

Evidence for the true type–locality of *Rhamdia quelen* (Siluriformes: Heptapteridae), and the geographical origin and invalid neotype designation of four of its synonyms



Correspondence:
Roberto E. Reis
reis@puccrs.br

Stefan Koerber¹ and Roberto E. Reis²

Submitted October 5, 2019
Accepted January 30, 2020
by Marcelo Britto
Published April 20, 2020

Historical information on the probable type–locality of *Pimelodus quelen* and of its four junior synonyms that share the same neotype, *Pimelodus namdia*, *Pimelodus sebae*, *Heterobranchus sextentaculatus*, and *Silurus rivularis*, is presented and discussed. The neotype designation for those four species is deemed invalid for not complying with the provisions of the International Code of Zoological Nomenclature, making it technically possible to revalidate any of the four taxa from the synonymy of *Rhamdia quelen* without having to address the International Commission of Zoological Nomenclature. The type–locality of both *Curimata gilbert* and *Callichthys asper* are also restricted to rio Macacu at the village of Japuíba, State of Rio de Janeiro, Brazil.

Keywords: Catfish, Diversity, Nomenclature, Synonymy, Taxonomy.

Online version ISSN 1982-0224
Print version ISSN 1679-6225

Neotrop. Ichthyol.
vol. 18, no. 1, Maringá 2020
Epub, Apr 17, 2020

¹ Friesenstr. 11, 45476 Muelheim, Germany. www.pecescrilloos.de. pecescrilloos@koerber-germany.de

² Pontificia Universidade Católica do Rio Grande do Sul (PUCRS), Av. Ipiranga, 6681, 90619-900 Porto Alegre, RS, Brazil. reis@puccrs.br

São apresentadas e discutidas informações históricas sobre as prováveis localidades-tipo de *Pimelodus quelen* e seus quatro sinônimos juniores que compartilham o mesmo neótipo, *Pimelodus namdia*, *Pimelodus sebae*, *Heterobranchus sextentaculatus* e *Silurus rivularis*. A designação do neótipo para essas quatro espécies é considerada inválida por não estar em conformidade com as disposições do Código Internacional de Nomenclatura Zoológica, tornando tecnicamente possível revalidar qualquer um dos quatro táxons da sinonímia de *Rhamdia quelen* sem ter que apelar à Comissão Internacional de Nomenclatura Zoológica. As localidades-tipo de *Curimata gilbert* e *Callichthys asper* também são restringidas ao rio Macacu na vila de Japuiba, estado do Rio de Janeiro, Brasil.

Palavras-chave: Bagre, Diversidade, Nomenclatura, Sinonímia, Taxonomia.

INTRODUCTION

This is the second paper in a series on the taxonomy of the genus *Rhamdia* Bleeker, 1858. In the first paper Koerber, Reis (2019) have provided the original descriptions and their respective English translations from either Latin, French, or German along with other relevant writings on *Pimelodus quelen* Quoy, Gaimard, 1824, *Pimelodus namdia* Cuvier, 1829, *Pimelodus sebae* Cuvier, 1829, *Heterobranchus sextentaculatus* Agassiz, in Spix, Agassiz, 1829, and *Silurus rivularis* Larrañaga, 1923, four of the 47 nominal species of *Rhamdia* that have been synonymized to *R. quelen* and which share the same neotype specimen designated by Silfvergrip (1996). As it will be demonstrated below, the original type specimens of the above species have been collected in different regions of South America, suggesting that their conspecific status is questionable. A taxonomic revision of *Rhamdia* is urgently needed in order to solve several issues currently hampering the correct identification of its species in most of the continent. The first step towards this goal is to know the correct type-locality of the nominal species and then try to tackle their geographic distributions.

In the present paper we present and discuss historical information on the locality where the lost type specimens of the above five species have most probably been collected, suggesting that designation of neotypes for any of them should be from the areas identified herein.

MATERIAL AND METHODS

An extensive bibliographic revision on all relevant species descriptions and other literature regarding the collection of the species of *Rhamdia* has been conducted. All publications for which the original texts and, if not in English, the respective translations have been provided by Koerber, Reis (2019), are indicated by an arrow (†). All information on validity, synonyms, and type-localities have been taken from Fricke *et al.* (2019). Sherborn, Woodward (1901) provided detailed information on the

publication dates of the chapters on zoology of some old French voyagers [pages 1–328 in 1824, 329–616 in 1825, and 617–712 in 1826]. As the formal description of *Pimelodus quelen* was published on page 228, for the present context Quoy and Gaimard’s work is regarded as published in 1824. This publication has been registered in Zoobank under the code D10EF5B4–473C–4062–B34F–83CC7E8634FA.

