



Sewellia lineolata by Kathy Hughes



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Freshwater Fish Specialist Group

NEWSLETTER OF IUCN FRESHWATER FISH SPECIALIST GROUP

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A NOTE FROM OUR CHAIRS

Dear FFSG members,

We are delighted to bring back the popular Freshwater Fish Specialist Group newsletter after a few years of absence. The newsletter was something that FFSG members always appreciated and was one of the things that we as Chairs were overwhelmingly requested to reintroduce. We hope that the relaunch of the newsletter, with its content created by you, our members, provides a source of information, inspiration and collaboration. We will aim to include in each issue any upcoming news such as conferences, meetings, policy news, funding opportunities, and new species discoveries and descriptions. We also hope that the articles provide our membership with the chance to showcase where conservation action is working to save freshwater fishes and that each issue is a source of valuable information to fight against freshwater fish extinction. Our aim is to deliver the newsletter quarterly to our members, but this will depend on how much information and articles you share with us so please consider writing a short article from your areas of work and supporting future editions of the newsletter. Thanks to those members who have already sent us articles and thanks to our intern Jason Motely and format designer Caitlin Daly for helping create the first issue. We hope you enjoy reading it and look forward to many more.



Brian Zimmerman



Kathy Hughes

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Pseudobarbus asper by Jeremy Shelton

FFSG WEBSITE

As you may have noticed, the FFSG has not had a website for the last few years. Sadly it was corrupted and could not be recovered, so we have been working to create a new one. The website is still under development, but you can take a look at our progress here: <https://freshwaterfish.org/>. We would like to say a big thank you to Lesley Wright of the Otter Specialist Group for her support in helping create the new website.

WHAT'S NEW

International Mahseer Conference 2024

17th – 20th March

This conference will take place in Da Lat City, in the Lam Dong Province of Vietnam. Da Lat is a part of the Langbiang Biosphere Reserve, home to more than 1,940 plant and 747 animal species, which was recognised by Man and the Biosphere Program - UNESCO in 2015. More information on the conference can be found here: <https://mahseerconservation.org/imc3-information>.

Strategic Framework to Accelerate Urgent Conservation Action for ASAP Freshwater Fishes in Southeast Asia

An important new framework for Southeast Asian fish conservation was released in June. Led by SHOAL, IUCN Asian Species Action Partnership and Mandai Nature, the 'Strategic Framework to Accelerate Urgent Conservation Action for ASAP Freshwater Fishes in Southeast Asia' was developed to support the conservation of the 90 Critically Endangered Southeast Asian freshwater fish species found across 11 countries in Southeast Asia. This includes Brunei Darussalam, Cambodia, Lao PDR, Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste and Vietnam. The framework can be seen here: <https://speciesonthebrink.org/news/articles/press-releases/new-roadmap-sets-the-course-for-urgent-conservation-of-freshwater-fishes-in-southeast-asia/>



Betta cracens by Wentian Shi

Congratulations to Professor Rajeev Raghavan!



FFSG are proud to announce that FFSG South Asia Regional Chair and Red List Coordinator Assistant (Asia and Oceania) Professor Rajeev Raghavan was awarded the Fisheries Society of the British Isles Medal this year to recognise his exceptional advances in the study of fish biology, the first year that the medal was awarded to someone from the Asian continent. Rajeev is Assistant Professor at the Kerala University of Fisheries and Ocean Studies where he has discovered 23 new fish species, including the now famous gollum snakehead, *Aenigmachanna gollum*. Rajeev has been a valuable contributor to FFSG since he was encouraged to join by previous FFSG Chair and founder Gordon McGregor Reid in 2009. Rajeev attended his first FFSG meeting in Chester in 2010 (photo below) and took over as the South Asia Co-Chair in 2012, after Dr. Remadevi stepped down as she was nearing retirement (group photo, front row right corner). Rajeev's commitment to FFSG has remained since then and he is now in his 11th year of coordinating the FFSG activities in the South Asia region. Rajeev has recently been awarded an IUCN SSC EDGE Grant for work to protect *Aenigmachanna gollum*. Rajeev has valued his role in the FFSG stating that "My association with FFSG has helped me grow as a scientist, practitioner, and an advocate for freshwater fish conservation, and raise the profile for South Asia's threatened freshwater fish species". In turn, FFSG are very grateful for Rajeev's unfaltering passion and support for the freshwater fishes we all try so hard to protect.

