

Identification of a small Collection of *Aphyosemion* from Zaïre in the Munich Museum (Z.S.M.), with further Comments on the Validity of the known Components of the *elegans* Superspecies Part 2

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Aphyosemion ferranti

Diagnosis: a single longitudinal red line on male sides and short red flames in unpaired fins of male (hypothesized from the well preserved types: unknown live). This species has the same type area as *lujae* and according to BMHN labels it is known with certainty as sympatric with *lujae* in “Sankan River”. See further the re-description after the study of types at London BMHN.

Range: known only from type area, near Kondué (“Lake Congo”), Kasai river, in the southern belts of the cuvette in southeastern Zaïre (but some “spotty” populations of the cuvette, geographically very far from Kondué, show the same pattern).

3. Insufficiently diagnosed and defined, possibly valid names or synonyms.

Aphyosemion christyi

Diagnosis: according to current knowledge erroneously diagnosed; originally diagnosed by the “more or less large” number of “rounded” spots on the sides and red upper

and lower margins at caudal in male; in need of full redefinition (see above, the 3 options, including a lectotype designation) since the 1985 upper Zaïre collections where 2 phenotypes were shown available in the type area (one similar to “*margaretae*”, the other similar to “*castaneum*”).

Range: undefined (type locality at Lindi river, Bafwasendé, in northeastern Zaïre; unknown live with 100% certainty from type locality but known live from very nearby - about 1km away).



Aphyosemion decorsei Photo M. Chauche

Diagnosis: few red spots on male sides, notably arranged into 2 - 3 anterior longitudinal series; red margins on dorsal and caudal, but not anal in male (hypothesized from well preserved subadult types: unknown live from type locality; see the mention above on the number of spots on sides of types).



A. christyi HZ85-1

Photo M. Chauche

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Range: known only from type area (with certainty), near Bessou, 25km east of Possel, in southern Centrafrique (type locality geographical position disclosed by Huber, only in 1994).



Aphyosemion polli

Diagnosis: very few red spots on male sides; red margins on dorsal and caudal fins but not anal in male (not separable from the hypothesized topotypes of *decorsei* from Centrafrique, that is unknown live). The distance between the 2 type localities of *polli* and *decorsei* is huge by *Aphyosemion* standards and hence the 2 names have been considered as valid. However, no DNA sample has been undertaken yet. It should notably be checked if *polli* has not been introduced artificially (accidentally) into the Kinshasa area from strains of Centrafrique, since an isolated population of *Epiplatys spilargyreus*, also from Kinshasa, raises the same issue, or from strains of extreme northern Zaïre (*schoutedeni* type in today's sense or the Gilima aquarium population).

Range: very small; known only from type area, near Kinshasa, capital town of Zaïre (and replaced a few kilometres away by *coëgnatum*).

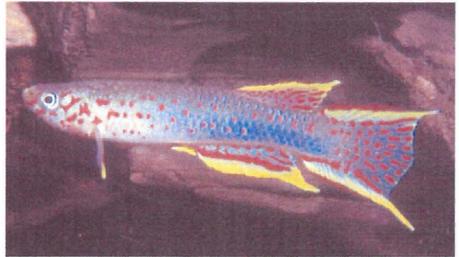
Aphyosemion schoutedeni BKA Photo Aquarium strain presently identified as *schoutedeni* (real pattern, unknown)

Diagnosis: few red spots on male sides, conspicuous red margins on caudal fin, with thin short red flames (or spots) innerly and small flames but no margin at dorsal and anal fins (unknown live from type locality). Not easily



separable from *decorsei* for male colour pattern and considered, hence, as its junior synonym. Not easily separable either from the fish from Kisangani, i.e. “*christyi*” (in the present sense or *castaneum* s.s.). However, Boulenger himself has described the 2 taxa, *christyi* and *schoutedeni*, at 5 years' distance and his experience and his knowledge must not be underestimated. The aquarium population from Gilima (3.917N;28.367E) is the closest by live colour pattern and type locality to *schoutedeni* (2.417N;27.302E).

Range: known only from type area (with certainty), Madié, between Nepoko river and Nava river, in northeastern Zaïre, which is not very far from that of *castaneum*, but may also be lying in the same biogeographical region as *decorsei*.