RESULTS

Pimelodus quelen Quoy, Gaimard, 1824. In his revision of the genus *Rhamdia*, Silfvergrip (1996) wrote “The origin (and type-locality) of *Pimelodus quelen* Quoy & Gaimard, in Freycinet (1824: 228, Pl. 49 figs 3–4) was stated in the original description as ‘Il provient du Brasil...’ and “...the original description and the two illustrations are the only sources of information at hand”. The first statement was done referring to the type-locality and the second about the lack of type material. Explicitly referring to page 228 and the two figures on plate 49 is only half of the evidence. Quoy, Gaimard (1824) provided information on *Rhamdia quelen* on four pages, twice in the written text and also twice in the section containing the plates. At the end of the volume containing the text, Quoy, Gaimard (1824) added a table of contents or index to the book in which they mentioned details not included in the main text. On page 701 it reads “Pimélode Quélen, espèce nouvelle de poisson, de la baie de Rio de Janeiro; ses rapports avec le nhamdia, 228, pl. 49, fig. 3”. The second information that remained unmentioned by Silfvergrip (1996) is found on page 3 of the Atlas, the volume containing the zoological plates. This volume starts with a “Table explicative... des planches dans l’atlas zoologique...”, a legend to the zoological figures, and regarding plate 49, figure 3, the authors state “Pimélode quélen, de la baie de Rio de Janeiro”. Following the two statements of Quoy, Gaimard (1824), there is no space for doubts that their specimen of *Rhamdia quelen* was collected while the French ship Uranie anchored in the bay of Rio de Janeiro (currently Guanabara Bay), during a circumnavigational expedition under Louis de Freycinet (1817–1820).

Among the descriptions of other freshwater fishes collected by them in Rio de Janeiro there is information that enables the identification of two possible localities where *Rhamdia quelen* could have collected along with other specimens described in their work. For *Curimata gilbert* Quoy, Gaimard, 1824 [currently *Cyphocharax gilbert* (Quoy, Gaimard 1824)] they provide as locality the “Rio Macacu” (page 219), while for *Callichthys asper* Quoy, Gaimard, 1824 [currently *Callichthys callichthys* (Linnaeus, 1758)] the authors describe on page 233 a locality not included in modern maps: “ils proviennent d’un ruisseau qui coule devant la ferme de Santa-Anna, sur le chemin qui conduit de Rio de Janeiro à la colonie Suisse”. *Callichthys asper* was collected ‘in a brook that flows in front of the farm Santa Anna, on the way that leads from Rio de Janeiro to the Swiss colony’. A map published in 1819 and titled ‘Reconhecimento do Rio de Macacu e da estrada que conduz a Nova Friburgo (colônia suíça)’ (SophiA, 2019), not only confirms that Nova Friburgo is the Swiss colony mentioned in the text, and that in those times the way to get there was through the valley of the Rio Macacu, the same river as mentioned for *Curimata gilbert*, but also shows a locality called St. Anna. In modern maps this locality is the village of Japuiba (22°33’39”S, 42°41’38”W - GoogleEarth). The old map shows a brook ‘B. Japuiba’ that flows into the Rio Macacu just North of

'St. Anna'. Although the respective type localities 'Rio Macacu' and 'Rio de Janeiro' (Fricke *et al.*, 2019) are not 'erroneous' in the sense of recommendation 76A.2 of the Code (ICZN 1999), the Rio Macacu at the village of Japuiba, 22°33'40"S 42°41'40"W, State of Rio de Janeiro, Brazil, is here restricted as the type-locality of both, *Curimata gilbert* and *Callichthys asper*.

Another locality visited during their stay in Rio de Janeiro has been portrayed in the description of *Callichthys barbatus* Quoy, Gaimard, 1824 [currently *Scleromystax barbatus* (Quoy, Gaimard, 1824)] on page 235: "Notre individu habitoit aussi les eaux douces du Brésil, et il fut pris par l'un de nous dans les petits ruisseaux qui arrosent, près de Rio de Janeiro, la ferme de Mandioca, appartenante à M. Langsdorff, consul de Russie". The authors describe that their specimen lives in Brazilian freshwater and was collected by one of them 'in the small streams which irrigate, close to Rio de Janeiro, the Mandioca Farm, belonging to Mr. Langsdorff, consul of Russia'. Johann Baptist von Spix and Carl Friedrich von Martius, who joined Johann Natterer in the Austrian expedition to Brazil, have been guests of Georg von Langsdorff in his Mandioca Farm in September 1817, and in the respective part of their travel reports, Spix, Martius (1818) provide details on that locality. Langsdorff's Mandioca Farm was located in Raiz da Serra (Echeverria, 2014), a hamlet at the Rio Inhomirim, village of Inhomirim, city of Magé, state of Rio de Janeiro (22°34'34"S 43°11'05"W - GoogleEarth). In addition to the current work on *Rhamdia quelen*, this represents a refinement of the type-locality of *Scleromystax barbatus* and probably also for the syntype of *Callichthys laeviceps*, which Langsdorff himself sent to Valenciennes from Rio de Janeiro.