The Indian Express has recently published a fascinating interview with Rajeev entitled 'If asked to name ten native fish species, students would be stumped'. You can read it here:

<https://www.newindianexpress.com/cities/kochi/2023/oct/26/if-asked-to-name-ten-native-fish-species-students-would-be-stumped-professorrajeev-raghavan-2626958.html>



Bioinventory in high gear: DNA barcoding of types and topotypes to advance biodiscovery and taxonomy of southern Africa's freshwater fish fauna

Albert Chakona

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With large sections of the southern African landscape increasingly becoming transformed, there are concerns that a significant proportion of freshwater fishes may be pushed to extinction, and most of them will potentially disappear before they are even scientifically documented. Although efforts have been initiated to address this “biodiversity crisis”, for example through evaluation of extinction risk and establishment of action strategies to try and mitigate against the impacts of the key threats, a prevailing challenge is that such evaluations are incomplete, or sometimes misleading, because the fundamental baseline, the inventory of the species in the region, remains unsatisfactory, particularly in terms of taxonomic completeness, taxonomic accuracy and distribution patterns. To address this information gap, the NRF-SAIAB initiated the Topotypes Project in 2013 whose aim is to generate COI-barcode reference libraries for topotype specimens of all freshwater fishes that were described from southern Africa. This project which includes multiple participants from research institutions and natural history museums in southern Africa has facilitated the collection of fresh voucher specimens, tissue samples and live colour photographs of several freshwater fishes from South Africa, Zimbabwe, Mozambique, Zambia, Malawi, Botswana, Namibia, Angola, Democratic Republic of Congo, Tanzania and Kenya. Generation of COI sequences linked to curated topotype specimens identified by taxonomic experts and curated into natural history museums in the region including the National Fish Collection at the NRF-SAIAB (South Africa), Natural History Museum of Zimbabwe (Zimbabwe) and Museu De História Natural de Maputo (Mozambique) represents a gold standard reference library and a unique resource that is crucial for assigning unknown specimens to known (valid) species and identification of potential new species for science.

Since the inception of this project, several new species have been described, and a number of synonyms have been revalidated. The research focus is on almost all taxonomic groups, including the genera *Amphilius*, *Zaireichthys*, *Chiloglanis*, *Parauchenoglanis*, *Enteromius*, *Heteromormyrus*, *Lacustricola*, *Galaxias*, *Pseudobarbus* and *Sandelia*. The implementation of DNA barcoding anchored to a reference library of tissues and voucher specimens (particularly topotypes) curated in natural history museums has substantially improved the quality and integrity of biodiversity inventories in the region. As this research continues, several new species will be described and distribution ranges will be mapped more accurately.



