

courtesy of

ARK - Arizona Rivulin Keepers

The Scheel Letters, No. 49

West African Rivulins: *Epiplatys dageti* and *Epiplatys chaperi*; Draft (Aquarium Journal)

In 1882, Sauvage in France described a new Rivulin from West Africa under the name *Haplochilus chaperi*. Sauvage's material came from swamps at the bottom of the Lagune Assinie from a locality named Couacrou. We have not been able to find such a locality at the bottom of the Lagune Aby, but some 16 miles east of the northernmost part of the lagune there is a village named Kouakro which may be identical with Sauvage's locality for this new species. In 1895, this species was synonymized by Garman with *H. senegalensis* Steindachner 1870. This synonymizing indeed was incorrect. In 1933, Myers identified the species described by Peters in 1863 as *Poecilia sexfasciata* with Sauvage's species. At present it is not quite certain if Myers' identification is right. Also it will be correct to reserve the species name *sexfasciatus* for *Epiplatys sexfasciatus* Gill 1862, which is not found west of the Dahomey Gap.

On 13 Jan. 1908, a shipment of live aquarium fishes arrived at Hamburg and was inspected by amateur zoologist J.P. Arnold. He noticed that the shipment contained a "sexfasciatus like" Rivulin and also a couple of small Rivulins unknown to him. He kept these two unknown Rivulins in his tanks for some months waiting for a male to be imported, as his two individuals developed into females. After some time he preserved these two fishes and mailed them to his friend Boulenger in London who based his description of *Haplochilus liberiensis* on this material (*Aphyosemion liberiense* is a form which seems to be very close to the forms known as *A. calabaricum* and *A. roloffi*). Arnold also took a pair of the "sexfasciatus like" Rivulin and he was soon able to raise an aquarium strain of this species. As he was unable to identify this fish, he mailed specimens to Boulenger who identified the fish as *H. chaperi* Sauvage. From his publications on this species it is quite clear that Arnold was not satisfied with Boulenger's identification and he examined the original description of *H. chaperi* and found that the colors and color patterns of his fish did not agree with those described by Sauvage. As usual, however, he suppressed his doubt and used the name that Boulenger recommended.

Except for the pair of *E. "chaperi"* which Arnold bought, all the rest of the specimens imported in that shipment were taken by a breeder who lost them all and did not raise a single individual. Arnold's offspring from his pair however were numerous and were delivered to aquarists all over Germany. From information in German aquarium magazines of 1911 and 1913 we know that all *E. "chaperi"* kept by aquarists at that time originated from Arnold's pair. Also it is likely that even the present strain of *E. "chaperi"* kept by aquarists all over the world are all descendants from Arnold's pair. If this is true it is

difficult to explain some findings on the present strain of *E. "chaperi"*. Both Boulenger and Arnold inspected the fins of Arnold's breeding male and found that this specimen corresponded with Sauvage's species. However, the present *E. "chaperi"* has 11-12 dorsal rays, whereas Sauvage counted 7 dorsal rays only. Sauvage's type material had 15 anal rays whereas the present strain has 16 to 17. We are wondering why these alterations of the fin counts apparently have not been noticed by authors of aquarium books, etc., which still use the data given by Sauvage (and Boulenger etc.). Arnold's breeding male measured 52 mm total length when fully developed. The present strain reaches at least 65 mm. However, this change may be a result of the selection of individuals for breeding. Arnold's description and color picture of his strain make it quite sure that the fish that we now call *E. "chaperi"* is identical with the one imported back in 1908.

To make things even more complicated, Boulenger in his Catalogue of African Freshwater Fishes 1915 mentioned that the material that he received from Arnold originated from Sierra Leone and he pictures Arnold's breeding male (probably) with that locality. Arnold for his part however wrote in the "Wochenschrift" that the shipment came from Monrovia in Liberia. Oddly enough, Boulenger's type locality for his *H. liberiensis* imported as "odd balls" inside the shoal of *E. "chaperi"* is Liberia and not Sierra Leone. As we mentioned under *A. nigerianum* in connection with Boulenger's *Haplochilus calliurus*, the type locality given for this species also does not correspond with the information given in the "Wochenschrift" by Arnold. As all material used by Boulenger for the descriptions of these forms was delivered to him by Arnold who had the information about the origin of these fishes first hand from the sailors, we do not doubt that Arnold's information is true (as true as such information from collectors could be). This means that the origin of Arnold's *E. "chaperi"* is without much doubt Monrovia in Liberia, whereas the type locality of *H. calliurus* Boulenger - freshwater pools of Sierra Leone - is more more doubtful (as Arnold did not consider the information given by the collector as quite true).

