



## INTRODUCTION

The present Wassup is back to normal, just after a solution is found, not by Aqua editor, but by Zootaxa editor, for 5 new taxa, temporarily not available in 2022, now ICZN available (and dated 2023): *Anablepsoides katukina* and *falconi* Nielsen, Hoetmer & Vandekerkhove, 2023 {in Killi-Data, maintained in *Rivulus*, according to latest evidence}, *Laimosemion anitae* Nielsen, Hoetmer & Vandekerkhove, 2023 {in Killi-Data, maintained in *Rivulus*, according to latest evidence}, all 3 prematurely dealt in previous Wassup, and *Aphyosemion lorai* and *Caeruleamsemion* (a new subgenus of *Aphyosemion*) Valdesalici & Malumbres, 2023, both 2 dealt with herein for the first time.

Within this time frame of present Wassup and not taking into account 3 of the above taxa already covered in previous issues, it must be noted only 5 new species and 1 new generic name, i.e., 1 African sp., *Aphyosemion lorai* and a not related new subgenus of *Aphyosemion*, *Caeruleamsemion* (for the *coeleste* superspecies in an extended sense), 4 South American sp., *Hypsolebias lulai* (kept in genus *Simpsonichthys* by Killi-Data, as latest evidence, but it is becoming uneasy because in the latest evidence AND in that new paper with *lulai* there is one author in common, Dalton Nielsen -then who might have changed his mind-, and it is hoped that a comprehensive molecular review of *Simpsonichthys* in large sense is published soon) and *Moema beltramonorum* (in subgenus *Aphyolebias*) and lately *Hypsolebias gongobira* and *bonita* (same remarks as *lulai*).

Besides, there are some further discussions on major themes:

First is the double publication on molecular *Aphyosemion* systematics (2022, with invalid names but valid contents, never analyzed herein, and 2023, with limited contents but valid names) by Valdesalici & Malumbres and it is worth commenting because it is among the first studies mixing known GenBank-published data mainly from academic but non-professional author Collier and new sequences by those 2 non-professionals, and the resulting tree is clearing some issues but (and that is surprising it has been accepted by reviewers) it leaves unsolved many others (a group of species *wildekampii-punctatum-raddai-labarrei* with very low bootstrap value, a group of heterogeneous species *joergenscheeli-escherichi* (sensu Seegers)-*herzogi*, another group of heterogeneous species, *callipteron-schluppi*, and again another group of heterogeneous species *hofmanni-tirbaki*) which stands in total as an unstable tree, and further studies are compulsorily needed to understand fully the phylogeny of genus *Aphyosemion*; note: the authors (2022) state an *affinis* location of *lorai* at Nsogobor in Guinea Ecuatorial, very near to Gabon border, then again indirectly raising the issue of unstable identification of *etsamense-escherichi*.

Second is the full review of Poeciliidae by Rodriguez et al. aiming at clarifying some ambiguous branches of groups of species by using reviewed molecular sequences and succeeding in that objectives for some but with the drawback that other branches become unstable (while they were not before, such as *Phallichthys* and

*Poecilia*). Obviously this is a useful study but even more it raises the issues of solidity of sub-branches in molecular trees in general and for killifish trees in particular, similarly to above study by Valdesalici & Malumbres (solidity is materialized by bootstrap values for each branch or any similar index). Yes early molecular studies (with limited sequences and limited samples) looked as miracles to many early observers because, unlike previous tools, they were able to “solve” previously mysterious phylogenetic relationships, notably between atypical congeners. Sometimes the new evidence is later confirmed and new stability has arisen. But many other times the contrary has happened when with extended sequences and samples are used, e.g. full mitochondrion and-or 90% list of congeners. If to study full mitochondrion or even full genome (cf. here *Poeciliopsis prolifica*) is a matter of time (and patience), it is another story for extended samples. With Tyrone Genade, the present author has launched a molecular killi-bank of species with the great volunteering participation of dedicated aquarists and collectors, but it failed to meet molecularists’ interest because of the lack of budget on their sides (to undertake new molecular studies) and because the usual previous process of a given molecularist using only a personal close contact with a given donor of tissue is not meeting the principle of that killi tissue bank, even free. Time will tell what will outcome!

Third is the situation, following several questions on incongruences between latest published evidence and non-conformity to scientific results in California C.O.F. (and this time too in Fishbase), that occurs after the reshuffling of *Austrolebias* and split into 11 distinct genera by Alonso et al., and this time again the present author cannot answer for those 2 institutions ; however, yes, this corresponds to previous analysis on other cases that C.O.F. and independently (and sometimes differently) Fishbase are run by anonymous professionals and decisions are taken with their own rules (Killi-Data follows latest evidence, no matter its source, author(s), journal, flag, whatsoever). Is C.O.F. better, or is Fishbase better, or is Killi-Data better, or else? Nobody knows. The decision by C.O.F. synonymizing all 10 genera back into *Austrolebias* has been felt by the authors led by Alonso as a blow on their work especially since it is published in a very notorious international journal (Zoological Journal of the Linnean Society). Time will tell, but now previous decisions by C.O.F. (e.g., not taking into account non-splitting latest evidence on *Rivulus* in a large sense or on *Simpsonichthys* in a large sense, and favoring Costa’s splitting in those 2 cases) are clearer and clearly opinion-based or say it differently professional judgement-based. Who will have the voice power, today or in the future? Nobody knows.

