Killi-Data Wassup n°3

Overview of Killifish research output

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EDITORIAL

With Killi-Data Wassup n°3, a very sad news takes precedence over everything else. German researcher Lothar Seegers passed away abruptly on August 6. He was born in 1947, he described 21 killifish names, including 2 generic names, *Diapteron* and *Paranothobranchius* and 19 species names (many of which he discovered himself), and studied notably *Nothobranchius*, lampeyes and Peru fauna before his cichlid and catfish refocus (with about the same number of new taxa, in addition). A teacher in biology, he was a remarkable fish morphologist, his work culminating in his thesis “The fishes of the Lake Rukwa drainage” published in 1996. He was a fine breeding aquarist and photographer, too (having authored the picturial Aqualog series of books) and an expert collector and biologist in East Africa. He was a shy, meticulous and solitary researcher, more interested in fish in general and notably in fish fauna of a single region (notably the African Rift lakes). Two killifish species are dedicated to him, *Aphyosemion* (*Diapteron*) *seegersi* Huber, 1978, and, *Nothobranchius seegersi* Valdesalici & Kardashev, 2011 {thanks to Harro Hieronimus and Jouke van der Zee for helping gathering information}. The full list of new killifish species with their today’s names he has described is : *Aphyolebias rubrocaudatus*, *Aphyolebias wischmanni*, *Kryptolebias caudomarginatus* (revalidated recently), *Lacustricola centralis*, *Lacustricola lacustris*, *Lacustricola matthesi*, *Moema staecki*, *Nothobranchius cyaneus* (today a synonym), *Nothobranchius eggersi*, *Nothobranchius fuscotaeniatus*, *Nothobranchius luekei*, *Nothobranchius ocellatus*, *Nothobranchius rubripinnis*, *Plesiolebias pantanalensis* (today an unfortunate synonym), *Rivulus bolivianus*, *Rivulus cryptocallus*, *Rivulus deltaphilus*, *Rivulus luelingi*, *Scriptaphyosemion banforense* (all, except one, as a single describer).

PS: no collecting report with this issue since, alas, since all contacted collectors declined to cooperate or to answer.

VIEW FROM THE CHAIR

Killi-Data Wassup n°3 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, a collecting report of non annual *Rivulus xiphidius* and *geayi* by Origuela et al. is interesting not because of the extended distributions of those 2 species (only a few kilometers on the other side of the very large river Oyapoque), not because that large is river or the political boundary to Brasil are jumped by the 2 species (this is routine for many killifish sp.), but because with it systematic questions are raised on the ranges of molecular species (it may be recalled that *geayi, dibaphus, strigatus* are considered distinct, the last 2 names being revalidated mainly on the basis of separate molecular data) ; the fact that the new *xiphidius* population in Brasil is identical to its counterpart in pattern probably discards the possibility that it is molecularly distinct, but the limits of *xiphidius* easterly would be an interesting topic of research, notably when the maybe similarly patterned (but unrelated) *campelloi* (today in genus *Kryptolebias*) is collected live for the first time (its type locality is not too far away without geographical barriers) ; on the other hand the new *geayi* population in Brasil is not an extension because Geay reports the species in neighboring Brasil already at the end of 19th century, but in the mean time *dibaphus* is described from a locality even nearer to *campelloi* and also without geographical barriers ; if *dibaphus* is really distinct, what are the changes that explain speciation (or at least molecular differentiation (while *geayi* is very variable in male and female patterns, including in French Guyane) ; besides the same applies for *Rivulus igneus* (also very variable in male and female patterns) and the closely related taxon, *Rivulus cajariensis*, whose single known locality is not far from Guyane-Brasil border ; would those fishes represent polytypic species only (with molecular variation)... not simple (and not evidenced yet), all the more that, to complicate the problem, recent collections of *Rivulus schuncki* (in *Melanorivulus*) are reported not far from Guyane-Brasil border (with apparently some change in faunal groups).

