



Killi-Data Wassup n°4

Overview of Killifish research output

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EDITORIAL : the African Pandora box now fully open

With Killi-Data Wassup n°4, this editorial may be seen as somewhat provocative (at least based on its title), but it is not, it is simply factual and it bears absolutely no criticizing aspects like everything in K-D-W. Yes, the Pandora box is now fully open with killifish for Africa too with the descriptions of 6 new species in subgenus *Chromaphyosemion* which are objectively molecular species, i.e., taxa that are minimally diagnosed by morphology including pattern (if any solid diagnosis is proposed!) but that are separated by molecular data. What is a Pandora box? A Pandora box is a symbolic concept connected with unknown outcome, but according to Wikipedia with a more negative tone, Pandora's box is an artifact in Greek mythology and in modern times an idiom has grown from it meaning «any source of great and unexpected troubles» or alternatively «a present which seems valuable but which in reality is a curse» and I would not endorse, in this editorial, the negative tone, because simply nobody knows with killifish systematics what will be the final outcome and it will not be sizable and measurable before long. Beware it is not new for South American killifish (Costa and his students have started to describe molecular species since at least 10 years formally or implicitly and now routinely) and it is not new either for Africa but in the case of Africa very rare cases have been published to date until those 6 new species, all in a pocket range, in a single publication. Beware it is not new either for other groups of fish (although North American ichthyologists for their countries, USA and Canada, have consensually decided yet not to go that way... e.g., in genus *Fundulus*) but for tropical killifish it has potentially extraordinary consequences because since Scheel in the nineteen sixties to nineteen eighties and his «primitive» tools of karyotypy it is well known and accepted that killifish populations are uniquely variable in terms of genetics and therefore at least hundreds of new taxa might be described as molecular species, maybe up to individual populations where variation is high. Genera *Aphyosemion*, *Nothobranchius*, *Scriptaphyosemion*, *Fundulopanchax*, just as examples, could contain at least 5 fold more named components. Is this good or bad (Wikipedia meaning)? I shall remain neutral and modest and this editorial will have no impact on behavior of the concerned researchers (and if any on the reaction of other researchers in the long term), but probably from now on systematics and nomenclature of killifish will not be the same anymore as before (in Killi-Data database, progressively, those molecular species will be plainly tagged as such, but without any judgment, in order to separate them from specific names linked with a diagnosis including at least 1 morphological or pattern character that is solid and stable in a population (variability study) and vs. other comparable populations with another name (variability study, again) of the same genus or subgenus. In case the negative definition of the Pandora box is used then putative negative consequences of a flow of named molecular named species will negatively impact nomenclatural rules, systematics, common name usage, and, yes, conservation status.

PS: in 2019, Killi-Data celebrate the 25th anniversary of the first Killi-Data book, Killi-Data 1994 (ISBN 2-9507 330-2-6), and in 1994, 2 editions are recorded, the first edition on January 31. 1994, the second edition, already strongly augmented, on November 30. 1994 ; again no collecting report with this issue since, alas,

since all contacted collectors declined to cooperate or to answer... Killi-Data is and has always been a cooperative platform but if there is no data on the offer side, no cooperative outcome may be produced for the community.

VIEW FROM THE CHAIR

Killi-Data Wassup n°4 contains several features that push to some comments raised from some of the selected publications in view of the translation of their results into Killi-Data, and not as opinions or judgments on the quality of those research papers.

First, the major study by Garcia et al. (including Loureiro) on the morphological and genetic patterns of variability in 4 taxa of the *Austrolebias robustus* species group distributed in 2 of the major southernmost river basins in South America is a landmark in killifish knowledge. It concludes that *robustus* and *nonoiuliensis* are well supported systematically, but that the group of *cinereus* populations also contains individuals of *vazferreirai* which induces synonymy of the latter ; this last result rises the question of systematic validity of a taxon with no molecular separation when compared to several populations of another species (herein *vazferreirai* falls within the branches of *cinereus* in the molecular and combined tree) while the concerned taxon is separated by at least a stable morphological character for its diagnosis ; the authors consider *vazferreirai* as an ecotype (a local adaptation or a variation at the population level, due to ecological constraints or opportunities) of *cinereus*, a case that has been frequently observed in other groups of fishes (e.g. in Cyprinidae, in Goodeinae of viviparous Cyprinodontiformes, in loaches, etc.) ; more generally, the synonymization of such ecotypes is fully in line with the phylogenetic concept of species (based on populations sharing the same gene pool)... which induces, on the very opposite side, the recent creation of many species, labeled herein as molecular species, not or poorly separated by morphological data, but separated by molecular data at some level, variable according to authors.