Side note: this issue of K-D Wassup (hopefully from now on ) is also a bit different since, among the alert analyses, there are 3 authors (thanks to them), distinct from the editor, Vasco Gomes, Thomas Litz, Stefano Valdesalici, each time credited. Others are welcome!

## SELECTION OF PUBLICATIONS (last in, first out)

- Abrantes, Y.G., T.P.A. Ramos, D.M. Bento & S.M.Q. Lima. [Abrantes et al. describe *Hypsolebias gongobira* and *bonita* {K-D maintained in *Simpsonichthys, heloplites* group}, from N.E. Brasil ; *Hypsolebias antenori* was hitherto considered to be distributed over a broader geographic range, and to be variable in morphological characters and color pattern ; detailed investigations show that the fishes from a temporary pool in the rio Pacoti basin in Ceará State northwest of the distribution range of *antenori* are described as *gongobira*, and the fishes in the floodplains of the rio Apodi-Mossoró basin and in the córrego Virgílio microbasin in the Furna Feia National Park, in Rio Grande do Norte State to the southeast are described as *bonita*, respectively ; the *antenori* species complex now consists of 8 species: *antenori* {=*heloplites*}, *bonita*, *coamazonicus*, *faouri*, *gongobira*, *igneus*, *martinsi* and *nudiorbitatus* ; in addition to morphological data the molecular data indicate a deep separation between *antenori*, *bonita*, and *gongobira*, greater than between hitherto known valid nominal species (*martinsi* and *coamazonicus*, *faouri* and *igneus*) {note: one obvious fact is unfortunately not considered in this publication, the new species are distinguished against *antenori* only, and a possible synonym of this senior taxon, *Cynolebias*

*heloplites*, is not included into the discussion ; due to the current controversial discussion about the status of *Cynolebias antenori* and *heloplites* the discrimination of the two new species to both older taxa would significantly improve this work}. 2023. Zootaxa, <https://mapress.com/zt/article/view/zootaxa.5389.5.2> ] {Thomas Litz, 23-December-2023} <°))>< <°))>< <°))><

- Styga, J.M., I.G. Brown & M.V. McMullen. [Styga et al. show in *Kryptolebias marmoratus* that clones from clutches with 7 or fewer eggs produce longer average jumps as adults ; this is again a smart and very micro-detailed behavioral experiment this time linked to phenotypic plasticity (jumping performance capacity, based on videos) ; *Kryptolebias marmoratus*, in the wild, are today well known as hermaphroditic populations of clones (isogenic lines) ; in the present study, possible males are easily (from pattern of Caudal fin mainly) and clones are housed in a common garden ; the authors investigate the link between variation in adult terrestrial jumping performance and early life experience (i.e., egg density equal or lower than 7 or on the contrary more than 8) ; results show that significant genetic variance is associated with mean jumping performance ( $p < 0.001$ ), but not maximum jumping performance, that average jumping performance exhibits a significant positive relationship to S.L. (standard length), that, in each trial, there is a significant negative relationship between relative jump distance and jump number, that surprisingly egg density during early LHT has a significant effect on average and maximum jumping performance when adult (much later), but that age and trial do not have a significant effect on average or maximum jumping performance ; finally the authors discuss their sometimes unexpected results with previous studies for that unique mangrove species. 2023. BJLS, <https://academic.oup.com/biolinnean/advance-article-abstract/doi/10.1093/biolinnean/blad162/7455764> ] {Jean Huber, 22-December-2023} <°))>< <°))>< <°))><
- Zhang, Y., Y. Reynoso, D.R. Reznick & X. Wang. [Zhang et al. disclose full genome of blackstripe livebearer, *Poeciliopsis prolifica*, at 27,227 bp, separated from Guppy ca. 19 MYA ; *Poeciliopsis prolifica* is a viviparous matrotrophic species that has evolved a structure similarly to the mammalian placenta (humans included) even if, in Poeciliidae, fish placentas have independently evolved multiple times ; the authors details the full genome of that species after a 674 Mbp assembly in 504 contigs with excellent continuity (contig N50 7.7 Mb) and completeness (97.2% BUSCO completeness score, including 92.6% single copy and 4.6% duplicated BUSCO score) ; this is about the best in terms of details that can be achieved today on full genome ; and they compare their results with the very much researched guppy (*Poecilia reticulata*) and according to the automatic computation the 2 lineages separated some 19 MYA (million years ago) {this study is an example of cooperation between China and USA thru internationally renowned New Yorker David Reznick}. 2023. GBE, <https://academic.oup.com/gbe/advance-article/doi/10.1093/gbe/evad195/7394835?se> ] {Jean Huber, 21-December-2023} <°))>< <°))>< <°))><
- Valdesalici, S. [Valdesalici describes Bolivian *Moema beltramonorum* {K-D in subgenus *Aphyolebias*} with irregular vertical rows of red dots in male : the new species originates from a seasonal swamp next to arroyo Crespo, belonging to rio San Martin, a tributary of rio Iténez, Amazon River basin ; it is separated by a combination of characters based on pattern and morph, notably a pattern of irregular and discontinuous vertical rows of red dots on sides of both sexes ; according to the author, it is related to *boticarioi*, *claudiae*, *juanderibaensis*, *kenwoodi*, *manuensis*, *obliqua*, *rubrocaudata*, and *wischmanni* ; the species is named in honor to Christine and Jean Marc Beltramon, renown French aquarists, the initial collectors. 2023. Zootaxa, <https://www.mapress.com/zt/article/view/zootaxa.5383.4.10> ] {Jean Huber, 19-December-2023} <°))>< <°))>< <°))><
- Johnson, E.S., M. Tobler & J.B. Johnson. [Johnson et al. study changing LHT of female lecithotrophic *Priapichthys annectens* during wet season (fewer but larger offspring) ; the species is known as both lecithotrophic (provisioning eggs with nutrients being deposited in the ova prior to fertilization) and

