

Miscellaneous Notes on Some Systematic Difficulties Regarding Old World Cyprinodonts

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I. Further investigations on the systematic status of *Panchax bualanus* Ahl, *Panchax escherichi* Ahl, *Haplochilus striatus* Boulenger and *Aphyosemion striatum microphthalmum* Lambert & Géry.

Few cases of discussions have taken place, since Scheel's remarkable pioneering works (1968 et subseq.), about the systematics and the validity/synonymy status of old Rivulin taxa from the tropical west African forest's genus *Aphyosemion*. However Scheel was unable to study the types of most taxa in the various institutions, including those from the Berlin Museum in (the former) East Germany. His conclusions are well known regarding Ahl's descriptions. Most of Ahl's taxa were considered as synonyms of older taxa described by others and even by Ahl himself, e.g. :

1- *Panchax elberti* Ahl, 1924 is a junior synonym of *P. bualanus* Ahl, 1924 ; the former taxon being named in a later issue of the same publication (Zool. Anz.) than the latter.

2- *Panchax escherichi* Ahl, 1924 (in the same article as *elberti*) is a junior synonym of *Haplochilus striatus* Boulenger, 1911.

Radda, who did study material at the Berliner Museum on several occasions, did not question Scheel's conclusions. We did not either, especially since we had the opportunity to survey "probably" paratypic material of *P. escherichi* from Z.M.B. (Berliner Zool. Museum) in the mid eighties for the latter case and because of distributional reasons for the former case.

The situation remained stable until Seegers' publications of 1986 and 1988. Seegers was, with the help and dedication of the present Z.M.B. curator Hans-Joachim Pöpke, the first to stay long periods in Z.M.B. and find out most of Ahl's type series, study them and publish major shifts in their systematic status. Seegers' major contribution was well accepted because of his reputation of seriousness, his record of publications, especially regarding the east African genus *Nothobranchius* and because the proposed shifts did not hurt the then accepted validity of the studied taxa...except in three cases; the two stated above, plus the complicated problem involving *fallax/walkeri/deltaense/kribianum/schwoiseri/gulare*, which we will not cover because *Aphyosemion fallax* Ahl, 1935 has been named from an

aquarium population with a questionable origin and the types are said to be lost (nomen vanum).

It was not until recently that we were able to find the time to ask to borrow Ahl's types through the courtesy of our old friendly connaissance H.-J. Pöpke and, to avoid any confusion, we requested the holotype (or the lectotype) which is the single voucher of a species. The purpose of these notes is to report on the study of these two types and of related material for comparison.

1-Panchax bualanus Ahl (holotype and single type) : ZMB 21947, "Buala, Kamerun, Elbert leg."

The subadult specimen is in a desperate condition. The fish is squashed laterally, which makes it higher than in reality, most fins are cut near their base, except the pectorals (which position excludes a relationship with the Aplocheilichthyins), no trace of pigments (especially not a single bar on sides) can be found and many scales are lost, including in the lower post-orbital region. There is a lateral, somewhat darker, band on the lower mid sides from the pectoral root to the level of half of the anal base, but this may be seen as the standard lower median band, present in the *Kathetys* subgenus (and also other subgenera) in formalin preserved or frightened specimens. Neither the scalation type, nor the predorsal scale count can be discerned. Due to the lateral squash, many scales are lost on the sides. The lateral series count could only be hypothesized as 29 (+2 on peduncle), whereas the transversal series count could be evaluated as 8. Measurements : S.L. : 25.2 mm, head length : 6.8 mm (27% in S.L.), predorsal length : 18.2 mm (72% in S.L.), preanal length : 16.3 mm (65% in S.L.). All these data look reasonable for a non-annual *Aphyosemion* which, for biogeographical reasons, belong to the subgenera *Aphyosemion*, *Mesoaphyosemion*, *Kathetys*.

The radiophotograph was more informative : D= 10 ; A= probably 15 ; D/A= +8 ; vertebrae= 11+16. The skull is of the genus *Aphyosemion* type and the hypural plate is divided very little. The above mentioned data leave little probability of it belonging to another genus than *Aphyosemion*, i.e. either *Epiplatys* or *Nothobranchius* s.l. ; the longer dorsal fin base and the somewhat lower D/A deviation would favor for the subgenus *Kathetys* or *Mesoaphyosemion* more than *Aphyosemion* s.s. For comparison, two series of specimens belonging to the Paris M.N.H.N. collections have been radiophotographed with the following results :

· MNHN 1978-387 : *Aphyosemion bualanum* sensu Scheel ; 3 specimens : D= 11, 10, 9 ; A= 16, 15, 16 ; D/A= +7, +8, +9 ; vertebrae= 11+16 ; 11+16 ; 12+15.

· MNHN 1981-1368 : *A. exiguum* ; 2 specimens : D= 9, 10 ; A= 15, 15 ; D/A= +7, +7 ; vertebrae= 12+15 ; 12+15.

All 5 specimens, with a very little divided plate, like Ahl's type.

