is often underestimated simply because it lies beneath the surface. The fact that a large, long-recognised fish in one of the most populated regions of the United States could remain undescribed for so long illustrates how much remains to be clarified.

As Akin reflects, “I hope people take away the opportunity to be curious – to think about not only what fishes might be, but how they got to be there. There’s always something to learn. Be curious.”

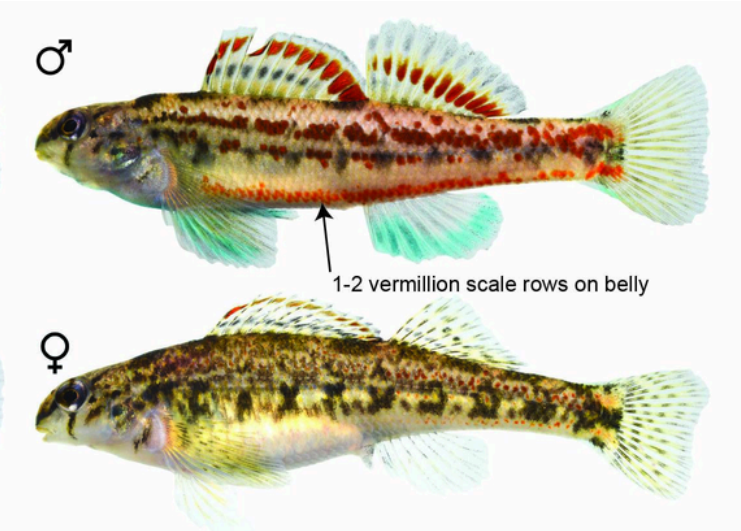
At a glance, redhorses might seem like humble bottom-feeders. But together, they tell a richer story about North America’s freshwater diversity. Even in well-studied regions, unnamed biodiversity persists.

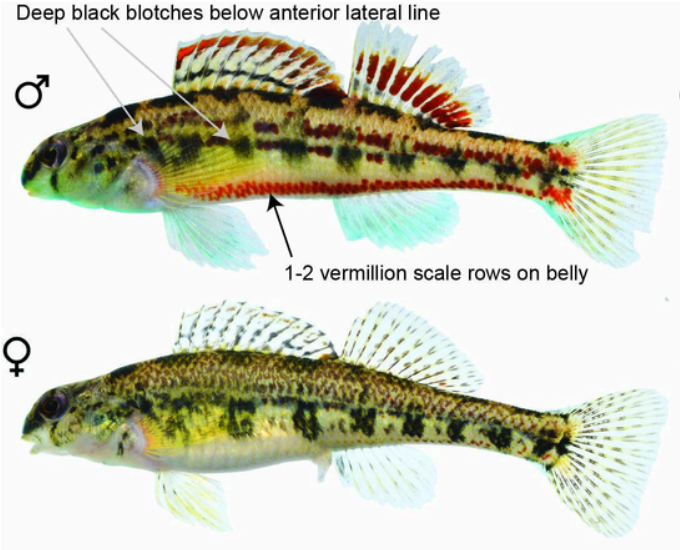
Anglers and naturalists alike have begun to reevaluate redhorses once dismissed as “rough” or “trash fish”. Today they are increasingly recognised as integral components of river ecosystems, and as compelling sport fishes in their own right.

As freshwater ecosystems face mounting pressures, giving species a name is a first step toward understanding and managing them. The recognition of the Sicklefin and Apalachicola Redhorse serves as a celebration of the unseen richness flowing through North America’s rivers, and of the long, patient work required to bring them into focus.

Left: Birmingham Darter, Right: Gurley Darter © J.E.W., Z.D.A., and Bernie Kuhajda

Birmingham Darter & Gurley Darter
Etheostoma birminghamense & Etheostoma gurleyense





Researchers: Brownstein, Kim, Wood, Alley, Stokes & Near
Location: Blue Creek at Johns Road, Jefferson County, Alabama, and Gurley Creek, Blount County, Alabama, U.S.A.
Highlight: These beautiful little darters already have a high extinction risk.

Both of these stunningly colourful fishes were described from the southeastern United States – one of the most intensively studied freshwater fish faunas on Earth – where brightly coloured darters have long been icons of North American biodiversity.

The Birmingham Darter, taking its name from the nearby Birmingham, Alabama, and the Gurley Darter, from the Gurley Creek, both belong to Etheostoma, a genus rich with colour, endemism, and taxonomic complexity. The 2025 description by Brownstein, Kim, Wood, Alley, Stokes, and Near set out to resolve fine-scale diversity within a group of closely related darters from northern Alabama, drawing on morphology, colour patterning, and genetic evidence to separate lineages that had previously been subsumed within broader species concepts.

The result was the formal recognition of these two species, both with extremely restricted distributions, each tied to a narrow set of streams and tributaries.

These fishes are strikingly beautiful: the authors describe males in breeding condition as exceptionally colourful, with vivid combinations of blues, oranges, reds, and greens, arranged in bars and blotches. As with many darters, these colours intensify during the breeding season, when males defend territories over clean gravel and cobble substrates.

In darters, colour pattern is one of the most important tools for distinguishing species, and in these two cases it played a central role in recognising that populations once thought to be variants were actually evolutionarily distinct.

Both species are endemic to northern Alabama, known only from single river systems and their immediate tributaries.

The Birmingham Darter is restricted to streams within the Black Warrior River basin, occurring in a small number of localities around the Birmingham area.

The Gurley Darter is known from the Paint Rock River system, a separate drainage with its own long history of endemism.

In both cases, the habitats described are clear, shallow streams with flowing water and coarse substrates – usual habitats for darters' feeding and reproduction needs, but which are particularly sensitive to disturbance.

The *Etheostoma* genus has multiple threatened species, with 27 currently included on SHOAL's list of Priority Species – those freshwater fishes in most need of conservation action globally. For the Birmingham Darter and the Gurley Darter, the risk of extinction is articulated at the point of description.

The authors emphasise that both darters have:

- Extremely limited ranges
- Small numbers of known populations
- Ongoing exposure to threats including urban development, sedimentation, altered flow regimes, and water quality degradation

Northern Alabama is a landscape with a long history of industrial activity, urban expansion, and river modification, and the streams that sustain these fishes are among the most vulnerable components of that system.

As a result, both species are highlighted as being of immediate conservation concern, with their narrow endemism making them especially susceptible to even minor environmental change.

They highlight that even in regions thought to be well understood, distinct species can persist unrecognised – right up until the point where their survival is already precarious.
Their description adds two more names to the catalogue of North American freshwater biodiversity. It also adds two more urgent questions: how many others remain hidden in plain sight, and how many will only be recognised when there is very little time left to act?