In 1942, L.P. Schultz in the USA reported *E. chaperi* in preserved material collected near Harbel and Monrovia in Liberia. In 1948, Daget reported this form from Yapo and Banco in Ivory Coast. The material reported by Schultz probably is identical with Arnold's strain, whereas the material reported by Daget needs further investigation.

During fall 1952, Dr. L. Sheljuzhko from Germany collected freshwater fishes suited for the aquarium for Werner at Munich. His collections took place around Abidjan in Ivory Coast and up to a distance of 50 miles north of this city. In a small pool near Port Bouet he caught some small fishes that he first considered as juveniles of *E. "chaperi"*. As the individuals were very small, he looked around the collecting area to find further populations, but he did not find this species elsewhere. Live specimens of the Port Bouet population were mailed to Munich and were sold as aquarium fishes. Some specimens reached E. Roloff in Karlsruhe who sent material of this form to Dr. M. Poll in Belgium for identification. In 1953, Poll described this fish as *Epiplatys dageti*. The description was based on an adult pair. Poll and Sheljuzhko both were aware that this form was very much like the Rivulin called *E. "chaperi"* by aquarists. Poll however found sufficient differences between these two forms to be able to separate them at species level. Males of the Port Bouet population did not develop the very characteristic red area of the male throat which is always present on adult males of the Monrovia *E. "chaperi"*. The aquarium strain of the Port Bouet population of *E. dageti* disappeared rather quickly from the aquarium trade, probably because this fish is not very handsome or interesting, although it is very easy to keep and

to breed. The interest in this fish was so poor that not even an article has been published about it in German aquarium magazines.

In summer 1962, Stenholt Clausen discovered *E. dageti* inside the plain and swampy landscape around Awiebo in SW Ghana and not very far from the type locality of this species. At Awiebo the species seems to prefer just the same sort of biotope as that of Port Bouet. Port Bouet is situated on the southern part of a long and narrow island which separates the large Lagune Ebrie from the Atlantic. This island is partly covered by a particular type of sublithoral forest. Such forest and the corresponding type of soil stretches out as a narrow strip along the coast of Ivory Coast from Gran Lahou eastwards into southern Ghana.

In summer 1963, Bruce Turner in the USA sent us live specimens of an *Epiplatys* apparently related to both *E. "chaperi"* and *E. dageti*. This form was imported into the USA from "Nigeria". From our personal knowledge of the Nigerian Rivulin fauna we consider it as a fact that this form does not belong to the Rivulin fauna east of the Dahomey Gap and that is likely that the form originated somewhere near the coast of Ghana, Ivory Coast or Liberia. Apparently, Bruce's strain is a link between the populations of *E. dageti* Awiebo and Arnold's "*E. chaperi*".

Dr. Poll kindly lend us preserved specimens of the Port Bouet population (aquarium raised) and then we were able to compare the three populations of *E. dageti* mutually and in connection with the aquarium strain of *E. "chaperi"*. The differences within the normal zoological counts and measurements do not permit us to separate these four strains, at least not at species level.

The Monrovia strain (*E. "chaperi"*) seems to possess a few more rays in the dorsal and anal fins: D 10-11 / A 16-17 versus D 9-10 / A 14-16 for the three populations of *E. dageti*. All populations have black crossbars on the body sides of both sexes. The Monrovia population apparently have had a very constant pattern of such bars since the importation in 1908. If compared with the normal system of black crossbars seen in individuals of *E. sexfasciatus* Gill, the Monrovia population lacks the black bar just above the root of the ventral fins. The "V bar". The three populations of *E. dageti* do not possess any constant bar pattern. At least on juveniles the bar system is just like that of *E. sexfasciatus* in most cases. During maturing the constant system often breaks down, as males loose some of the normal bars in particular the V bar is lost or temporarily absent on one or both sides. On the contrary, females often tend to produce doubling of the black bars. The extra bars mostly come midway between two normal bars. They often are not fully developed and may look like oblong spots situated high or low on the body sides. Old females of Bruce's strain develop such a system very markedly and they appear as they were more dotted than barred with black. On Awiebo females the extra bars mostly are complete and the fish only looks barred. Many females of this strain however may loose many bars temporarily or perhaps even permanently when old. These variations make it quite impossible to describe the bar pattern of the females.