In conclusion Ahl's type cannot be distinguished easily from the Cameroonian *bualanum* sensu Scheel. Many aspects of morphology, meristics, osteology are similar, however it cannot be ruled out

that Ahl's type belongs to *Mesoaphyosemion*. The two known *Mesoaphyosemion* species from the neighboring regions are *A. cameronense* (D= 12; A= 16; D/A= +6) and *A. wildekampi* (D= 11; A= 16; D/A= +9), but both do not display the vertically barred color pattern disclosed by Ahl for his *bualanum*, and also present in the Cameroonian *bualanum* sensu Scheel. It cannot be ruled out also, that following Seegers, *A. bualanum* is a fasciated, unknown live, *Mesoaphyosemion* species, which would be isolated in the highlands with distinctive morphomeristics from its neighboring counterpart, either *cameronense* or more probably *wildekampi*. It cannot be ruled out finally that Ahl's type is a distinctive *Kathetys* species related to the Cameroonian component, but we know of no geographical barrier in the area and *bualanum* sensu Scheel is widely distributed on the Plateau.

Therefore we feel the probability that Scheel's view is correct is high, (but not 100%) and both names for the Cameroonian populations are then possible... conservatively as *bualanum* (like in Killi-Data 1996 and according to the ethics of I.C.Z.N.) or following Seegers as *elberti*, until live topotypes from the mountainous village of Buala, alt. 1200m. (now Bouala : 6.42 N ; 15.58 E) presently in the Central African Republic are collected by keen enthusiastic killie hobbyists or ichthyologists.

2-*Panchax escherichi* Ahl (lectotype), ZMB 21936 ; "Attogondema, Kamerun, Escherich leg."

The fully adult male specimen is in a rather satisfactory condition. Few scales are missing, all fins are entire except the upper half of the caudal and the upper part of the dorsal. Some pigments are indeed available, except the preopercular markings and the caudal pattern. On the sides, there are 2-3 lateral rows of discontinuous, rather large light (red) spots, up to the level of the dorsal insertion (the following ones being faded out) and between them, 3-4 dark contrasted lines, up to the dorsal ending level (just like in Roman's photos -1971 : fig. 66- of freshly preserved *A. striatum* from southern Equatorial Guinea). The largest number of red spots in the striation for a line was 16, the lowest was 3. A dark reticulation may be seen on the upper posterior sides. A typical marginal dark band is seen on anal, not on dorsal (because of the cut, at least at its beginning), both fins being pointed, the former having at its tip a streak like a flame and a faded mid-series of dots. Similarly, because of the cut, no median band on the dorsal can be seen. Equally important is the dark brown colors following the rays at the dorsal base level and on the lower part of the caudal (red band ?).

The morpho-meristic data are, after confirmation by a radiophotography (a valuable tool now available) for some of them : frontal scalation= G-type ; total length= 43.2 mm (124% in S.L.) ; S.L.= 34.9 mm ; predorsal length= 23.4 mm (67% in S.L.) ; body height at anal level= 6.0 mm (17% in S.L.) ; at peduncle level= 4.0 mm (11% in S.L.) ; head = 9.5 mm (27% in S.L.) ; interorbital= 4.8



This popular fish was brought in to the U.S. as *Aphyosemion bualanum*, but now is widely known as *A. elberti*
Photograph by L. Mackowiack



The author suggests seeking a type locality for *Epiplatys bifasciatus*
Photograph by L. Mackowiack

mm (14% in S.L.) ; eye diameter= 2.9 mm (8% in S.L.) ; scales, LL= 29 (+1 on peduncle), predorsal= 19, transversal at anal= 7 ; fins, D= 11 ; A= 15 ; D/A= +6 ; vertebrae= 12+17 ; (relatively !) well divided hypural plate.

The key issue on the *escherichi*'s case is not at the genus level (this is clearly an *Aphyosemion* species, belonging to the subgenus *Mesoaphyosemion* and to the *striatum* superspecies), but at the species level. Is *escherichi* identical to *striatum* or to *microphthalmum*, both species being roughly isomorphs, having the same distribution north of the Ogooué River, being occasionally sympatric, having a roughly similar color pattern ?

For comparison two series of specimens from the Paris MNHN, belonging to both species have been radiophotographed and studied with the following results (both series with a well divided hypural plate) :

· MNHN 1981-873, *A. striatum*, 8 specimens : D= 11, 11, 10, 11, 11, 10, 11, 11 (mean 10.75) ; A= 14, 14, 14, 15, 16, 15, 16, 15 (mean 14.88) ; D/A= +6, +6, +6, +6, +5, +7, +6 (mean +6.0) ; vertebrae= 12+16, 12+15, 12+15, 12+15, 12+15, 12+16, 11+18, 12+15 (mean 27.5).

· MNHN 1978-152, *A. microphthalmum* from N. Gabon (ex. *simulans*), 3 specimens : D= 11, 10, 10 (mean 10.33) ; A= 16, 16, 17 (mean 16.33) ; D/A= +7, +8, +8 (mean 7.67) ; vertebrae= 11+17, 11+17, 10+17 (mean 27.7).

Except for the anal ray count and the D/A deviation of *P. escherichi* lectotype which are closer to *striatum* than to *microphthalmum*, (two major factors) no statistical difference could be found.

The tendency of these results to be nearer to *striatum* have been confirmed on a larger number of specimens... that is, the ten remaining paralectotypes, requested on loan a few months later .

