Supplementary Tables and Figures

Table S1. Voucher specimens used for molecular analyses. Institution codes: Auburn University Museum of Natural History (AUM), Universidade Federal do Rio Grande do Sul (UFGRS), and Academy of Natural Sciences of Drexel University (ANSP).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Species | Voucher | Group | Country | Drainage | River |
| Crenicichla acutirostris | AUM67845 | lugubris | Brazil | Tapajos | Tapajos |
| Crenicichla albopunctata | AUM50716 | saxatilis | Suriname | Marowijne | Gran Creek |
| Crenicichla alta | AUM62691 | saxatilis | Guyana | Kuribrong | Amaila |
| Crenicichla cf. reticulata | AUM67847 | reticulata | Colombia | Rio Meta | Rio Meta |
| Crenicichla celidochilus | AUM63376 | lacustris | Uruguay | Uruguay | Cuareim |
| Crenicichla cincta | AUM67850 | lugubris | Peru | Napo | Napo |
| Crenicichla compressiceps | AUM67848 | wallacii | Brazil | Tocantins | Tocantins |
| Crenicichla hadrostigma | UFRGS13203 | lacustris | Uruguay | Uruguay | Ijui |
| Crenicichla iguapina | UFRGS18535 | lacustris | Brazil | Acungui | Acungui |
| Crenicichla jegui | AUM67846 | reticulata | Brazil | Tocantins | Tocantins |
| Crenicichla lepidota | AUM63374 | saxatilis | Uruguay | Uruguay | Cuareim |
| Crenicichla lenticulata | AUM43751 | lugubris | Venezuela | Negro | Casiquiare |
| Crenicichla macrophthalma | ANSP189593 | reticulata | Brazil | Xingu | Xingu |
| Crenicichla maculata | UFRGS17758 | lacustris | Brazil | Tramandai | Tramandai |
| Crenicichla marmorata | INPA40588 | lugubris | Brazil | Xingu | Igarape |
| Crenicichla minuano | AUM63359 | lacustris | Uruguay | Uruguay | Negro |
| Crenicichla minuano | AUM63373 | lacustris | Uruguay | Uruguay | Cuareim |
| Crenicichla missioneira | AUM63393 | lacustris | Uruguay | Uruguay | Uruguay |
| Crenicichla missioneira | AUM63372 | lacustris | Uruguay | Uruguay | Cuareim |
| Crenicichla missioneira | AUM63401 | lacustris | Uruguay | Uruguay | Yi |
| Crenicichla missioneira | AUM63404 | lacustris | Uruguay | Uruguay | Queguay |
| Crenicichla missioneira | AUM63349 | lacustris | Uruguay | Uruguay | Tacuarembo |
| Crenicichla missioneira | AUM63360 | lacustris | Uruguay | Uruguay | Negro |
| Crenicichla multispinosa | ANSP189593 | lacustris | Suriname | Marowini | Litanie |
| Crenicichla percna | ANSP193085 | lugubris | Brazil | Xingu | Xingu |
| Crenicichla punctata | AUM63162 | lacustris | Uruguay | Yaguaron | Yaguaron |
| Crenicichla regani | AUM67849 | wallacii | Brazil | Tapajos | Tapajos |
| Crenicichla saxatilis | AUM63161 | saxatilis | Uruguay | Yaguaron | Yaguaron |
| Crenicichla scottii | AUM63375 | lacustris | Uruguay | Uruguay | Cuareim |
| Crenicichla sveni | AUM67851 | saxatilis | Colombia | Meta | Meta |
| Crenicichla tendybaguassu | AUM65908 | lacustris | Uruguay | Uruguay | Cuareim |
| Crenicichla vittata | AUM63158 | lacustris | Uruguay | Uruguay | Uruguay |
| Crenicichla wallacii | AUM56744 | wallacii | Venezuela | Orinoco | Ventuari |
| Crenicichla sp. Xingu II | ANSP194912 | lugubris | Brazil | Xingu | Xingu |
| Crenicichla sp. Xingu III | ANSP193066 | lugubris | Brazil | Xingu | Xingu |
| Crenicichla zebrina | N/A | lugubris | Venezuela | Orinoco | Ventuari |
| Teleocichla sp. Cl | ANSP194669 | *Teleocichla* | Brazil | Xingu | Iriri |
| Teleocichla gephyrogramma | ANSP194660 | *Teleocichla* | Brazil | Xingu | Iriri |
| Teleocichla sp. preta | ANSP194913 | *Teleocichla* | Brazil | Xingu | Xingu |
| Acarichthys heckelii | AUM49790 | outgroup | Guyana | Rupununi | Takutu |
| Apistgroamma ortmanni | AUM62860 | outgroup | Guyana | Kuribrong | Kuribrong |
| Gymnogeophagus tiraparae | AUM63400 | outgroup | Uruguay | Uruguay | Yi |

Table S2. Voucher specimens used for geometric morphometric analyses. Institution codes: Auburn University Museum of Natural History (AUM) and Universidad Federal do Rio Grande do Sul (UFRGS).

|  |  |
| --- | --- |
| Species | Vouchers |
| *Crenicichla celidochilus* | AUM57657; AUM65899; AUM63376 |
| *Crenicichla hadrostigma* | UFRGS11321; UFRGS13203 |
| *Crenicichla minuano* | AUM56897; UFRGS13228; UFRGS2421; UFRGS6447; UFRGS10931; AUM63359; AUM63373 |
| *Crenicichla missioneira* | AUM5756; AUM63360; AUM63388; AUM63404; AUM65905; AUM63393; AUM63372; AUM63401; AUM63349; UFRGS9415; UFRGS10814 |
| *Crenicichla tendybaguassu* | AUM65908; UFRGS6443; UFRGS7544 |

Figure legends

Figure S1. Hypotheses of the relationships among *Crenicichla* species groups based on morphology (a) Ploeg (1991) and molecules (b) López-Fernández et al. (2010), (c) Kullander et al. (2010), (d) Piálek et al. (2012). Representatives of the species groups: (e) *Crenicichla lugubris* (AUM43158), (f) *C. saxatilis* (AUM65898), (g) *C. wallacii* (AUM44460), (h) *C. reticulata* (AUM48266), (i) *C. lacustris* (UFRGS13073), the type species: (j) *C. macrophthalma* (ANSP195888), and (k) *Teleocichla monogramma* (ANSP194664). Photos: *T. monogramma* courtesy of Mark Sabaj; all others by EDB.

Figure S2. Landmark schemes used to quantify (left) body and (right) lower pharyngeal jaw shape: homologous (red) and sliding (purple) landmarks.

Figure S3. Concatenated Maximum likelihood *Crenicichla* phylogenies based on data sets with different proportions of missing data (A-D). Nodal support was assessed by 500 non-parametric bootstrap replicates.

Figure S4. Bayesian inference *Crenicichla* phylogenies based on data sets with different proportions of missing data (A-D). Nodal support was assessed by 500 non-parametric bootstrap replicates.

Figure S5. Species trees (SVDquartets) *Crenicichla* phylogenies based on data sets with different proportions of missing data (A-D). Nodal support was assessed by 500 non-parametric bootstrap replicates.