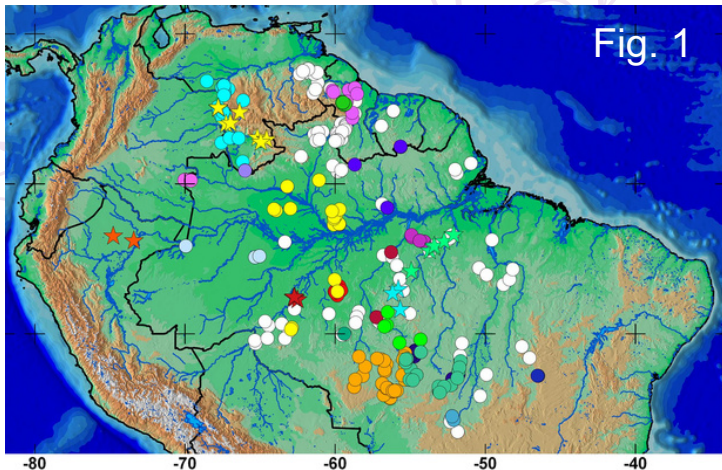
Pseudobarbus serra by Jeremy Shelton

The next phase of the Topotypes Project is being supported through the NRF-Foundational Biodiversity Information Programme (NRF-FBIP: FBIP211006643719) that is funding the REFRESH Project which was initiated in 2022. The objectives of the REFRESH Project are to: (i) mobilise existing data for six taxonomic groups through transcription, digitisation and georeferencing, (ii) undertake field surveys to fill sampling gaps and improve species identification tools through DNA barcodes, updated taxonomic descriptions, animal checklists and species pages, (iii) strengthen collaboration amongst stakeholders in the freshwater biodiversity sector in southern Africa and stimulate a broader awareness and interest in freshwater biodiversity with the public, (iv) Assess the threat status of species using the IUCN Red List of Species Categories and Criteria v3.1, (v) ensure that data and information from the project is made available to relevant audiences (decision makers, scientists, public) and (vi) upskill scientists in the collection of field data in freshwater systems, and build capacity in taxonomy and Red List assessments. The Principal Investigators for this multi-institutional project are Albert Chakona (NRF-SAIAB) and Dewidine van der Colff (South African National Biodiversity Institute (SANBI)). The REFRESH Project includes multiple partners working of other freshwater taxonomic groups including freshwater fish parasites, crabs, amphibians, large branchiopods, snails and dragonflies.

Uncovering Fish Diversity in the Greater Amazon, the genus *Rhinotocinclus*

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The northern portion of the cis-Andean South American continent encompassing the Amazon, Orinoco, and coastal river basins of the Guianas is an immense, historically connected hydrographic complex (Fig. 1), termed the Greater Amazon by Van der Sleen & Albert (2017). Loricariids inhabiting this region represent an amazing assemblage of species, containing members of all subfamilies except Delturinae, which is endemic to coastal rivers of eastern Brazil. This group includes an astonishing diversity of shapes, sizes, and behaviors, from which

Hypoptopomatinae stands out as small sized, plant or bottom dweller species popularly known as “otos” worldwide or “cascudinhos” in Brazil. Two groups of hypoptopomatines have been traditionally described from the Greater Amazon, those belonging to the tribe Hypoptopomatini and to the genus *Parotocinclus*.

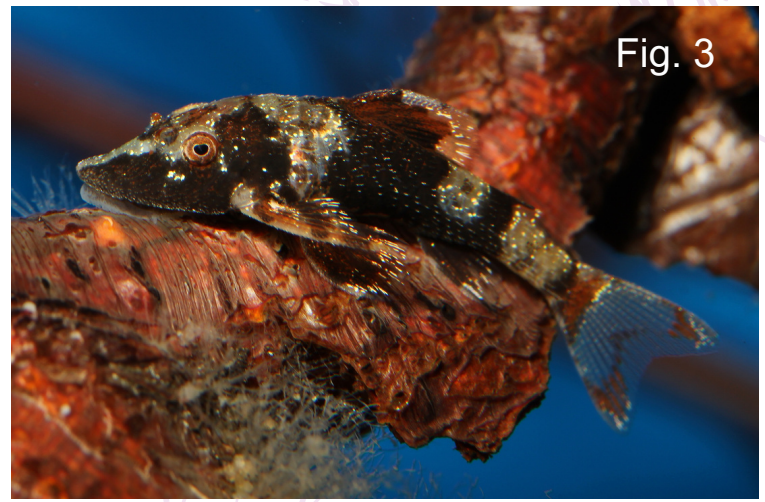
Phylogenetic studies of the Hypoptopomatinae containing combined molecular and morphological analyses (Reis et al., 2017) have recovered the Greater Amazon species of *Parotocinclus* as a monophyletic group apart from the typical *Parotocinclus* species from the coastal drainages of Brazil. The possession of an adipose fin by some members of this group has been misleading for decades, causing those species to be describe in *Parotocinclus*. Other species in this group that lack an adipose fin may have a few platelets in the dorsal midline at the typical adipose-fin position and some of those were also described in *Parotocinclus*. Other species without an adipose fin, however, were described in *Hisonotus* or *Curculionichthys*, with which they share some superficial similarity. By reassigning all these species to a new genus, *Parotocinclus*, *Hisonotus* and *Curculionichthys* became more clearly defined and restricted to waterways of the Brazilian Shield.