All paralectotypes are of lower interest than lectotype (Seegers' choice was then appropriate). Most patterns are wiped out, except some faded brown striations on sides of three of them. Many fins are cut and all are without markings. The overall morphology lies within *Mesoaphyosemion* (G-type frontal scalation, open neuromast pattern of head, average morphology) ; the radiophotographies were more informative : D= 11, 11, 11, 11, 11, 12, 11, 11, 11, 12 (mean with lectotype : 11.18) ; A= 14, 14, 14, 13, 14, 14, 14, 14, 14, 13 (mean with lectotype : 13.91) ; D/A= +6, +6, +6, +5, +6, +6, +6, +6, +5, +6 (mean with lectotype : 5.82) ; vertebrae : 13+16, 13+17, 12+17, 13+17, 13+17, 14+17, 13+17, 13+16, 13+16, 13+16 (mean with lectotype : 29.55) ; the meristical counts fit strongly with *striatum* and the abdominal vertebrae counts correspond better to *striatum*.

There are additionally some other points in favor of the resemblance of males *escherichi* and *striatum* :

- both have pointed vertical fins (rounded in *microphthalmum*) ;
- both have the dark (red) streak at anal tip ;



A colorful male *Epiplatys sexfasciatus sexfasciatus* Rathkei
Photograph by Al Castro



The author proposes a type locality for this *Aphyosemion ogoense ogoense*
near the confluence of the Ogooué and Mpassa Rivers
Photograph by L. Mackowiack

- both have the dark (red) margin at anal (thin light edge in *microphthalmum*, dark submargin) ;
- both have large red spots on sides (rather smaller in *microphthalmum*) ;
- both have the red lines along the rays at dorsal and anal bases ;
- both are more slender (*microphthalmum* being somewhat more robust).

Moreover, Ahl, in his description, mentions the strongly reflecting blue anterior sides and the conspicuous carmine markings which is more true of *striatum* than of *microphthalmum* in life.

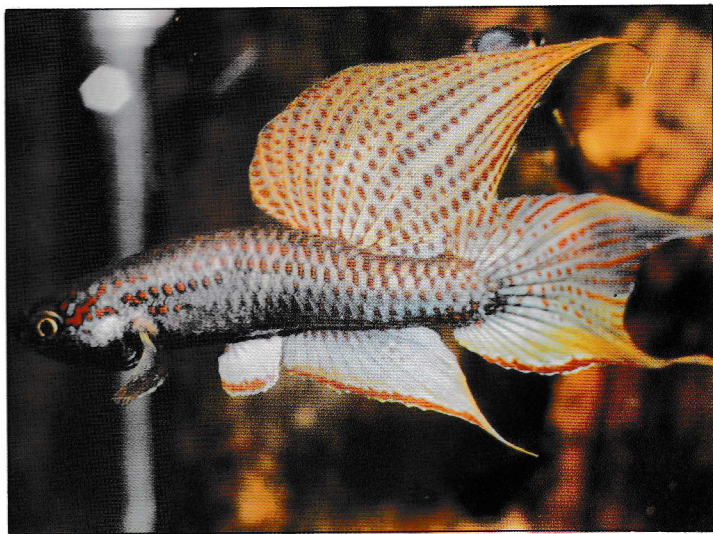
However this flow of converging characters towards *striatum* does not make a 100% proof, especially when for some of them Seegers' observations are opposite. Until live topotypes are made available by collectors (Attogondema, 0.85 N ; 10.25 E, is now in N.W. Gabon at the foot of the Monts de Cristal) or until the lectotype may be genetically studied (actually recent techniques now make possible to undertake karyotype and DNA fingerprints of preserved-in-alcohol-only specimens, even very old. However, the lectotype of *escherichi* has stayed in formalin for a while and thus we shall have to await the improvement of the technique), both options are respectable. That is, *striatum* and *microphthalmum* as valid with *escherichi* as a junior synonym of *striatum*, or, *striatum* and *escherichi* as valid with *microphthalmum* as a synonym of *escherichi*. But, alas, this is not even certain that live topotypes (both species may live sympatrically there, as is often the case near the Monts) or karyotyping (both species are close : *striatum*, n= 20 ; A= 33 ; *microphthalmum*, n= 19-20 ; A= 35-38) rule out one of these two options. DNA fingerprinting techniques are more promising since they have recently demonstrated their capability of separating two heteromorphic species with similar karyotypes.

For the time being, as for *bualanum*, and because of the converging flow of evidence and due to our own experience of collecting both species in the Monts de Cristal foothills, we will stick personally to the conservative widely acknowledged option of keeping valid the well described *striatum* and *microphthalmum*, while waiting for new data or new techniques to strengthen or obviously to change our mind. Seegers' works are nonetheless very valuable and full of merit. They pushed us to reconsider facts that may have been too quickly accepted at the time when radiophotography techniques were not as currently used as today.

