



## INTRODUCTION

With Killi-Data Wassup n°10, no more 'Editorial' is proposed but instead a short introduction to the selected publications during the time frame. Likewise no more 'View from the Chair' is proposed : even if analyses are formal and objective, neutral and disclaimed, they have been seen as too personal by some authors of publications.

Within this time frame, the menu contains (1) 4 new sp. (*cheffei*, *lourenciano*, *botocudo*, *nubium*) of *Austrolebias* from isolated zones in S.E. Brasil (thanks to perseverant researchers) but all are more or less endangered along their unique annual biotopes (due to human expansion), (2) the systematic placement of congener *varzeae* is confirmed as moved close to *wichi*, (3) new '*Lacustricola*' *pygmaeus* from Okavango, Cuando, Zambezi and revalidation of *chobensis* from synonymy of *hutereaui* {not for *schalleri*, yet } within an unstable genus {probably to be named after the finalization of postdoc work by Brazilian Pedro Bragança in South Africa, speculatively due late 2021 or in 2022}, (4) new blue and red phased *Nothobranchius nikiforovi* from *eggersi* {as a molecular sp.}, (5) present distribution of *Cyprinodon* sp. across Great Plains-Chihuahuan Desert with 8 hypotheses based on palaeo-data (including reticulation) {with 1 possible new sp. as sp. *Aguanaval*}, (6) 13 new locs of mangrove *Kryptolebias* molecularly studied in Brasil along an original cooperation between US (Tatarenkov) Brazilian researchers, (7) genetic trans-oceanic dispersal between Seychelle small islands for *Pachypanchax playfairii*, (8) twice higher gene flow from San Salvador island in multiple genes of *Cyprinodon variegatus* group across range {this tiny island harbors 3 sympatric sp., 2 being endemic, *brontotheroides* and *desquamator*}, (9) 3 genetically distinct populations of *Aphanius fasciatus* in Cyprus {all endangered}, (10) new sp. *origuelai* in *Rivulus obscurus* group {or *ornatus* group depending on authors, while live topotypes of *ornatus* are still unknown}, without forgetting interesting contributions by Briñoccoli, Garcia-Andrade, Chalar, Furness, Loayza, Monti, Okyere, Reznick, Sandkam, and their colleagues, some with brand new findings, others as follow-ups of previous works.

The major milestone of knowledge concerns unequivocally Polacik et al. (Reichard lab in Czechia) who show from field *Nothobranchius* eggs full synchrony in D1 diapause in rainy season and D2 from onset of dry season {contrary to previous understanding, notably by expert aquarists, then in artificial aquarium or lab conditions, that diapauses are randomly distributed among eggs in order to possibly save some in case of adverse events, such as precocious rains followed by droughts} ; this unexpected finding would deserve confirmation in other groups of sympatric annual killifish in other regions {of course easy targets can be proposed such as Uruguay (with several *Austrolebias*), central Brasil (with several sp. in various unrelated genera *Simpsonichthys*, *Pituna*, *Pterolebias*, *Plesiolebias*, etc.), Venezuela (*Rachovia*, *Terranatos*, etc.), and Nigeria (various subgenera of *Fundulopanchax*).

Knowledge on *Millerichthys robustus* continues to expand with 3 new papers by the Dominguez {Castanedo} team, showing further unique characteristics of that planktophagous annual killifish, single in Central America {alas poorly managed in terms of conservation, including by aquarists, because male is not colorful}.