There is evidence that during their stay in Rio de Janeiro Jean René Quoy and Joseph Paul Gaimard have collected freshwater fishes in the Rio Macacu at Japuiba and the rio Inhomirim at Raiz da Serra. As they have been very thorough and detailed in the description of their activities, and no further freshwater locality from around Rio de Janeiro has been mentioned, it can be considered that the original collection locality of the missing type specimen of *Rhamdia quelen* is an affluent of the Guanabara Bay.

During their travel around the world Quoy and Gaimard have been thorough collectors, who brought home thousands of zoological specimens which are still today available at the museum of Paris. Albeit, the type specimens of several species are missing and those seem not to show any pattern in common regarding their taxonomic position or geographical provenance. A possible reason could be that when sailing back from Australia, the Uranie ran on a rock at the Falkland Islands and could not be repaired. Sailors and passengers have been lucky to save their lives and most of what they had collected during the previous years around the globe. Saunders (2012) informs quite generally that "the wreck at the Falklands resulted in the loss of many specimens, notes and drawings", while Arago (1823), a participant in the expedition, reported more exactly the loss of 18 cases with zoological specimens. It is probable that the missing type specimen of *Rhamdia quelen* has been lost in those boxes. As Saunders (2012) also informs about the loss of drawings in the Falklands, it is demonstrated that illustrations have been produced already during the voyage. That would explain why there is an illustration of *Rhamdia quelen* although the specimen never arrived in Paris.

Neotype designations in terms of the Code. Silfvergrip (1996) designated NRM 16091 as the neotype for *Rhamdia quelen* bringing forward the argument that the original type specimen of Quoy, Gaimard (1824) is considered lost. In addition, he designated the same specimen as neotype for *Pimelodus namdia* Cuvier, 1829, *Pimelodus sebae* Cuvier, 1829, *Heterobranchus sextentaculatus* Agassiz in Spix, Agassiz, 1829, and *Silurus rivularis* Larrañaga, 1923, simultaneously making those four taxa objective junior synonyms of *Rhamdia quelen*. Silfvergrip, however, did not explain why he “considers that a name-bearing type is necessary to define the nominal taxon objectively” (§75.1) for the above four species. Following the spirit of Silfvergrip’s action, this was not the case as he placed the four respective taxa in the synonymy of *Rhamdia quelen*. In addition, Silfvergrip did not explain the “exceptional need” as required (§75.3) and failed with other conditions of the included sub-clauses and recommendations.

The designation of the same specimen used as neotype for *Rhamdia quelen* also as neotype for the four synonymous taxa did not add value to define these nominal taxa objectively. Regarding the four synonyms, it is hereby concluded that proposing the same specimen as neotype for a nominal valid taxon and simultaneously for further taxa considered synonyms of the first is an act with “an end in itself” and thus “any such neotype designation is invalid” (§ 75.2). If it was not for the above concluded invalidity of neotype designation for the synonyms, it would be technically impossible to revalidate any of the four taxa from the synonymy with *Rhamdia quelen* without addressing the Commission to set aside the neotype status of any of the four taxa in question. The above discussed facts and arguments have all been valid already at the moment of Silfvergrip’s act in 1996, as they have been included in the then valid 3rd edition of the code (ICZN, 1985), using different wording and structure of articles, but expressing the same conditions for the valid designation of neotypes.

The present contribution is the second in a series of papers on *Rhamdia* taxonomy. Since the initial conception of this series it is planned that one of the further contributions will consist in the submission of a formal petition to the International Commission of Zoological Nomenclature to set aside the neotype status of NRM 16091 for *Rhamdia quelen*. Only after considering the neotype designations for the four synonyms to be invalid and subsequently obtaining the Commission’s agreement to invalidate the current neotype specimen of *Rhamdia quelen*, it will be possible to choose new neotypes from the below identified areas and thus, ‘start all over again’ in *Rhamdia* taxonomy (Koerber, Reis, 2019).

Probable collection localities of the four taxa sharing the neotype with *Rhamdia quelen*. As the neotype designation of NRM 16091 for the four species considered as junior synonyms of *Rhamdia quelen* is deemed invalid for not complying with the code, the probable type-localities for these taxa are discussed below. If neotypes shall ever be designated for any of those, specimens from the respective area of distribution should be chosen.

***Pimelodus namdia* Cuvier, 1829.** The description of *Pimelodus namdia* Cuvier, 1829 (†) is based on the text of Marcgraf (1648 †), who worked and travelled within the territory of Dutch Brazil, or New Holland, a Dutch colony that existed in Eastern Brazil from 1630 to 1654. The maps left by Georg Marcgraf cover the

coastal areas between parallels 5°S and 11°S, showing some 80 km of the hinterland (Klemp, 1993). This mapped area approximately matches the shoreline of the current Brazilian states of Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, and Sergipe. The rivers of this area drain to the Atlantic Ocean, being the Rio São Francisco the largest, and not to the Amazon basin. There is no information available that Marcgraf could have obtained his specimen of *Pimelodus namdia* from any place outside the above-mentioned area and it is highly probable that it originated from these coastal systems in Northeastern Brazil. Silfvergrip (1996) indicated that the vernacular name 'nhambia' probably originated from an indigenous language from an area south of the Rio São Francisco mouth but regardless designated a neotype from Loreto in the Peruvian Amazon.