In the near future, hopefully, DNA techniques will be made available to establish the identity (and the ancestry !) card, even for old type specimens and reveal their true identity (a further example would be the not completely settled case of *A. congium* and *A. melanopteron*). Unfortunately this closure will not be possible with species for which types do not exist or were lost, as in the *A. fallax* case (mentioned above) or the unsettled case of *A. oeseri* versus *A.*



Although there are still some identity problems with *Aphyosemion* (or *Fundulopanchax*) *splendidum*, the type locality is now Ouessou
Photograph by L. Mackowiack



Amidst additional confusion with *Aphyosemion multicolor*, this male *A. bitaeniatum* is assigned the same type locality, that is Apapa
Photograph by Wolfgang Eberl

santaisabellae, or the undesired case of *A. trilineatum*, or the questionable case of *A. tessmanni* versus *bualanum/elberti*. In addition, debates have arisen because some of the addressed taxa (*fallax*, *oeseri*, *trilineatum*) plus the ambiguous case of *A. roloffi* (versus *etzeli*) were based on confusing or vague type localities and on patterns figured out by hand drawings or poor black and white photos not surely compatible with the so called "description". It is necessary to be cautious in drawing absolute conclusions from these patterns which are very standard, that is, banal in *Aphyosemion*. As an example of difficulty it is appropriate to mention that recently a new phenotype of the *Fundulopanchax* series has been discovered in Equatorial Guinea which shows remarkable similarities (but not identity) with *deltaense* or *fallax* sensu Scheel (1990) but not Seegers (1988)... then who is who ?

Let's wish and hope that luck will allow to find preserved old aquarium specimens still hidden in Museums that fit with these taxa and to apply rational powerful techniques.

II. Proposal of allocation of precise type localities for key taxa, (still missing one).

Because of the frequent emergence of cryptic species in Cyprinodonts, the precise labeling of the type locality, enhanced by its geographical coordinates, has become overwhelmingly important and in fact a key issue in Systematics. As a prerequisite, it is critical to fix these data for the named taxa of a given superspecies before starting a study of newer components.

Most type localities coordinates of old world Cyprinodonts are now available, either because they were given by the describer or because they were easily deduced from the labeling of the type locality or else because they were inferred from the study of the bibliography or internal museum reports. Wildekamp, Romand & Scheel working together have brought a large share of these data for C.L.O.F.F.A. in 1986 and they must be thanked for this hard and obscure job! Anecdotally, and to illustrate the difficulty, they appeared in disagreement for one case (Scheel, 1990), i.e. the type locality of *A. decorsei* (Pellegrin, 1904). It was only owing to luck and to the experience of two senior ichthyologists at the Paris Museum that the real type locality was found plotted on a map in a french geographical bulletin published by Chevalier in 1904, distinctively distant from their two proposals (Huber, 1994).

By the way let's point out that the coordinates of *Proc. loemensis* are erroneous in C.L.O.F.F.A. In fact they plot in Western Zaïre and not Southwestern Congo. The confusion comes from the fact that there is no Lombo river in Congo, but one in Zaïre. Actually, the collector was a civil administrator based in Loango, the most important place in the Loémé area at that time, and not Pointe Noire. Thus he collected in the northern tributaries of the Loémé river and one of them in the surrounding area is now called Koulombo which



Aphyosemion ahli proved to be one of the most complicated cases which the author undertook. This male is from Lobé, Cameroon
Photograph by Friedrich Bitter



Fundulopanchax sjoestedti is no stranger to nomenclatural controversy having had several names during its tenure
Photograph by L. Mackowiack

crosses the old way from Loango to Brazza, at approximately 4.63 S ; 11.98 E, which should be the proper coordinates!

It is with this example in mind that we propose the allocation of precise geographical coordinates for some remaining taxa, after detailed studies. They have been already published in Killi-Data 1996 without comments (Huber, 1996) : with these established there are still three remaining imprecise type localities for old world Cyprinodonts :

- *Pachypanchax nuchimaculatus* (Guichenot, 1866) from "Madagascar" for which a preserved type exists (MNHN -2937, 162-2-38-1). Some hope has been raised recently by Loiselle et al. (De Rham, pers. comm.) due to their discovery of another *Pachypanchax* species in Southern Madagascar, which might be linked with Goudot's neck-marked fish (he actually stayed long periods of his chaotic life in Southern Madagascar, whereas the two hitherto known species - *omalonotus* and *sakaramyi*- are from the north). I have not studied *sakaramyi*, but I have compared four syntypes of *omalonotus* and the single type of *nuchimaculatus*. These two lots cannot be assigned to the same species, as has been done by Scheel (1968) and subsequent authors. *Pachy. nuchimaculatus* (S.L.= 52.3 mm ; T.L.= 64.5 mm, 123% of S.L., predorsal length= 75 % of S.L.) is slenderer, with D= 11, A= 15, D/A= +9, vertebrae= 14+18 ; the hypural plate is well divided and large, much more than *omalonotus* (not divided at all, like in *playfairii*). Although the specimen is in poor condition, it seems that the frontal scalation and neuromasts patterns are also different (small upper scales; pores). I take this opportunity to hereby designate a lectotype for *omalonotus* (S.L.= 47.8 mm ; T.L.= 54.7 mm, 114% ; predorsal length= 74% ; LL= 29+6, TRAV.= 12), in good condition but with a slightly cut caudal. The other fifteen specimens being paralectotypes with the new number MNHN 1997-655. The four studied types have the following counts on radiophotographies: D= 12, 12, 13, 12 ; A= 19, 19, 18, 19 ; D/A= +11, +10, +10, +10 ; vertebrae : 14+17, 14+16, 15+16, 13+17. Pending further collections and field observations, *nuchimaculatus* should be considered as distinctive from *omalonotus*. It should be compared with *Pachy. sakaramyi* (Holly, 1928), described later, for which proper meristic data are lacking. Guichenot's description is clear and precise, although his meristics are underestimated as usual. Not surprisingly from above, Guichenot compares his *nuchimaculata* to *spilargyreia* and not to *omalonota*, the other Old World *Poecilia* sp. known at that time. Finally, let's add that Scheel (1990) mentions that Myers has reported that *nuchimaculatus* is a brackish species, but no data in M.N.H.N. can confirm this hypothesis as yet.