without placentation (females only carry one developing brood at a time) ; here the authors provide with a new approach to life history studies (LHT) by differentiating observations during wet (or rainy) season and the rest of year ; results make sense (but are evidenced) such as reproductive investment, but not the timing of reproductive events, differing between seasons ; during wet season, female body condition increases, female invests less in reproduction, with fewer but larger offspring ; as usual but irrespective of season, larger female gives birth to larger offspring. 2023. BJLS,

<https://academic.oup.com/biolinnean/advance-article-abstract/doi/10.1093/biolinnean/blad119/7428692> ] {Jean Huber, 12-December-2023} <°)))))><

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- Rodriguez, S.M., D.J. Elias, C.D. McMahan, A. Gruskiewicz-Tolli, K.R. Piller & P. Chakrabarty. [Rodriguez-Machado et al. recover 4 major supra-clades within Poeciliidae using concatenated and coalescent phylogenomic inferences ; the authors reassess phylogenetic relationships within Poeciliidae using loci from over 1,000 ultraconserved elements and explore different potential sources of gene tree discordance ; the study includes 25 of the 27 genera recognized in Poeciliidae (*Xenophallus* and *Pseudopoecilia* missing) and *Jenynsia lineata* and *Anableps dowei* from the family Anablepsidae as outgroup ; the concatenated and coalescent phylogenomic inferences congruently recovered 4 major clades of Poeciliidae, all the genera included in the study are recovered as monophyletic except *Phallichthys* and *Poecilia (Mollienesis)* ; the phylogenetic relationships of Poeciliidae based on genome-scale data, multiple factors obscure major diversification events in Poeciliidae and biographic considerations are discussed in detail, based on previous data and data generated during this study. 2023. M.P.E., <https://www.sciencedirect.com/science/article/pii/S1055790323002658> ] {Thomas Litz, 7-December-2023} <°)))))>< <°)))))>< <°)))))><
- Dominguez, O.C., T.M.C. Muñoz, S.C. Valdez & A.A. Echelle. [Dominguez et al. study male territorial behavior of sympatric *Garmanella pulchra* and *Cyprinodon artifrons*, with asymmetric densities ; this is a smart and very micro-detailed behavioral experiment differentiating for cases when those 2 killifish are sympatric in a small mangrove floodplain of Yucatan peninsula, Mexico ; the authors disclose 2 contrasting situations, one case where territorial males of *pulchra* are several times more abundant than those of *artifrons* {a species related to *variegatus*} and the reverse case ; in both situations, the roughly circular breeding territories are non-overlapping intraspecifically and show complete overlap interspecifically ; territories of both species are several times smaller in the situation where they are numerically dominant and territories of *pulchra* are about twice as large as those of *artifrons* and males of both species show higher conspecific aggression, lower heterospecific aggression, more reproductive activity, lower feeding rates, and lower percentages of body fat ; social behavior in the wild, described for the first time for both species, generally conforms to typical Cyprinodontidae themes for territorial and reproductive behavior ; besides, in *Garmanella pulchra*, there is no evidence of the typical courtship dance, nor the overt, male parental care, well known for related *Jordanella floridae*, endemic to Florida (USA). 2023. A.E., <https://link.springer.com/article/10.1007/s10211-023-00433-5> ] {Jean Huber, 5-December-2023} <°)))))>< <°)))))>< <°)))))><
- Bragança, P.H.N., J. Van der Zee, P.S. Lobel & U. Schliewen. [Bragança et al. review osteology of *Congopanchax* and its 2 components, *myersi* and *brichardi*, plus an undefined pop from N.W. Congo ; this is mainly a detailed osteological study of that Congo endemic genus {previously as a subgenus} and its 2 current species members (a third species is said to be described as new, soon) ; then the genus is redescribed from new osteological characters and also from morphological characters, notably the extended Ventral fins in male (plus autapomorphies as Dorsal fin bilobate, with first two and last Dorsal fin rays filamentous, infraorbital bar present and a longitudinal dark line on ventral mid region of sides) ; besides, an updated list of African freshwater miniature (pygmy) species containing a total of 58 species is presented, including information about their distribution, habitat and conservation status, including

*Micropanchax jeanneli*. 2023. Spx, [https://pfeil-verlag.de/wp-content/uploads/2023/11/spx\\_46-1\\_16\\_ne.pdf](https://pfeil-verlag.de/wp-content/uploads/2023/11/spx_46-1_16_ne.pdf) ] {Jean Huber, 2-December-2023} <°))>< <°))>< <°))><