**I'M ONE OF FIVE
NEW SPECIES
DISCOVERED!**



Fig. 2

To accommodate this newly discovered group of fishes in the taxonomic classification, Reis & Lehmann (2022) described the genus *Rhinotocinclus*, which includes 18 previously known and five new species. This new genus is diagnosed by having the canal cheek plate on the ventral surface of the head posteriorly elongated and contacting the cleithrum, among other features. Species in this genus are small (up to 33 mm SL), usually have a long, pointed snout, and are often sharply barred with dark colors. Species of *Rhinotocinclus* exhibit conspicuous secondary sexual dimorphism in which males display a urogenital papilla immediately behind the vent, a skin fold along the first pelvic-fin ray and a much larger nostril than females. On the other hand, females usually attain larger size than males. Some of the species are very beautiful and are currently exported as ornamental fishes by the international aquarium trade (Figs. 2 and 3).



Reis RE, Calegari BB, Carvalho TP, Cramer CA, Delapieve MLS, Lehmann P, & Pereira EHL. 2017. A phylogeny of the armored catfishes, with emphasis on the Neoplecostominae-Hypoptopomatinae clade (Siluriformes: Loricariidae): Integrating phenotypical and molecular data. Londrina: II International Symposium on Phylogeny and Classification of Neotropical Fishes.

Reis RE & Lehmann, P. 2022. A new genus of armored catfish (Diluriformes: Loricariidae) from the Greater Amazon, with a review of the species and description of five new species. Neotropical Ichthyology, 20: 1-100.

Van der Sleen P, & Albert JS, editors. 2017. Field guide to the fishes of the Amazon, Orinoco, and Guianas. Princeton Univ. Press.

Figures:

Fig. 1. Geographic distribution of *Rhinotocinclus* species in central and northwestern South America. Each color corresponds to one species. Stars represent new species. Note some species widespread and others endemic to small areas.

Fig. 2. Live specimen of *Rhinotocinclus epleyi* from Venezuela. Photo by Nathan Lujan.

Fig. 3. Live specimen of *Rhinotocinclus isabelae* from Peru. Photo by Daniel Konn-Vetterlein.

Beyond the global Mexican freshwater fish assessment

Topiltzin Contreras-MacBeath

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After having carried out the global assessment of 536 freshwater fish species of Mexico using red list criteria, there is a need to advance in the development of strategies to protect the 177 threatened species, since the analysis showed that only 9 species had concrete in situ conservation actions (Lyons et al. 2020).

Seeking to advance in the planning process, a theory of change model was recently published that proposes the definition of priorities in relation to conservation interventions (Contreras-MacBeath et al. 2022) and taking advantage of the fact that many leading Mexican ichthyologists as well as some from other countries with extensive experience in the study of Mexican fish participated in the assessment. We have taken on the task of identifying and promoting ongoing projects, as well as developing new interventions and conservation initiatives for threatened species throughout the country, with the help of our strategic allies.

In this respect, we are working on the conservation of several freshwater fish species in Mexico (Figure 1), such as *Cyprinodon eremus* and *Agosia chrysogaster* at the Rio Sonoyta in Sonora, a project led by the Intercultural Center for the Study of Deserts and Oceans, and financed by the US Southwest Border Resource Protection Program; *Poeciliopsis jackschultzi* in Rio de la Concepción Sonora, led by Texas A&M University, and funding from MBZ; *Girardinichthys multiradiatus* and *Aztecuela sallaei* in Zempoala Lagoons National Park, led by the University of Morelos (UAEM) with funding from NatGeo; *Astyanax salvatoris* in Tamazulapam Spring Oaxaca, led by UAEM in collaboration with the Mexican Alliance of Conservation Photographers, with a MBZ grant; the reintroduction of *Poeciliopsis balsas* into Morelos, led by UAEM with an MBZ grant.