- *Aphyosemion spoorenbergi* Berkenkamp, 1976 from "between Calabar and Mamfé, in Biafra, Southeastern Nigeria", in fact from an aquarium trade import. This case is dependent on aquarists' expeditions in the area to rediscover the fish and bring back data on the *gardneri* superspecies. Understandably, these expeditions have

been rare due to the political situation, but it is only a question of time.

- *Epiplatys bifasciatus* and *Ep. marnoi* (Steindachner, 1881) from "Bahr-el-Seraf, Nile basin, central Soudan", approx. 9° N ; 30-31° E. This case is somewhat similar to that of *Rivulus micropus* (Steindachner, 1863) for which the type locality is "Rio Negro", a large river 2200 km long (Huber, 1992), but this is simpler. The above quoted river, a by-pass of the White Nile, is (only) about 250 km long - although hazardous since it has become mainly dry due to Sahel extension, but also marshy. The fact that a Sahelian population of one of these species (*Ep. bifasciatus* ?) has been disclosed at Malakal (central Soudan : 9.52° N ; 31.67° E) by Guma'a (1982) to enjoy internal fertilization may be a spur for killie hobbyists to undertake collecting trips along this river and thus allow someone to propose an actual type locality. Furthermore, why not find a *Nothobranchius* species and *Micropanchax loati* in addition (note that in 1919, Werner has reported also as viviparous *Ep. marnoi* from Gonga and Reik, two localities of central Soudan which are not mentioned in the present Gazetteer).

In Killi-Data 1996, the following proposals have been brought forward and they are detailed below :

- *Micropanchax pfaffi* (Daget, 1954) from several localities in Mali. This case has been fairly easy. On our request, the describer decided to choose "Diafarabé, upper Niger river, S.W. Mali" as the most appropriate type locality (14.15° N ; 5.02° W). A lectotype is hereby designated with the old number MNHN 1960-417 (S.L.= 16.4 mm; T.L.= 21.6 mm or 132% of S.L.), the remaining six syntypes (paralectotypes) from the same collection granted with the new number 1997-55.

- *Aphyosemion guineense* Daget, 1954 from several localities in highlands of Guinée. This case has been equally easy. On the same request, the describer decided to choose "Dabola, S.E. Guinée" as the most appropriate type locality (10.81° N ; 11.03° W). He also selected for us the lectotype hereby designated, 43.3 mm T.L. and 35.8 mm S.L., with the old number MNHN 1960-475, the remaining seven syntypes (paralectotypes) from the same collection granted with the new number MNHN 1997-33. The lectotype has 12+16 vertebrae.

- *Epiplatys sexfasciatus* Gill, 1862. This case is very difficult, because the type locality is given as lower Ogooué River, N.W. Gabon. The collector is Du Chaillu in 1860 (for whom a mountainous region was besides named in Southern Gabon East and South of Lambaréné). However, Gill worked at the same time with fishes from very distant locations in Africa, including marine, and therefore no further information may be obtained from the Philadelphia Museum (E. Boehlke, pers. comm.). The study of types has confirmed for us the diagnosis (six bars, open frontal neuromasts system). According to our present knowledge, such a fish may not live downstream from Lambaréné to the Ogooué mouth into the Atlantic Ocean, but is quite

frequent north of the city, i.e. on the right side of the river (we have collected it 9 km S.W. Bifoun and an uncontrolled local collection reports it from not far from the northern suburbs of Lambaréné) and it is replaced by *Ep. ansorgii* (also named *berkenkampii*) with a closed frontal neuromast system in the south, about 30 km away, according to our present knowledge (but, the limit of distribution of both species is unclear). The search of the fishing and shipping books of the mid nineteenth century has clearly disclosed that, to the contrary of the present time, Lambaréné was the most important harbor in the area, and neither was it the present Libreville, nor Port Gentil, at Ogooué mouth. Therefore we feel reasonable and safe to propose as for the type locality, close to the northern parts of Lambaréné (approx. 0.52 S ; 10.22 E). Etzel (1995) has conducted interesting crossing experiments between components of the *Ep. sexfasciatus* superspecies which has led him to restrict the distribution of *Ep. sexfasciatus* s.s. (which has no more subspecies) to northwest Gabon and southwest Equatorial Guinea.