- Piller, K.R., E. Parker, C.D. McMahan, D.J. Elias, W.A. Matamoros & E.V. Velazquez. [Piller et al. show micro-ranges and gene flow do not match for populations of *Tlaloc hildebrandi*, an highland endemic to Mexico ; the authors test if various models of distribution, namely Stream Hierarchy (SH), Death Valley (DV), Headwater (HW), and Widespread Gene flow (WG) models correspond to pattern of distribution {rather a dendritic stream network} of populations for *Tlaloc hildebrandi*, Profundulidae {previously in genus *Profundulus*}, i.e. if a spatial hierarchy of reaches, streams, subcatchments, and catchments exists in line with gene flow ; molecular results with ultraconserved elements of genes provide support for SH model, although some individuals from the Jataté sub-basin conform to HW model, probably due to historical connections among headwater streams and rivers of Jataté and Amarillo–Chenalho clades/clusters ; besides, greatest degree of gene flow occurs from Grijlava to Usumacinta basins, 2 geographically proximate basins where previous connections are hypothesized. 2023. BJLS, <https://academic.oup.com/biolinnean/advance-article-abstract/doi/10.1093/biolinnean/blad137/7320167> ] {Jean Huber, 10-November-2023} <°))>< <°))>< <°))><
- Dominguez, O.C., M.R. Suarez, I.Z. Solano & J.J.V. Zuñiga. [Dominguez et al. do not statistically show relationship between male morpho-anatomy and placentotrophy in 3 species of *Poeciliopsis* ; placentotrophy is a particular type of maternal provisioning in embryos, where nutrients are included with complex placental structures ; this means less pre-fertilization investment for male (sperm) and this occurs in various groups of ovoviviparous Poeciliidae ; the authors test, for the first time at the intraspecific level, whether there is a similar relationship between a higher degree of female placentotrophy and the evolution of male reproductive traits (larger testes and longer gonopodia) along 3 species of genus *Poeciliopsis* (*gracilis*, *infans*, *prolifica*) ; results show a tendency (trend) towards longer gonopodia in male of *gracilis* as well as largest testes of *prolifica* male in populations with highest degrees of placentotrophy, but this is not statistically significant, and further studies are required. 2023. E.E., <https://link.springer.com/article/10.1007/s10682-023-10270-4> ] {Jean Huber, 9-November-2023} <°))>< <°))>< <°))><
- Borisov, V., F. Shkil, D. Seleznev & S. Smirnov. [Borisov et al. show less intense versions of DII and DIII in *Fundulopanchax gardneri* compared to true annual *Austrofundulus limnaeus* ; *Fundulopanchax gardneri* {in a strict sense, because the studied strain is from Lafia, Nigeria} is well known {by aquarists} as an annual or seasonal killifish {or semi-annual, or non-annual, depending on a given population of *gardneri* superspecies, roughly north or south} ; the authors describe in detail for the first time embryonic development of *gardneri* (4 breeds) and show it resembles to undoubtedly annual *Austrofundulus limnaeus*, in displaying 2 developmental arrests ; however, if compared with *limnaeus*, these developmental states look like less intense versions of DII and DIII rather than true diapauses ; according to them, before new further studies (e.g., different temperatures, desiccation, oxygen deprivation, etc.), acceptance of *gardneri* as a representative non-annual fish seems premature ; besides the authors give new data on prehatching embryos and on early life history traits (color patterns, osteology, anatomy, notably 30–32 ossified vertebrae, numerous teeth, ossified rays in Pectoral and Caudal fins, and cartilaginous rays in Dorsal and Anal fin folds) of the species. 2023. D.D., <https://anatomypubs.onlinelibrary.wiley.com/doi/pdfdirect/10.1002/dvdy.668> ] {Jean Huber, 7-November-2023} <°))>< <°))>< <°))><
- Dominguez, O.C. & I. Schlupp. [Dominguez and Schlupp compare ecology and interactive ethology of sympatric *Poecilia velifera* and *mexicana* in Yucatan mangroves : the 2 mollies {*Mollienesia* is a subgenus of *Poecilia*} inhabit overlapping habitats in Mexico, notably in Yucatan peninsula ; the authors study and discriminate elements of behavior for the 2 dimorphic species (rest, body cleaning, suffer sneaking,



foraging, copulating attempts, position in vertical orientation, aquatic surface respiration, courtship displays) ; notably they separate their analysis according to 3 morphotypes of *velifera* (large, intermediate-ornamented and cryptic-intermediate, surprisingly with advantages to the latter) ; according to them, frequent courtship and sexual behaviors from *mexicana* males directed to *velifera* females should deserve future attention to determine if hybrids are created in nature {a detailed study as a food for thought on useful discriminant criteria to compare sympatric congeners}. 2023. Beh,

<https://brill.com/view/journals/beh/aop/article-10.1163-1568539X-bja10243/article-10.1163-1568539X-bja10243.xml> ] {Jean Huber, 6-November-2023} <°))>< <°))>< <°))><