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

- Loayza, E., D. Alvestegui, K. Herbas, C. Ibañez, C. Zepita & G.C. Miranda. [Loayza et al. compare ecomorphological features of *Orestias* sp. in Hichu Khota (W. slope) and Puina (E. slope, planted) in Bolivia ; *Orestias agassii* [as *agassizii*] species {or group of sp.} is the most widely distributed congener throughout southern Peru, Bolivia and northeast Chile in the western slope of the Andes mountains ; a few populations are found in headwaters of Amazon and Paraguay-Parana basins in eastern slopes of the Andes {they correspond to recent introductions} ; results show variation among populations, differentiating them mainly on morphometric characters, pending future genetic analysis and DNA barcodes of those eastern populations. 2021. E.B., [http://www.scielo.org.bo/scielo.php?script=sci\\_arttext&pid=S1605-25282021000100005](http://www.scielo.org.bo/scielo.php?script=sci_arttext&pid=S1605-25282021000100005) ] {Jean Huber, 8-June-2021}
- Chalar, C., G. Clivio, J. Montagne, A. Costabile, A. Lima, N.G. Papa, N. Berois & M.J. Arezo. [Chalar et al. provide insights into molecular mechanisms (not 1) of diapause III in *Austrolebias charrua* with specific proteins ; this is the first attempt to gather information about embryonic diapauses using proteomics on diapause III and prehatching *Austrolebias charrua* embryos ; results show a diapause-dependent change in a large group of proteins involved in different functions, such as metabolic pathways and stress tolerance, as well as proteins related to DNA repair and epigenetic modifications ; further studies should provide clues regarding the induction or maintenance of developmental arrests in *charrua* embryos {even if according to the authors, there appears to be no single mechanism underlying diapause}. 2021. PlosOne, <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0251820> ] {Jean Huber, 8-June-2021}
- Langeneck, J., C. Englezou, M. Di Maggio, A. Castelli & F. Maltagliati. [The Maltagliati team discloses 3 genetically distinct pops of *Aphanius fasciatus* in Cyprus (vs. range) with conservation issues {paper not obtained}. 2021. Hydrob., <https://link.springer.com/article/10.1007/s10750-021-04627-5> ] {Jean Huber, 8-June-2021}
- Furness, A.I., A. Hagmayer & B.J.A. Pollux. [Furness et al. show that, in matrotrophic *Poeciliopsis retropinna* and *paucimaculata*, allometric relationships are linked with morph ; both species in *Poeciliopsis* are matrotrophic and they lack courtship and dichromatic coloration {note : not all congeners are matrotrophic, e.g., *Poeciliopsis turrubarensis*} ; according to the authors {and various other papers by the Reznick team}, a shift from lecithotrophic (yolk-nourished) to matrotrophic (mother-nourished or placental) viviparity drives a shift from pre-copulatory toward post-copulatory sexual selection ; in lecithotrophic sp., the authors predict that pre-copulatory sexual selection will manifest as males exhibiting a broad distribution of sizes, and small and large males exhibiting contrasting phenotypes (morphology and coloration) whereas, in matrotrophic species, an emphasis on post-copulatory sexual selection will preclude these patterns ; the predictions are tested along male size, morphology, and coloration for 5 sympatric Costa Rican Poeciliidae species that differ in reproductive mode (i.e. lecithotrophy vs matrotrophy) ; the 3 lecithotrophic sp. (*Poecilia gillii*, *Brachyrhaphis roseni*, and *Poeciliopsis turrubarensis*) tend to show a broader distribution of male sizes than matrotrophic sp. and large males of such species tend to exhibit proportionately large Dorsal and Caudal fins and short

gonopodium length, relative to small males, while these patterns are expressed to a lesser extent in the 2 matrotrophic sp. (*Poeciliopsis retropinna* and *paucimaculata*) ; besides, large males in some of the lecithotrophic sp. (not all 3) exhibit darker fins relative to small males, a pattern not evident in either matrotrophic species. 2021. JEB, <https://onlinelibrary.wiley.com/doi/abs/10.1111/jeb.13875> ] {Jean Huber, 8-June-2021} <°))>< <°))>< <°))><