Second, the description of 6 new cryptic *Aphyosemion* species related to *alpha*. Those are molecular species that are either close in pattern for male to *alpha* or surprisingly to, very far away, *bitaeniatum* ; all 6 new species can only be diagnosed by the authors from the related *alpha* (the other subcongener from Gabon, *kouamense*, being unrelated to them), i.e. they are not diagnosed from all other components in *Chromaphyosemion* (apart from molecular data) and even based on text and photos it is not easy to separate 3 of the 6, each from the 2 others ; last comment, the authors do decide to give each of them a separate name because between each (including *alpha*) the molecular gap is at least equal to the gap previously reported for each component of the other group of species between Bénin and Ecuatorial Guinea, all also in subgenus *Chromaphyosemion* (several of those northern names are already molecular species) which rises the issue of quantifying what will (or can or should) be the minimum molecular gap in order that a population be considered as a separate molecular species (with, at the moment, no universal answer).

Third, the detailed work on *Austrolebias* molecular phylogeny by Loureiro et al. (allii meaning actually nearly all Brazilian researchers on oviparous killifish, today independent from Costa and his students... an unprecedented cooperative event) ; nearly all *Austrolebias* sp. are molecularly studied (major exceptions are *camaquensis*, *luzardoj*, *patriciae*, *pelotapes*, *pongondo*) ; this major work reshuffles considerably the morphological and osteological revisions and phylogenies with no molecular data by Costa (2006, 2009) that have ended up in the description of 5 subgenera, *Acantholebias*, *Acrolebias*, *Argolebias*, *Gymnolebias*, *Cypholebias*, on top of already known *Megalebias* and nominotypical subgenus, and it adds 2 un-named subgenera for species that cannot be assigned to named subgenera ; if those groups are named in the future, then the 9 subgenera of *Austrolebias* with about 40 species will be equivalent to as many superspecies (is this where the scientific community wants to go ?) ; alternatively, several subgenera with unstable molecular positioning may be lumped (then with the necessity of building new diagnoses for the remaining valid subgenera... with the same question on what the scientific community wants) ; the authors do not take

position on the unavoidable moves that follow their results and they prefer to use conditional proposals waiting for further strengthening studies which is perfectly acceptable ; as food for thought, here is an extract of their wise discussion : «Problems arise from the great morphological similarity among species and even genera, often diagnosed mainly by coloration patterns alone; and the great intraspecific variability, which has not even been incorporated in analyses of many taxa. Going forward, we must increase molecular sampling and analyses with conservative markers and variable markers to refine the species limits and relationships among closely related taxa. Morphological work also needs to be expanded to the analysis of intraspecific variability, since many diagnostic characters for species and genera rely on very few specimens, and the polymorphic nature of many species remains obscure».

Fourth, the description by Bragança of 2 cryptic *Fluviophylax* species, *gouldingi* and *wallacei*, is not a further revision of the genus after the main work by Costa [Costa, W.J.E.M. 1996a. Relationships, Monophyly and three new Species of the neotropical Miniature Poeciliid Genus *Fluviophylax* (Cyprinodontiformes: Cyprinodontoidei). Ichthyol. Explor. Freshwaters, 7 (2): 111-130, 16 figs., 5 tabs.], but rather the creation of 2 species names based on new live collections in limited areas (in this case of mid to upper rio Negro, in Amazonas state) molecularly found distinctive in a previous paper by Costa & Bragança (cf. K-D-W n°3). That is already a lot and it is obviously agreeable-understandable how much the osteological and morphological work was difficult given the size of those miniature fishes (about 15 mm in S.L.) ; however, this study leaves outside and unstudied the many collections as preserved specimens of congeners outside the type areas of the today 7 species (*gouldingi*, *obscurus*, *palikur*, *pygmaeus*, *simplex*, *wallacei*, *zonatus*), notably those which were previously identified either as *pygmaeus* or *obscurus*, and notably those sampled outside the middle Amazon basin, either in Colombia, Venezuela, Peru or in mid lower Amazon far from the huge river ; no doubt that without speculating dozens of new species may be expected from those localities when live fish is available ; the second comment concerns 2 aspects of increased complexity raised by this article : (1) *Fluviophylax* species are shown as possibly sympatric (and when so, they are very similar externally, even with very similar live color patterns), then identification complexity is increased sharply, (2) *Fluviophylax* species are shown as having variability in cephalic neuromast patterns between species, between age of specimens and even between sexes of the same species (and this increases sharply complexity, bearing in mind that in the past, for their lampeyes cousins in Africa, that variability was considered as polymorphism only in the nineteen seventies and eighties... time will tell).