***Pimelodus sebae* Cuvier, 1829.** Albertus Seba, the person Cuvier's species is dedicated to, was a Dutch pharmacist living in Amsterdam, who besides his profession was a famous collector of natural history specimens. He gathered an enormous collection of plants, minerals, and animals, which was presented to the public in the volumes of the so-called Thesaurus, of which part 3 was published in 1759 (†), 23 years after Seba's death. The fish section was written by Peter Artedi, who had moved to Amsterdam to work on Seba's fish collection. Artedi, later known as the father of ichthyology, delivered an excellent work, of superior quality than the descriptive texts on all other animals treated in the Thesaurus (Cuvier, 1828).

After selling his first collection to the Russian czar in 1717, Seba build his second collection, on which the Thesaurus was based, until his death in 1736 (Muesch, 2017). One source of specimens worth to be included in his collection was to treat ill sailors, sometimes even before they left their ships, in exchange for items those had brought from far away (Engel, 1937). Also, Seba had established connections with organizations, which sent ships to Amsterdam from abroad, among those the West Indian Company (Engel, 1937). Seba must have received the specimen of *Pimelodus sebae* shown in the Thesaurus between 1717 and 1735, the year Artedi died. During this lapse of time, the Dutch colony in Northeastern Brazil had already vanished and the only remaining territory under influence of the Netherlands (and thus from where ships sailed to Amsterdam frequently) and which is a possible area of distribution of *Rhamdia*, was the Dutch colony of Surinam. Specimens of *Rhamdia* collected in Surinam, Cayenne in French Guyana, or Demerara in British Guyana have been mentioned by Gronovius (1754 †), Valenciennes (1840 †), Günther (1864 †), and Boeseman (1972 †). It cannot be totally excluded that Seba has received his specimen of *Rhamdia* from another port in the South American Atlantic coast, but an original locality of collection in Surinam or the Guyanas is the most probable option.

***Heterobranchus sextentaculatus* Agassiz in Spix, Agassiz, 1829.** Based on Spix' travel records Louis Agassiz assigned the following details on the localities of the new species of freshwater fishes described in their work (Spix, Agassiz, 1829 †):

1. habitat in *Brasiliae fluviis*
2. habitat in *Brasiliae mediae fluviis*
3. habitat in *Brasiliae septentrionalis fluviis*
4. habitat in *fluviis Brasiliae aequatorialis* | habitat in *Brasiliae aequatorialis fluviis*

5. habitat in *Brasiliae aequatorialis fluviis lacubusque*
6. habitat in *Brasiliae aequatoriali*
7. habitat in *flumine Amazonum*
8. habitat in *flumine S. Francisci* | in *fluvio Sancti Francisci*
9. habitat in *fluvio S. Francisci mediae Brasiliae* | in *flumine S. Francisci Brasiliae mediae*
10. habitat in *Brasiliae aequatorialis fluviis, in flumine Amazonum, Solimoëns, Rio Negro*
11. habitat in *fluviis Japurá et Solimoëns Brasiliae aequatorialis*
12. habitat in *lacu Almada Prov. Bahiensis et in fluvio S. Francisci*
13. habitat in *Peruguaçu*
14. habitat in *Brasiliae aequinoctialis fluviis*

Some of these localities are very detailed while others like ‘in Brazilian rivers’ provide little evidence. Useful information, however, can be obtained about the type-locality of *Heterobranchus sextentaculatus*. With slightly different wording groups 4, 5, and 6 were joined as equatorial Brazil. The analysis presented by Silva *et al.* (2016) is followed in that the species assigned by Agassiz to rivers in equatorial Brazil share a distribution in the Amazon basin. This cluster contains *H. sextentaculatus* along with 15 additional species listed in Tab. 1.

There are several clues, however, that allow to narrow the distribution of Agassiz’ species listed in Tab. 1 to the lower Amazon basin in the state of Pará. *Pristobrycon aureus* (Spix, Agassiz, 1829) is found in the “lower portion of tributaries of lower

TABLE 1 | Species that share the information on the geographical origin as stated in numbers 4, 5, or 6 of Spix, Agassiz (1829) list (equatorial Brazil). All species previously described by other authors were excluded as the earlier works may have influenced Agassiz’ statements on the respective distribution. Currently valid names from Fricke (2019).