- Loureiro, M., S. Stareczek, A. D'Anatro, A.W. Thompson & G. Orti. [Loureiro et al. show genetic variation and gene flow of *Austrolebias arachan* {K-D in *Garcialebias*}, from 17 localities over range ; according to the authors {and most killifish researchers}, palaeogeographical and climatic processes are among the main factors affecting biological diversity and distribution patterns and in freshwater systems, major dispersal processes are caused by river drainage rearrangements where the direction of flow of a stream changes, allowing range expansions and connection of previously isolated communities ; precisely, in palaeo-times, connections of southwestern Amazon basin occurred with La Plata basin during the formation of the Bolivian Orocline, and La Plata basin with Atlantic coastal basins since the split of South America from Africa ; in this article the authors analyze with molecular data of many populations the phylogeographic pattern of *Austrolebias arachan* in the context of putative river rearrangements ; 2 hypotheses are tested: (a) the spatial configuration of river basins determines the genetic structure and distribution of this species, or (b) coastal drainages captured sections of upland shield river drainages ; results support more prediction of first hypothesis, but second hypothesis is also in part confirmed ; cytochrome b haplotype network configuration and its phylogenetic pattern suggests at least 2 independent events of capture, with divergence time estimated at the onset of Pleistocene glacial cycles {i.e., starting 2.6 MYA, million years ago, with duration cycles of about 41, 000 years slowing down to 100, 000 years, in less old times}. 2023. Z.S., <https://onlinelibrary.wiley.com/doi/abs/10.1111/zsc.12636> ] {Thomas Litz, 4-November-2023} <°))>< <°))>< <°))><
- Valdesalici, S. & F. Malumbres. [Valdesalici and Malumbres ICZN-validly publish new *Aphyosemion lorai* from EcuGui and new *Caeruleamsemion* (subgenus of *Aphyosemion*) ; those 2 new names, *Aphyosemion lorai* and *Caeruleamsemion* (a new subgenus of *Aphyosemion* with *coeleste* as type species), previously published in Journal titled Aqua (now defunct) in 2022, but ICZN unavailable, are officially published as a synthesis of previous article, with a Zoobank number and Internet source, dated 2023 (all systematic contents, except the new names, are though fully ICZN acceptable) ; the new species, also characterized by molecular data, shows a male color pattern very close but rather distinct from Gabonese congener *mimbon* and even if from Ecuatorial Guinea, the 2 spots (one as aff.) are very close to Gabon border. 2023. Zootaxa, <https://www.mapress.com/zt/article/view/zootaxa.5361.1.11> ] {Jean Huber, 31-October-2023} <°))>< <°))>< <°))><
- Bragança, P.H.N., D. Tweddle, J. van der Zee, E. Njagi, B. Nagy, W.J.E.M. Costa & A. Chakona. [Bragança et al. show that hitherto named *Procatopus* sp. from Lake Baringo is introduced, conspecific with *Lacustricola maculatus* ; Bragança et al. solve the long-lasting question about the species status of the Lake Baringo lampeye ; Mann (1971) first published *Aplocheilichthys* sp. as new record ; later, several authors discuss the species status, both in scientific and aquarium literature, the Bragança team is able to collect that lampeye at 6 locations around Lake Baringo in 2022, to identify the species status ; specimens are molecularly studied and compared to *Lacustricola bukobanus*, *lualabaensis*, *maculatus*, *margaritatus* and *pumilus* ; results show that the Lake Baringo lampeye is identical to *Lacustricola maculatus* ; due to disjunct ranges with the natural distribution range of *maculatus*, it is likely introduced by humans in that Rift lake ; unfortunately the introduction pathway is still not clear up to date ; due to endemism the Lake Baringo lampeye has been considered to be critically endangered according to the IUCN assessment, the

status can now be changed, historically since 1941 ; specimens are then molecularly studied and compared to identified *Lacustricola maculatus*, and as outgroup *pumilus* and *lualabaensis* ; results show that Lake Baringo fish is identical to *maculatus*, then due to disjunct ranges with natural *maculatus*, it is considered as an artificial introduction in that Rift lake. 2023. PAFFA, <http://www.killi-data.org/registration.php> ] {Thomas Litz, 30-October-2023} <°))>< <°))>< <°))><