SELECTION OF PUBLICATIONS

- Garcia G., Gutiérrez V., Rios N., Serra S., Calviño P., Duarte A., Loureiro M. [Garcia et al. synonymize *Austrolebias vazferreirai* into *cinereus* in a detailed morpho-molecular study of *robustus* superspecies, besides including *robustus* and *nonoiuliensis* {the authors study in details morphology (163 males and 194 females), biogeography and molecular data (mitochondrial Cytb) of at least 30 populations of the 4 species and their results are robust, showing *vazferreirai* is molecularly imbedded into *cinereus*, then as a synonym, but a morphological ecotype}. 2019. JZSER, <https://onlinelibrary.wiley.com/doi/abs/10.1111/jzs.12268>] {Jean Huber, 30-January-2019}
- Saint John, M.E., J.A. McGirr & C.H. Martin [The Martin team finds aggression for speciation in *Cyprinodon desquamator* and -surprise- in *brontotheroides* (not in generalist *baconii*) [note : the Martin team is pivotal in the study of the study of 3 sympatric species in the San Salvador radiation (generalist, snail-eating specialist *brontotheroides*, and scale-eating specialist *desquamator*) with initial major papers with following references [Martin, C.H. & P.C. Wainwright. 2013b. A remarkable species Flock of *Cyprinodon* Pupfishes endemic to San Salvador Island, Bahamas. Bull. Peabody Mus. Nat. Hist., 54 (2) (October): 231-240, 5 figs., 2 tabs.] and [Richards, E.J. & C.H. Martin. 2017. Adaptive Introgression from distant Caribbean

islands contributed to the Diversification of a microendemic adaptive Radiation of trophic Specialist pupfishes. PLoS ONE Genet, 13(8): e1006919, <http://journals.plos.org/plosgenetics/article?id=10.1371/journal.pgen.1006919>]. 2019. B.E., <https://academic.oup.com/beheco/advance-article-abstract/doi/10.1093/beheco/ary196/5289190>] {Jean Huber, 23-January-2019} <°))>< <°))>< <°))><