Second, a major study of karyotypes of *Nothobranchius* species (and components of related genera *Fundulosoma* and *Pronothobranchius*) is published to confirm high diversity in diploid arms and chromosome arms (NF) among species ; this is an unprecedented work by the number of species studied, even if 3 minor comments may be forwarded (without criticism) : the authors (1) claim that for 35 species the karyotype is disclosed for the first time but on several cases such karyotypes have been already published at least in parts by other authors and indexed in Killi-Data, (2) disclose different karyotypes (number of arms, more rarely NF) from results of previous publications, but unfortunately they do not discuss or explain those not-rare-in-killifish discrepancies of results, (3) list 3 taxa, *ditte*, *torgashevi*, *usanguensis*, as unrecognized species, but they do not explain why they classify those taxa as such ; finally according to Killi-Data, there are 13 remaining congeners, *bellemansi*, *bojiensis*, *cooperi*, *insularis*, *krammeri*, *mkuziensis*, *niassa*, *occultus*, *oestergaardi*, *sagittae*, *sainthousei*, *serengetiensis*, *willerti*, today with unstudied karyotypes, several of them being still unknown live. For the anecdote, it may also be pointed out that the authors do not attempt to explain the relationships between species from karyotypical results (like Scheel innovatively did in the 1960ies onwards… the molecular technique has swept away the issue definitely).

Third, the descriptions by Costa (in Costa, Amorim & Mattos) of 2 new *Simpsonichthys* sp. (see generic discussion in http://www.killi-data.org/infoweb12.php), namely *gardneri* and *hamadryades*, out of 3 other very closely related components of the superspecies (*magnificus*, *harmonicus*, *picturatus*) are claimed as cryptic species. They are diagnosed by molecular data (cyt. b), morphological combined data and a series of color photos of male Caudal fin (at least 2 fish, both sides) and that is thought as sufficient. However it seems a pity, even if it is understandable due to very few number of registered collecting localities, that color variability is not studied within a population and-or between years of collections at the same locality (or even qualitatively detailed based on in-situ collected more numerous material for this paper), not to speak of in-between populations, and only future works can strengthen those diagnoses. Besides, the independent description, this time by Costa and Amorim, of new species *Spectrolebias gracilis* {K-D also maintained in *Simpsonichthys*}, similar to *costai*, could be associated with similar considerations although this time several localities of *costai* in a large sense are known and the "species" is truly variable (or consisting of several species as purported by the authors, several others then probably to be described or misidentified as *costai* in the past). Note : the authors are the only ones among current researchers to consider the aquarium article by Baker, in 1990, using the name *costae* as an ICZN available description (instead of the formal description published by Lazara in 1991 as *costai*). They seem to have a uniquely extended interpretation of the ICZN code (valid in 1990-1991) for species definition (they do not discuss their interpretation in the article but Costa has already published in 2008 that *costae* is available and senior to *costai*, ref. Costa, W.J.E.M. 2008l. Catalog of aplocheiloid Killifishes of the World. Universidade Federal do Rio de Janeiro Ed., Rio de Janeiro, Brasil, 127 pp. (March)), probably like the similar case of *antenori* Tulipano, 1973 vs. *heloplites* Huber, 1981.

Fourth, the comprehensive molecular and morphometric comparative study of multiple populations across full range of *wolterstorffi* by Garcez et al. (including well known researchers Loureiro and Volcan) is a milestone for future knowledge regarding species evaluation borders in killifish. The study concerns a region known for speciation, *Austrolebias wolterstorffi*, several populations, and significant material (mitochondrial cytochrome b of 122 specimens, nuclear rhodopsin genes of 110 specimens, and shape variations for 92 specimens, i.e. 43 males and 49 females), making its results highly valuable. Results show minor (but still real) morphometric differences throughout range and variable molecular differences (at least 0.9% and a maximum of 2.6% -which is a lot- of corrected cyt b nucleotide distances) and 6 groups of homogeneous populations. The authors do not state their intentions whether they will translate those differences-groups into new taxa or not, but their study represent a trend towards a new standard in future systematics and in possible species recognition (differentiation).