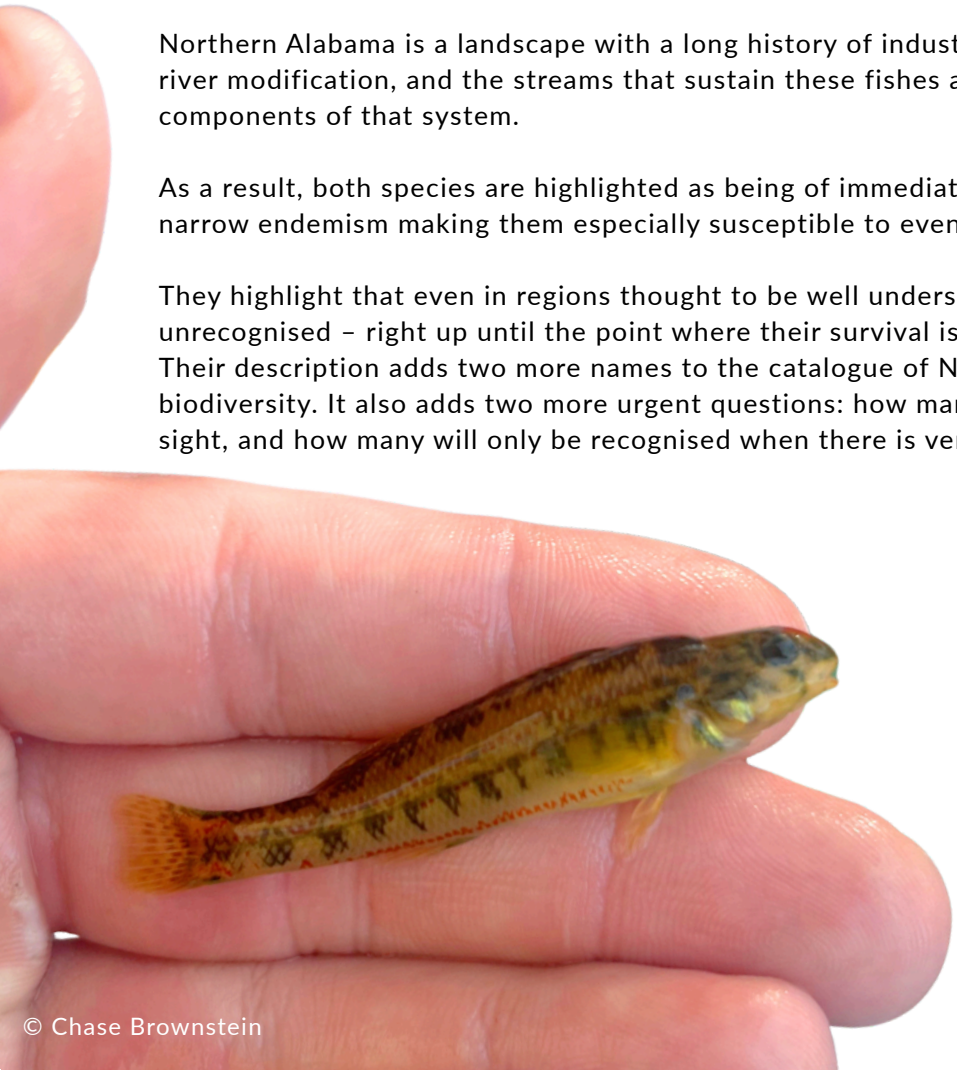


Image: Marcelo Alany and Nelson from *Baryancistrus* spp. discovery team

SOUTH AMERICA

Black Arrow Tetra, Isaac's Acari, Quilombola Acari, Floripa Sabrefin Killi, Ancestor Cory, & Javier's Electric Knifefish

Black Arrow Tetra
Inpaichthys luizae

Black Arrow Tetra © Fernando Dagosta

Researcher: Dagosta
Location: Tributary of the rio dos Peixes, affluent of the rio Juruena, rio Tapajós basin, Brazil.
Highlight: Before description, individuals were reportedly being sold in the aquarium trade for more than USD 100.

Long before the Black Arrow Tetra had a formal scientific name, it was already circulating quietly in the aquarium world as *Inpaichthys* sp. “Black Arrow”, admired for its striking appearance and commanding surprisingly high prices.

It was formally described by Fernando César Paiva Dagosta in Neotropical Ichthyology, in a paper titled *An ode to beauty: the discovery of one of the most spectacular tetras*. The fish is recognisable by a bold, oblique dark stripe along the lower flank that runs cleanly onto the middle rays of the caudal fin, creating an arresting feature unlike that of any other known congener.

The story begins in tributaries of the Rio Juruena, in Mato Grosso State, Brazil. During a collecting trip, ornamental fisherman André Bulgarelli encountered specimens that looked superficially similar to *Inpaichthys kerri* (known as the Blue Emperor Tetra or Royal Tetra), but differed enough to raise suspicion. Like many specialist fishers, Bulgarelli works almost exclusively with tetras and has developed a fine-grained understanding of their variation in the wild. When something unusual turns up, fishers like him often contact taxonomic specialists directly.

In this case, Bulgarelli sent images and specimens to Dagosta, asking whether the fish might represent a known species. Dagosta quickly confirmed that it did not. This close, pragmatic relationship between ornamental fishers and taxonomists is not unusual, and in groups such as tetras it has been instrumental in revealing hidden diversity. Fishers often encounter population-level variation long before it appears in the scientific literature, even if the tools needed for formal species delimitation, such as microscopy, comparative material, and sometimes genetic data, might lie beyond their reach.

The Black Arrow Tetra is known from tributaries of the rio dos Peixes, itself part of the rio Juruena system within the upper Tapajós basin. Despite extensive surveys across the rio Juruena and neighbouring basins, no additional specimens have been found, and none exist in Brazilian scientific collections. Together, this strongly suggests a naturally restricted distribution.

Its evolutionary story adds another layer of significance. Although *Inpaichthys* species resemble other small characids, the genus is thought to be more closely related to lineages associated with Andean drainages thousands of kilometres away, with no present-day aquatic connection. This striking disjunction is best explained by deep-time changes in Amazonian geography, dating back to before the full uplift of the Andes, when the basin was divided into separate western and eastern systems. Inpaichthys represents a relict lineage, surviving today on the Brazilian Shield while its closest relatives persist west of the Andes, a reminder of how ancient landscapes continue to shape modern biodiversity.

Beyond its signature “arrow”, the species shows clear sexual dimorphism. Males display stronger red coloration in the fins and differ subtly in anal-fin shape. According to the original description, adults reach around 4 cm standard length in the wild, with aquarium specimens often growing slightly larger, likely reflecting better food availability and longer lifespans under captive conditions.

One particularly unusual feature is polymorphism in the presence of an adipose fin: while most individuals possess one, some lack it entirely. This kind of variation is rare among tetras and may prove important for understanding evolutionary patterns within the group. By late 2023, the Black Arrow Tetra was already attracting attention among aquarists, with individual fish reportedly selling for more than USD 100. That commercial appeal raised immediate concerns. In Brazil, only formally described species can be included in legal frameworks regulating collection and trade. Undescribed fishes cannot be properly assessed, listed, or protected, and may effectively fall through regulatory gaps.

Recognising this risk, Dagosta moved quickly to describe the species. With a valid scientific name, *Inpaichthys luizae* became visible to Brazil’s environmental authorities and eligible for formal conservation assessment. This step alone was enough to bring the species under existing oversight mechanisms.

As Dagosta told SHOAL, “Only formally described species may be included in decrees that regulate which taxa are permitted or prohibited from commercial trade. Without a scientific name, a species remains invisible: it cannot be assessed, listed, or protected.”

Based on available evidence, Dagosta recommends the species be listed as Least Concern under IUCN criteria. Local fishers report that its habitats are well preserved, located within privately owned lands, and currently face no immediate environmental threats.