- Goodloe, O. & J. Nishimura. [Goodloe and Nishimura show, in *Fundulus heteroclitus*, purely social coordination results in fewer total spawns than purely lunar coordination. 2019. CNSNS, <https://www.sciencedirect.com/science/article/pii/S1007570419300061>] {Jean Huber, 20-January-2019} <°))>< <°))>< <°))><
- Dominguez, O.C. & M.C. Uribe. [Dominguez and Uribe detail anatomy of ovary (2 parts) and steps of folliculogenesis and oogenesis in annual *Millerichthys robustus*. 2019. JoM, <https://onlinelibrary.wiley.com/doi/abs/10.1002/jmor.20945>] {Jean Huber, 13-January-2019} <°))>< <°))>< <°))><
- Lambert, J.W., M. Reichard & D. Pincheira-Donoso. [Lambert et al. propose *Nothobranchius* non adaptatively diversified, more on opportunities (new areas) than constraints (ephemeral, vertisol soils). 2019. BMC, <https://bmcevolbiol.biomedcentral.com/articles/10.1186/s12862-019-1344-0>] {Jean Huber, 11-January-2019} <°))>< <°))>< <°))><
- Reichard, M. & M. Polacik. [Reichard and Polacik synthesize solid cumulative knowledge on *Nothobranchius furzeri* as a promising vertebrate model for multiple applis {note : a very useful paper because there are so many research articles on *Nothobranchius furzeri*, since it is a promising vertebrate model in ageing research and an emerging model organism in genomics, regenerative medicine, developmental biology and ecotoxicology... just like the synthetic paper on the equally unique *Kryptolebias marmoratus* [ref.: Taylor, D.S. 2012. Twenty-Four Years in the Mud: What Have We Learned About the Natural History and Ecology of the Mangrove *Rivulus*, *Kryptolebias marmoratus*? Integrative Comparative Biology (Integr. Comp. Biol.), 52 (6) (December): 724-736]}. 2019. EEB, <https://elifesciences.org/articles/41548>] {Jean Huber, 11-January-2019} <°))>< <°))>< <°))><
- Esmaeili, H.R., F. Zarei, N.S. Vahed & M. Masoudi. [Esmaeili et al. confirm scale micro-macro-morphology (spines, ...) as useless for identification and phylogeny in 16 *Aphanius* sp. After a detailed survey of some morphological characters linked to scales {not neuromasts} patterns, the authors conclude that neither scale shape and scale surface morphology, nor scale surface microstructure can be used for the species identification and inferring phylogenetic relationships in the genus *Aphanius* {this study is congruent with results concerning others killifish groups for scales, however for other micromorphological characters the issue is still to be tackled the same way}. 2019. Micron, <https://www.sciencedirect.com/science/article/pii/S0968432818303354>] {Jean Huber, 11-January-2019} <°))>< <°))>< <°))><
- Costa, W.J.E.M., J.L.O. Mattos & P.F. Amorim. [Costa, Mattos and Amorim report live rediscovery of presumed extinct *Leptopanchax splendens* (ex- *Leptolebias*), 5 km from type locality {that the authors infer as the Estrela River basin, 74 years after its last record {note : there have been previous recent live records of the species, e.g. Costa, W.J.E.M. 2016a. Inferring Evolution of Habitat Usage and Body Size in endangered, seasonal Cynopoeciline Killifishes from the South American Atlantic Forest through an integrative Approach (Cyprinodontiformes: Rivulidae). PLoS ONE, 1-16, 2 figs, 2 tabs., 2 appx., and back at the end of the 1950ies by Hoedeman on frontal squamation, but according to the authors those are misidentifications of another species from the same region that they announce they will describe as a new species in the future ; besides, the authors do not say if their mentioned type locality of *splendens* is identical with another senior taxon, *sandrii*, first considered as a senior synonym of *splendens*, before ICZN declared *sandrii* as invalid}. 2019. J.F.B., <https://onlinelibrary.wiley.com/doi/pdf/10.1111/jfb.13898>] {Jean Huber, 3-January-2019} <°))>< <°))>< <°))><

