









First record of *Melanorivulus decoratus* (Costa, 1989) (Cyprinodontiformes: Rivulidae) in the lower-middle São Francisco River, Brazil

Primeiro registro de *Melanorivulus decoratus* (Costa, 1989) (Cyprinodontiformes:
Rivulidae) no Submédio Rio São Francisco, Brasil

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Abstract: The non-annual rivulid *Melanorivulus decoratus* is an endemic fish from the São Francisco River basin that was previously recorded only in small tributaries along river's middle stretch in northwestern Bahia. The present record marks the first appearance of *M. decoratus* in the lower-middle São Francisco, approximately 450 km northeast of the closest previously documented site, providing an updated map of the species' distribution. Currently classified as Least Concern (LC), this new occurrence record expands knowledge of the species' range and conservation status.

Keywords: Brazilian semiarid; conservation; new record; non-annual rivulids; Rivulinae.

Resumo: O rivulídeo não-anual *Melanorivulus decoratus* é um peixe endêmico da bacia do Rio São Francisco que foi registrado anteriormente apenas em pequenos tributários no trecho médio do Rio, no noroeste da Bahia. Este é o primeiro registro de *M. decoratus* no submédio São Francisco, cerca de 450 km a nordeste do ponto mais próximo documentado anteriormente, gerando um mapa atualizado da distribuição da espécie. Classificada atualmente como Pouco Preocupante (LC), este registro de ocorrência da espécie contribui para o conhecimento da sua distribuição e seu estado de conservação.

Palavras-chave: semiárido brasileiro; conservação; novo registro; rivulídeos não-anuais; Rivulinae.



The genus *Melanorivulus* Costa, 2006 (Rivulidae) comprises 64 valid species distributed across Central and northeastern South America, inhabiting diverse watersheds in Brazil (Costa, 2011; Ywamoto et al., 2020; Fricke et al., 2025). Species of *Melanorivulus* are typically found in muddy sediment areas with clear, shallow, and warm waters in ponds, canals, or small streams (Costa & Brasil, 2008). Within this genus, *Melanorivulus decoratus* (Costa, 1989), an endemic species of the São Francisco River basin (Barbosa et al., 2017), is distinguishable from its congeners by the following morphological traits in adult males: “14 scale rows around the caudal peduncle, a dark horizontal stripe extending from the middle of the operculum to the base of the caudal fin, and a dark stripe along the lower margin of the caudal fin” (Costa, 1989, p. 524). To date, *M. decoratus* had been documented only in the tributaries of the middle São Francisco River (Bahia state), according to Specieslink database and Lima & Caires (2011) (Figure 1).

Two specimens of *M. decoratus* (10 and 14 mm Standard Length) were collected on January 9, 2018 (Figure 2A), from the marginal pool of the lower-middle São Francisco River, coordinates 8°32'46.4"S 39°27'24.2"W, near Fazenda Toco Preto, in the municipality of Cabrobó, Pernambuco.

The site is located approximately 400 meters downstream of the Riacho Paredão mouth and 50 meters upstream of the water intake for the São Francisco River Integration Project (PISF) - North Axis (Figure 2A). Aquatic macrophytes such as *Pontederia crassipes* Mart., *Nymphoides* spp. and *Azolla caroliniana* Willd were present in the habitat. The specimens were captured using a seine net (10 m long, 1.5 m high and 5 mm mesh). Immediately following capture, the fish were photographed alive to document their coloration (Figure 2B). The specimens were then euthanized using clove oil (Eugenol – Brasil, 2018), fixed in a 5% formaldehyde solution for approximately three to five days, and subsequently preserved in 70% ethanol. The taxonomic confirmation was double-checked after consulting the original description manuscript (Costa, 1989) and its very own author, Dr. Wilson Costa. The specimens were deposited in the ichthyological collection of the Museu de Fauna da Caatinga (catalog number MFCI 006818), housed at the Universidade Federal do Vale do São Francisco – UNIVASF. Collection was conducted under Authorization for Capture, Collection and Transport of Biological Material No. 94/2014 and subsequent renewals. Registration code of SISGEN