However, species with small populations are inherently more vulnerable to sudden change, particularly when market demand spikes. In this case, the story has taken positive turn: captive breeding in Asia (including China, Taiwan, and Hong Kong) has rapidly driven prices down, making wild collection economically unviable. Rather than exacerbating pressure on native populations, the aquarium trade in this instance may contribute to species preservation by promoting ex situ conservation through captive propagation.

The Black Arrow Tetra’s story illustrates why taxonomy remains a frontline conservation tool, especially for commercially attractive species. Without a name, *Inpaichthys luizae* would have remained invisible, and unassessed. Now it stands as a recognised part of Brazil’s freshwater heritage and freshwater biodiversity.

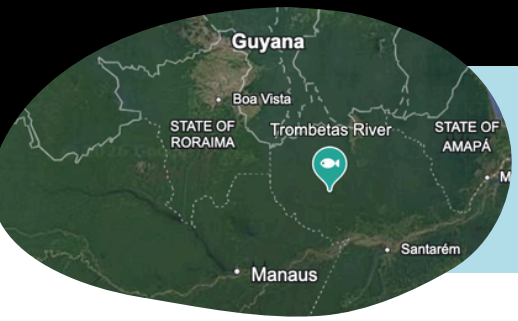
"Only formally described species may be included in decrees that regulate which taxa are permitted or prohibited from commercial trade. Without a scientific name, a species remains invisible: it cannot be assessed, listed, or protected."

- Fernando Dagosta

Black Arrow Tetra Habitat © André Bulgarelli

Top: Isaac's Acari holotype, Bottom: Quilombola Acari holotype © Renildo Ribeiro de Oliveira

Isaac's Acari & Quilombola Acari
Baryancistrus isaaci & Baryancistrus quilombola



Researchers: de Oliveira & Rapp Py-Daniel
Location: rio Trombetas basin
Highlight: Although they occur in a protected area, they are still under threat.

Before either of these species had a formal description, hobby literature and photo catalogues were already circulating two striking plecos as *Baryancistrus* sp. L274 and L384. In 2025, Renildo Ribeiro de Oliveira and Lúcia H. Rapp Py-Daniel finally anchored those familiar faces to science, describing two new Baryancistrus from Brazil's clearwater Trombetas basin, based on specimens originally collected in the mid-to-late 1980s and later in 2007 and 2008.

Both species are reported from fast-flowing, clear waters, particularly rapids, waterfalls, and rocky stretches, and the authors note that the two can be sympatric and sometimes syntopic (occurring together, even in the same local habitat at the same time).

Both Isaac's Acari and the Quilombola Acari are restricted to the rio Trombetas basin (a left-bank tributary of the Amazon in Pará, draining from the Guianas. Isaac's Acari has been recorded from the Trombetas itself and major tributaries such as Igarapé Caxipacoré, and repeatedly associated with named cataracts including Cachoeira Porteira, Cachoeira Vira-Mundo, Cachoeira da Enseada, and Cachoeira Trava, while the Quilombola Acari has records from Cachoeira Porteira, Cachoeira Vira-Mundo, and Cachoeira Enseada, as well as Igarapé Caxipacoré.

Fisher supporting field work © Alany Pedrosa Gonçalves

Oliveira and Rapp Py-Daniel emphasise that both new species are separated from their congeners using a combination of characters, particularly colour pattern, the extent of the membrane behind the last dorsal-fin ray, abdominal covering, mandibular tooth counts, and aspects of fin size.

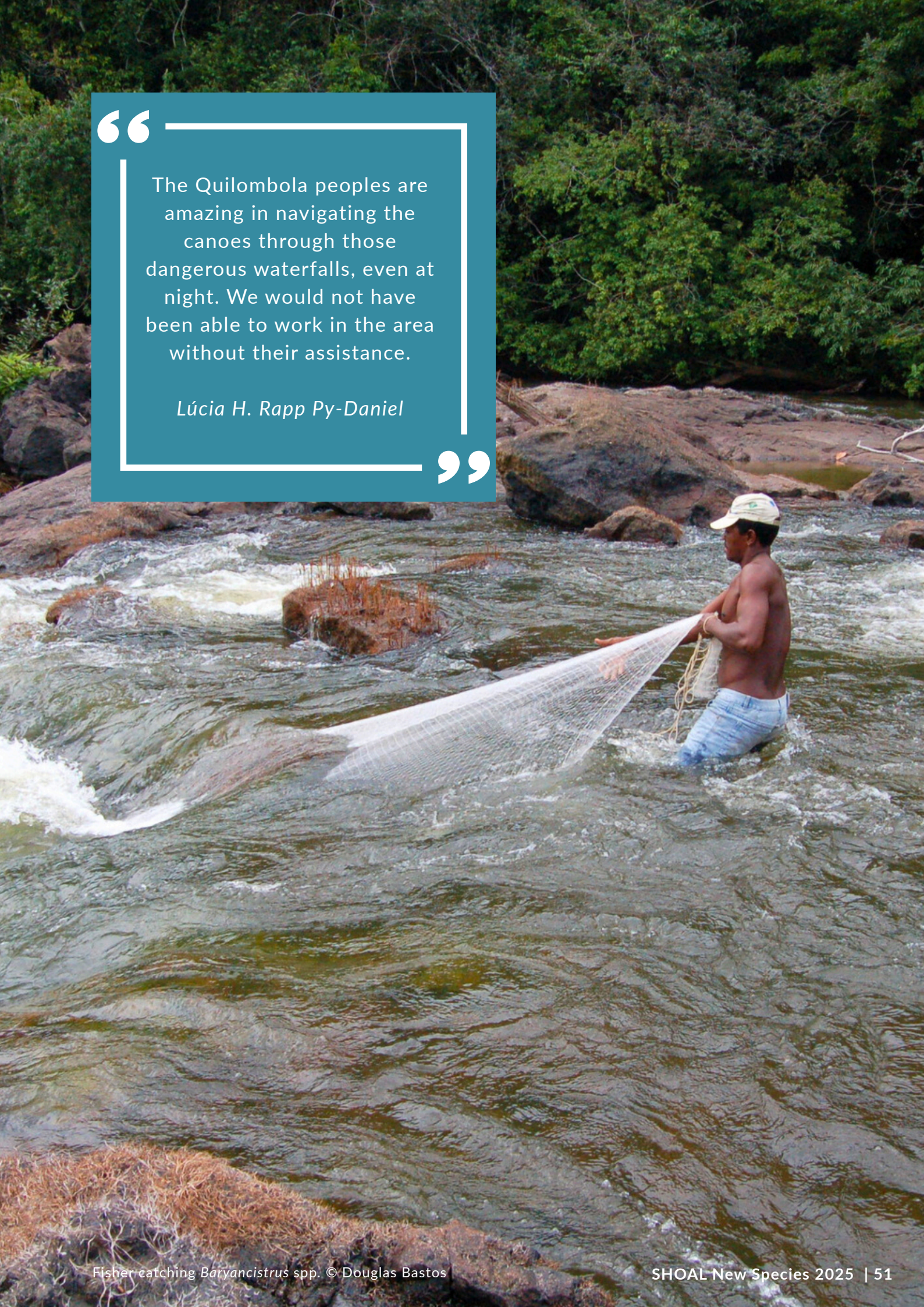
Isaac's Acari honours Isaäc Isbrücker, cited for his contributions to Neotropical ichthyology (especially *loricariids*), including the description of over a dozen species, and the genus *Hypancistrus* and for sharing knowledge across academia and the aquarium community.