- Yogurtçuoğlu, B. [Yogurtçuoğlu reassesses *Aphanius sureyanus* conservation, endemic to 1 Turkish lake, as critically endangered, despite legal protection. 2018. HJBC, <http://www.hjbc.hacettepe.edu.tr/journal/volume-46/issue-4/a-reassessment-of-the-conservation-status-of-aphanius-sureyanus-neu-1937-cyprinodontiformes-aphaniidae-and-the-first-data-on/index.html>] {Jean Huber, 31-December-2018} <°))>< <°))>< <°))><
- İlhan, D., A. İlhan & S. Akalin. [İlhan et al. confirm previous LWR results of *Aphanius fasciatus* based on 2 populations collected near Izmir, Turkey, with female larger than male. 2018. FEB, https://www.prt-parlar.de/download_feb_2018/] {Jean Huber, 31-December-2018} <°))>< <°))>< <°))><
- Zee, J.R. van der & R. Sonnenberg. [Zee and Sonnenberg describe *Aphyosemion fellmanni*, from Brazzaville region, Congo, for Emmanuel Fellmann, and redefine *A. congicum*. The new species, with seemingly a pocket range shows a male color pattern of very wide black margins of Dorsal, Caudal, and Anal fins (like congener *congicum* in the same species group and reported not far on the other side of the Congo river) in combination with flames in Caudal fin of male (not present in *congicum*) ; on the other hand, flames are present in male of *rectogoense* but margins are not wide and its range is not too far, northerly, but with another species in-between, *schioetzi* ; however, molecular data for the new species are distinctive from both *congicum* and *rectogoense*. 2018. K-D-S, http://www.killi-data.org/series-kd-2018-Zee_Sonnenberg.php] {Jean Huber, 19-December-2018} <°))>< <°))>< <°))><
- Masoudi, M., H.R. Esmaeili, M. Ebrahimi, A. Teimori & M. Seifali. [Masoudi et al. study LHT sympatric *Aphanius hormuzensis* and *furcatus* as very similar implying pre- and post-ethological barriers to hybridizing. 2018. IJAB, <http://ij-aquaticbiology.com/index.php/ijab/article/view/490>] {Jean Huber, 19-December-2018} <°))>< <°))>< <°))><
- Ghafouri, Z., Y. Keivany & N.M. Soofiani. [Ghafouri et al. deepens LHT (life history traits) of *Aphanius isfahanensis*, with female larger size, equal sex ratio, average fecundity 90 per gram of fish {notes : this is a confirmation study of following reference [Keivany, Y. 2013. Threatened Fishes of the World: *Aphanius isfahanensis* Hrbek, Keivany & Coad, 2006 (Cyprinodontidae). Aqua, Journal of Ichthyology and Aquatic Biology, 19 (2): 67-70, 5 figs.] ; the new study gives similar results based on monthly samples from June 2016 to May 2017 ; in the previous study the sex ratio is a bit biased as 0.8F:1M ; the new study confirms a growing observation that female can grow larger than male in genus *Aphanius* and the case should be tackled again for their cousins of genus *Cyprinodon*}. 2018. EBF, <https://link.springer.com/article/10.1007/s10641-018-0833-0>] {Jean Huber, 29-November-2018} <°))>< <°))>< <°))><
- Espirito-Santo H.M.V., Sodr  J.G., Zuanon J. [Espirito-Santo et al. show in *Anablepsoides micropus* {K-D maintained in *Rivulus*} that male moves overland (mates, predators) more often than female. This study attempts to separate the effects of predator threat, of intraspecific competition and of mate searching on overland movement of this amphibious fish, like most *Rivulus* sp. that are routinely aestivating and jumping. The field experiment consists of using artificial pools set in enclosures in a primary forest area, then counting fish leaps according to variable constraints. Results show that males move overland significantly more frequently than females and that their movement depend on the social context, being higher with predators (defensive strategy) and lower with females (mating conservative strategy). Females, instead, show context-independent movement rates, i.e. leaps are less frequent, even in presence of predator {note : this is not a study restricted to that species in theory then it should be confirmed, notably the female differential strategy, on at least another species of the *urophthalmus-taeniatus* groups or to another species living in Amazon flooded plain, like *micropus* near Manaus}. 2018. EFF, <https://onlinelibrary.wiley.com/doi/abs/10.1111/eff.12458>] {Jean Huber, 27-November-2018} <°))>< <°))>< <°))><
- Uribe, M.C., H.J. Grier & L.R. Parenti. [The Parenti team shows testis of *Crenichthys baileyi* and *Empetrichthys latos*, similar to viviparous *Ataeniobius*, but not in bundles {note : previous paper : Uribe,

M.C., H.J. Grier & L.R. Parenti. 2012. Ovarian Structure and Oogenesis of the oviparous Goodeids *Crenichthys baileyi* (Gilbert, 1893) and *Empetrichthys latos* Miller, 1948 (Teleostei, Cyprinodontiformes). *Journal of Morphology*, 273 (4): 371-387}. 2018. J.Mor, <https://onlinelibrary.wiley.com/doi/abs/10.1002/jmor.20901>] {Jean Huber, 27-November-2018} <°))>< <°))>< <°))><