| Species described by Agassiz (1829) | Currently valid as |
|---------------------------------------|--|
| <i>Anodus latior</i> | <i>Potamorhina latior</i> |
| <i>Cetopsis candiru</i> | <i>Cetopsis candiru</i> |
| <i>Chalceus angulatus</i> | <i>Triportheus angulatus</i> |
| <i>Heterobranchus sextentaculatus</i> | <i>Rhamdia quelen</i> |
| <i>Hypophthalmus edentatus</i> | <i>Hypophthalmus edentatus</i> |
| <i>Hypophthalmus nuchalis</i> | <i>Auchenipterus nuchalis</i> |
| <i>Leporinus novemfasciatus</i> | <i>Leporinus fasciatus</i> |
| <i>Myletes aureus</i> | <i>Mylossoma aureum</i> |
| <i>Myletes bidens</i> | <i>Piaractus brachypomus</i> |
| <i>Platystoma spatula</i> | <i>Sorubimichthys planiceps</i> |
| <i>Pimelodus ctenodus</i> | <i>Calophysus macropterus</i> |
| <i>Pimelodus rigidus</i> | species inquirenda in <i>Pimelodus</i> |
| <i>Pimelodus spixii</i> | <i>Cathorops spixii</i> |
| <i>Serrasalmo aureus</i> | <i>Pristobrycon aureus</i> |
| <i>Serrasalmo nigricans</i> | <i>Serrasalmus nigricans</i> |
| <i>Tetragonopterus chalceus</i> | <i>Tetragonopterus chalceus</i> |

Amazon River” and Guyana (Jegú, 2003) and *Cathorops spixii* (Agassiz, 1829) is a marine catfish, which “inhabits mostly estuarine areas, but can occur in lower reaches of rivers as well” (Marceniuk *et al.*, 2012). Also, there is information available that Spix and Martius collected their specimens of *Anodus latior* [currently *Potamorhina latior* (Spix, Agassiz, 1829)] and *Pimelodus spixii* [currently *Cathorops spixii*] before reaching to Santarém when travelling up the Amazon (ongoing research on Spix’ freshwater fishes, *in prep.*) and for fishes collected in the upper part of the Amazon basin they have made a difference by naming *e.g.*, the ‘Solimoëns’ (see 10. and 11. in the above list).

In many families and genera, the ichthyofauna of the lower Amazon basin is different from that in the Solimões/Marañón basin (*e.g.*, Dagosta, de Pinna, 2017, 2018, 2019). Future research will show whether there is a single species of *Rhamdia* in the Amazon basin or several. In the latter case it must be left to the judgement of future investigators to accept *Heterobranchus sextentaculatus* as a valid species from the Amazon or the lower portions of its Southern tributaries in the state of Pará or consider it a *species inquirenda* in the genus *Rhamdia*.

Nevertheless, there is a high probability that the different portions of the Amazon basin host different species of *Rhamdia*. Yet unpublished data of Angrizani, Malabarba (2017) confirm that “the South American clade is divided into three main groups: the Amazon clade, the upper-Amazon clade, and the Brazilian-Shield clade”. The latter could be of importance for the identity of *Pimelodus namdia*.

***Silurus rivularis* Larrañaga, 1923.** Silfvergrip (1996) synonymized *Silurus rivularis* Larrañaga, 1923 with *Rhamdia quelen* and assigned the neotype NRM 16091 for this species, not including *Silurus novemradiatus* Larrañaga, 1923(†), a second species published in the same paper. Devincenzi (1925) considered both species to be conspecific, listed them in a joined taxon as *Silurus rivularis* vel *9-radiatus*, and proposed a synonymy with *Rhamdia quelen*. Generally, Dámaso Antonio Larrañaga is considered to have been the first natural scientist of Uruguay and that the species he has mentioned and the specimens his descriptions were based on originated from that country. While the first is beyond doubt, the latter statement must be looked at with caution.

Larrañaga built his personal collection of specimens between 1796 and 1825, the year he became blind (Klappenbach, 2004). During those years, Larrañaga officially lived in the Virreinato del Río de la Plata, while also experienced the colony being occupied by British and Portuguese military forces. Uruguay only obtained independency from the Spanish crown in 1828, three years after Larrañaga stopped collecting. The viceroyalty’s territory included portions of today Argentina, Bolivia, Chile, Paraguay, Uruguay, and South Brazil. Therefore, Larrañagas’ collections did not necessarily originate from within the political limits of present days Uruguay. In a letter dating from 1837 regarding the donation of the “colecciones minerales y zoológicas y todos mis herbarios” to the museum in Montevideo, Larrañaga confirms that his specimens had been gathered in “*nuestra República, en la Provincia de Buenos Aires, del Janeiro, de Santa Catalina etc*” (Klappenbach, 2004). This statement made by Larrañaga himself confirms that his specimens may have been collected either in the Río de La Plata or along the coast between Maldonado, Florianópolis, and Rio de Janeiro. This coastal area includes the distribution of the recently described *Rhamdia gabriellae* Angrizani, Malabarba, 2018

and *Rhamdia eurycephala* Angrizani, Malabarba, 2018 and thus, as the whereabouts of Larrañaga's specimens are unknown and no type is available for examination, the synonymy with *Rhamdia quelen* as proposed by Devincenzi (1925) and Silfvergrip (1996) is questionable. Larrañaga's *Rhamdia* could be conspecific with e.g., *Rhamdia sapo* (Valenciennes, 1835) from Buenos Aires, if valid, or the '*Pimelodus sebae*' that Valenciennes (1840 ↑) reported on, collected by Quoy and Gaimard in Montevideo. Hence, in the absence of type specimens, a determination of Larrañaga's *Rhamdia* at species level is not possible and both, *Silurus rivularis* and *S. novemradiatus*, have to be treated as *species inquirendae* in the genus *Rhamdia*.