No red (orange red) color was noticed on the throat of males from the Port Bouet population. Superficially seen, this is also the case for the Awiebo population. Now and then one may notice a certain pinkish color where the red color normally is present on male *E. "chaperi"*. Bruce's strain show just as much red on male's throat as do the *E. "chaperi"*. If the Awiebo male is crossed with the Bruce strain female, the "hybrid" male does not develop a red throat. However, the pigmentation of the throat

looks more pinkish to yellowish than that of the pure Awiebo males. These "hybrid males" however are not fully grown at present. They have been breeding for months so it is not likely that the pigmentation will increase much. The development of a relatively large area of brilliant red pigmentation on the anterior part of the male's throat represents (so far) a quite exceptional type of throat signal pattern within African Rivulins. The red pigmentation however is not the only component of the throat pattern that is unique. The system of black pigments on the throat of both sexes also differs from that of most West African Rivulins and in particular from those of *Epiplatys*. The *E. dageti* system seems to come closest to that of *Aphyosemion bivittatum*. Among the four populations of *E. dageti* considered here, there are some minor differences of the black pattern. There seems to be no difference between the males of Bruce's strain, the Monrovia and the Port Bouet populations. The female pattern differs from that of the males not only in the absence of red pigmentation (if present on males) but also rather markedly by a certain black pigmentation inside the area which is red on male's throat. Oddly enough, the male of the Awiebo population develops the same black system as seen on females of the Port Bouet population and Bruce's strain. To compensate for this, the females of the Awiebo population develop more black pigments. See drawings. The "hybrids" from Awiebo male to Bruce's female show the black pattern of the latter population. Juvenile individuals possess the "basic" red pattern of West African Rivulins: a narrow red line just behind the lower lip and a like line more posteriorly. Red pigments are seen in between these two basic red lines. It is likely that the red pigmentation of the males of some populations comes from a leaking of red pigments from these lines into the adjacent area followed by an increase of the development of red pigment cells. There are no red dots on the body sides of the males of any of the four populations. The scales are edged with a dark violet red color. Males of the Awiebo population develop a certain yellowish brown shine on body sides. The Monrovia population and Bruce's strain develop the same general color of fins and body sides. The pectoral fin color is a warm orange on all males (not described for the Port Bouet population).

Males of the Monrovia population and of Bruce's strain develop a short "sword" by the way that the lower rays of the caudal fin produce with maturity. The dark black edge of the lower part of that fin runs into the sword. *E. dageti* shares the development of such "swords" with *E. sheljuzhkoi* and also but less developed with some populations of Nigerian *E. sexfasciatus*. The "sword" is very weakly developed on males of the Awiebo population and it is not mentioned in the description of the type from Port Bouet.

Females of the Awiebo population develop a very conspicuous black band along the anal fin. This band it shares with *E. grahami*, *E. macrostigma* females, however inside the Awiebo females it is much broader and much more visible. Also females of *E. sheljuzhkoi* develop such anal fin band, but we never saw such a band on females of *E. sexfasciatus*.

The Monrovia population (*E. "chaperi"*) probably grows to the largest size and may reach 65 mm or even more (caudal fin included). The Awiebo population no doubt is the smallest fish as we never managed to raise males above 40-41 mm (= 31-32 mm standard length). The types of the Port Bouet species were 44 mm/42 mm long. The individuals of Bruce's strain may grow bigger than this, but so far this is not known with certainty.

After this review of four strains of *E. dageti*-like forms we may return to the *H. chaperi* Sauvage described from an area near the Awiebo and the Port Bouet populations and identified as similar to the

form which Arnold received back in 1908. We do not consider the Monrovia strain as identical with Sauvage's species for the following reasons:

- " Sauvage had two or more males and two or more females for his description. We do not know on which characters he separated the males from the females and it may be so that his males are females and his females are males.
- " Sauvage's "males" had red dots on the body sides. The dots were brilliantly red. The "males" had dark edges of pectoral and ventral fins, but not such dark edges on unpaired fins. They had four dark crossbars below the midline and behind the first ray of the anal fin. His "females" had no red dots on body sides but reddish edges of scales, they had no visible crossbars, whereas there were visible black pigments at fin edges and on the gill cover. This seems to exclude that crossbars originally were present but decomposed during preservation or before Sauvage received the preserved material.
- " More important however is the length of the individuals. The "males" measured (up to?) 70 mm, whereas the "females" were 55 mm.
- Just like Arnold back in 1908, we are unable to identify any of the four populations of *E. dageti* with Sauvage's species which are much too big, have well developed red dots at least on some individuals, have a different system of dark body crossbars, have dark fin edges where such formations are not developed on any individual of *E. dageti* (at least not on pectorals), and lacks dark fin edges where these are highly developed on males of *E. dageti*. It may be so that Sauvage's material was heterogenous and that his males were males of some strain of *E. sheljuzhkoi* or even mixed up with females of that species. As adult or matured males of this species normally lose their black crossbars completely also when preserved it may be so that Sauvage's females more or less are males of *E. sheljuzhkoi*, but if so they should show red dots on the body sides.