- Weber, V., R.S. Godoy, L.E.K. Lanés, P.H.O. Hoffmann, C. Stenert & L. Maltchik. [Weber et al. show fecundity of *Austrolebias cyaneus* {K-D in *Matilebias*} and *Cynopoecilus nigrovittatus* in situ throughout hydroperiod ; the authors evaluate the fecundity of *Matilebias cyaneus* and *Cynopoecilus nigrovittatus* throughout the hydroperiod (June: early inundation, August: drying, and September: late inundation) of a temporary pond in 2022 ; fecundity is studied by examining the total number of eggs produced ; the Weber team also correlates egg production with the size and weight of fish from both species ; furthermore, the fecundity of *cyaneus* in the presence of *nigrovittatus* and vice versa is evaluated ; the approach involves exploratory analysis to infer the underlying factors affecting egg production ; results indicate that there are reproductive differences between non congeners *cyaneus* and *nigrovittatus* ; both species exhibit continuous reproduction, however, *cyaneus* exhibits constant egg deposition throughout the study period, and body size of *nigrovittatus* positively influences the number of eggs, with greater deposition at the end of the cycle ; when the species *cyaneus* and *nigrovittatus* are in interaction, there is a reduction in the fecundity of *cyaneus* only at the beginning of the cycle compared to the monospecific treatment ; for *nigrovittatus*, there is a reduction in fecundity when in co-occurrence, considering the entire hydrological cycle, but the interaction between species does not affect the number of eggs of *nigrovittatus* in each sampling ; these results show that both species exhibit egg laying throughout their entire life cycle ; this continuous effort in egg production is evolutionarily considered a way to ensure the persistence of species of the Rivulidae family in temporary wetlands. 2023. W.L., <https://link.springer.com/article/10.1007/s13157-023-01745-9> ] {Thomas Litz, 30-October-2023} <°))>< <°))>< <°))><
- Ramos, T.P.A., D.T.B. Nielsen, Y.G. Abrantes, F.O. de Lira & S.Y.L. Costa. [Ramos et al. describe *lulai*, new species of genus *Hypsolebias* {K-D maintained in *Simpsonichthys*} from Trairi basin, Northeast Brasil ; it belongs to the *Hypsolebias flammeus* species group and differs from congeners *alternatus*, *delucai*, *fasciatus* and *longignatus* by color pattern of both males and females and from *brunoi*, *flammeus* and *multiradiatus* by dorsal and anal fin shape and by the orientation of the reddish-brown bars on the body and anal fin of males ; type locality is at Capim Grosso Lagoon, a natural temporary body of water in the drainage of the rio Traisi basin, and is only found at two other artificial reservoirs of Malhadas and Quixabeira dams, both in the proximity of the type locality ; the species is named in honor of Luiz Inacio Lula da Silva, Brazilian president at the time of the description ; *Hypsolebias lulai* is categorized as Vulnerable (VU) according to IUCN criteria. 2023. N.I., <https://www.scielo.br/j/ni/a/g4jfMDMycYjprbmFJLdgk5h/?lang=en#> ] {Vasco Gomes, 24-October-2023} <°))>< <°))>< <°))><
- Dominguez, S.E.C., A. Kobelkowsky & E.V. Velazquez. [Dominguez-Cisneros et al. register presence of coronoid cartilage and intestinal valve in *Tlaloc hildebrandi*, from southern Mexico ; *Tlaloc hildebrandi* is a freshwater killifish, endemic to southern Mexico and under threat of extinction ; the knowledge of the trophic morphology and diet is needed by conservation managers ; Domínguez-Cisneros et al. study the trophic anatomy on 20 adult specimens of both sexes, through the manual dissection ; and stomach contents analysis is performed in 60 individuals to describe the diet ; they discover that digestive system of *Tlaloc hildebrandi* corresponds to the general morphologic pattern of the Cyprinodontiformes ; additionally they register the presence of a coronoid cartilage and an intestinal valve ; the structures of the trophic morphology and the components of the diet, confirm that *hildebrandi* is a carnivorous-insectivorous fish in particular the insects of the Chironomidae family (53% IVI<sub>r</sub>) are dominant item in the

diet. 2023. R.B.T., <https://revistas.ucr.ac.cr/index.php/rbt/article/view/54253> ] {Stefano Valdesalici, 12-October-2023}

- Wisenden, B.D., C.M. Anderson, K.A. Hanson, M.I.M. Johnson & C.A. Stockwell. [Wisenden et al. show predator recognition via epidermal alarm cues but not via dietary alarm in *Cyprinodon shoshone* and *amargosae*; the 2 tested congeners, both subspecies of *nevadensis shoshone* and *amargosae*, show similar responses to conspecific chemical alarm cues released when epidermal tissue is damaged by a predator; then according to the authors both subspecies reduce their activity and change vertical position in water column in response to those alarm cues; besides, both subspecies are tested if they can use alarm cue to acquire recognition of a novel predator (here, a largemouth bass), either with water plus odor of bass when fed a diet of earthworms, or cues from skin extract (epidermal alarm cues) plus odor of bass when fed a diet of earthworms, or alternatively water plus odor of bass when fed a diet of pupfish (dietary alarm cues) and results show that both subspecies react to epidermal alarm cues but not to dietary alarm cues; besides if both subspecies are retested with odor of bass that are fed an earthworm diet and if they had previously received epidermal alarm cues, they reduce vertical position and change activity relative to the other two treatments and this experiment is the first demonstration of acquired recognition of a novel predator by a pupfish, the first report of partial predator naiveté, and opens the possibility of predator-recognition training as a tool for management and conservation of endangered desert fishes {though uneasy to implement}. 2023. RSOS, <https://royalsocietypublishing.org/doi/pdf/10.1098/rsos.230444> ] {Jean Huber, 21-September-2023}
- Trujillo, P.J., K.K.R. Bonilla, R.F. Castro & M.G.Z. Bustos. [Trujillo et al. disclose LHT of viviparous *Ilyodon whitei* as sex-ratio (1:1.2), 7% larger females, 18 eggs by batch (min 9-max 42); *Ilyodon whitei* is a true viviparous (small) fish member of relict Goodeinae, endemic to rio Balsas basin in Mexico; the authors present rare life history study for one population (not endangered, but fragmented) in rio Amacuzac with collection of 1493 specimens; methodology is standard, evaluating size structure, sex ratio, length-weight relationship, gonadal maturity stage, size at first maturity, fertility, morphological indexes related to reproduction and reproductive habitat from typified classes (group of specimens); length at maturity is 51.54 mm (female) and 48.12 mm (male), fertility ranges between 9 and 42 embryos per female, averaging 18 {a high maximum in comparison to size of female}; the authors believe that with the above detailed data, the conservation status of the species may be better managed, notable because of anthropogenic activities that imperil the current population sizes of *Ilyodon whitei*. 2023. H.R., <https://hydrobiologicalresearch.com/index.php/pub/article/view/2/2> ] {Jean Huber, 15-September-2023}
- Rodriguez, S.M., J.L. Ponce, I. Germon, D. Casane & E.M. Garcia. [Rodriguez et al. disclose in *Limia vittata* {K-D maintained in *Poecilia*} 3 groups of populations in Cuba and high haplotype diversity; the ovoviviparous subgenus (or genus for still rare authors and for aquarists) *Limia* is endemic to Greater Antilles with a single species in Cuba, *Limia vittata*, widespread in lowland ecosystems {no conservation concern, except locally}; with molecular data of 2 mitochondrial markers, the authors show that levels of intraspecific divergence in *vittata* are lower compared to other Cuban Poeciliidae, that however it is formed by 3 genetically differentiated and geographically delimited groups of populations {un-named, yet}, with moderate intraspecific divergence and a mtDNA pattern of high haplotype diversity and low nucleotide diversity; according to the authors this genetic pattern is consistent with a rapid {and recent} demographic expansion, notably from eastern to western Cuba as the most likely scenario; this distinct regional distribution (in haplogroups) corresponds to major core landmasses within Cuba, along palaeoclimatic changes and the observation is congruent with phylogeographic patterns in other freshwater and terrestrial taxa on the island {note: the authors are a solid French-Cuban team specialized in Cuban Cyprinodontiformes since a decade}. 2023. BJLS, <https://academic.oup.com/biolinnean/advance->