DISCUSSION

Considering the diversity within *Rhamdia* and the demonstrated endemism of some of its species to restricted river basins (Garavello, Shibatta, 2016; Angrizani, Malabarba, 2018), Silfvergrip's (1996) assignment of a single neotype from the Peruvian Amazon for the five taxa mentioned above is considered inappropriate and does hinder further taxonomic work on the genus *Rhamdia*. Researchers working on *Rhamdia* from Central or Trans-Andean America (Perdices *et al.*, 2002; Hernández *et al.*, 2015) have already demonstrated their disagreement with Silfvergrip's extensive synonymizations. Five species have been revalidated, 16 species have been placed into different synonymies, and two new species have been described, *R. laluchensis* Weber, Allegrucci, Sbordoni, 2003, and *R. macuspanensis* Weber, Wilkens, 1998, both from southern Mexico. During the same period only two species of South American *Rhamdia* have been revalidated from the synonymy of *R. quelen*, *R. branneri* Haseman, 1911, and *R. voulezi* Haseman, 1911 (Garavello, Shibatta, 2016), and four species have been described as new. *Rhamdia enfurnada* Bichuette, Trajano, 2005, was described from a cave in the São Francisco River basin in Bahia, Brazil, *R. guasarensis* DoNascimento, Provenzano, Lundberg, 2004 from the Guasare River basin in northwestern Venezuela, and both, *R. eurycephala* and *R. gabriellae*, from two small isolated Atlantic drainages in Southern Brazil.

From the species of *Rhamdia* inhabiting cis-Andean South America, all of which could be conspecific with the type species of the genus, *Pimelodus sebae*, or *Rhamdia quelen*, 41 still show the status as left by Silfvergrip (Fricke *et al.*, 2019). Recent work on South American *Rhamdia* (Bichuette, Trajano, 2005; Anza, 2006; Garavello, Shibatta, 2016; Ríos *et al.*, 2017; Angrizani, Malabarba, 2018) compare different local populations with *Rhamdia* cf. *quelen*, *Rhamdia* aff. *quelen*, or *Rhamdia* sp. 1 from somewhere outside the respective focus area of their studies and struggle to reach further conclusions on the actual identity of *R. quelen*. For an effective restart in *Rhamdia* taxonomy it will be essential to review the still existing type material of all nominal species assigned to the genus. In addition, the threat of modified local ichthyofaunas by the introduction of allochthonous species of *Rhamdia* from aquaculture or the bastardization of those with local populations (Ríos *et al.*, 2019) becomes nearly prevalent, a strong urgency is advised for these taxonomic studies.

ACKNOWLEDGEMENTS

We are grateful to Aléssio Datovo (MZUSP) and Paulo Buckup (MNRJ) for sending specimens on loan. RER is partially funded by the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq process # 306455/2014-5).