Isaac's Acari © Douglas A. Bastos

Quilombola Acari honours the Quilombola communities of the rio Trombetas –Afro-Brazilian communities in Brazil, descendants of enslaved people who escaped to form self-governing settlements called quilombos, preserving unique cultures and traditional land use. They are recognised by Brazil's constitution but continue to fight for land rights, cultural preservation, and against marginalisation by agribusiness and development projects, and represent historical resistance to slavery, maintaining strong connections to their territories. They are vital guardians of biodiversity.

Neither Isaac's Acari or the Quilombola Acari have been assessed for the IUCN Red List. Both species occur within what is nominally a protected area but despite this, as Ribeiro de Oliveira and Rapp Py-Daniel 's paper says, 'previous studies on hydroelectric plants for the rio Trombetas, as the Hydropower Plant of Cachoeira Porteira, are being re-examined by current authorities, raising deep concerns on the future conservation of the unique biodiversity of the rio Trombetas basin.'

Quilombola Acari © Douglas A. Bastos



> The Quilombola peoples are amazing in navigating the canoes through those dangerous waterfalls, even at night. We would not have been able to work in the area without their assistance.
>
> *Lúcia H. Rapp Py-Daniel*

Fisher catching *Baryancistrus* spp. © Douglas Bastos

Floripa Sabrefin Killi
Campellolebias insularis

Floripa Sabrefin Killi © Matheus Volcan

Researchers: Volcan, Garcez, Robe, Feltrin, Costa & Lanés
Location: Floodplain of Tapera basin, Florianópolis Municipality, Santa Catarina Island, Brazil.
Highlight: Mating behaviour is characterised by specialised internal fertilisation mechanisms and unique, complex courtship rituals.

The Floripa Sabrefin Killi is a tiny, beautiful seasonal killifish that lives its entire wild existence on a single Atlantic Forest island in southern Brazil, in temporary wetlands now being rapidly transformed by development.

Locally, Florianópolis is affectionately known as “Floripa”, the capital of Santa Catarina State and a city famous for its beaches and rapid growth. But hidden among fragments of Atlantic Forest on this so-called “Magic Island” are shallow, temporary freshwater pools. And in them, a fish found nowhere else on Earth.

The genus *Campellolebias* contains small, internally inseminating seasonal killifishes associated with temporary pools in tropical and subtropical parts of Brazil’s Atlantic Forest. In 2025, an integrative taxonomic study confirmed that an island population from Florianópolis represents a distinct species: *Campellolebias insularis*.

For Luis Esteban Krause Lanés, one of the researchers involved, the recognition came quickly. “Yes, as soon as we captured the first specimen, after the initial excitement, we already knew it was a new species.”


© Matheus Volcan

Although superficially similar to *C. brucei*, subtle but consistent differences stood out, including colour pattern and fin proportions, alongside the significant geographic separation from known populations. In annual killifishes such as *Campellolebias*, distributions are typically highly restricted and spatially structured. The Florianópolis population lay roughly 140 km from its closest relatives, positioned between the ranges of *C. brucei* and *C. chrysolineatus*.

Floripa Sabrefin Killi males share the dark purplish-red body sides and horizontal rows of metallic spots typical of the genus, but with distinguishing details: the metallic spots are yellowish-green (rather than green), and the pelvic-fin tips reach further forward relative to the anal fin than in *C. brucei*.

Like other seasonal killifishes, the Floripa Sabrefin Killi's life cycle is tightly bound to seasonal rhythms of rainwater and dryness. As an annual fish, they have a peculiar life cycle: its temporary wetlands dry out completely and can remain dry for longer than with water throughout the year. Lanés told SHOAL, "Killifishes have therefore developed a highly specialised evolutionary strategy and life cycle meticulously synchronised with the hydrological variations of ephemeral wetlands. The survival of the species through extreme environmental stress is facilitated by drought-resistant embryos. Rivulid embryos can undergo up to three distinct stages of diapause, which allows them to withstand prolonged periods of desiccation and hypoxia for months or even years. Furthermore, life in this unpredictable and stochastic environment, selected for extremely rapid growth and early sexual maturation, often reaches reproductive age within a few weeks to capitalise on the transient availability of water."

Mating behaviour in the *Campellolebias* genus is characterised by specialised internal fertilisation mechanisms and unique, complex courtship rituals known as "Coiled Retrorse Motion". Lanés explains: "This involves a series of repetitive movements where the male coils his body while simultaneously moving backwards and upwards at approximately a 45° angle to the substrate."

The species has been recorded from just three sites across two small hydrographic basins on Santa Catarina Island: one in the Tapera River basin (the type locality) and two in the Tavares River basin. Its type locality is listed as a flooded forest habitat on the Tapera basin floodplain. Although technically a swamp, Lanés points out the biotope is perhaps nothing like what the imagination might conjure from the word: "The habitat isn't the typical 'swamp' of DC Comics or films like Swamp Thing or Shrek. In fact, the biotope consists of shallow and temporary freshwater pools formed by rainwater accumulation in small depressions."

These pools are shaded, around 15 cm deep, with muddy substrates and little aquatic vegetation. Tall grasses often obscure the water entirely, and even when the pools are flooded, they can appear totally dry to the untrained eye.

Unfortunately, two of the three populations of the species are in imminent danger. "If we compare the satellite imagery data available from 1985," Lanés says, "there has been an alarming replacement of natural wetlands with broad housing and urban development, accompanied by the installation of developments, road works, canalisation, and drainage. These changes are most noticeable from November 2002 onwards. It can be stated that currently the known populations live only in small remnants of natural environments located on the immediate border with anthropogenic environments."

On that basis, along with the species' already small population, the authors consider the species Critically Endangered, though it has not been formally evaluated on the IUCN Red List yet.

Lanés is clear that conservation action is both urgent and possible. He highlights crucial next steps as the cancellation of installation licences for planned developments, habitat recovery, searches for additional populations, and the creation of a protected area within Florianópolis.

"If someone reads about *Campellolebias insularis* and remembers just one thing," he says, "I would hope it is this: the species stands as a remarkable example of evolutionary adaptation and conservation within distinctive environments, such as wetlands and island habitats, and its protection is vital to safeguarding our rich and remarkable biodiversity."

On an island celebrated for its beaches and growth, this tiny fish survives in pools most people would walk past without noticing. Whether it remains part of Floripa's hidden natural heritage now depends on how quickly those unnoticed wetlands are recognised as the irreplaceable habitats that they are.

> If someone reads about *Campellolebias insularis* and remembers just one thing, I would hope it is this: the species stands as a remarkable example of evolutionary adaptation and conservation within distinctive environments, such as wetlands and island habitats, and its protection is vital to safeguarding our rich and remarkable biodiversity.
>
> *Luis Esteban Krause Lanés*

Floripa Sabrefin Killi © Matheus Volcan

Ancestor Cory
Hoplisoma noxium

Ancestor Cory © Hans Evers

Researchers: Tencatt, Ohara, Carvalho, Grant & Britto
Location: Tapajós River drainage, Amazon basin, Pará State, Brazil.
Highlight: Noted to produce powerful toxins when stressed that can kill other fish when kept in close proximity after capture.