SELECTION OF PUBLICATIONS

- Volcan, M.V., A.C. Gonçalves & Guadagnin, D.L. [Volcan et al. show hatching synchrony in sympatric *Cynopoecilus melanotaenia*, *Austrolebias nigrofasciatus* and (rare) *wolterstorffi*. The study is based on observations from 11 heterogeneous temporary pools not far from Pelotas in southern Brasil during entire hydrological cycle. Results, contrary to previous qualitative suggestions, notably in central Brasil, clearly show that annual fish assemblages are formed by a single cohort from various eggs that hatch synchronously and maintain differences in body size and density between species throughout flooding phase. The climate, there, is humid temperate (CFa) with marine influence. The annual average temperature is 17.8°C, with a mean of 23.2°C in the hottest month (January) and 12.3°C in the coldest month (July). The average annual rainfall is 1,249 mm (monthly average of 67 mm in April to 153 mm in August). The decreasing temperature and increasing rainfall in Autumn initiate the flooding phase of the pools, usually between April and November. *Austrolebias nigrofasciatus* and *Cynopoecilus melanotaenia* are caught in all pools, while *Austrolebias wolterstorffi* is only found in 4 pools and in those pools it is always rare. Body size of *nigrofasciatus* ranges from 4 to 58 mm T.L., that of *wolterstorffi* between 17 and 90 mm T.L. and that of *melanotaenia* between 9 and 46 mm T.L. Hatching is synchronous soon after the pools are flooded but hatching may continue as flooding advances over dry land, because juveniles are found in the first 3 months {note : this is a follow-up by the same authors of paper, also worth reading, with reference : Volcan, M.V., A.C. Gonçalves & D.L. Guadagnin. 2013. Length-Weight Relationship of three annual fishes (Rivulidae) from temporary freshwater Wetlands of southern Brazil. Journal of Applied Ichthyology, 29 (5) (October): 1188-1190}. 2018. Hydr, https://rd.springer.com/article/10.1007%2Fs10750-018-3789-3] {Jean Huber, 10-October-2018} <°))))>< <°))))>< <°))))><
- Bressman, N.R., M. Simms, B.M. Perlman & M.A. Ashley-Ross. [Bressman et al. show that usually-rare-in-nature male *Kryptolebias marmoratus* (orange patterned) prefers in lab a terrestrial move towards an orange-colored artificial substrate (vs. water, dark colors v. light colors) compared to hermaphrodites (female patterned, without orange color) or towards a down slope. The species is well known as a quasi-amphibious, hermaphroditic selfing fish, uses to orient in an unfamiliar terrestrial environment. And the preference is obviously rather interpreted as a camouflage behavior. Younger (unsexed) specimens also prefer to move toward the orange quadrant than older individuals, suggesting age-dependent orientation performance or behavior. For the preference of a sloped substrate with more movement downhill, the

authors suggest the importance of the otolith-vestibular system in terrestrial orientation {note : such a similar study should be performed also with *Rivulus* (s.l.) species where males are common and juveniles are often patterned intermediately between male and female}. 2018. JFB, https://onlinelibrary.wiley.com/doi/abs/10.1111/jfb.13802] {Jean Huber, 26-September-2018} <°))))>< <°))))>< <°))))><