- Safian, D., A. Marwa, H. van Kruistum, A.I. Furness, D.N. Reznick, G.F. Wiegertjes & B.J.A. Pollux. [Safian et al. show that ovoviviparous Cyprinodontiformes have independently evolved 2 different kinds of placentas multiple times ; in Poeciliidae, the authors morphologically disclose, for placenta as a complex organ in female, 2 types, one (for *Poeciliopsis turneri* and *Poeciliopsis presidionis*, *Poeciliopsis (Aulophallus) retropinna* and *Poeciliopsis (Aulophallus) paucimaculata*) named villous type, the other (for *Poeciliopsis prolifica*, *Phalloptychus januarius*, *Heterandria formosa* and *Poecilia (Micropoecilia) bifurca*) named smooth types ; those 2 types are scattered over the molecular tree then they have independently evolved multiple times across the family, providing evidence for repeated convergence ; besides, comparative genomic analysis shows that genomes of species with different placentas are evolving at a different pace ; the 2 placental phenotypes correlate with two previously described contrasting life-history (LHT) optima [Furness, A.I., J.C. Avise, B.J.A. Pollux, Y. Reynoso & D.N. Reznick. 2021. The Evolution of the Placenta in poeciliid fishes. *Current Biology*, 31 (9): 2004-2011, <https://doi.org/10.1016/j.cub.2021.02.008> ], with 2 phenotypic adaptive peaks, corresponding to 2 selective optima, associated with placentation in Poeciliidae, one represented by small-bodied species that have fast life histories and second by large-bodied species with slow life histories ; in conclusion according to authors, there is a high evolvability (both divergent and convergent) of placenta within a group of closely related species in a single family. 2023. S.A., <https://www.science.org/doi/pdf/10.1126/sciadv.adf3915> ] {Jean Huber, 26-August-2023} <°))>< <°))>< <°))><
- Caballero, C.V., J.O. Alvarado & K.M.S. Cantalice. [Caballero et al. describe new fossil viviparous Goodeidae genus-species *Paleocharacodon guzmanae*, maybe related to extant *Characodon* ; this is a major discovery based on osteological study of 14 fossil male and female specimens recovered in the Pliocene deposits (2-5 MYA) of paleo-lake Amajac, in Sanctorum, Hidalgo department, in Mexico ; like all Goodeidae, viviparous (subfamily Goodeinae) and oviparous (subfamily Empetrichthyinae), its premaxilla has a straight distal end, and its premaxillary ascending process is small ; new species is viviparous with its first Anal fin ray as rudimentary and male has an andropodium ; the authors consider it is not possible to place it in any of Goodeinae tribes {more or less Characodontini, Girardinichthyini, Goodeini, Ilyodontini, Zoogoneticini}, which currently are vaguely defined by osteological features ; however it seems to be closely related to genus *Characodon*; because both fossil and extant share articular facet for quadrate with a donut-like structure, in which the retroarticular forms central region and a couple of semicircular angulo-articular processes forming surrounding part ; discovery of this extinct species in great Panuco-Salado basin on eastern {Caribbean} slope of Mexican territory represents an unexpected historical element {note: the authors compare the various tribes listed in various papers from Parenti (1981, none) to Webb (1998, 4 tribes), Parker (2017, 5 tribes) and Foster+Piller (2018, 5 tribes) based on morpho and-or molecular data and fail to reconcile them ; besides they list in total 50 valid species of Goodeidae, including *Ilyodon lennoni* as valid and all fossils, each with its conservation status}. 2023. P.E., <https://palaeo-electronica.org/content/pdfs/1259.pdf> ] {Jean Huber, 20-August-2023} <°))>< <°))>< <°))><
- Polacik, M., D. Garcia, M.J. Arezo, N. Papa, H. Schlueb, D. Blanco, J.E. Podrabsky & M. Vrtílek. [Polacik et al. study in details embryology of 4 *Austrolebias* in a large sense and compare them with *Nothobranchius* and *Millerichthys* ; repeated, independent emergence of the same trait within different phylogenetic lineages is termed parallel evolution, sourced by similar selective pressures ; as well known, for annual killifish, when pools dry up, embryos survive through the dry phase in bottom substrate in a stage of dormancy, named diapause ; the authors hypothesize that the natural development of annual killifishes is largely synchronised and governed by ambient conditions as shown in African genus *Nothobranchius*, based on their experience and test the hypothesis in aquarium on 4 species of South American genus group *Austrolebias* {now named *Austrolebias bellottii*, *Argolebias nigripinnis*, *Titanolebias elongatus*, *Garcialebias*