- Richards, E.J., J.A. McGirr, J.R. Wang, M.E. St. John, J.W. Poelstra, M.J. Solano, D.C. OConnell, B.J. Turner & C.H. Martin. [The Martin team finds twice higher gene flow from San Salvador island in multiple genes of *Cyprinodon variegatus* group across range ; most biodiversity has evolved in rapid bursts of new species, adaptations, and ecological niches ; the authors study through large-scale genomic sequencing {own new molecular data} across entire Caribbean range of pupfishes {not mainland, e.g. Mexico or USA} to understand why radiation in this group is restricted to a single Bahamian island {with 3 sp., 2 being endemic, *brontotheroides* and *desquamator*, last being probably *variegatus baconi*} results a much higher gene flow to this island brought in new combinations of ancient adaptive mutations needed for colonizing novel ecological niches of scale-eating and snail-eating ; adaptation has occurred in stages: first selection on feeding behavior (molluscivorous, scale-eater), then selection for trophic morphology, and finally refinement through gene coding change ; {note : present distribution of *Cyprinodon variegatus* and its allied doesn't make any sense along Mexican coast and south of Belize (completely missing between Atlantic Belize and Colombia) and in Caribbean islands (completely missing east of Hispaniola, notably in Martinique and Guadeloupe, up to Trinidad... to reappear in Venezuela-Colombia!). 2021. PNAS, <https://www.pnas.org/content/118/20/e2011811118> ] {Jean Huber, 28-May-2021} <°))>< <°))>< <°))><
- Reznick, D.N., J. Travis, B.J.A. Pollux & A.I. Furness. [Reznick et al. discuss relations of sex pattern + morphs and rate of speciation along reproductive mode and evolution, in livebearers ; fish in killifish family Poeciliidae vary from completely provisioning eggs before they are fertilized {lecithotrophic} to providing virtually all resources after fertilization via the functional equivalent of a mammalian placenta {matrotrophic} ; according to the authors, if eggs are provisioned before fertilization {lecithotrophic}, there should be strong selection for females to choose with whom they mate and reversally maternal provisioning after fertilization {matrotrophic} should promote a shift to post-copulatory mate choice, with cascading effects on evolution of diverse features of the biology of these fish because of this shift in when mates are chosen ; however, evolution of placentas and associated conflict does not cause accelerated speciation, contrary to predictions ; accelerated speciation rate is instead correlated with evolution of male traits associated with sexual selection, which implies a more prominent role of pre-copulatory reproductive isolation in causing speciation in family Poeciliidae. 2021. FEE, <https://www.frontiersin.org/articles/10.3389/fevo.2021.639751/full> ] {Jean Huber, 28-May-2021} <°))>< <°))>< <°))><
- Dominguez, O.C. [Dominguez shows female of *Millerichthys robustus* yields much more embryos and turns selective when competition risk is perceived ; this lab experiment {in a compartmented aquarium with 2 halves, one for subject, one for audience, either competition or various males} shows that females do not show a significant preference for males of any size in a scenario without perceived competition (of other females) ; however, females turn selective under competition risk, then choosing the large males ; females produce significantly more embryos when they perceived a risk of competition ; females turn selective under risk of competition, probably due to an increased parental investment expressed by reduction of female-male encounters and breeding rate, the increased reproductive effort and the time spent searching a mate ; females that mate with larger males may gain access to more benefits derived from his social status, as best territories and high-quality sites for the spawn, thus increasing the probabilities of survival for the females and their offspring. 2021. E.E.E.,