Aphyosemion castaneum Photo Ruud Wildekamp

Diagnosis: according to the types and topotypic live material, it may be characterized by the pseudo-symmetric pattern of male unpaired fins: thin red margin, then yellow or blue submargin and in addition, anal with a red inner nearly median line, sometimes broken (vs. dorsal fin, with no such line), but it will

have to be demonstrated if it can or cannot be separated from the similar (and senior) *schoutedeni*, living in the same region (possibly not the same biological region). Should the latter be the case, it would be a pity since *castaneum* is the type species for the genus *Aphyosemion*.

Range: it has been described from Kisangani in northeastern Zaïre, but is widely available all over the north and east central cuvette, with the new Schliewen's samples.



Aphyosemion melanopteron Photo Ed.Pürzl

This taxon has been modernly described from about 100km east of Kinshasa in Zaïre (southern belts of the cuvette) but cannot be separated by colour pattern from the similar *congenicum*. However, *congenicum* has no precise type locality ("Kongo"): if populations with broad dark margins on male upper unpaired fins are re-collected from areas in Congo cuvette that are distant from eastern Kinshasa and with a different karyotype (which is not unlikely at all), then there will be a problem and a revalidation of *melanopteron* might be preferred, instead of the ill-defined *congenicum*, or alternatively a new type locality may be attributed to *congenicum* that is identical to *melanopteron* (but this action might be seen as unfair to Goldstein & Ricco who offered a fairly good description for their *melanopteron* taxon).



Aphyosemion margaretae Photo van der Zee

Diagnosis: a red closed pattern at male caudal, according to the drawing of the description (i.e. with red posterior thin vertical bar connected to the upper and lower margins, bearing in mind that Fowler's drawings are usually not accurate). Actually, collections at Bafwasené and easterly up to Epulu (only 30km southwest of type locality) by Stenglein et al. in 1985 revealed a fish with a nearly completely closed pattern: the male exhibits an upper and lower red margin at caudal (like *christyi*) and the rear border of the fin shows short conspicuous red flames that are more or less linked with those margins. No DNA sample has been undertaken to separate that taxon - or not - from *christyi/schoutedeni* in today's sense. May or may not be revalidated, depending on the decision on the status of *castaneum*.

Range: known only from type area (with certainty), near Saidi in northeastern Zaïre, but the 1985 collections, at Bafwasené and eastwards, can be referable to it.

111. STUDY OF ZSM MATERIAL

During the summer of 2002, Uli Schliewen from the Munich Museum made a collecting trip to the Bandundu Province of west central Zaïre. He was so kind to send on loan the important material belonging to the genus *Aphyosemion* for study at Paris MNHN.

Forward notes:

1. the colour patterns of females are not hereby detailed since all are faint grey on the body with faint dark reticulations around scale edges, named the "net" and unmarked or poorly marked unpaired fins,
2. the morpho-meristic data of ZSM material have been computed but they are not listed because they are not different from those of other *elegans* components,
3. the only morphometric character

that might have some value in differentiating the components of the *elegans* superspecies is the shape of the unpaired fins in male, notably of the caudal fin, but this is still poorly documented,

4. the systematic identification of fish is based on type material and type localities: for the *elegans* group, it is critically important because many of the elderly described species are unknown live, hence the researcher is left with the preserved colour pattern of types and the geographical position of the type locality.

Male colour pattern, notably living, is thus THE single criterion of diagnosis, yet and identifications are tentative until LIVE topotype material (= from type locality) becomes available.



1. *Aphyosemion* sp. Blue “Lompolé”

The 6 studied specimens (out of a total of 9) are registered under ZSM 29610, collected by Uli Schliewen on August 28-29 2002, at Lompolé, Bandundu Province in central Zaïre (geographical coordinates in thousands of degrees: 2.567S 20.233E)

Male, with dark margins at dorsal and caudal and irregularly at anal; the caudal fin upper inner part shows some yellowish, red in life, spots; the anal fin exhibits a dark margin only in fully grown, probably dominant specimens and a lighter (yellowish or whitish, in life?) band along its basis; sides, with numerous yellowish, red in life, spots arranged in longitudinal series (more regularly on upper sides).