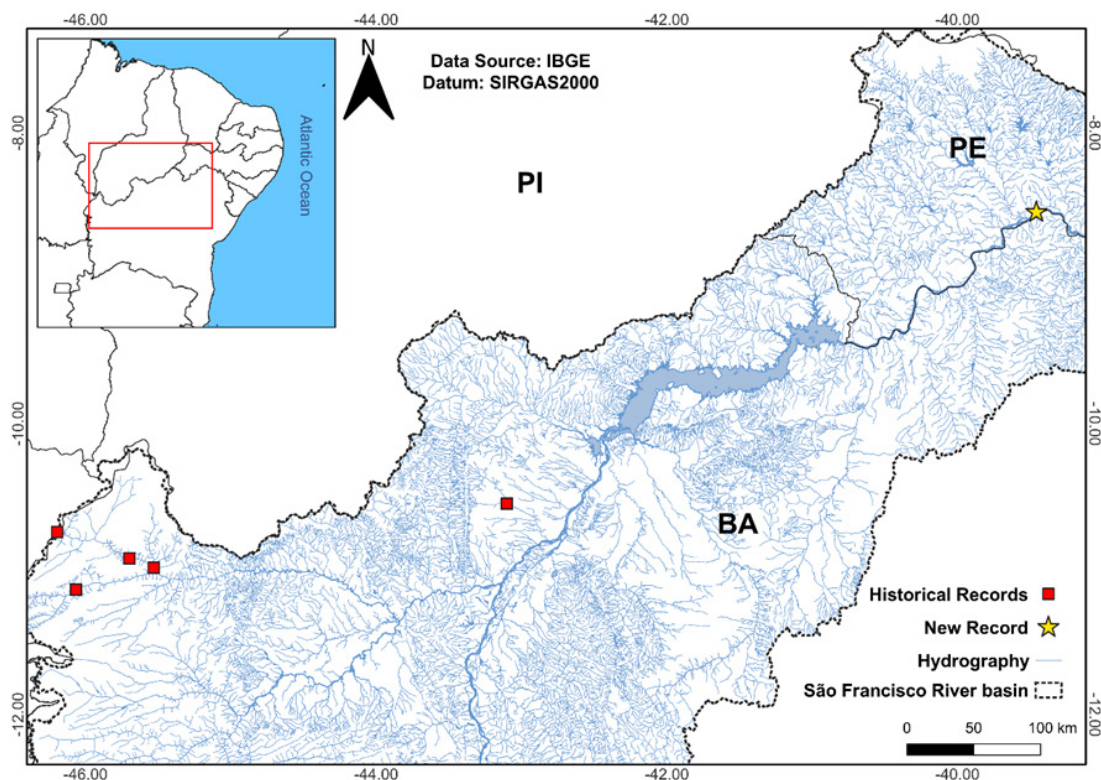


Figure 1. Distribution map of *Melanorivulus decoratus* with historical (red squares) and new (yellow star) records.



Figure 2. (A) Marginal pool on the left bank of São Francisco River where *Melanorivulus decoratus* was recorded (8°32'46.4"S 39°27'24.2"W) and (B) Live specimens of *M. decoratus*.

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The lower-middle stretch of the São Francisco River, spanning 686 km, is the second largest in the river's course and is partially obstructed by the Sobradinho and Luiz Gonzaga/Itaparica hydropower plants (Sato & Godinho, 1999). Despite these modifications, the lower-middle stretch supports diverse microhabitats, including rapids and lentic environments, with sandy and rocky substrates and areas of marginal riparian vegetation, which can be

either preserved or anthropogenically impacted – deforested for agriculture and livestock (Godinho & Godinho, 2003).

Additionally, in the Brazilian Priority Areas for Conservation (Silva et al., 2003 – updated by the Ministério do Meio Ambiente, Ordinance no. 463 of December 18) the São Francisco River area near the PISF intake is classified as a region of “High/Very High” biological importance. The SALVE system (*Sistema de Avaliação de Risco de Extinção da Biodiversidade*) from Instituto Chico

Mendes de Conservação da Biodiversidade (ICMBio) currently lists *M. decoratus* as Least Concern – LC (Brasil, 2025), and updated occurrence records are crucial for understanding the species' distribution and dispersal patterns, which are fundamental for future studies on population dynamics. The present records support the hypothesis that *M. decoratus* might present a wider distribution than previous thought. Therefore, we suggest additional collection efforts to elucidate the distribution of the species in the middle and lower-middle course of the São Francisco River.

Notably, species within the Rivulidae family constitute approximately 40% of potentially threatened Brazilian freshwater fishes (Castro & Polaz, 2020). The detection of *M. decoratus* in the lower-middle São Francisco stretches ensures the ecological significance of the area and highlights the need for conservation action plans for this endemic species, identified as one of the rivulids facing imminent threats.

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Data availability

The entire dataset supporting the results of this study has been published in the article itself.