The Ancestor Cory has been circulating in the aquarium trade for years, listed as *Corydoras* sp. CW004, CW155, or CW156, and sold to passionate Corydoradinae enthusiasts as a very rare cory long before its formal description. Its scientific recognition in 2025 gave a long-kept secret a proper place in taxonomy.

The species was described by Tencatt, Ohara, Carvalho, Grant, and Britto, following visits to several rivers in the Brazilian state of Pará in 2023 as part of a crowdfunded project to document the region's fish diversity. After detailed examination of material collected from the wild and specimens already present in aquaria, the team published the fish as a newly described species on 7 April 2025 in the peer-reviewed journal Neotropical Ichthyology.

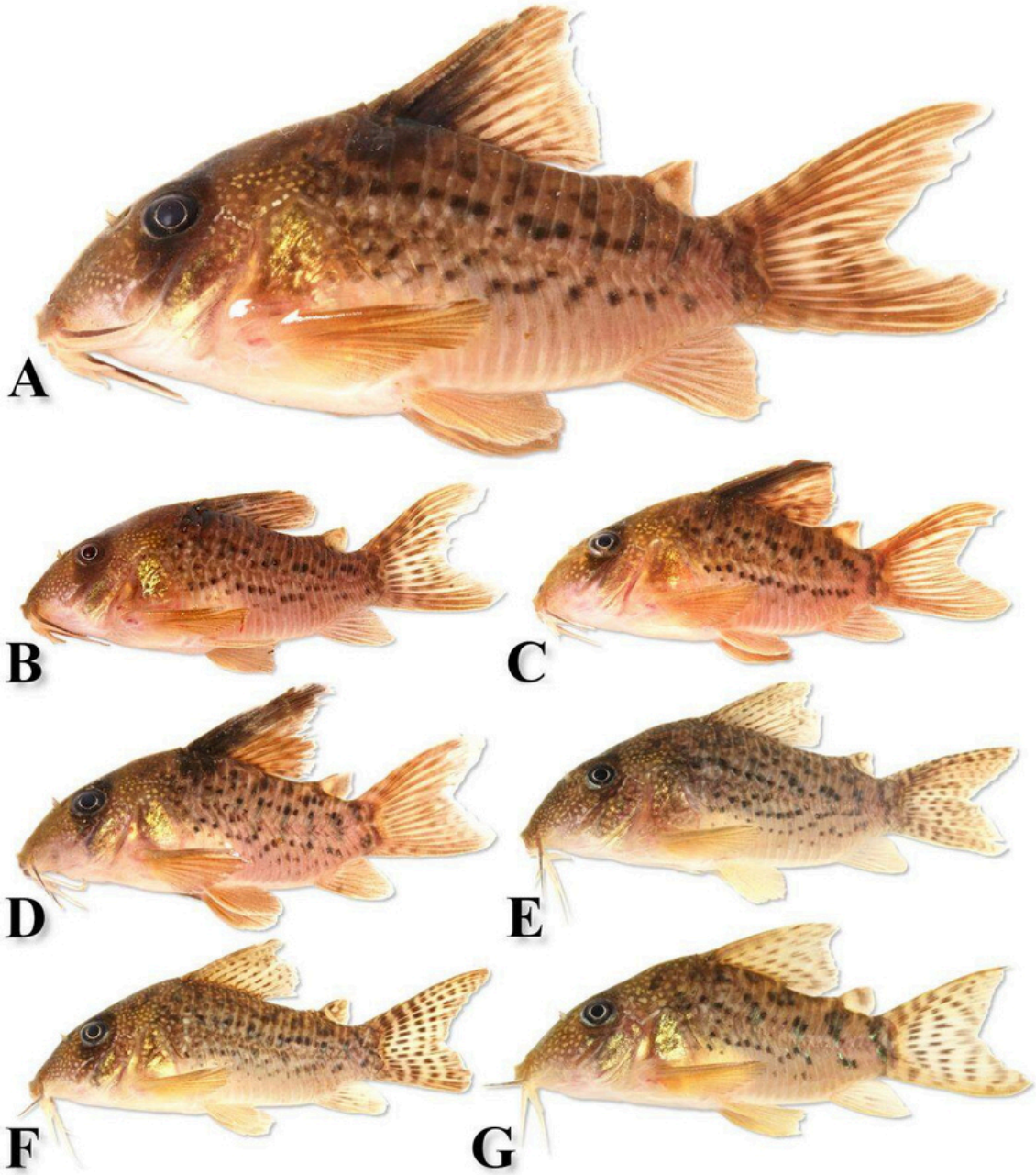
Morphologically, the species sits within the group of small, armoured callichthyid catfishes widely referred to as 'corys': compact-bodied, primarily bottom-dwelling fishes adapted to life among leaf litter and fine substrates. Like many other corydoradins, the Ancestor Cory produces a potent defensive toxin that is released from glands under the scutes when the fish is stressed or attacked. The substance can be lethal to other fishes kept in close proximity, and fishermen told researchers that the new species "must be separated from any other fish species just after capture, otherwise they can rapidly kill' the other fish. Fishermen also reported "getting 'stung" by the new species, a "painful" experience "eventually causing minor allergic/inflammatory processes," hence the epithet *noxium*, meaning injury or damage in Latin.

The type specimens were found in a medium-sized tributary of the rio Tapajós, which is characterised by having relatively clear tea-coloured water, with slow to moderate water current in the sampled sites. The substrate is mostly composed of sand and fine gravel, with stretches accumulating leaf litter and submerged logs and branches. Additionally, some stretches present submerged and marginal vegetation, including the partially exposed submerged roots of marginal trees.

Another location, the Igarapé Miuçuzinho, is a relatively large tributary of the Igarapé Muiuçu, itself a tributary of the rio Tapajós. In both localities, the Ancestor Cory was only observed and captured during the night.

Despite the relatively restricted geographical distribution, part of the drainage where the species has been found is protected, notably by the Floresta Nacional do Amaná, Floresta Nacional do Urupadi, and by Indigenous territories of the Munduruku ethnic group. Therefore, considering the currently available data, the Ancestor Cory is classified as Least Concern.

Tencatt, Ohara, Carvalho, Grant and Britto state that “We would like to thank the crowdfunding initiative carried out by renowned aquarist Eric Bodrock, for making the expedition to Jacareacanga, Pará, possible. This is another example of aquarists supporting ichthyologists to further the study of catfishes and help highlight and protect species and their environments.”



Ancestor Cory paratypes © Willian Ohara

Javier's Electric Knifefish
Microsternarchus javieri

Javier's Electric Knifefish male © Carolina Escamilla Pinilla Cristina

Researchers: Pinilla, Cox Fernandes & Alves-Gomes
Location: Negro and Branco River basins, Amazonas and Roraima States, Brazil.
Highlight: Releases electric charge to aid with navigation and communication.