*charrua*}, where diapauses independently occur vs. African lineage ; results, largely synchronised embryos with a high degree of environmental control (influence), are the same as in African *Nothobranchius* ; it represents a unique example of evolutionary parallelism in Africa and South America ; the case of *Millerichthys*, an annual killifish of Central America is discussed. 2023. F.B., [https://pdxscholar.library.pdx.edu/cgi/viewcontent.cgi?article=1437&context=bio\\_fac](https://pdxscholar.library.pdx.edu/cgi/viewcontent.cgi?article=1437&context=bio_fac) ] {Jean Huber, 15-August-2023}

- Guedes, G.H.S., C.H.P. Luz, R. Mazzoni, F.O. Lira & F.G. Araujo. [Guedes et al. disclose 3 new pops of endangered *Notholebias minimus* in coastal plains of Rio de Janeiro state with first LHT data ; the species in genera *Leptolebias* and in its recent spin-off are strongly endangered annual killifish endemic to coastal plains of Rio de Janeiro state, Brasil, and *Notholebias minimus* is not different ; the authors report, after continuous collecting efforts, new occurrences of the species in Atlantic Forest biome {progressively disappearing due to human activities} and provide for the first time LHT population features (body and egg size, fecundity, sexual ratio, and length-weight relationship – LWR) ; besides they compare changes in land use and coverage between 1985 and 2021 in biotopes located inside and outside protected areas ; following results are : shallow temporary wetlands with acidic pH ( $6.4 \pm 0.2$ ) and low concentrations of dissolved oxygen ( $2.0 \pm 0.9$  mg/l) ; male and female total length ranges, respectively, from 11.1 mm to 31 mm and 11 mm to 26 mm ; batch fecundity for these annual fish range from 18 to 40 oocytes ( $24.8 \pm 8.8$ ), corresponding to oocytes with sizes between 800–1,006  $\mu\text{m}$  ( $905 \pm 56$ ) ; males are significantly larger than females ( $W = 2193.5$ ,  $p = 0.0067$ ), but both sexes occur in similar proportions ( $p = 0.472$ ) ; LWR shows positive allometry ( $b = 3.18$ ). 2023. N.I., <https://www.scielo.br/j/ni/a/x7mvg3DYdPxJsrGNgWwK95c> ] {Jean Huber, 15-August-2023}
- Oliveira, I.J. de, N.A. Diamante, T.M.C. Fabrin, A. Frota, W.J. da Graça, A.V. de Oliveira, S.M.A.P. Prioli & A.J. Prioli. [Oliveira et al. disclose high polygenism in ovoviviparous widely distributed *Phalloceros harpagos* with 7-9 phylogenetic groups ; among the 21 taxa species described by Lucinda (2008) [ref.: Systematics and Biogeography of the genus *Phalloceros* Eigenmann, 1907 (Cyprinodontiformes: Poeciliidae: Poeciliinae), with the Description of twenty-one new species. Neotropical Ichthyology (Neotrop. ichthyol.), 6 (2): 113-158, <http://dx.doi.org/10.1590/S1679-62252008000200001>], only one, *harpagos*, has a huge distribution in Brasil and doubts have been raised whether such a relatively atypical range is solid or not {the species being then polytypic} ; distribution of *Phalloceros* species is generally allopatric and restricted {but it is often sympatric with other congeners} ; according to the authors, *harpagos* shows morphological variation, outside gonopodium structure, among populations from different Brazilian river basins and with tests using cytochrome C oxidase subunit I gene sequences it is indeed a species complex that comprises {not less than} 7 to 9 phylogroups ; it is suggested that geological separation of rio Parana and Paraiba do Sul basins most likely is the cause of that diversification during Miocene ; besides, majority of those 7-9 phylogroups has a narrow distribution, except one found primarily in rios Parana, Ribeira de Iguape and Iguacu basins (with headwater capture palaeo-events). 2023. EFF, <https://onlinelibrary.wiley.com/doi/abs/10.1111/eff.12741> ] {Jean Huber, 15-August-2023}

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