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- Tessy, M.C.M., V.C., Sharon & O.C. Dominguez. [The Dominguez team disclose food of *Millerichthys robustus* as planktophagous, vs. sympatric *Rivulus tenuis* and *Poecilia mexicana* ; in temporary water bodies dwelt by unique annual killifish non annuals can also be present ; in a fish community in a temporary pool near of Tlacotalpan (Veracruz state), in S.E. Mexico, stomach contents of fish fauna are analysed : annual killifish *Millerichthys robustus* (the only autochthonous species) is planktophagous {making it even more difficult to breed in aquarium in the long term}, non annual killifish *Rivulus (Cynodonichthys) tenuis* and *Astyanax aeneus* are insectivorous, *Dormitator maculatus* and larvae of amphibians (*Lithobates* sp.) are mainly detritivores and livebearing *Poecilia (Mollienesia) mexicana* is planktophagous and insectivorous ; niches of *Millerichthys robustus* and *Poecilia mexicana* evidence overlap, but the breadth is adjusted inversely, suggesting feeding specialization in oviparous in response to competition (there are 2 cohorts for *robustus*) ; niche of oviparous *tenuis*, other fishes and tadpoles overlaps, too. 2021. E.F.F., <https://onlinelibrary.wiley.com/doi/abs/10.1111/eff.12604> ] {Jean Huber, 23-May-2021} <°)))))>< <°)))))>< <°)))))><
- Domínguez, O.C. [Dominguez studies behavior of 2 adult age groups (sexual maturity vs near death) of *Millerichthys robustus* with body size asymmetries ; in this behavior lab study {after many others, alone or with colleagues, as the leading authority on this unique and endangered sp.}, the author evaluates 2 adult age groups with body size asymmetries to determine strategies used by an annual killifish during agonistic interactions of different ontogenetic stages (through standard ethogram) ; results show 7 behavioral units in males and 5 behavioral units in females ; fish are then classed according to body size asymmetries in 2 groups of different adult ages that represent different ontogenetic stages: (a) just after sexual maturity is reached, at 5 weeks of age, and (b) near natural death, at 24 weeks of age {only} ; as usual (cost–benefits strategies), large males have an advantage during their interactions in both age groups, winning all of encounters, but there is more aggression in 5-week-old fish encounters ; besides, small {not large} 24-week-old fish are more aggressive than small 5-week-old fish ; in female encounters, size does not predict winners, as both small and large fish win a similar number of encounters, and some contests remain unresolved regardless of age group ; there is a tendency {no significance} for small females of any age to risk more than males in fights to maintain reproductive fitness. 2021. JFB, <https://onlinelibrary.wiley.com/doi/10.1111/jfb.14757> ] {Jean Huber, 23-May-2021} <°)))))>< <°)))))>< <°)))))><
- Cui, R., Tyers, A.M., Malubhoy, Z.J., Wisotsky, S., Valdesalici, S., Henriette, E., Kosakovsky Pond, S.L. and Valenzano, D.R. [Cui et al. show genetic trans-oceanic dispersal between Seychelle small islands for *Pachypanchax playfairii* (seawater adaptation) {paper not obtained, in abstract, the authors state that progressive decline in effective population size in a recent time-scale likely leads to segregation of slightly deleterious mutations across *Pachypanchax* populations, which represents a potential threat for species preservation on the long run}. 2021. M.E., <https://onlinelibrary.wiley.com/doi/10.1111/mec.15982> ] {Jean Huber, 23-May-2021} <°)))))>< <°)))))>< <°)))))><
- Monti, F., M. Marcelli, P. Fastelli & N. Fattorini. [Monti et al. show *Aphanius fasciatus* pushed to stressing environments (higher salinity, temperature, depth) by invasive *Gambusia* ; according to the authors, effects of invaders are particularly evident in aquatic ecosystems with delicate and complex balances, such as Mediterranean coastal wetlands, characterized by unpredictable water flows and variable reserves ; in a coastal Ramsar site in central Italy, comparison of abundance of *Aphanius* in relation to water parameters and presence of its putative competitor, is performed by sampling during over 2 years ; results show both probability of presence and abundance of native killifish increased with water salinity, but this increase is stronger when mosquitofish is present ; increasing water temperature and water depth is associated with a higher probability of presence and abundance of killifish respectively, although the

effect of water depth is small ; both salinity and presence of invader (mosquitofish) act synergistically in characterizing and shaping the population structure of native species ; pushed to living in the most extreme and stressed environments, killifish is potentially at higher risk of extinction {note : introduction of mosquitofish *Gambusia (affinis or holbrooki)* has been catastrophic and is a major threat of extinction for most *Aphanius* sp. (in part because of food competition), even, surprisingly, for marine or brackish killifish, like *fasciatus*}. 2021. ACMFE, <https://onlinelibrary.wiley.com/doi/10.1002/aqc.3600> ] {Jean Huber, 18-May-2021}