- Marson, K.M., D.S. Taylor, R.L. Earley. [Marson et al. disclose up to 13% hidden males (without orange color, but with male testis) in Florida *Kryptolebias marmoratus*, duller than selfing hermaphrodite {note : those surprising results reshuffle earlier knowledge on very rare primary males and indirectly on secondary males, all with orange colors, established since the nineteen sixties}. 2018. B.B., <https://www.journals.uchicago.edu/doi/abs/10.1086/700697>] {Jean Huber, 24-November-2018} <°))>< <°))>< <°))><
- Serra, W.S. & M. Loureiro. [Serra and Loureiro describe cryptic *Austrolebias queguay* from lower rio Uruguay basin related to *bellottii*, *melanoorus*, *univentripinnis*. Fusion of urogenital papilla to first Anal fin ray in male characterizes the clade formed by the new species, *bellottii*, *melanoorus* and *univentripinnis* ; *queguay* is somewhat diagnosed from related components by well-defined light bands contrasting on mlae sides (the overall color pattern shows a dull *bellottii*-like population with vertical continuous lines, not interrupted series of dots) ; it seems to be endemic to Queguay river basin and should be protected (the area being included in the Uruguayan protected areas system) [note : in the clade, *apaii* is not listed, then implying the authors approve its synonymy status, and *accorsii* is not listed, probably because the authors did not study material). 2018. Z-E, <https://zse.pensoft.net/article/29115/>] {Jean Huber, 23-November-2018} <°))>< <°))>< <°))><
- Costa, W.J.E.M., P.F. Amorim & J.L.O. Mattos. [Costa, supported by Amorim and Mattos, describes molecular *Hypsolebias splendissimus*, next to *fulminantis* {K-D maintained in *Simpsonichthys*}. After having described 4 months ago, in genus *Hypsolebias*, *gardneri* and *hamadryades* {K-D maintained in *Simpsonichthys*}, next to *magnificus*, Wilson Costa passes the plate again with new *Hypsolebias splendissimus*, next to *fulminantis*. The new species is also from Bahia state, also molecularly established and also endangered {note : the new taxon is then objectively best defined as a molecular species not distinguishable from *fulminantis*, yet known from a single spot geographically close to *fulminantis* distribution}. 2018. Z-E, <https://zse.pensoft.net/article/29718/>] {Jean Huber, 16-November-2018} <°))>< <°))>< <°))><
- Fonseca, A.P., M.V. Volcan, L.A. Romano & R.B. Robaldo. [Fonseca et al. link belly sliders in *Austrolebias nigrofasciatus* with swim bladder cell alteration and blood loss, but do not propose cause explanations or prevention measures. 2018. N.I., http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1679-62252018000400205&lng=en] {Jean Huber, 10-November-2018} <°))>< <°))>< <°))><
- Agnèse, J.-F., Chirio, L., Legros, O., Oslisly, R. & Bhé, H.M. [Chirio, Legros + Agnèse describe *Aphyosemion aurantiacum*, *barakoniense*, *flammulatum*, *flavocyaneum*, *pusillum*, *rubrogaster* from Gabon. All of them molecularly form a cluster of species with *alpha*, previously only known from North of Gabon estuary (and now reported South of it, in the same region as the 6 other species, each with a tiny distribution. The 6 new species are sympatric with 4 undetermined, probably new, killifish, 2 in genus *Epiplatys*, 1 in *Aphyosemion* (not subgenus *Chromaphyosemion*) and 1 in *Plataplochilus* ; *kouamense*, another *Chromaphyosemion* species from North of Gabon river, like *alpha* is not related to them but to all other components of subgenus northerly up to Bénin. All of 6 new species have been discovered by biologist and collector based in Africa Laurent Chirio, in Wonga-Wongué Presidential Reserve ; based on a genetic marker (mitochondrial DNA cytochrome b sequences), the populations studied are grouped into 6 new species sharing black *alpha*-shaped mark on the pre- and post-opercular region, like *alpha* {note : several of them are molecular sp., with a limited diagnosis, cf. editorial}. 2018. EJT,

<http://www.europeanjournaloftaxonomy.eu/index.php/ejt/article/view/602>] {Jean Huber, 30-October-2018} <°))>< <°))>< <°))><