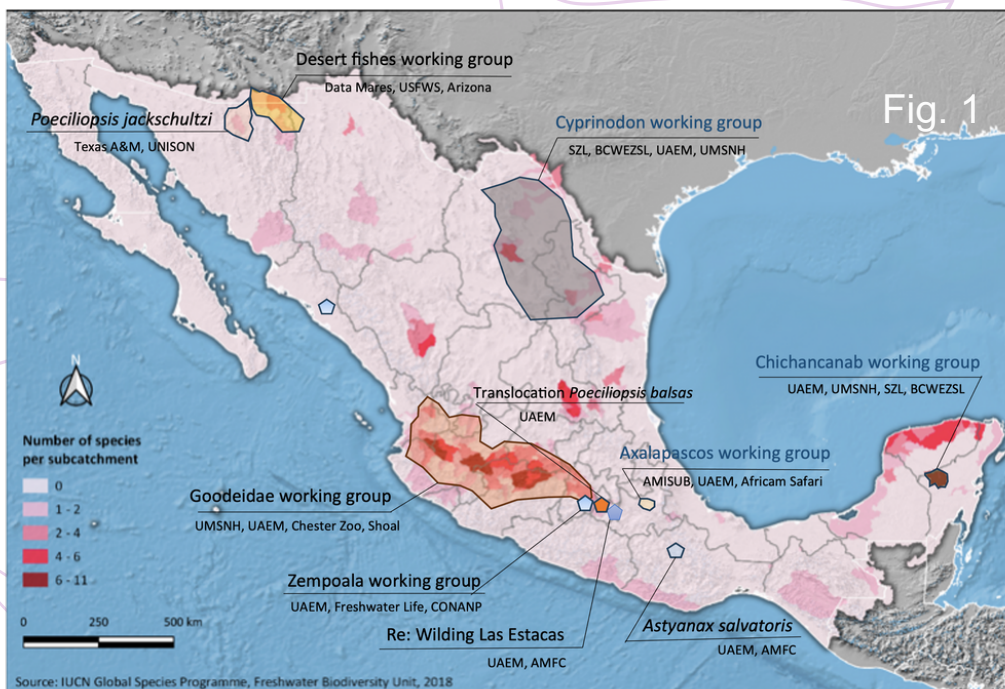


Figure 1. Map of Mexico highlighting ongoing fish conservation projects. Blue titles show those initiatives in their initial stages.



Figure 2. Golden Skiffia (*Skiffia francesae*). Photo by Enrique Ramírez, UNAM

With the leadership of the Fish Ark Project of the Aquatic Biology Laboratory at the Universidad Michoacana de San Nicolás de Hidalgo, and Chester Zoo, we have recently developed a conservation strategy for Mexican Goodeid species that will be published in the following months, as well as a project to establish viable wild populations of the extinct in the wild Golden Skiffia (Figure 2) and *Notropis ameca*, in the upper Ameca River, following the success with *Zoogoneticus tequila* (Domínguez-Domínguez et al. 2018).

Other projects in their initial phases are related to the *Cyprinodon* species flock from Lake Chichancanab in the Yucatan, the reintroduction of three EW *Cyprinodon* species from Nuevo León, and the conservation of four CR *Poblana* species from the Axalapascos in Puebla. All of these with the collaboration of Shoal, Re:Wild, Zoological Society of London, Bristol Zoological Society, Acuario Inbursa, Guadalajara Zoo, Africam Zafari, Asociación Mexicana de Imagen Subacuática (AMISUB), among others.

This work has led us to create the Mexican Freshwater Biodiversity Conservation Alliance (MFBCA) as a framework for our collaboration. In the following months we will work to consolidate this alliance.

On a final note, it is important to mention that following the Central American freshwater fish assessment (Contreras-MacBeath et al. 2022), we will begin a similar process to protect threatened species in that region.