- Chang, C.-H., J.E. Schult, J. Sanders, S.-H. Liu & R.C. Fuller. [The Fuller team experimentally discards depth or spawning site for differentiation to separate *Lucania goodei* 2 natural color phases {note : the Fuller team is the most important research group to work on behavior on the coupled species, often sympatric, *Lucania goodei* and *parva*... here follows the list of their major innovative papers, notably the 2014 famous paper : Fuller, R.C. 2001. Patterns in Male breeding Behaviors in the bluefin Killifish, *Lucania goodei*: A field Study (Cyprinodontiformes: Fundulidae). Copeia, (3) (August): 823-828. Fuller, R.C. 2002. Lighting Environment predicts the relative Abundance of male Colour Morphs in bluefin Killifish (*Lucania goodei*) Populations. Proceedings of the Royal Society Biological Sciences (Proc. R. Soc. B), B, 269 (1499): 1457-1465. Fuller, R.C. 2008. A Test for a Trade-Off in Salinity Tolerance in Early Life-History Stages in *Lucania goodei* and *Lucania parva*. Copeia, (1), 154-157. Sandkam, B.A. & R.C. Fuller. 2011. The Effects of Water Depth and Light on Oviposition and Egg Cannibalism in the bluefin killifish *Lucania goodei*. Journal of Fish Biology (J. Fish Biol.), 78: 967-972, 1 fig. Berdan, E.L. & R.C. Fuller. 2012. Interspecific Divergence of ionoregulatory Physiology in killifish: Insight into Adaptation and Speciation. Journal of Zoology (ZSL, London), 287: 283-291, 3 figs, 4 tabs. Kozak, G.M., R.S. Brennan, E.L. Berdan, R.C. Fuller & A. Whitehead. 2013. Functional and population genomic Divergence within and between two species of killifish adapted to different osmotic Niches. Evolution, 68 (1): 63-80, 4 figs., 3 tabs. Phamduy, P., G. Polverino, R.C. Fuller & M. Porfiri. 2014. Fish and Robot dancing together: bluefin killifish females respond differently to the Courtship of a Robot with varying Color Morphs. Bioinspiration & Biomimetics, 9 (3) (August): 036021. Kozak, G.M., G. Roland, C. Rankhorn, A. Falater, E.L. Berdan & R.C. Fuller. 2015. Behavioral Isolation due to Cascade Reinforcement in *Lucania* Killifish. The American Naturalist, 185 (4): 491-506, figs. Johnson, A.M., C.H. Chang & R.C. Fuller. 2018. Testing the potential Mechanisms for the Maintenance of a genetic Color Polymorphism in bluefin killifish Populations. Current Zoology, https://doi.org/10.1093/cz/zoy017}. 2018. JFB, https://onlinelibrary.wiley.com/doi/abs/10.1111/jfb.13661] {Jean Huber, 25-September-2018} <°))))>< <°))))>< <°))))><
- Krysanov, E. & T. Demidova [Krysanov and Demidova review karyotypes of 65 *Nothobranchius* species of which 35 are said as newly disclosed and 5 are with sex chromosomes. More than a half of teleost fish examined have diploid chromosomes number 2n = 48-50 but intrachromosomal rearrangements such as inversions and centromere shift are common. Sex chromosomes are found in 6 species, namely *guentheri*, *brieni*, and for the first time, *lourensi*, *janpapi*, *ditte*, in 2 subgenera, and related *Fundulosoma thierryi*, and it is supposed that multiple sex chromosomes originate in these species independently. Some discussion is added according to the current placement of each species in today considered as valid subgenera, following molecular data. 2018. CCyt, https://compcytogen.pensoft.net/articles.php?id=25092] {Jean Huber, 15-September-2018} <°))))>< <°))))>< <°))))><
- James, W.R., J.M. Styga, S. White, K.M. Marson & R.L. Earley. [Earley's team shows learning behavior and morph adaptation (for jumping) of *Kryptolebias marmoratus* in experiment with mangrove water predator snake (*Nerodia clarkii compressicauda*). 2018. EvEco, https://link.springer.com/article/10.1007/s10682-018-9952-5] {Jean Huber, 11-September-2018} <°))))>< <°))))>< <°))))><
- [German Lothar Seegers passed away on August 6 (born 1947), he described 21 killifish names {before cichlid+ catfish focus} 2018. Killi-Data, http://www.killi-data.org/registration.php] {Jean Huber, 3-September-2018} <°))))>< <°))))>< <°))))><
- Silvia, S.C. & M. Griggio. [Silvia and Griggio show females *Aphanius fasciatus* prefer shoal with variable pattern of bars in males rather than more homogeneous patterned shoal. 2018. BL,

http://rsbl.royalsocietypublishing.org/content/14/8/20180293] {Jean Huber, 26-August-2018} <°))))>< <°))))>< <°))))><