At first glance, the fish cannot be easily separated from the currently identified as “blue colour phase of *A. christyi*” from the type area of *castaneum*, near Kisangani in northeastern Zaïre; however, the living colour pattern of the male shows some distinct characteristics, such as the dark margin and the white to pale blue submargin at dorsal fin and the red median line at anal fin with unstable marginal feature. Such a median anal line is clearly seen in males of the Kisangani region (cf. Stenglein’s photo of population HZ85/8, north of Kisangani, op. cit. 1987b and Chauche’s photo in Pt.1) but not as regularly and somewhat less median; it is also seen in the male types of *lujae*, which shows in addition red flames between the base of the fin and that line, to form a “ladder” pattern (but live topotypes of *lujae* have not been collected yet and this remark is only based on the study of the lectotype in BMNH); in addition, 2 populations looking like this hypothetical *lujae* has been collected far away from each other: the first near Oyo in eastern Congo by us and later by Dutch aquarists, the second by Stenglein et al. near Madula (HZ85/13) in northeastern Zaïre but both are of the yellow phenotype.

The Lompolé fish might be a new species but this is unlikely: it would then deserve a new name when more information can be gathered from new collections in the area and when the knowledge of older taxa in the superspecies, notably *lujae* from southeastern Zaïre, is improved. Due to the important distance (600km!) in-between with Kisangani, where no known collections of live fish has been made, it is provisionally identified as *Aphyosemion* sp. Kisangani-like (*christyi* in today’s sense, *castaneum* in a strict sense).

2. *Aphyosemion* sp. Blue “Yaka”

The 9 studied specimens (out of a total of ca. 20) are registered under ZSM 29619, collected by Uli Schliewen on August 27 2002, at Yaka, Bandundu Province in central Zaïre (geographical coordinates in thousands of degrees: 1.150S 20.333E)

Male, very similar to the specimens from Lompolé, except that the spots on inner caudal fin are replaced by short streaks (no real flames) and that the first longitudinal series on sides is very regular and nearly fusing into a line. The identification is hypothetically identical, as *Aphyosemion* sp. Kisangani-like. However, this is tentative since no colour photo of the male is available.

3. *Aphyosemion* sp. Yellow “Lui Kotale”

The 7 studied specimens (out of a total of ca. 20) are registered under ZSM 29737, collected by Uli Schliewen on August 23-27 2002, at Lui Kotale, Bandundu Province in central Zaïre (geographical coordinates in thousands of degrees: 2.760S 20.379E). This is a yellow colour phase, not a blue phase as above, with orange tinge in preserved fins. Male, with dark (red-black in life) margins at caudal and possibly also at anal fin; the dorsal fin is not margined, but submargined with dark, leaving a thin light outer edge; sides are conspicuously marked with 5 to 6 longitudinal and regular series of yellowish (red in life) spots, with those series progressively coming closer to each other towards peduncle, like a mosaic; in life, this pattern forms a series of vertical red bars posteriorly.

This fish is identical (preserved and in life) to populations I have collected in northwestern Congo in 1978, near Débrouillé and that Lambert collected in the early sixties near Boendé (re-collected by VanDeun, 2002: see ZSM material donated by Heinz Ott); it is conservatively identified as *Aphyosemion* cf. *elegans* (see above, the discussion on the status of *elegans*).

4. *Aphyosemion* sp. Yellow “Inongo”

The 2 specimens, 1 male and 1 female are registered under ZSM 29604, collected by Uli Schliewen between August 29 and September 4 2002, at Km.14, road Inongo-Mbombokonda, Bandundu Province in central Zaïre (geographical coordinates in thousands of degrees for Inongo: 1.950S 18.267E).



Male, very similar to specimens from Lui Kotale, except that yellowish (red in life) spots are present on inner upper caudal fin and that the margins on unpaired fins are very thin, hardly visible. In life, no vertical bars are seen in male, although the red spots are vertically organised and the dark margin at the male dorsal fin is thin, not broad. This sample is characteristic of the difficulties facing the researcher in the study of the *elegans* super-species: it may be either a local colour variation (see comments on the Bombala collection, further, where few irregular bars are shown on sides of some males) or another aberrant “spotty” phenotype. The identification is then tentatively derived from the Lui Kotale fish, as *Aphyosemion* aff. *elegans*.