- **Angrizani RC, Malabarba LR.** Genetic diversity in *Rhamdia quelen* Quoy & Gaimard, 1824 (Siluriformes: Heptapteridae). In: Birindelli, JLO, org. Abstract Book of II International Symposium on Phylogeny and Classification of Neotropical Fishes. Londrina: Sociedade Brasileira de Ictiologia; 2017. p.270.
- **Angrizani RC, Malabarba LR.** Morphology and molecular data reveal the presence of two new species under *Rhamdia quelen* (Quoy & Gaimard, 1824) (Siluriformes: Heptapteridae) species complex. *Zootaxa*. 2018; 4388(1):41–60. <http://dx.doi.org/10.11646/zootaxa.4388.1.3>
- **Anza JA.** Revisão das espécies do gênero *Rhamdia* (Siluriformes: Heptapteridae) de drenagens costeiras do sul e sudeste do Brasil, um exemplo de diversidade subestimada de gênero. [Master Dissertation]. Porto Alegre: Universidade Federal do Rio Grande do Sul; 2006.
- **Arago J.** Narrative of a voyage around the world. Part 1. London: Treuttel & Wurtz; 1823.
- **Bichuette ME, Trajano E.** A new cave species of *Rhamdia* (Siluriformes: Heptapteridae) from Serra do Ramalho, northeastern Brazil, with notes on ecology and behavior. *Neotrop Ichthyol*. 2005; 3(4):58–595. <https://dx.doi.org/10.1590/S1679-62252005000400016>
- **Boeseman M.** Notes on South American catfishes, including remarks on Valenciennes and Bleeker types in the Leiden Museum. *Zool Meded*. 1972; 47(23):293–320.
- **Cuvier G, Valenciennes A.** Histoire naturelle des Poissons. Paris: Chez F. V. Levrault; 1828. t. 1.
- **Cuvier G.** Le Règne Animal, distribué d'après son organisation, pour servir de base à l'histoire naturelle des animaux et d'introduction à l'anatomie comparée. Paris: Chez Déterville; Chez Crochard; 1829. t. 2.
- **Dagosta FCP, de Pinna M.** Biogeography of Amazonian fishes: deconstructing river basins as biogeographic units. *Neotrop Ichthyol*. 2017; 15(3):e170034. <https://dx.doi.org/10.1590/1982-0224-20170034>
- **Dagosta FCP, de Pinna M.** A history of the biogeography of Amazonian fishes. *Neotrop Ichthyol*. 2018; 16(3):e180023. <https://dx.doi.org/10.1590/1982-0224-20180023>
- **Dagosta FCP, de Pinna M.** The fishes of the Amazon: distribution and biogeographical patterns, with a comprehensive list of species. *Bull Am Mus Nat Hist*. 2019; 431(1):1–163. <https://dx.doi.org/10.1206/0003-0090.431.1.1>
- **Devincenzi GJ.** El primer ensayo sobre ictiología del Uruguay: La clase “Peces” de la zoología de don Dámaso A. Larrañaga. *An Mus Nac Hist Nat Montev*. 1925; 6:295–323.
- **Echeverria R.** A história da Princesa Isabel: Amor, liberdade e exílio. Rio de Janeiro: Versal Editores; 2014.
- **Engel H.** The life of Albert Seba. *Svenska Linnésällskapetets Årsskrift: Yearbook of the Swedish Linnaeus Society*: 1937.
- **Fricke R, Eschmeyer WN, Van der Laan R.** Eschmeyer's catalog of fishes: genera, species, references [Internet]. San Francisco: California Academy of Sciences; 2019. Available from: <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>

- **Garavello JC, Shibatta OA.** Reappraisal of *Rhamdia branneri* Haseman, 1911 and *R. voulezi* Haseman, 1911 (Siluriformes: Heptapteridae) from the rio Iguaçú with notes on their morphometry and karyotype. *Neotrop Ichthyol.* 2016; 14(1):e140111. <https://dx.doi.org/10.1590/1982-0224-20140111>
- **Gronovius LT.** Museum Ichthyologicum, sistens piscium indigenorum et quorundam exoticorum, qui in Museo Laur. Theod. Gronovii adservantur: descriptiones, ordine systematico; accedunt nonnullorum exoticorum piscium icones, aeri incisae. 1754; vol 1. I–viii + 1–70, pls. 1–4.
- **Günther A.** Catalogue of the Physostomi, containing the families Siluridae, Characinidae, Haplochitonidae, Sternoptychidae, Scopelidae, Stomiatidae in the collection of the British Museum. London: Collection of the fishes in the British Museum; 1864.
- **Hernández CL, Ortega-Lara A, Sánchez-Garcés GC, Alford MH.** Genetic and morphometric evidence for the recognition of several recently synonymized species of Trans-Andean *Rhamdia* (Pisces: Siluriformes: Heptapteridae). *Copeia.* 2015; 103(3):563–79. <https://dx.doi.org/10.1643/CI-14-145>
- **International Commission on Zoological Nomenclature (ICZN).** International code of zoological nomenclature. 3rd edition. London: The International Trust for Zoological Nomenclature Natural History Museum; 1985.
- **International Commission on Zoological Nomenclature (ICZN).** International code of zoological nomenclature. 4th edition. London: The International Trust for Zoological Nomenclature Natural History Museum [internet]. London; 1999. Available from: <https://www.iczn.org/the-code/the-international-code-of-zoological-nomenclature>
- **Jégu M.** Subfamily Serrasalminae (Pacus and piranhas). In: Reis RE, Kullander SO, Ferraris CJ, Jr., editors. Check list of the freshwater fishes of South and Central America. Porto Alegre: Edipucrs; 2003. p.182–196.
- **Klappenbach MA.** Larrañaga y el viejo museo. *Publ Extra Mus Nac Hist Nat Antropol.* 2004; 53:1–32.
- **Klemp E.** Georg Markgraf als Naturforscher, Landmesser und Kartograph in Brasilien (1638– 1643). *Cartographica Helvetica.* 1993; 7–8(8):44–46.
- **Koerber S, Reis RE.** The current situation of *Rhamdia* (Siluriformes: Heptapteridae) – gather and analyze available information, define a zero point and start all over again. *Historia Natural.* 2019; 9(2):51–74.
- **Marceniuk AP, Betancur-R R, Acero-P A, Muriel-Cunha J.** Review of the genus *Cathorops* (Siluriformes: Ariidae) from the Caribbean and Atlantic South America, with description of a new species. *Copeia.* 2012; 2012(1):77–97. <https://dx.doi.org/10.1643/CI-10-202>
- **Marcgraf G.** Rerum naturalium historiae. Liber quartus, qui agit de piscibus brasiliae. 142–181. In: Laet J, editor. *Historia Naturalis Brasiliae.* Leiden & Amsterdam. 1648.
- **Muesch I.** Albertus Seba’s collection of natural specimens and its pictorial inventory. In: Muesch I, Rust J, Willmann R, editors. *Cabinet of Natural Curiosities.* Koeln: Taschen-Verlag; 2017. p.6–27.
- **Perdices A, Bermingham E, Montilla A, Doadrio I.** Evolutionary history of the genus *Rhamdia* (Teleostei: Pimelodidae) in Central America. *Mol Phylogenet Evol.* 2002; 25(1):172–89. [https://dx.doi.org/10.1016/S1055-7903\(02\)00224-5](https://dx.doi.org/10.1016/S1055-7903(02)00224-5)
- **Quoy JRC, Gaimard JP.** *Description des Poissons.* Chapter IX. In: Freycinet, L, *Voyage autour du Monde... exécuté sur les corvettes de L. M. “L’Uranie” et “La Physicienne,” pendant les années 1817, 1818, 1819 et 1820.* Paris; 1824. p.1–328.
- **Ríos N, Bouza C, García G.** Past hybridization and introgression erased traces of mitochondrial lineages evolution in the Neotropical silver catfish *Rhamdia quelen* (Siluriformes: Heptapteridae). *Hydrobiologia.* 2019; 830(1):161–77. <https://dx.doi.org/10.1007/s10750-018-3861-z>
- **Ríos N, Bouza C, Gutiérrez V, García G.** Species complex delimitation and patterns of population structure at different geographic scales in Neotropical silver catfish (: Heptapteridae). *Environ Biol Fishes.* 2017; 100(9):1047–67. <https://dx.doi.org/10.1007/s10641-017-0622-1>
- **Saunders B.** Discovery of Australia’s fishes: A history of Australian ichthyology to 1930. Collingwood: Csiro Publishing; 2012.