- Ponce, J.L. & M.C. Uribe. [Ponce and Uribe separate embryos between either lecithotrophic (*creolus*, *puncticulata*, *vittata*, *atrizona*) or matrotrophic (*formosa*) sp. ; for this embryological study, the authors use histological techniques to describe the morphology of the yolk and pericardial sacs in developing embryos of the lecithotrophic viviparous killifish (*Girardinus creolus*, *Gambusia puncticulata*, *Limia vittata*, and *Quintana atrizona*), in comparison with the extremely matrotrophic but related *Heterandria formosa* (mother-nourished or placental) ; in lecithotrophic sp., yolk sac is enlarged and lasts until final stages of development, while in matrotrophic sp., it is completely absorbed soon after fertilization ; lecithotrophic sp. show a pericardial sac with a single layer of blood vessels covering dorsal surface of cephalic region only, while matrotrophic sp. shows a more complex largely vascularized pericardial sac covering entire dorsal surface, except caudal region ; according to the authors, these morphological differences in embryo suggest that matrotrophy derives from lecithotrophy {which seems not congruent, at least phylogenetically, with previous works by Reznick team}. 2021. J.M., <https://onlinelibrary.wiley.com/doi/10.1002/jmor.21355> ] {Jean Huber, 9-May-2021}
- Briñocoli, Y.F., Jardim de Queiroz L., S. Bogan, A. Paracampo, P.E. Posadas, G.M. Somoza, J.I. Montoya-Burgos, Y.P. Cardoso. [Briñocoli et al., in 19 pops of *Jenynsia lineata* of Argentina, disclose 3 molecular types due to altitude and river isolations ; *Jenynsia lineata* is a small viviparous fish that inhabits a wide range of habitats in South America {including its junior synonym *multidentata* : Argentina; Brasil (Rio de Janeiro, Santa Catarina); Uruguay} ; the authors analyze 221 sequences of the mitochondrial cytochrome c oxidase I gene (COI), from 19 localities and compare data to 3 most common types of isolation (altitude, latitude, basin) in order to explain the genetic variation found in this species ; results reveal a marked structuration, with 3 groups: (a) La Plata/Desaguadero Rivers (sampling sites across Argentina, Uruguay, and Southern Brasil), (b) Central Argentina, and (c) Northern Argentina ; the 3 most common types of isolation explain up to 65% of genetic structure, notably altitude and type of basin (river barriers) ; however, processes of population diversification are complex and are not limited to a single mechanism. 2021. E.E., <https://onlinelibrary.wiley.com/doi/epdf/10.1002/ece3.7427> ] {Jean Huber, 9-May-2021}
- Sandkam, B.A., P. Almeida, I. Darolti, B.L.S. Furman, W. van der Bijl, J. Morris, G.R. Bourne, F. Breden & J.E. Mank. [Sandkam et al. relate occurrence of 5 male phase patterns in livebearer *Poecilia parae* to extreme Y chromosome polymorphism ; in male *Poecilia (Micropoecilia) parae*, 5 male phase patterns occur, sympatrically or allopatrically ; each morph uses a different complex reproductive strategy and morphs differ dramatically in color, body size and mating behavior ; morph phenotype is passed perfectly from father to son, indicating there are five Y haplotypes segregating within the species {those phase colors are also known in other *Micropoecilia*} ; the authors examine Y sex chromosome diversity in natural populations ; results show that genetic architecture of male morphs evolves on the Y chromosome after recombination suppression has occurred with the X ; comparing Y chromosomes between each of 5 morphs, there are substantial amounts of unique genetic material and there is divergence between the Ys of the 3 major morphs that differ in reproductive strategy, body size and mating behavior (the *minor* morphs differing only in color are highly similar). 2021. N.E.E., <https://www.nature.com/articles/s41559-021-01452-w> ] {Jean Huber, 9-May-2021}