Javier's Electric Knifefish is a species of weakly electric knifefish from the Negro River basin in Amazonas, Brazil. It belongs to the family Hypopomidae, a group of slender, nocturnal knifefishes known for emitting low-voltage electric signals used in navigation and communication rather than for stunning prey. The species' description was published in Acta Amazonica by Carolina Escamilla Pinilla, Cristina Cox Fernandes, and José Antônio Alves-Gomes. The name javieri honours the late Colombian ichthyologist Javier Maldonado Ocampo – Pinilla's PhD supervisor – for his significant contributions to the study of neotropical fishes, and whose life was tragically cut short during a field expedition.

Like its congeners, Javier's Electric Knifefish generates weak electric organ discharges (EODs). These electric fields are not dangerous but are crucial for life in the often dark, tannin-stained waters of the Amazon. Fish use them to sense their surroundings and to communicate with conspecifics in habitats where vision is limited by water colour or structure. The discharges also help the researchers find them. Pinilla explains: "We use electrodes – a plastic stick with two iron ends – connected to amplifiers that pick up very low electrical discharges. With those electrodes and attached amplifiers, we hear the signals." There are a lot of fishes releasing their own signals, so interference pulls through the audio. Though, Pinilla says, "Once you get to know how the discharge sounds, you can identify all those fishes without having to take them out."

The discharge is extremely weak, in the order of millivolts, which is too low for humans to be able to feel, but enough for the fish to sense what is happening around it. Discharges vary between males and females, and it is thought females may use the electric signals to assess the condition of males, offering a signal to potential mates how strong and healthy they are.

The species inhabits streams in the Negro River basin, including flooded savanna channels of the Branco River and terra-firme streams (non-flooded upland waterways) in mid and lower portions of the basin. These waters are slow-flowing and often richly structured with leaf litter, roots, and submerged vegetation – environments that provide plenty of tactile and electrical feedback from the environment.

In the Amazon, river levels fluctuate dramatically throughout the year. Terre-firme streams sit higher than the main river, so their levels depend only on local rains, and are immune to the seasonal flood and dry cycles that affect much of the rest of the Amazon Basin. Pinilla says, “These terre-firme environments are therefore more variable, so the fishes in those streams have to be more adaptable.”

Although there is currently no IUCN Red List status for the species, its known habitat faces ongoing threats from deforestation, road construction, illegal mineral extraction, hydrological alteration and broader impacts of pollution and climate change. According to Pinilla though, there is currently no evidence of population decline: “I don’t think it is vulnerable now – they are really adaptable and can spend days without food. But in the long-term, the species will become more vulnerable as the habitat changes.

“These are protected areas,” Pinilla adds, “but there is no way it can all be protected.” The fish itself is relatively small, with specimens reaching up to about 10.1 cm in total length. Its body is elongated and laterally compressed, typical of the blunt-nosed knifefishes in Hypopomidae, and it lacks the tubular snout seen in some related electric fish families.

Key traits that distinguish the species from its congeners include: Smaller maximum body depth, longer caudal filament, differences in the number of anal fin rays and vertebrae counts. These morphological and anatomical differences were confirmed using DNA barcoding and comparative EOD features.

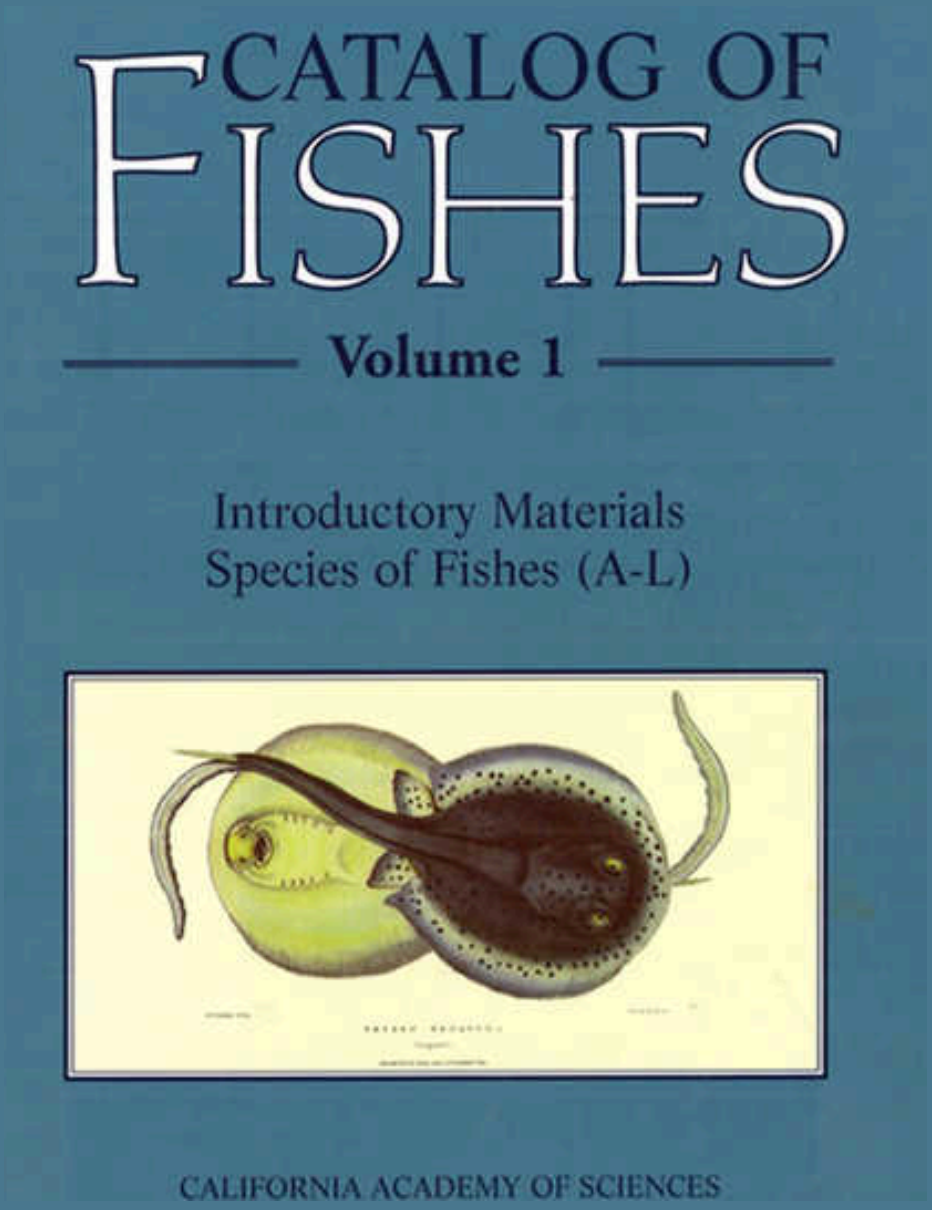
The Amazon basin remains one of the richest hotspots of freshwater biodiversity on Earth, and electric fish like Javier’s Electric Knifefish are emblematic of that hidden richness. These fishes are often overlooked because of their shy, nocturnal habits, but their electric communication systems represent complex evolutionary innovations with deep ecological importance.