- *Aplocheilichthys spilauchen* (Duméril, 1861) from 3 type specimens collected by M. Aubry-Lecomte. This case is very similar and is apparently contradictory to the preceding one. Duméril gave "Gabon River" (now the Ogooué) only as the type locality and it is known that the fish prefers brackish biotopes, which explains its gigantic distribution along the coast from Senegal to Angola. Then it should be close to the sea, i.e. far from Lambaréné, 150 km distant ! This apparent contradiction was levied when we disclosed in the Tervueren Museum a collection of this fish by the renowned U.S. ichthyologist, Tyson Roberts, in 1978 from a lake only 35 km southwest of Lambaréné (precisely at the northern end of Lake Ezanga). Therefore we feel it is reasonable to propose the type locality close to the southern parts of Lambaréné (approx. 0.72 S ; 10.11 E) at the beginning of the delta marshes, all the more that an uncontrolled local aquarist report has confirmed its occurrence there.

I hereby designate, from the syntype series, one lectotype MNHN-2936 of 46.0 mm T.L. and 34.5 mm S.L. and two paralectotypes (S.L.: 27.1 mm and 24.6 mm) with the new number MNHN 1997-4083.

- *Aphyosemion ogoense ogoense* (Pellegrin, 1930). This case is again linked to the Ogooué River, but in the upper part of its stream and precisely from one of its tributaries, La Passa or Mpassa River, which crosses the Ogooué in the Eastern surroundings of Franceville. It is simpler, but anecdotally attractive. In-depth studies of the Baudon's trips in 1929 disclosed that he "let" (meaning that he did not collect himself, but sent teams to do so) samples in the surroundings of Franceville (Pellegrin, 1930 : 196 and MNHN registers), where now *A. ogoense ogoense* and *A. pyrophore*, two components of the same superspecies with distinct color patterns, are frequently collected. The anecdote is that, unaware of this fact, Radda and ourselves in 1976, discovered a fish further east of Franceville with a

similar color pattern but with a distinctive morphology (in fact a member of the *elegans* superspecies), and we were convinced that the type locality given for *ogoense* was erroneous and decided to name that fish *rectogoense* (i.e. the correct *ogoense*) ! To be fully complete, we must add that Pellegrin had two series of syntypes, the other from Léconi or Lécéni, but we designated (Huber, 1981) a lectotype from La Passa. Anyhow it is clear now that the type locality of *A. ogoense* should be close to east of Franceville (approx. 1.70 S ; 13.78 E) near the confluence of the Ogooué and Mpassa Rivers, and lately it has been collected very close : 6 km East Binomi from Franceville to Onkoua, 1.72 S ; 13.72 E (Eberl, pers. comm.).

- *Procatopus terveri* Huber, 1981. This case is identical to that of *ogoense*, since it was also collected by Baudon at Mpassa, i.e. probably sympatrically (further west, *Proc. terveri* is sympatric with another *Aphyosemion* species : *A. coeleste*) or close to each other. We therefore propose the same coordinates for the type locality (approx. 1.70 S ; 13.78 E). Further south it is replaced by another Procatopodid with a restricted distribution (maybe a frontier species, as per Huber, 1981), *Hypsopanchax catenatus*.

- *Aphyosemion splendidum* (Pellegrin, 1930). This case is parallel to the two preceding ones. Baudon (1929) gave two syntypes series to Pellegrin, one from the "Upper Sangha basin", the other from "between Souanké and Garabinzam", Ivindo basin, in northern Congo. To avoid (if at all possible) its identity with Radda's taxon, *A. kunzi*, we redescribed (1982) *splendidum* and fixed a lectotype from the former series. In fact, in-depth studies showed that Baudon had collected in the neighborhood of Ouessou, near the Sangha River (Pellegrin, 1925 : 98 and MNHN registers) and without knowing this fact we "rediscovered" that fish 40 km South Ouessou in a marshy area along the river (where we got dangerously lost !) during our 1978 trip. Therefore we feel it is reasonable to propose Ouessou as the type locality, near the Eastern marshy banks of the river (1.62 N ; 16.07 E).

- *Epiplatys boulengeri* (Pellegrin, 1926). This case is an easy one, since Schouteden (1925) collected three syntypes series, one from Mongendé, W. Zaïre, with one specimen, the other from Kidada with two specimens (MRAC 18371-72) and the third from Tshimbu with three specimens (MRAC 17414-415 ; MNHN 1926-242). Out of the three, only Mongendé is given in the Gazetteer and therefore this is the proposed type locality (2.15 S ; 16.17 E), close to the Congo river which makes the frontier between Zaïre and Congo. A lectotype is hereby designated accordingly. Because the types of this species have been split between Tervueren and Paris, the hereby designated lectotype happens to be in Belgium (MRAC 18370), a specimen of 41.5 mm S.L. and 51.5 mm T.L. (kindly measured for us by Guy Teugels), with the paralectotypes being stated above. The two other localities are probably not far away. There is a village named Tshimbi, today, also along the banks of the Congo River, further upstream. The radiophotography of the lectotype gives the following

meristics: D= 11, A= 16, D/A= +9, vertebrae= 13+14. It should be stressed that this taxon is well defined by populations not far from the type locality, in eastern Congo. On the contrary, the oldest taxon of that superspecies, *Ep. multifasciatus*, is unknown live from its type locality, although it is precisely quoted : Kondoué, Kasai, S.E. Zaïre, 4.98 S ; 23.30 E. We encourage aquarists to target it as a collecting trip when the political situation permits. It was sympatric with *Aphyosemion ferranti* and *A. lujae*, all with the same type locality (and several *Nothobranchius* species are reported not too far away).