- Hoagstrom, C.W. & M.J. Osborne. [Hoagstrom and Osborne study distribution of *Cyprinodon* sp. across Great Plains-Chihuahuan Desert with 8 hypotheses (including reticulation) ; *Cyprinodon* genus is renowned for localized endemism across North American desert ; according to molecular data, place of origin for the genus is the Gulf of Mexico ; based on current literature spanning geomorphology, climate, and biogeography vs. mtDNA phylogeny for *Cyprinodon* {mainly published by the Echelle team, in the early 2000s}, the authors show that a Late Miocene {11.6-5.3 MYA}-Early Pleistocene {2.6-0.8 MYA} diversification is supported across all major clades ; geography of each clade corresponds to drainage configurations and their evolution through the proposed period of diversification ; broadly, aridity within the Late Miocene apparently facilitates inland invasion of coastal *Cyprinodon* along ancestral Brazos River and Río Grande (USA, Mexico) ; following Pliocene warm-wet period enables survival and range expansion through arid-land and drainages and into adjacent ones ; Mio-Pliocene development of Río Grande Rift and Gila River drainages, causing inter-drainage transfers, is then crucial to range expansion ; development of other Gulf of California drainages (Colorado River, Rio Yaqui) plays peripheral roles ; finally, climatic cooling in Quaternary Period {starting with Pleistocene from 2.6 MYA, up to present} evidently causes range contractions for populations living at higher latitudes and elevations ; future studies that could improve understanding and address ongoing dilemmas are identified following 8 hypotheses to address major evolutionary events {note : 1 possible new sp. as sp. Aguanaval is mentioned}. 2021. PDFC, <https://repositories.lib.utexas.edu/handle/2152/85402> ] {Jean Huber, 28-April-2021} <°))>< <°))>< <°))><
- Volcan, M.V., C. Barbosa, L.J. Robe, L.E.K. Lanés. [Volcan et al. describe 2 molecular species in *Austrolebias adloffii* group, *cheffei* and *lourenciano*, from laguna dos Patos, Brasil ; the *Austrolebias adloffii* species group {*adloffii*, *arachan*, *bagual*, *charrua*, *cheffei*, *lourenciano*, *minuano*, *nachtigalli*, *nigrofasciatus*, *pelotapes*, *pongondo*, *reicherti*, *salviai*, *viarius*} encompasses a diverse lineage of annual killifishes ; the authors propose a dichotomous identification live pattern key of all components {note : *salviai* is not mentioned implying that they consider the taxon as synonymous} ; based on molecular data the authors describe 2 new species known only from their type area and separated by a few dozens kms and they are critically endangered {sadly enough *lourenciano*, on discovery in 2013 -not so long ago- is abundant but today type area is vanishing due to human activities} ; the molecular data point out that several components of the group are heterogeneous {notably *minuano*} ; a conservation status should be engaged quickly. 2021. Zootaxa, <https://www.mapress.com/j/zt/article/view/zootaxa.4965.1.4> ] {Jean Huber, 27-April-2021} <°))>< <°))>< <°))><
- Nielsen, D.T.B. & R.P. Veiga. [Nielsen and Veiga describe cryptic *Anablepsoides origuelai* {K-D maintained in *Rivulus*} in *ornatus* {K-D as *obscurus*} group in Brasil ; it is described from rio Tapajos drainage, near at its mouth at the Amazon river, close to large city of Santarem {with risks of conservation if other localities are not disclosed in the future, according to the authors} ; the new species is dedicated to environmentalist Fabio Origuela Lira and not to the discoverer who is a co-author ; it is strongly related to recently described *amanan*, *gamae*, *henschelae*, *ottonii* {note : unfortunately it is the fifth cryptic species named in the group while senior species, *ornatus* and *obscurus*, valid or not are unknown as live topotypes, if any of the 2 or both are members of that group}. 2021. Aqua, <https://aqua-aquapress.com/anablepsoides-origuelai-a-new-species-of-the-anablepsoides-ornatus-species-group-cyprinodontiformes-rivulidae-from-rio-tapajos-drainage-amazon-basin-brazil/> ] {Jean Huber, 18-April-2021} <°))>< <°))>< <°))><
- Lira, M.G.S., W.M. Berbel-Filho, H.M.V. Espírito-Santo, A. Tatarenkov, J.C. Avise, C.G. Leaniz, S. Consuegra & S.M.Q. Lima. [Brazilian and US teams genetically study 13 new locs of mangrove *Kryptolebias* in Brasil (5434 km) with 2 clades overlapping in Amazon ; with this study, molecular data are available for most of its distribution (except probably in southeastern Panama and neighboring Colombia) and for all its given taxa (except *heyeyi* for topotypes, which prevents the authors to propose valid names under a full