Javier’s Electric Knifefish habitat (Left), Research Team (Right) © Carolina Escamilla Pinilla Cristina

> For non-scientific readers, I hope they appreciate and respect all kinds of living creatures. Javier's Electric Knifefish and other fishes in the genus are not the most colourful or shiny, they're not flashy. But it is all worthy of respect. There is so much we can learn from animals that have these cool sensory systems.
>
> *Carolina Escamilla Pinilla Cristina*

Javier's Electric Knifefish © Carolina Escamilla Pinilla Cristina

SPOTLIGHT ON
Eschmeyer's Catalog of Fishes



Eschmeyer's Catalog of Fishes is the most authoritative global reference for fish scientific names and taxonomy, maintained as a continuously updated online database by the California Academy of Sciences and edited by experts. It compiles nomenclatural data, original descriptions, type specimens, and current taxonomic status for tens of thousands of fish species and genera, serving as the baseline standard for ichthyological research worldwide.

The Catalog's rigorous, month-by-month updates ensure that newly described species and changes in classification are captured promptly, making it indispensable for biodiversity assessments and species lists.

Click here or scan the QR Code to visit the catalog

MEET THE RESEARCHER
Richard van der Laan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CALIFORNIA ACADEMY OF SCIENCES

Richard van der Laan is a Dutch chemist and ichthyologist who, along with Ron Fricke, maintains the collection of fish names at Eschmeyer's Catalog of Fishes.

FOR READERS UNFAMILIAR WITH IT, WHAT EXACTLY IS ESCHMEYER'S CATALOG OF FISHES, AND WHY IS IT CONSIDERED THE GLOBAL AUTHORITY ON FISH NAMES?

Bill Eschmeyer started to collect the genera and species names of Recent Fishes a long time ago. With our website we present these data for free to the whole world. One can search the website for the ever-proposed genera and species names (spanning more than 260 years!) and we present the validity of these names, backed up with many citations. This provides answers to many questions: "Is the name available? Is the name still valid? Is the spelling correct? To what family/subfamily is a species assigned? By whom and where was the species described?" We currently have 11,300 genus-names (for 5,336 valid genera), 65,792 species-names (for 37,537 valid species), all compiled from 36,476 literature references.

For many of the cited publications, we present a link to the publication itself and with just a click the publication can be assessed. All this information proved very useful and reliable to a lot of people (saving a lot of research time) and by this, specialists keep informing us with many helpful suggestions to improve the database.

EVERY YEAR YOU HELP COMPILE THE NEWLY DESCRIBED FRESHWATER FISHES OF THE WORLD. WHY DOES THAT ANNUAL ACCOUNTING MATTER?

It serves some important issues, e.g. to show there were still undescribed (and undiscovered) freshwater species and to keep track of the research work that has been carried out over the years. It also directs attention to the fact there is still work to be done.

FROM YOUR PERSPECTIVE, ARE WE IN A GOLDEN AGE OF FISH DISCOVERY, OR ARE WE RACING AGAINST EXTINCTION?

At many new descriptions, comments are made on the conservation status of the new species and that information is often worrying. I fear there will be many extinctions in the near future.

WHAT SURPRISES YOU MOST ABOUT THE GLOBAL PATTERN OF NEW FRESHWATER FISH DISCOVERIES?

Even in researched areas, there are still new finds to be reported. And these new finds come from all over the world, and (particularly with the help of molecular studies) also from the "well-known" areas.

WHAT TRENDS ARE YOU SEEING IN THE TYPES OF HABITATS YIELDING NEW DISCOVERIES?

Of course, remote difficult to reach areas present many new discoveries. I am still amazed by the fact that there are waters were no fishes have been recorded. Luckily, a lot of people do their very best to discover fishes and record their existence and vulnerability.

IS THERE A SPECIES DESCRIPTION FROM 2025 THAT PARTICULARLY CAUGHT YOUR ATTENTION?

The many new species recorded from the Red River basin by Marco Endruweit. How he managed to bring the data together from Chinese and Vietnamese literature and by doing this to present a much larger number of freshwater fish species from that area.

WHAT HAPPENS BETWEEN A SPECIES BEING DESCRIBED IN A JOURNAL AND IT APPEARING IN THE CATALOG?

We collect the papers (and books) with new names and we check if all the necessary data are described. Then we enter the new data into the database. Normally, we can present the new data within a few months after the publication date on the website.

HOW DO YOU VERIFY AND STANDARDISE INFORMATION FROM HUNDREDS OF TAXONOMIC PAPERS PUBLISHED ACROSS THE WORLD EACH YEAR?

We check all the International Code of Zoological Nomenclature (ICZN) necessary data when entering the new names into the database. We also check the other provided information against the data we have already in the database and change these if necessary. We also enter other publications with new data on the classification, genera and species that are already in the database.

WHAT ARE THE MOST COMMON TAXONOMIC COMPLICATIONS YOU ENCOUNTER?

Online publishing without evidence of Zoobank Registration (without the Life Science Identifiers), making the new names ICZN unavailable and causing confusion. And of course the different opinions on synonyms, genera or subgenera and species or subspecies. We try to be a little conservative by not changing well-used names.

FROM A TECHNICAL PERSPECTIVE, WHAT DOES IT TAKE TO KEEP A GLOBAL TAXONOMIC DATABASE CURRENT AND USABLE?

Funding for the server and technical assistance is important (we have excellent help from the California Academy of Sciences and Jon Fong) and editors to keep the database up to date.

WHAT KEEPS YOU MOTIVATED IN THIS FIELD?

An overview is only useful if we have all the names and the accompanying data (preferably without mistakes) and this inspires me to help to reach that goal. Also, as a frequent user of the Catalog in the past, I am convinced of the usefulness of our website.

ANYTHING ELSE YOU'D LIKE TO ADD?

Bill Eschmeyer got health problems, so he couldn´t work on his Catalog anymore; he asked me to join the team working on his monumental "Catalog". It is a great honor for me that he trusted me with this task and to present me the opportunity to do something in return for my great email friend, who has helped me over the years with lots of advice.

FULL LIST

Absumbra kongi
Absumbra nigriventer
Acrossocheilus dabieensis
Ageneiogarra kleini
Alligarina alligarina
Allohistium anas
Anabarilius megalaspis
Aphyocypris robertsi
Atlantirivulus peruibensis
Atlantirivulus tupinambas
Bagarius dolichonema
Bagarius protos
Balitora dehouensis
Balitora plithora
Balitora scyphus
Barbatula fluvicola
Barbatula ommata
Barbodes klapanunggalensis
Barbucca heokhuii
Barilius imphalensis
Baryancistrus isaaci
Baryancistrus quilombola
Batasio eugenius
Betta iaspis
Betta mulyadii
Cambeva babilonica
Cambeva capetinga
Cambeva capitoliensis
Cambeva occidentalis
Campellolebias insularis
Catostomus murivallis
Cetopsorhamdia ramirezi
Channa bhoi
Channa nachi
Characidium dumonti
Characidium jivaro
Characidium ortegai
Characidium tupi
Chiloglanis asperocutis
Chiloglanis compactus
Chiloglanis kinsuka
Chiloglanis wagenia
Chrysobrycon ximango
Claea scet
Cnesterodon pampeanus
Cobitis austiumensis
Cobitis beijingensis
Cobitis monorus
Cobitis petrtyli
Cobitis pulchra
Cyphocharax ivo
Desmopuntius mahakamensis
Devario altus
Devario perisseia
Devario xanthella
Discogobio angustimarginis
Discogobio carnatus
Eigenmannia wazowskii
Enteromius bieensis
Enteromius ruacanaensis
Eremodon yetateku
Ernstichthys casalinuovoi
Esomus hypothrix
Etheostoma birminghamense
Etheostoma gurleyense
Etheostoma kimberlae
Etheostoma michellae
Eugnathogobius ganuensis
Exostoma hajiensis
Exostoma microadiposa
Farlowella kirane
Fluviphylax rubens
Fundulus caddo
Fundulus cryptocatenatus
Gambusia echelleorum
Gambusia pyrros
Garra cavernicola
Garra magnarostrum
Garra nambashiensis
Glaridoglanis verruciloba
Glossogobius hanisii
Glyptothorax ahangkyensis
Glyptothorax bhurainu
Glyptothorax carnatus
Glyptothorax chakpiensis
Glyptothorax dihangensis
Glyptothorax eurychorus
Glyptothorax flaccidus
Glyptothorax helike
Glyptothorax himalaicus
Glyptothorax hymavatiae
Glyptothorax ngoi
Glyptothorax othrys
Glyptothorax palakkadiensis
Glyptothorax parakelis
Glyptothorax reductus
Glyptothorax rhadinus
Glyptothorax sulculus
Gobio uralensis
Grasseichthys zamba
Hainania minzhengi
Hampala katibas