On top of these proposals reported in Killi-Data 1996, we would like to put forward suggestions of type localities of three important taxa belonging to two *Aphyosemion* superspecies, with components having variable karyotypes and thus emerging cryptic species. We feel they are reasonable and desirable.

- *Aphyosemion bitaeniatum* (Ahl, 1924). Here the systematic move by Seegers (1988, op. cit.), i.e. *multicolor*, although widely used, as a junior synonym of *bitaeniatum*, has been readily accepted, including by us. The taxon *bitaeniatum* is a well defined taxon, lacking only type locality information, whereas *multicolor* is a confusing taxon because this is an aquarium based "poor" description claimed by two authors, Brüning (1929) and Meinken (1930). However, *multicolor* has the advantage of having been allocated a posteriori a precise type locality (Ladiges, 1951), near Lagos, where the fish is very common. This location is today called Apapa and we suggest to allocate it to *bitaeniatum* (6.48 N ; 3.37 E), along a principle of parsimony.

- *Aphyosemion calliurum* (Boulenger, 1911). In this case the type locality, Liberia, is erroneous (or is it a misunderstanding between Boulenger and Arnold, regarding the origin of this trade import ?). At any rate, Clausen has demonstrated that the types have an open frontal neuromasts system and were originating from Nigeria. It is known that in those days most aquarium fishes were collected and exported from nearby big cities and harbors. This is especially the case with Lagos in Nigeria where the type locality of *Ep. grahami* falls and which was described also by Boulenger (1911) in the same paper. Furthermore, *A. calliurum* is very common in this part of Nigeria. We therefore suggest to consider "inland Lagos" as the type locality for *calliurum*, like for *Ep. grahami* and *Micropanchax macrophthalmus macrophthalmus* : 6.45 N ; 3.38 E.

- *Aphyosemion ahli* (Myers, 1933). This is the most complicated case of all. It was "described" by Meinken (1932) as a variety of *calliurum*, *Panchax calliurus* var. *caeruleus*, and renamed as *ahli* since the name *caeruleus* was preoccupied by *caeruleus* (1) as per Boulenger (1915). This so called description was based on imported aquarium material of unknown origin and no type has been deposited and none is to be found in Berlin (Päpke & Seegers, 1986).

(Continued on page 28)

eat, you can supply a varied diet that will aid your fish in staying healthy, to grow fast, and spawn readily.

One of the biggest "secrets" of success with any species of fish is to take time to take care of your fish. Neglect will kill your fish quicker than almost anything else. Keep your fishkeeping simple and efficient so you can enjoy the fruits of your labors and not become overwhelmed. You will certainly understand that harvest when you see a full colored male *A. striatum* showing off for his mate in the front of the tank.

Happy killie keeping.

46 Cuero Lane
Los Lunas, NM 87031

All color illustrations furnished in this article were done by the author.

Additional reading for beginners:

Beginner's Guide (AKA) by Roger Langton, et al
Killifish, A Complete Pet Owner's Manual by Steffen Hellner
Killifish Their Care and Breeding by Tony Terceira
Success with Killifish by Ed Warner
Enjoy Your Killifish by Bruce Turner and John Pafenyk
Breeding Killifish by Marshall Ostrow

(Continued from page 17)

Additionally, no other fish has been reported from the same import so there is absolutely no rationale for a type locality. However, we tentatively suggest to allocate it to "Longji, approx. 10 km N.W. Kribi" for the following reasons. First, Longji is close to Kribi, a harbor that was used in exporting fishes in the twenties and thirties. Second, this place is in the middle of the distribution of *ahli* s.l., i.e. far from the type localities of *calliurum* and *australe*, its two most related species. Third, a population of *ahli* has been discovered there by Scheel and Clausen, on January 9., 1966 (in fact, it is probably one of the first aquarium strain since the original trade import). This population has a well known karyotype (Scheel, 1990) and a standard one for *ahli*, i.e. different from the populations with variable karyotypes collected between the Sanaga and the Nyong rivers. Fourth, the females there (according to Radda, 1973) of *ahli* are easily set apart because they

show the rare fasciated pattern that has been described by Meinken in his drawing. Fifth, this option leaves open for comparative study two recent taxa of the superspecies, *Aphyosemion heinemanni* Berkenkamp, 1983 and *A. edeanum* Amiet, 1987, and also for a further study and eventually a separate naming the populations having a different karyotype (from in between the two above mentioned rivers) and those, poorly known from Equatorial Guinea.