- Livingston, M.D., V.V. Bhargav, A.J. Turko, J.M. Wilson & P.A. Wright. [Wright's team discloses similar nitrogen excretion strategies while out of water (probably plesiomorphic) in 6 tropical killifish species from all 3 continents (*Rivulus hartii*, *Rivulus hildebrandi*, *Rivulus cylindraceus*, *Kryptolebias marmoratus*, *Fundulopanchax gardneri* and *Aplocheilus lineatus*, with Killi-Data names). 2018. PRSBS, http://rspb.royalsocietypublishing.org/content/285/1884/20181496] {Jean Huber, 26-August-2018} <°))))>< <°))))>< <°))))><
- Bragança, P.H.N. & W.J.E.M. Costa. [Bragança and Costa, in time-calibrated molecular study of *Fluviphylax*, disclose 3 undescribed sp., from a Miocene first diversification. They present the first multigene molecular phylogeny of *Fluviphylax*, including all 5 described components (*obscurus*, *palikur*, *pygmaeus*, *simplex*, *zonatus*) and 3 undescribed species (spec. A, B, C, to be described shortly, bearing in mind that most populations previously assigned to *pygmaeus* are misidentifications, true *pygmaeus* being restricted to southwestern Amazon basin). Their analysis indicates that *Fluviphylax* lineage derives from a clade comprising *Anableps* et al. and Poeciliidae during the Eocene, about 37 MYA. Since the basal extant components of that clade in genera *Oxyzygonectes* and *Anableps* and in genera *Tomeurus* and *Phalloptychus* are uniquely found in estuarine brackish waters of tropical America, the authors hypothesize that ancestor of *Fluviphylax* lived in similar habitats. Although no records are available for *Fluviphylax* species inhabiting brackish water, the distribution of *Fluviphylax palikur*, the most basal congener, along coastal river basins, may be indicative of this past brackish water tolerance. In contrast to *Fluviphylax palikur*, the clade comprising all other species of *Fluviphylax* is distributed in the western-central Amazon river basin and in the Orinoco river basin. This distribution pattern is geographically partially concordant with the Miocene Pebas lake-wetland system (about 24 – 11 MYA), which was fed by Andean rivers westerly, with small cratonic drainages easterly, and with connection to sea in present Venezuela Caribbean coast. Other geological events push to suggest that species diversification within Amazon-Orinoco *Fluviphylax* clade took place between Late Miocene (about 10 MYA) and Pleistocene (about 1 MYA), i.e. contemporary to modern Amazon river basin configuration (West-East flow, the reverse as before), as a consequence of continuing uplift of Eastern Cordillera in Late Miocene, and around 10 - 8 MYA, the Andean uplift in northern South America, leading to capture of rio Negro drainage from rio Orinoco basin to Amazon basin. The split between *Fluviphylax* sp. A, endemic to Orinoco river basin and an adjacent area of upper rio Negro drainage, and the clade containing all other species of the Amazon-Orinoco, estimated to about 10 MYA, is thus contemporary with the Vaupés arch uplift. 2018. ODE, https://rd.springer.com/article/10.1007%2Fs13127-018-0373-7] {Jean Huber, 17-August-2018} <°))))>< <°))))>< <°))))><
- Reichenbacher, B., S. Filipescu & A. Miclea. [Reichenbacher et al. find fossils identifiable to *Aphanius stoliczkanus* and to 2 *Aphanolebias* sp. (close to *Valencia*), one as new sp., described as *Aphanolebias sarmaticus*, based on otoliths only, in a single location of Romanian deposits, near the Apuseni mountains, eastern Europe (dated as 12.3 MYA by presence of foraminifera to the Varidentella reussi and Elphidium reginum biozones). 2018. PP, https://rd.springer.com/article/10.1007%2Fs12549-018-0334-3] {Jean Huber, 17-August-2018} <°))))>< <°))))>< <°))))><
- Trape, S. [Trape reports discovery of *Epiplatys bifasciatus* in relict lake Djara (previously connected to Holocene megalake) of Tchad, Sahara desert {note : this is the third killifish species in relict lakes of desert western Sahara in Tchad with *Poropanchax normani* and *Epiplatys spilargyreius* {notes : the 2 *Epiplatys* species, *bifasciatus* and *marnoi*, the latter as a current synonym of *spilargyreius* but distinct by at least vertebrae counts, have been otherwise reviewed with lectotypes designation by Huber, 2017, and, the still unresolved major enigma of *Epiplatys bifasciatus* (or *marnoi*?), at Malakal, central Sudan, 9.520 N 31.670 E, where it has been shown as a livebearer, requires a special unsafe and uneasy collecting trip}. 2018.