IV. REDESCRIPTION OF *LUJAE*, COMMENTS ON THE SYSTEMATICS OF *FERRANTI* AND DISCUSSION ON THE OTHER UN-NAMED AQUARIUM POPULATIONS OF THE *ELEGANS* SUPER-SPECIES

During a visit to B.M.N.H. in London in 2001 that was dedicated to the study of rare types (notably *fallax* in prep.), we were able to study the series of *Haplochilus ferranti* and *H. lujae*, described by Boulenger. While *lujae* has always been considered as a component of the *elegans* superspecies, *ferranti* may not (Huber, 1978) or may (Wildekamp, 1993) have the same phylogenetic position. However, while Huber's positioning was based on the study of one of the type series to place it closer to *Mesoaphyosemion*, Wildekamp's move was not argued.

Therefore the following samples have been seen for a new evaluation:

Aphyosemion lujae, BMNH 1911.7.17.1924, syntypes; River: Sankan; Locality: Kondué, Sankan River, Kasai; Presented: Collector: Mons. (=Mr) M. Luja; No. specimens: 6

Aphyosemion ferranti, BMNH 1910.9.13.3, lectotype. Locality: near Kondue, Lake Congo; collected by M. Luja Esq.

Aphyosemion ferranti, BMNH 1911.7.17.17-18, paralectotypes; River: Sankan; Locality: Kondue, a Sankan river, Kasai; Collected by Mons. M. Luja.

Aphyosemion ferranti. BMNH 1913.4.5.5-10, paralectotypes (already studied in 1977 for my thesis in Huber, 1978); River: Kasai; Locality: Kondué, Kasai river, Belgian Congo; Presented; Collector: M. Luja Esq. No of specimens 6

1. *Haplochilus ferranti* Boulenger, 1910

The 6 paralectotypes (BMNH 193.4.5-10), probably all males, are in rather good condition. Their morphology is definitely distinctive from *lujae*: it is less slender, relatively more heavy and could be hypothesized to belong to the same lineage than *labarrei* (subgenus *Mesoaphyosemion*); this would mean that the several hundreds of kilometres of land where no known collections of live fish have been made, host other components, new, of that superspecies. Like *labarrei*, *ferranti* exhibits yellow or green markings and reflections on anterior sides, on the inner part of dorsal fin and on the upper of caudal fin near to peduncle (represented by clear spots on preserved material); a (red?) band runs over the mid lower sides; the anal fin shows a few scattered red dots and the caudal, rather deep (unlike the standards in the *elegans* superspecies), a dark (red?) submargin and a light (white, yellow?) margin, which is wider at the lower level than at the upper level. These conclusions are very much in line with my 1978 publication.

However, our biogeographical knowledge of the *Aphyosemion* sp. from the cuvette has increased since 1978.

- the ‘spotty’ sympatry of 2 components of the same superspecies is not rare in the Congo cuvette (and also in the Amazon basin, as stated above), to the contrary of other inland tropical regions,

- the evolutive speciation of those fishes has been shown to clearly follow a vicariance process, as it has been shown by the concept of superspecies (confirmed by DNA samples).

Then, while no *Mesoaphysemion* fish had been collected east of *labarrei* range, the ‘necessity’ of 2 sympatric components belonging to 2 distinct superspecies was becoming less compelling. On top of those rising doubts, the technique of radiophotography came in with many advantages, notably to study old types in less good conditions. Hence the new study of the lectotype and 5 paralectotypes, notably the important meristics in dorsal rays, because in the *elegans* superspecies dorsal rays range around 9 - 11, while in *labarrei* superspecies (*Mesoaphyosemion*) they range around 12 - 14. The results are clear: D = 9,10,11,10,10,10 (besides, A = 13,15,15,13,15,14). While types of *ferranti* are less slender, are having more rays and rounded fins, the species is still more probably a member of the *elegans* superspecies and Wildekamp’s recent assumption is correct.

2. *Haplochilus lujae* Boulenger, 1910

The 6 types (BMNH 1911.1.17.19-24) are in very good condition and the last time we studied them was back in 1977 for our thesis. This *Aphyosemion* species is definitely distinctive from *ferranti*: it is slender with short-based fins and belongs clearly to the *elegans* superspecies. It is rather more melanistic (strong reticulations on sides) than the other components of the superspecies. Male is characterised by typical red markings on fins and posterior sides: a flamed pattern of the caudal (asymmetrical) and dorsal fins, a ‘ladder’ pattern of the anal fin (there, the inner flames are stopped at the median level by a red band across rays); female is characterised by fewer

markings: two brown lines on sides, one upper along the entire body, the other lower and short, up to the ventral fin level, with unmarked fins, except the anal which is light anteriorly and becomes dark posteriorly. We hereby designate a lectotype (BMNH 1911.7.17.19) for the largest male (TL=43.37mm; SL=34.95mm). It may be worth to mention how much the aquarium population from Oyo is similar to what is anticipated, live, for *lujae*.