Hampala lupar
Hampala siamensis
Heteromormyrus angusticaudata
Heteromormyrus chilembwei
Heteromormyrus dolichorhynchus
Heteromormyrus ndauorum
Heteromormyrus tangwenai
Heteromormyrus xanekweorum
Homatula gelao
Homatula shexiang
Homatula submarginata
Homatula xiangzhi
Hongiastoma zhangbuensis
Hoplias cazumba
Hoplias guri
Hoplias maranhensis
Hoplisoma noxium
Hoplisoma tenebrosum
Hyphessobrycon mamuruensis
Hyphessobrycon mapinguari
Hyphessobrycon ribeiroi
Hypancistrus parkateje
Hypancistrus seideli
Hypancistrus yudja
Hypomasticus australis
Ictalurus nazas
Imparfinis arceae
Indoreonectes mahadeoensis
Inpaichthys luizae
Ituglanis jaguarete
Ituglanis jussariensis
Kibizon kibizon
Labeo chekida
Labeo ngqikai
Labeo niariensis
Labeo uru
Labeobarbus kylei
Labrochromis mawe
Labrochromis mawepili
Lacustricola gemma
Laogarra heokheei
Laubuka indawgyiana
Laubuka myitthaensis
Lasiancistrus ruitoquensis
Lentipes ptasan
Leporinus lignator
Liniparhomaloptera gracilis
Liniparhomaloptera vittata
Listrura elongata
Listrura garuva
Listrura guaratuba
Listrura intermedia
Listrura itapocu
Listrura paranagua
Magdalenichthys lundbergi
Magdalenichthys yariguies
Mastacembelus dictyon
Mastacembelus leucostictus
Mesonauta karipuna
Microcobitis stilaspi
Micropterus calliurus
Micropterus pucpuggy
Microsternarchus javieri
Moema humaita
Moenkhausia solaris
Moxostoma antelunare
Moxostoma ugidatli
Niwaella tigrina
Nipponocypris weigoldi
Nothobranchius dubieensis
Nothobranchius iridescens
Nothobranchius katemomandai
Nothobranchius marmoreus
Nothobranchius sylvaticus
Notropis lucifer
Notropis multicorniculatus
Notropis oblitus
Oncorhynchus biwaensis
Olyra kolasibensis
Olyra sancta
Opsariichthys jishuiensis
Opsarius mujnaiensis
Oreonectes daguishanensis
Oreonectes guidongensis
Oreonectes qinae
Oryzias cabaranensis
Oryzias polylepis
Osteogaster oharai
Oxynoemacheilus sarali
Pangio juhuae
Pantanodon nyingi
Paretroplus risengi
Peckoltia amjikin
Penesilurus neglectus
Pethia dibrugarhensis
Phalloceros circummontanus
Phalloceros mimbi
Phoxinus ayukensis
Phoxinus kottelati
Pimelodella nuchalis
Placogobio basipunctatus
Poptella abathes
Poptella magnuspina
Poptella spinula
Porotergus maroon
Porotergus sambaibensis
Priocharax piagassu
Priocharax rex
Priocharax robbiei
Profundulus hectori

Propimelodus lobatus
Protocobitis longibarba
Psalidodon canaaensis
Psalidodon paiva
Psalidodon pessalii
Psalidodon terezinhae
Psalidodon velhochico
Pseudobarbus agulhas
Pseudobarbus kubhekai
Pseudobarbus outeniqua
Pseudogastromyzon putienensis
Pseudomystus nuchalis
Pseudophoxinus galilaeus
Pterocryptis vorax
Puntius torsai
Rhicron rhicron
Rhodeus tugbae
Rhinogobius chongkangensis
Rhinogobius lingjiangensis
Rhinogobius sexistriatus
Rineloricaria buckupi
Salmo emireae
Salmo epimolos
Salmo sengulae
Salpynx ephebus
Salpynx trombetensis
Scaphostoma annamense
Schistura bisseti
Schistura colossoceps
Schistura crassiceps
Schistura curta
Schistura densiclava
Schistura dextra
Schistura fusa
Schistura fuscocirrus
Schistura hemitelis
Schistura kalousi
Schistura laohu
Schistura lepoura
Schistura maiana
Schistura nanoceps
Schistura ngosyvani
Schistura nigriceps
Schistura opisthiopteron
Schistura oresbios
Schistura paracobitula
Schistura pigicola
Schistura porcellus
Schistura scoupoxylum
Schistura sinistra
Schistura stenotaeniata
Schistura stoicheioda
Schistura thoracilepidota
Schistura vexillifera
Serrasalmus castellonae
Sewellia pudens
Sinocyclocheilus changlensis
Sinocyclocheilus panzhouensis
Sinocyclocheilus wanlanensis
Sinocyclocheilus xingrenensis
Sinocyclocheilus zhenningensis
Sinogastromyzon celatum
Spectrolebias shoheiohtanii
Sternarchorhynchus guayaberensis
Stiphodon hadiatyae
Supradiscus varidiscus
Tariqilabeo iranicus
Titanolebias calvinoi
Traccatichthys annularis
Traccatichthys punctulatus
Tremeuchiloglanis homatuloides
Tremeuchiloglanis nereia
Tremeuchiloglanis zhouweii
Trichomycterus ariasi
Trichomycterus asocolcibios
Trichomycterus cepitaensis
Trichomycterus hatoensis
Trichomycterus riosae
Trichomycterus ruficaudatus
Trichomycterus suaitaensis
Trichomycterus tomarrazonensis
Trichomycterus urbanoi
Trichomycterus valenciae
Triplophysa baishuijiangensis
Triplophysa wenshanensis
Triplophysa xiuwenensis
Triplophysa yangi
Vanmanenia alta
Vanmanenia deficiens
Vanmanenia dimidiata
Vanmanenia kunfengae
Vanmanenia zhangei
Xenurolebias tupinikin
Yunnanilus mentibarbatus
Yunnanilus triangulus

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Catching *Nothobranchius* in the Democratic Republic of Congo © Béla Nagy

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