References

- Barbosa, J.M., Soares, E.C., Cintra, I.H.A., Hermann, M., & Araújo, A.R.R., 2017. Perfil da ictiofauna da bacia do Rio São Francisco. *Acta Fish. Aquat. Res.* 5(1), 70-90.
- Brasil. Conselho Nacional de Controle de Experimentação Animal – CONCEA. Ministério da Ciência, Tecnologia e Inovação – MCTI, 22 fev. 2018. Resolução normativa nº 37, de 15 de fevereiro de 2018. Diretriz da prática da eutanásia do CONCEA. Diário Oficial da União [da] República Federativa do Brasil, Poder Executivo, Brasília, DF. Retrieved in 2024, April 1, from <https://www.gov.br/mcti/pt-br/composicao/conselhos/concea/arquivos/arquivo/legislacao/anexo-da-resolucao-normativa-no-37-de-15-de-fevereiro-de-2018.pdf/view>
- Brasil. Instituto Chico Mendes de Conservação da Biodiversidade – ICMBio. Ministério do Meio Ambiente e Mudança do Clima – MMA, 2025. Sistema de Avaliação do Risco de Extinção da Biodiversidade. Brasília, DF. Retrieved in 2025, February 17, from <https://salve.icmbio.gov.br/>
- Castro, R.M.C., & Polaz, C.N.M., 2020. Small-sized fish: the largest and most threatened portion of the megadiverse neotropical freshwater fish fauna. *Biota Neotrop.* 20(1), e20180683. <http://doi.org/10.1590/1676-0611-bn-2018-0683>.
- Costa, W.J.E.M., 1989. Descrição de cinco novas espécies de *Rivulus* das bacias dos rios Paraná e São Francisco (Cyprinodontiformes, Rivulidae). *Rev. Bras. Zool.* 6(3), 523-534. <http://doi.org/10.1590/S0101-81751989000300012>.
- Costa, W.J.E.M., 2011. Phylogenetic position and taxonomic status of *Anablepsoides*, *Atlantirivulus*, *Cynodonichthys*, *Laimosemion* and *Melanorivulus* (Cyprinodontiformes: rivulidae). *Ichthyol. Explor. Freshwat.* 22(3), 193-288.
- Costa, W.J.E.M., & Brasil, G.C., 2008. A New Pelvicless Killifish Species of the Genus *Rivulus*, Subgenus *Melanorivulus* (Cyprinodontiformes: Rivulidae), from the Upper Tocantins River Basin, Central Brazil. *Copeia* 2008(1), 82-85. <http://doi.org/10.1643/CI-07-079>.
- Fricke, R., Eschmeyer, W.N., & van der Laan, R., 2025. Eschmeyer's catalog of fishes: genera, species, references. Retrieved in 2025, February 19, from <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>
- Godinho, A.L., & Godinho, H.P., 2003. Breve visão do São Francisco. In: Godinho, H.P., & Godinho, A.L., eds. *Águas, peixes e pescadores do São Francisco das Minas Gerais*. Belo Horizonte: PUC Minas, 15-24, 1 ed.
- Lima, F.C.T., & Caires, R.A., 2011. Peixes da Estação Ecológica Serra Geral do Tocantins, bacias dos rios Tocantins e São Francisco, com observações sobre as implicações biogeográficas das "águas emendadas" dos rios Sapão e Galheiros. *Biota Neotrop.* 11(1), bn03411012011. <http://doi.org/10.1590/S1676-06032011000100024>.
- Sato, Y., & Godinho, H.P., 1999. Peixes da bacia do rio São Francisco. In: Lowe-McConnell, R.H., ed. *Estudos ecológicos de comunidades de peixes tropicais*. São Paulo: EDUSP, 401-413.
- Silva, J.M.C., Tabarelli, M., & Fonseca, M.T., 2003. Áreas e ações prioritárias para a conservação da biodiversidade da Caatinga. In: Silva, J.M.C., Tabarelli, M., Fonseca, M.T., & Lins, L.V.,

eds. Biodiversidade da Caatinga: áreas e ações prioritárias para a conservação. Brasília: MMA, 349-374, 1 ed.

zootaxa.4852.1.6. PMid:33056711. <http://doi.org/10.11646/zootaxa.4852.1.6>.

Ywamoto, E.V., Nielsen, D.T.B., & Oliveira, C., 2020. Description of a new species of the *Melanorivulus pictus* species-group (Cyprinodontiformes: Rivulidae) from the Rio Paraná basin in Brazil. Zootaxa 4852(1),

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