3. The identification of other aquarium populations: the phenotypes from Lobaye, West-Mokéko, Bombala.

The West-Mokéko and Lobaye populations may be dealt with at the same time, because these localities belong to the northwestern belts of the cuvette in primary forest, either in northwestern Congo or southern Centrafrique but in the same biogeographical region. The second reason is that the colour patterns of the males are similar: heavily dotted on sides, regularly but not forming longitudinal or vertical lines; heavily and symmetrically dotted in all unpaired fins, also; all unpaired fins but anal are red margined, with a contrasting pale cream line, innerly. With our present limited knowledge, it is impossible to relate these populations to an available taxon and they may well belong to a new species. For the time being it is reasonable to identify them as *Aphyosemion* sp.

The Bombala population is different: the fish dwell in the cuvette (not far from Impfondo) in over-flooded biotopes of secondary forest and in terms of colour pattern they are closer to *elegans*. Actually, the colour pictures of 2 different aquarium males show a tendency of forming 2-5 irregular bars on sides, less numerous and less regular but still like *elegans* in Lambert's present sense (for one picture see cover). The case seems similar to Schlieven's population of Inongo, also in the cuvette and it is proposed to identify it as *Aphyosemion aff. elegans*.

V. TEMPORARY CONCLUSIONS

Before the future overall review of the *elegans* superspecies and further systematic decisions, it is better not to change the current systematics and then, for aquarists, 14 phenotypes may be considered as distinctly diagnosed and as corresponding to valid species with a stable name or not. These 14 phenotypes are listed hereafter according to the historical order of description (aquarium populations are given between '[]', together with the diagnosis and alternative naming);

1. *Aphyosemion elegans* (Boulenger 1899)

[Boendé, Bombala (aff.), Ignoli, Maimombe (Aff.)]: red bars on posterior sides of male, plus a broad dark red line on the mid part of the dorsal fin (Lambert's present sense: the diagnosis may be changed according to the first re-discovery of topotypes).

2. *Aphyosemion decorsei* (Pellegrin, 1904)

[unknown live]: few red spots on male sides, notably arranged into 2-3 anterior longitudinal series; red margins on dorsal and caudal but not anal in male (hypothesized from well preserved subadult types); *Aphyosemion polli* Radda & Pürzl, 1987, from an isolated region about 1000km away, presents a very similar diagnosis and may or may not be distinctive. *Aphyosemion schoutedeni* (Boulenger, 1920) may be identical to *decorsei* (then, a junior synonym) or to the species from Kisangani.

3. *Aphyosemion ferranti* (Boulenger, 1910)

[unknown live]: a single longitudinal red line on male sides and short flames in unpaired fins of male (hypothesized from well preserved types).

4. *Aphyosemion lujae* (Boulenger, 1911)

[unknown live]: a ladder-like red pattern on male anal fin, made of a broad red inner line and red flames towards the base; a red flamed caudal fin in male (hypothesized from well preserved types).