At least we are quite sure that the four strains dealt with in this article are not *E. chaperi* Sauvage and that they all belong to *E. dageti*. At present we are not able to decide whether the differences between the strains represent different subspecies or only variations within different populations. If it was not for Bruce's strain it would be easier to separate the Monrovia strain from the Port Bouet-Awiebo strains. It is likely that genetic studies alone will not settle this problem and that several adjacent populations between Monrovia and Port Bouet should be studied before we know if *E. dageti* is composed of two or more subspecies. Until this question has been settled it is recommended to use the following designation for *E. "chaperi"*: *E. dageti* from Monrovia.

Several crossings to other *Epiplatys* have been studied. As the three live strains differ rather much we will consider each strain separately:

Monrovia strain: the male was crossed to female *E. grahami* from Benin City, Nigeria. As mentioned in the article on *E. grahami*, the hybrids were female intersexes and very viable. The crossbars were weakly

developed (as usual when crossbar species are crossed). A marked black longitudinal band developed on body sides now and then.

Both male and female were crossed to male and female of Nigerian *E. sexfasciatus*. The majority of embryos died inside their eggs at different phases of development. Only very few, very feeble, hybrids hatched. Only one hybrid of each combination was raised to maturity. After maturing these hybrids were rather robust. Both developed male's characters and acted as males in spawnings. Both were sterile. The hybrid from the Monrovia male did not develop the V-bar and the A-bars (bars over the anal fin) were weakly developed. Instead of bars this male when activated had a broad blackish area on body sides. The hybrid male from the Monrovia female was less maleish than the hybrid first mentioned. Normally it only developed the black bars behind the pectorals and on the root of the caudal fin. Between these two black bars it had (when activated by females) a weakly developed (very broad and diffuse) longitudinal band on the body sides. The male was crossed to a female *Aplocheilus lineatus* and many fertile eggs were harvested from two spawnings. The development of the embryos was rather promising until a point near the full development inside the egg. Then all embryos died apparently from thrombus. The female was crossed to a male *E. sheljuzhkoii* and many fertile eggs were received. All embryos died inside their eggs. The male was crossed to a female *Aphyosemion cognatum* and also here the first phases of development of the embryo were rather promising. The development of the embryo differed markedly from one egg to another. Some embryos grew so big that it was possible to see that their heads were deformed. All died inside their eggs within 2 weeks after the spawning. The female was crossed with a male *A. australe*. This combination is very difficult as the female does not want to spawn with this male. Some eggs however were harvested from controlled pairings. No corda is formed in any egg. A mass of undifferentiated cells appears in the egg near the animale pole. The female was crossed with *E. bifasciatus* male. Many fertile eggs, but the embryos died rather soon in their development. Also with *Aphyosemion christyi* we had many fertile eggs. Like the cross with *A. cognatum* the development of the embryos first was rather promising, but later all embryos died, apparently from thrombus (just like most embryos mentioned above). The female was crossed with a male *Aphyosemion petersi*. The result was just a bit better than in *A. christyi*.

Bruce's strain: The male was crossed with a female *E. sheljuzhkoii*. Many fertile eggs were harvested and all eggs develop an apparently fully viable fry. Before they reached a length of 10 mm all fry (in three different tanks) died one by one apparently always after having lost their balance of swimming (belly up, but still very active).

The results of the crossings (as usual) are difficult to understand. However, it is quite clear that *E. dageti* is not very close to any of the species used for crossings and that represent a very broad extract of Old World Rivulins. Maybe it is worth pointing out that various crossings with nominal *Epiplatys* as partners gave just as bad results as the crossings with some *Aphyosemion* and that these crosses gave somewhat poorer results than the crossing with *Aplocheilus*. Dr. Sick analyzed the haemoglobines of the blood and found that exactly the same spectrum was developed by the Monrovia, the Awiebo and the Bruce strains as well as the Monrovia male/*E. grahamsi* female hybrids. The spectrum corresponded with that of *E. senegalensis*, *E. fasciolatus* and *E. grahamsi* and those of all species of *Aphyosemion* so far analyzed. The egg is small, it measures from just below 1.0 mm to approximately 1.1 mm inside the three live strains which we kept. This egg size corresponds to that of *E. grahamsi* and *E. "macrostigma"*.

All strains are very hardy aquarium fishes and they could be considered as very suited for the beginner. Even the reproduction is very easy and we found no differences when several types of water were used.

(P.S.: now and then I use the word "thrombus" to describe the complete blocking of the blood system. The blood elements assemble motionless, forming compact clusters at one or several places on the yolk ball)