BZB, http://www.zoologicalbulletin.de/BzB_Volumes/Volume_67_1/037_040_BzB67_1_trape.pdf] {Jean Huber, 14-August-2018} <°))))>< <°))))>< <°))))><

- Barbas, R.E. & M.R. Gilg. [Barbas and Gilg experiment on choice - no choice lab crossings between *Fundulus heteroclitus* and *grandis* with stronger barriers in former. The closely related killifishes *Fundulus heteroclitus* and *Fundulus grandis* occasionally hybridize in nature in a small region in coastal Northeastern Florida showing that while barriers to reproduction exist, they are incomplete ; in lab, under no-choice conditions (forced hybridization with an alien species), barriers to mating have the greatest influence on hybrid production in *Fundulus grandis*, whereas hatching barriers contribute to the majority of reproductive isolation in *Fundulus heteroclitus* ; and no-choice backcrosses show that at least some F1 hybrids are fertile ; under choice conditions (both fish species in the same aquarium), however, mating and fertilization barriers have the greatest influence on hybrid production in both species ; in total, there seems to be an asymmetry in the potential gene flow between those 2 species, with *Fundulus grandis* being more likely to hybridize than *Fundulus heteroclitus* in the absence of environmental influences. 2018. Ev.Bi., https://link.springer.com/article/10.1007/s11692-018-9460-0] {Jean Huber, 4-August-2018} <°))))>< <°))))>< <°))))><
- Costa, W.J.E.M., P.F. Amorim & J.L.O. Mattos. [Costa, supported by Amorim and Mattos, describes molecular sp. *Hypsolebias gardneri* and *hamadryades* {K-D maintained in *Simpsonichthys*}, similar to *magnificus*. The *Hypsolebias magnificus* superspecies is endemic to middle and southern portion of Caatinga, occupying about 120 km along floodplains of middle rio São Francisco and some adjacent tributaries. The authors, after several collecting efforts, consider components of this superspecies as rare and threatened with extinction, notably vulnerable to environmental changes. The describer separates 5 components, including newly described *gardneri* and *hamadryades*, based on molecular data and male color pattern of Caudal fin (at least 2 males, both sides), varying from regular spots overall to regular convex bars more or less continuous, including irregular intermediates. Each of the 5 components is known from a single locality or group of very close localities, separated from the other by more or less 100 km and the molecular tree, based on a cytb fragment, shows probability values, associated with a scale of genetic distance of 0.02. 2018. Zookeys, https://zookeys.pensoft.net/articles.php?id=25058] {Jean Huber, 1-August-2018} <°))))>< <°))))>< <°))))><
- Englezou, C., S. Gücel & S. Zogaris. [Englezou et al. disclose new isolated population of *Aphanius fasciatus* in northern Cyprus island (Mediterranean sea), with conservation issues. 2018. CBM, http://application.sb-roscoff.fr/cbm/article.htm?execution=e2s1] {Jean Huber, 1-August-2018} <°))))>< <°))))>< <°))))><
- Naumann, B. & C. Englert. [Naumann and Englert review distinct dispersed-reaggregation egg phase in annuals (4 sp.: *Nothobranchius furzeri*, *Austrofundulus limnaeus*, *Austrolebias charrua* and *Austrolebias bellottii*), to boost them as models of cell development. 2018. DD, https://www.sciencedirect.com/science/article/pii/S0012160618303634] {Jean Huber, 26-July-2018} <°))))>< <°))))>< <°))))><
- Foster, K.L. & K.R. Piller. [Foster and Piller explain much lower morphological diversification and speciation of Empetrichthyinae (genera *Empetrichthys* and *Crenichthys*) vs. (related) livebearing Goodeinae (more ecological opportunistic to novel habitats), as new lands are created in meso-America. The whole family Goodeidae is found within Great Basin of southwestern USA and central Mexican highlands. The subfamily Goodeinae is endemic to Mexico, with approximately 18 genera and 42 extant species, several being extinct or extremely theatened, with the highest diversity occurring in geographic area known as Mesa Central, a relatively depauperate, isolated highland plateau. Empetrichthyinae are only represented today by 3 species in 2 genera. Both subfamilies have today disjunct distribtions, the former to the south the latter to the north. According to molecular calibrated data, diversification has occured in extant species of both groups at about the same time, around Miocene (about 9-10 MYA). But body shape, head shape, and caudal fin shape are very variable in former subfamily and rather stable in latter subfamily. The authors