- 5. *Aphyosemion* sp.** Kisangani [to be assigned to *A. christyi* (Boulenger, 1915) as per option 1, to *A. schoutedeni* (Boulenger, 1920) as per option 2 or to *A. castaneum* Myer, 1924 as per option 3; other similar aquarium populations: Lompolé, PK40.5 Kisangani (HZ85/2), PK28.5 Kisangani (HZ85/8), Madula (aff., HZ85/13), PK18.1 West Bafwasené (aff., HZ85/20), PK67.9 West Bafwasené (HZ85/22): a median red, continuous or broken line on male anal fin and few rather large spots scattered on male sides.
- 6. *Aphyosemion* sp.** Epulu (HZ85/14) and east of Bafwasené [to be assigned to *A. margaretae* Fowler, 1936 as per option 1, to *A. christyi* as per options 2 and 3; other similar aquarium populations: HZ85/15, HZ85/16, HZ85/17, HZ85/18, HZ85/19]: a red closed pattern at male caudal and many small red dots, longitudinally arranged on male sides.
- 7. *Aphyosemion congicum*** Ahl, 1924 [Gembo, Kenge, Takundi, Vue River]: broad dark margin at male dorsal fin and at upper caudal fin, together with variably numerous red spots on yellow-brown sides (alternative name: *Aphyosemion melanopteron* Goldstein & Ricco, 1970).
- 8. *Aphyosemion cognatum*** Meinken, 1951 [Bandundu, Djoué, Kimuenza, Kinsuhka, Kintepe, Kisantu, Lake Fwa, Madimba, Mbanza-Ngungu, N'galiema, Ngangalin-golo, Nyangu-Cugolo]: narrow white (or pale blue) margin and red submargin on dorsal and caudal fin of male, red margin in anal; very numerous red dots (irregularly or in longitudinal series, not vertically arranged) on male sides.
- 9. *Aphyosemion lamberti*** Radda & Huber, 1977 [Abeilles, Booué, G80/5, Koulamoutou, Lekoko, Okondja]: red flames on all unpaired fins of males and scattered speckles on sides over blue background.
- 10. *Aphyosemion rectogoense*** Radda & Huber, 1977 [Bongoville, East Franceville, Léconi]: red flames near base of all unpaired fins in male, followed by a broad yellow submargin and a red margin, plus speckles regularly and longitudinally on sides over a yellow background.
- 11. *Aphyosemion chaucheii*** Huber & Scheel 1981 [Obeya, Oltombo, Oyoué]: deep orange (not yellow and thin) marginal broad zone in anal fin and red, vertically oblong, numerous spots on blue sides and inner fins of male.
- 12. *Aphyosemion schioetzi*** Huber & Scheel, 1981 [Kellé, Kinkala, Kounga, Linzolo, Lutoko, Mgondé, Mindouli, Missafou, Mokedo, N'kenni, Ngombe, PK50 Luozi, Taba, Voka, Voula]: yellow marginal thin zone in anal fin (with or without dark edge) and red, vertically oblong, numerous spots on yellow sides and inner fins of male.
- 13. *Aphyosemion lefiniense*** Woeltjes, 1984 [La Léfini]: yellow margin (not red) and broad red submargin on all fins of male (i.e. a reversed, symmetrical pattern).
- 14. *Aphyosemion plagitaenium*** Huber 2004 (separately described) [Epoma]: red chevrons or oblique lines (not bars) on sides and red blotches near base of anal fin of male over a yellow/blue background.

It is expected that Zee (pers. comm., 2004) will help in the understanding of the diagnosis and distribution of the *elegans* superspecies with the Tervuren collections and show distinct phenotypes and collecting localities. His important task should be supported as much as possible.

Still, the paucity of our knowledge for this group remains to-day: Only time will help, together with an improvement in the political situation and with better roads in the huge cuvette to allow in-depth collections. The

scope is immense but first of all, the task should commence with live re-discovery and study of topotypes of the first historically described species, *elegans*, *decorsei*, *lujae*, *ferranti*, *schoutedeni*. Before this important step, it is the author's opinion that there is little interest to describe new taxa from the cuvette itself, even if they may be distinctive such as the present Oyo population, on the basis of a single location. Within the belts regions, the situation is different and the Lobaye and West-Mokéko populations might deserve a new name when new live collections can be achieved, when the true topotypic *elegans* is revealed and the limits of both distributions better understood.

On the other hand, the new collections by Uli Schliewen are very important and for 3 reasons:

- they increase our limited knowledge of live populations within the cuvette (its central part),
- they allow to extend the distribution of a known phenotype from the belts into the cuvette itself, which is provisionally identified as *elegans*,
- they disclose another "spotty" phenotype that may be related to the fish from Kisangani some 600km away.

To sum up:

While these new collections are positively welcome, our level of knowledge of the *elegans* superspecies in the cuvette remains desperately poor and only detailed sampling may help understanding the very complex systematic status of these fishes, together with the live re-discovery of older taxa at their type locality, to use them as the basis of re-diagnosis of more recent taxa. This is the best optimistic message for a very pessimistic picture!

IV. ACKNOWLEDGEMENTS AND DEDICATION

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This study is dedicated to the memory of two renowned German aquarists who passed away recently, Winfried Stenglein and Wolfgang Grell. Together with JanPap, they were the first to visit the region around Kisangani and Bafwasendé in northeastern Zaïre and collect live several populations. Very kind and cooperative with others, including researchers, they are examples for us all.