- Zak, J., M. Reichard & L. Gvozdik. [The Reichard team shows that 3 sympatric Nothos (*furzeri*, *orthonotus*, *pienaari*) coexist without differentiation in thermal niches. 2018. JTB, <https://www.sciencedirect.com/science/article/pii/S0306456518302316>] {Jean Huber, 28-October-2018} <°))>< <°))>< <°))><
- Lencer, E.S. & A.R. McCune. [Lencer and McCune detail 34 morphological stages in egg development of *Cyp. variegatus* from San Salvador island (*baconi*) including skull and tail. 2018. JoM, <https://onlinelibrary.wiley.com/doi/abs/10.1002/jmor.20870>] {Jean Huber, 27-October-2018} <°))>< <°))>< <°))><
- Bragança, P.H.N. [Bragança describes *Fluviophylax gouldingi* and *wallacei*, previously misidentified as *pygmaeus*, from rio Negro basin, on top of *zonatus* and *obscurus*, from the same region. This is the first 2 (out of 3) new species announced in a previous article, as sp. A and B, respectively. The 2 new species differ from 5 previously described congeners (*obscurus*, *palikur*, *pygmaeus*, *simplex*, *zonatus*) by morphological characters, *gouldingi* by a sharp ventral process in opercle and *wallacei* by a dimorphic male-female pattern of cephalic lateral line system and by a pointed Dorsal fin in male. The author had disclosed in his previous work that speciation in this region for *Fluviophylax* is explained by orography (new earth elevations inducing river changes). Genus *Fluviophylax*, the single American lampeye genus, is separated by an eye extremely large, a series of osteological characters and its cephalic sensory system from African lampeyes (its color pattern shows melanophores concentrated on upper and lower mid-lines of sides) {note : the following monographic thesis is neither discussed nor referenced : Souza, E.R. 2008. Filogeografia do gênero Neotropical *Fluviophylax* (Cyprinodontiformes: Poeciliidae) das Bacias do Amazonas e do Orinoco. INPA, Manaus (Master's Thesis), 122 pp.}. 2018. Spx, <https://pfeil-verlag.de/publikationen/spixiana-zeitschrift-fuer-zoologie-band-41/>] {Jean Huber, 19-October-2018} <°))>< <°))>< <°))><
- Loureiro, M., R. de Sa, Serra S.W., F. Alonso, L.E.K. Lanés, M.V. Volcan, P. Calviño, D.T.B. Nielsen, A. Duarte & G. Garcia. [Loureiro et al. review genus *Austrolebias* and reshuffles systematic position and eventual validity of several species and subgenera. All valid species but a few (notably *camaquensis*, *luzardoii*, *patriciae*, *pelotapes*, *pongondo*) are molecularly and morphologically studied with a molecular tree and a combined tree. In total 52 species or distinct populations (named or un-named) are molecularly studied. Results are strongly divergent from morpho-osteological results by Costa in various previous works and several species are moved from a subgenus described by Costa to another, most often, also described by Costa too. The major result is the isolated primitive position of *nigripinnis* in molecular tree, even more primitive than other genera like *Cynolebias* and *Simpsonichthys*, just a bit less primitive than *Nematolebias* (*whitei*) and since *nigripinnis* is the type species of subgenus *Argolebias* it is possible that in the future *nigripinnis* and its close relative *araucarianus* are separated in a distinct genus with that name and that all taxa previously *Argolebias* components (the *affinis* group) are changed subgenus allocation ; among the subgenera described by Costa, only *Acantholebias* is confirmed (*luteoflammulatus* and *quirogai*) and maybe also *Gymnolebias* (*gymnoventris* and *jaegari*), related to the bellotti group, most others would change their definitions or their affiliated components or internal relationships. Two un-named genera are suggested, one for the clade previously allied to *nigripinnis* and the other for *patriciae-wichi-varzeae* (notes : this work is unfortunately shadowed by a series of errors, omission of important references (e.g., on *Prorivulus*), ambiguities in family-group names and even a new family-group name is inadvertently erected for taxon *Melanorivulus* but it is a nomen nudum, due to insufficient scrutiny by reviewers and probably to the fact that the article is written by several independent hands, but fortunately those problems do not concern the major part of the work, inside genus *Austrolebias*). 2018. N.I., http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1679-

[62252018000300202&lng=en&nrm=iso&tlng=en](https://www.killi-data.org/registration.php)] {Jean Huber, 19-October-2018} <°)))))>< <°)))))><
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- Nagy, B. & B.R. Watters. [Nagy and Watters report on comparative systematics-ecology-pattern on all 3 Ugandan *Nothobranchius* sp., *robustus* (with uncertainty on topotypes), *ugandensis* and an un-named sp. 2018. JAKA, <http://www.killi-data.org/registration.php>] {Jean Huber, 19-October-2018} <°)))))><
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