systematic study, if the Gordian knot of *ocellatus-caudomarginatus-hermaphroditus* is not tackled} ; selfing hermaphroditic and androdiecious mangrove killifishes (i.e., all taxa except *caudomarginatus* sensu Seegers or *ocellatus* sensu Costa that is not selfing but only androdiecious, i.e. with males and hermaphrodites} are ubiquitously distributed across the Caribbean, Central, and South American mangroves {also but rarely a bit inland, not in mangroves} ; the study of this selfing group is extremely complex because extensive hybridization and introgression between individuals from Northern clade, corresponding to *marmoratus*, and individuals from Central clade in San Salvador Island and Bahamas is evidenced ; besides a possible contact zone between Central and Southern clades lies on coast of Para state in Brasil, between Vigia and Ajuruteua (and again hybridization and introgression may be a reality) and molecular divergence between those 2 clades is weak ; recent results reinforce the idea that Southern clade spread southwards along South American coast, and has recently colonized mangroves in southeast Brasil (themselves expanding after the last glaciation, LGM) {next study on those selfings should evaluate *heyeyi* from Saona island, because this taxon is old and older than *bonairensis* and *hermaphroditus* if valid, Andrei Tatarenkov, personal communication, April 2021, putatively materializing in the end in a single species, as *marmoratus*, or 2 species with Northern and Central+Southern clades, as *marmoratus* and *heyeyi*, or 3 species for each clade as *marmoratus*, *heyeyi* and *ocellatus-hermaphroditus*, depending on genetic identification of *ocellatus* holotype}. 2021. J.F.B.,

<https://onlinelibrary.wiley.com/doi/abs/10.1111/jfb.14753> ] {Jean Huber, 17-April-2021} <°))>< <°))>< <°))><

- García-Andrade, A.B., J.D.Q. Carvajal, P.A. Tedesco & F. Villalobos. [García-Andrade et al. show in 256 Poeciliidae a bimodal latitudinal species richness favored by lineage seniority and past climatic stability ; the authors study various environmental determinants (basin area, topographical heterogeneity, energy, climate seasonality and past climatic stability) in relation to speciation for most poeciliid valid sp. {93% of named valid sp., according to them} along most accepted recent molecular phylogeny {this is the study by Reznick et al., 2017} ; distribution of Poeciliidae is shown to be biased to Atlantic coast, with species richness showing a bimodal latitudinal gradient, peaking in middle latitudes near Tropics of Cancer {a line approximately 23.5°N, with Mexico, Bahamas, southern USA} and Capricorn {resp. same latitude, but South, with Argentina, Brasil, Chile, Paraguay}, and exhibiting the highest richness in Middle America {mainly Mexico to Nicaragua} and this species richness pattern is influenced positively by evolutionary time and past climatic stability and negatively by climate seasonality ; regions with high sp. richness are those containing by ancient lineages, supporting the time-for-speciation effect, and that have experienced low historical stability in temperature and currently show low temperature seasonality ; conversely, species-poor regions contain younger lineages and experience greater temperature seasonality. 2021. G.E.B., <https://onlinelibrary.wiley.com/doi/abs/10.1111/geb.13299> ] {Jean Huber, 17-April-2021} <°))>< <°))>< <°))><
- Nagy, B., Watters, B.R. & Raspopova, A.A. [Nagy et al. describe blue and red phased *Nothobranchius nikiiforovi*, from S.E. Tanzania, related to *eggersi*, in subgenus *Adiniops* ; the new species is known from seasonal habitats in lower Matandu drainage in south-eastern coastal Tanzania, like the recently described *matanduensis* {but no sympatry is reported} ; it is diagnosed from *eggersi* by molecular data, a combined diagnosis and details of live color pattern in male {notes : even if the diagnosis by the authors is clear, *nikiiforovi* appears more as a molecular species for *eggersi*, like *matanduensis* is for *ocellatus* ; curiously, in the molecular tree (based on Bellstedt's lab previous report), the related species *guentheri* is pruned without explanation}. 2021. Zootaxa, <https://www.biotaxa.org/Zootaxa/article/view/zootaxa.4950.1.5> ] {Jean Huber, 31-March-2021} <°))>< <°))>< <°))><
- Bragança, P.H.N., P.H. Skelton, R. Bills, D. Tweddle & A. Chakona. [Bragança et al. describe *Lacustricola pygmaeus* from Okavango, Cuando, Zambezi and revalidate *chobensis* from synonymy of *hutereaui* ; the *hutereaui* species complex {genus *Lacustricola* to be revised by Bragança soon and genus assignment is