Finally, this option does not take a position on the pending validity of *ahli* and *pascheni*. Either, following Radda (1973), *ahli* and *pascheni*, both are valid species and then types of both species must be restudied in depth, or following Amiet (1987) (who may well be right), *pascheni* as a senior synonym of *ahli* and *festivum* as a valid species, both fishes being sympatric at Longji and *pascheni* sensu Radda to be renamed. The geographical coordinates of the type locality of *A. ahli* would then be identical to those of *A. pascheni*, i.e. 3.07 N ; 9.98 E and a neotype is hereby designated from Scheel's collection in the Copenhagen Museum of 21 specimens : a female of 34.2 mm S.L. and 43.2 mm T.L., with vertical markings (registration number P 35 4023), the remaining 20 specimens, males, females and juveniles, with registration numbers P 35 4220-39 being paraneotypes. The exact location name is Nziou, which lies in the immediate southern surroundings of Longji. The following meristics have been counted for respectively the neotype and an adult male paraneotype (n°35 4238): D= 11, 11; A= 14, 15; D/A= +8, +8; LL= 30, 29. Both show a G-type frontal scalation.

Finally, a last case may be forwarded, because of its high importance in *Epiplatys* phylogeny and of its huge distribution from Sénégal to central Sudan (see above its possible junior synonym *Ep. marnoi*) and to lower Zaïre (Kinshasa) :

- *Epiplatys spilargyreus* (Duméril, 1861) has been described from "les eaux douces de la Côte des Mandingues" (freshwaters of the Coast of Mandingues), collected by M. Schill, Captain of the Russian merchant navy which may imply a collection not far from the sea coast and not far from a major harbor of that time. According to Rochebrune (1883), also quoted in Pellegrin (1923), the type locality is "obviously situated either on the Falémé river (i.e. at its mouth with the Sénégal River : 14.69 N ; 12.78 W) or near the Gouina falls, on the Sénégal River (i.e. in Mali, upstream from Kayes and from the first falls where the ship's contents had to be transferred at that time : 14.02 N ; 11.01 W)". However, both localities are far inland in the Sénégal basin. According to Prof. Daget, Rochebrune's "obvious" statements have been proven erroneous in several cases and these data must be taken with care, since moreover, Duméril has given "the coast" as a clue. We are then facing three solutions, which are all possible, since the fish is reported all over that region. For the sake of simplicity, because of Duméril's remark and Daget's consideration, we therefore suggest that the type locality of *spilargyreus* is recorded as the surroundings of Saint-Louis, the main harbor at the mouth of

Sénégal into the Atlantic ocean (16.03 N ; 16.50 W). Most merchant ships stopped there for their business in the mid nineteenth century, the fish has been collected there and *Epiplatys senegalensis*, its junior synonym, has a type locality not too far upstream (Dagana : 16.65 N ; 15.52 W).

In conclusion we would like to add that we feel confident the above proposals and suggestions for type localities are adequate. This is not only because the various species are now known from these places, but also because it is now confirmed that, in the old days, collections for the aquarium trade were undertaken mostly from large harbors and their surroundings in order to avoid too many logistic problems to keep the fishes alive during shipment. However the future may disclose some new data which may contradict some of these assertions. We must always stay humble with our own reasoning and not precipitate on an apparently attractive solution. Furthermore, we may expect a lot of advances when DNA techniques will be efficient for old formalin-preserved types or topotypes, so that an identity card of all taxa may be prepared.

This article also exemplifies the very important role the aquarists play in disclosing solutions simply by visiting the places still unknown. Several cases are brought here as a challenge for them, so may we add a last one? In 1995 a (probably) new species of the *Aphyosemion wildekampi* superspecies was discovered by a french cooperant in Southern Central African Republic, about 60 km South-east Mbaïki (3.61 N ; 18.42 E) which is said to show a postopercular ocellus (we only have poorly preserved material). In fact the whole region between Nola and Mongoumba is very interesting because it is a primary forest where the non fish fauna (reptiles, insects) and the flora have been shown to be endemic.

Above all, a quick look to the maps published in Killi-Data 1996 strikes how many collecting trips in virgin regions remain to be undertaken! Good luck to the aquarist "explorateurs" and many anticipated thanks to them.

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Because we feel it is of utmost importance that the above proposals and suggestions be reviewed by the experts on Old World Cyprinodonts, we have sent the manuscript to them including to Lothar Seegers by courtesy. Those who took the time to comment receive also kindest thanks : Prof. J. Daget (Paris MNHN), Prof. J.L. Amiet (Nyons, France), Univ.-Prof. Dr A.C. Radda (Vienna, Austria).

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Author's note:

Although this article ends up with an optimistic flavor, one must not forget the risks still facing those expeditions. The renown enthusiastic US aquarist (and a good friend of ours), Dale Weber, was killed in Brazil, in early 1997 during a collecting trip. This article is dedicated to his memory. I am proud to have named an atypical species, *Rivulus weberi*, after him in 1992.

(1) Boulenger described the taxon as a variety of *Fundulus gularis*, the spellings *caeruleus* or *coeruleus* have been equally used by many authors, all the more that another preoccupied name *Fundulopanchax bivittatus* var. *coerulea* had been described by Meinken (1930). In the original Boulenger paper, it is not easy to disclose which of the two spellings is the correct one. Prof. Daget, through his vast experience, found out that "in the index, the taxon was placed just after *cabrae* (*Tilapia*) which proves unequivocally that for Boulenger, it was with an "a", and not an "o".