conclude that Goodeinae proves to have been more opportunistic when new lands are available (not far from Lerma basin) than their cousins Empetrichthyinae and that is not linked to trophic or dietary variations. 2018. BMC, https://bmcevolbiol.biomedcentral.com/articles/10.1186/s12862-018-1220-3] {Jean Huber, 26-July-2018} <°))))>< <°))))>< <°))))><

- Garcez, D.K., C. Barbosa, M. Loureiro, M.V. Volcan, D. Loebmann, F.M. Quintela & L.J. Robe. [Garcez et al. evaluate levels of (up to 2.6%) genetic and (low) morphometric diversity of *Austrolebias wolterstorffi* across full range (and about 100 specimens for each molecular and morphometric techniques). The authors, based on those hi-low differences, recognize at least 6 different population groups notably along the large Patos-Mirim lagoon, each group not sharing any mitochondrial haplotype with the others. 2018. EBF, https://link.springer.com/article/10.1007/s10641-018-0795-2] {Jean Huber, 20-July-2018} <°))))>< <°))))>< <°))))><
- Costa, W.J.E.M. & P.F. Amorim. [Costa and Amorim describe miniature cryptic *Spectrolebias gracilis* {K-D maintained in *Simpsonichthys*}, similar to *costai* (labeled as *costae*). The new species *gracilis* is molecularly separated and morphologically diagnosed from *costae* {*costai*}, *semiocellatus* and *inaequipinnatus* by Dorsal and Anal fins in male with iridescent dots restricted to the basal portion of fins (vs. scattered over whole fin), Caudal fin in male hyaline (vs. variably colored, usually dark red or grey), Caudal fin base with 2 pairs of neuromasts (vs. 1), and more precisely *gracilis* differs from *costae* {*costai*} by an iridescent light blue color pattern in male, comprising 10-12 small blue spots irregularly arranged on opercle, surrounded by diffuse blue iridescence (vs. 6–8 small blue spots, usually arranged in 3 vertical series, contrasting with dark brown color ground) and one or two series of dots irregularly arranged on basal portion of Dorsal fin (vs. blue dots arranged in single longitudinal row close to fin base). 2018. ZSE, https://zse.pensoft.net/articles.php?id=28085] {Jean Huber, 19-July-2018} <°))))>< <°))))>< <°))))><
- Yogurtçuoglu, B., S.G. Kirankaya, L. Gençoglu & F.G. Ekmekçi. [Yogurtçuoglu et al. study feeding of *Aphanius marassantensis* {KD as a junior synonym of *chantrei*}, omnivorous with seasonal and ontogenic variation. 2018. EBF, https://link.springer.com/article/10.1007/s10641-018-0794-3] {Jean Huber, 18-July-2018} <°))))>< <°))))>< <°))))><
- Origuela, F.L., D.T.B. Nielsen & L.A. Medeiros [Origuela, Nielsen and Medeiros first report *Laimosemion xiphidius* {K-D maintained in *Rivulus*} from Brasil (Amapa state) close to Guyane border. 2018. Aqua, https://aqua-aquapress.com/volume-23-issue-3-24-july-2017-3/] {Jean Huber, 1-July-2018} <°))))>< <°))))>< <°))))><
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