temporary} is herein defined by banded Dorsal, Anal and Caudal fins in male and also osteologically by a pointed premaxilla ascending process, in which premaxilla medial surface is slightly convex ; distribution of *pygmaeus*, new species, is largely overlapping with revalidated *chobensis* {mainly a molecular sp. spun off *hutereaui*} ; the last component of the group, *schalleri*, is provisionally maintained as a synonym, but not of *hutereaui*, rather of *chobensis* (for geographical reasons {pending further study} ; comprehensive information on osteology and external morphology of topotypes of *hutereaui* are presented, and description of coloration in life is provided for specimens from Ubangui river, in Centrafrique (Central African Republic). 2021. Copeia, <https://meridian.allenpress.com/copeia/article-abstract/109/1/123/463310/Revalidation-and-Redescription-of-Lacustricola> ] {Jean Huber, 30-March-2021}

- Polacik, M., M. Vrtílek, M. Reichard, J. Zak, R. Blazek & J. Podrabsky. [Polacik et al. show from field *Nothobranchius* eggs full synchrony in D1 diapause in rainy season and D2 from onset of dry season ; distinct *Nothobranchius* species live in temporary pools, often in sympatry and their eggs survive dry season in dry bottom substrate by entering a facultative developmental arrest, termed diapause ; uniquely among animals, embryos (encased in eggs) may enter diapause at 3 different developmental stages ; the authors, in the field, sample pool banks across progressing season, species and populations. We present important baseline field data and examine the role of environmental regulation in the embryonic development of this unique system ; results are {contrary to lab previous findings and expectations} that egg development across the embryo banks is synchronized within and across sampled populations with all embryos entering diapause I during rainy season and diapause II during dry season ; asynchrony {opposite of synchrony} only occurs at transient phases of habitat, during the process of habitat desiccation, and at dry season end. 2021. E.E., <https://onlinelibrary.wiley.com/doi/full/10.1002/ece3.7402> ] {Jean Huber, 30-March-2021}
- Lanés, L.E.K., M.V. Volcan & L. Maltchik. [Lanés et al. describe 2 new species, *Austrolebias botocudo* and *nubium*, from Araucaria Forest of S.E. Brasil, at 1000 m altitudes ; the 2 species are collected from 2 localities each and type localities are not so far away in a plateau, but from 2 separate subdrainages and are morphologically distinct ; this is the first report of *Austrolebias* from exceptionally high altitudes (ca. 1000 m), the genus being mainly known from lowlands ; and both are assigned to subgenus *Acrolebias*, but the authors confirm recent proposal to prune *varzeae*, from the same biogeographical region, but in lower highlands, from *Acrolebias* to *Argolebias* and move it close to *wichi* {hence subgenus *Acrolebias* contains now only *araucarianus*, *botocudo*, *carvalhoi*, *nubium*}. 2021. Zootaxa, <https://www.mapress.com/j/zt/article/view/zootaxa.4949.3.4> ] {Jean Huber, 26-March-2021}

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