VII. BIBLIOGRAPHY

Huber, J.H.1978. Contribution à la Connaissance des Cyprinodontidés de l'Afrique Occidentale: Caractères taxonomiques et Tentative de Groupement des

Espèces du genre *Aphyosemion* (Cyprinodontidés). Rev. fr. Aquariol.,5(1): 1-29,9 figs.,30 photos, 6 maps.

Huber, J.H. 1980. Rapport sur la deuxième Expédition au Gabon (Aôut 79). Etude des Cyprinodontidés récoltés. Rev. fr., Aquariol. Herpétol.,7: 37-42, 9 figs. tab., map.

Huber, J.H. 1982. Rapport de Synthèse sur l'Expédition au Congo (1978). Cyprinodontidés récoltés et *Micropanchax silvestris* synonyme de *stictopleuron*. Rev. fr. Aquariol., 9(1): 1-12, 9 photos, tab. 5 maps.

Huber, J.H. 1992. Review of *Rivulus*. Ecobiogeography - Relationships. Cybium Suppl., Soc. fr. Ichthyologie Publ.: 586 pp., 40pls. 85 tabs, 13 maps.

Huber, J.H. 1994. *Aphyosemion passaroï*, Espèce inédite du Gabon Sud-oriental, au Patron de Coloration unique et Description complémentaire de *Aphyosemion decorsei* Pellegrin. Rev. fr., Aquariol. Herpétol., 20 (1993): 77-79, 1 fig. (Trans. in Brit Kill. Assn. 1995).

Huber, J.H. 1998. A Comparison of Old World and New World Tropical Cyprinodonts. A parallel Outlook of similar and distinctive Characteristics regarding Distribution, Evolution, Ecology, Behaviour, Morphometrics, Genetics and Colour Pattern. Soc. fr. Ichthyologie: 109pp., 17 figs.

Huber, J.H. 2001-2004 Killi Data Online <<http://www.killi-data.org>> A Global Website dedicated to Oviparous Cyprinodontiformes or Killifishes, with a Data Base on all known

Taxa (all files of the *elegans* superspecies: dated January 1st 2001).

Huber, J.H. in press. Description of a new *Aphyosemion* species from Congo, *A. plagitaenium* n. sp. exhibiting a probable intra-generic colour convergence with oblique bars.

Huber, J.H. & J.J. Scheel 1981. Revue systématique de la Superespèce *Aphyosemion elegans*. Descriptions de *A. chauchei* et *A. schioetzi* n.sp. Rev. fr., Aquariol. Herpétol., 8: 33-42

Murphy, W.J. & G.E.Collier, 1999. Phylogenetic Relationships of African Killifishes in the Genera *Aphyosemion* and *Fundulopanchax* inferred from Mitochondrial DNA Sequences. Mol. Phylogenetics and Evol., 11(3) (April): 351-360, 5 figs.

Seegers, L. 1988. Bemerkungen über die Sammlung der Cyprinodontiformes (Pisces: Teleosta) des Zoologischen Museums Berlin. 1. Die Gattungen *Aphyosemion* Myers, 1924 and *Fundulosoma* Ahl, 1924. Teil 2. Mitt. Zool.Mus. Berl.,64(1): 3-70, figs.

Stenglein, W. 1987a. Haut Zaïre 1985 Reiseergebnisse. D.K.G. (Deutsche Killifisch Gem.) J.,19(1):10-16, 6 figs., map.

Stenglein, W. 1987b. Killifischbiotope in Nordost Zaïre. Aquar. Terr. Zeit (D.A.T.Z.), 40(11): 481-484, fig.

Wildekamp, R.H. 1993. A World of Killies. Atlas of the Oviparous Cyprinodontiform Fishes of the World. Vol 1. Amer. Killifish Assn.. Publ.: 311pp, figs.

Part 1 errata : intermediate (not immediate, line 9 left, page 106), genetic (not generic, line 9 right, page 106), "correspond to distinctive phenotypes with" (truncated sentence, after "alphabetically listed", line 24 right, page 112), *cognatum* (not *congenicum*, line 23 left, page 113); note : all photos selected by editor (Seegers's photo of *lujae* corresponds to one of the spotty phenotypes, probably from northeastern Zaïre, that looks like *lujae* but is definitely not, due to the huge distance from type locality).

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