- **Sherborn CD, Woodward BB.** Notes on the dates of publication of the natural history portions of some French voyages. Part 1. `Amérique méridionale'; `Indes orientales'; `Pôle Sud' (`Astrolabe' and `Zéléé'); `La Bonite'; `La Coquille'; and `L'Uranie et Physicienne'. *Ann Mag Nat Hist.* 1901; 7(40):388–92. <https://dx.doi.org/10.1080/00222930108678490>
- **Silfvergrip AMC.** A systematic revision of the Neotropical catfish genus *Rhamdia* (Teleostei, Pimelodidae). Stockholm: Swedish Museum of Natural History; 1996.
- **Silva GSC, Melo BF, Oliveira C, Benine RC.** Revision of the South American genus *Tetragonopterus* Cuvier, 1816 (Teleostei: Characidae) with description of four new species. *Zootaxa.* 2016; 4200(1):1–46. <http://dx.doi.org/10.11646/zootaxa.4200.1.1>
- **SophiA.** Map ARC.003,13,005. Reconhecimento do rio de Macacu e da estrada que conduz a Nova Friburgo (Colônia Suissa) [Internet]. Biblioteca Nacional Digital Brasil; 2019. Available from: http://acervo.bndigital.bn.br/sophia/index.asp?codigo_sophia=2688
- **Spix JB, Martius CFP.** Ueber die Sendung der baier. Akademiker Dr. Spix und Dr. Martius nach Brasilien i.J. 1817. Zweiter Brief aus Brasilien von Rio de Janeiro den 7 Sept 1817. *Eos (München).* 1818; 1(11):42–43.
- **Spix JB, Agassiz L.** Selecta genera et species piscium quos in itinere per Brasiliam annis MDCCCXVII-MDCCCXX. Monachii: Typis C. Wolf; 1829. pt 1.
- **Valenciennes A.** In: Cuvier G, Valenciennes A, editors. Histoire naturelle des poissons. Suite du livre dix-septième. Siluroïdes. Paris: Chez Pitois; Strasbourg: Chez Levrault; 1840. t. 15.

REFERENCES

AUTHOR CONTRIBUTIONS

Stefan Koerber: Conceptualization, Investigation.

Roberto E. Reis: Methodology, Validation, Visualization, Writing (original draft), Writing (review & editing).

ETHICAL STATEMENTS

Not applicable.

COMPETING INTERESTS

Not applicable.

HOW TO CITE THIS ARTICLE

- **Koerber S, Reis RE.** Evidence for the true type-locality of *Rhamdia quelen* (Siluriformes: Heptapteridae), and the geographical origin and invalid neotype designation of four of its synonyms. *Neotrop Ichthyol.* 2020; 18(1):e190117. <https://doi.org/10.1590/1982-0224-2019-0117>

Neotropical Ichthyology



This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

Distributed under
Creative Commons CC-BY 4.0

© 2020 The Authors.
Diversity and Distributions Published by SBI



Official Journal of the
Sociedade Brasileira de Ictiologia