References

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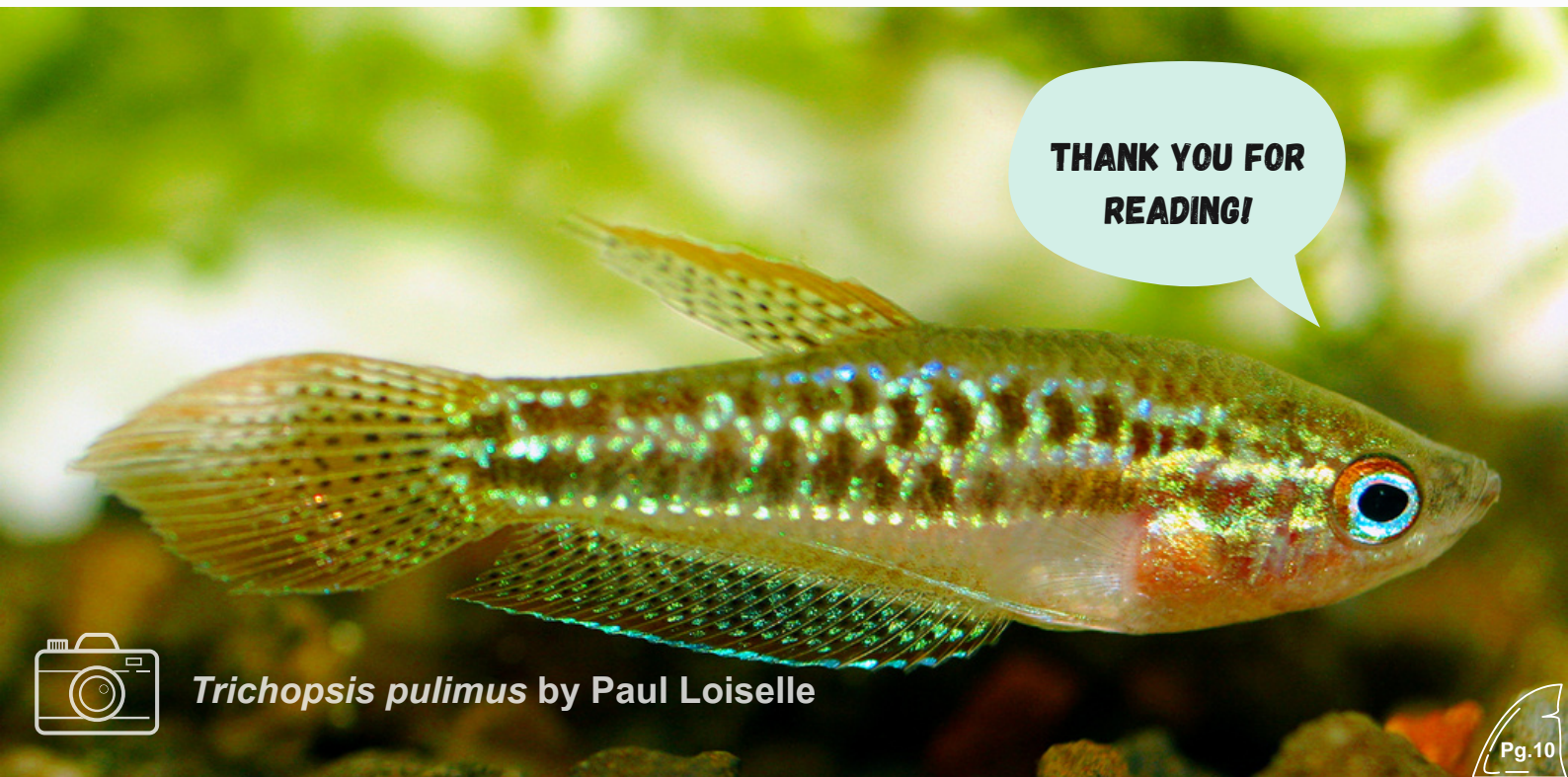
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Electrophorus electricus



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Trichopsis pulimus by Paul Loiselle