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Blue Gularis

Aphyosemion coeruleum. They call him "Blauer Prachtkarpfling" in Germany. He is the largest species in his genus. Adult males will reach 12 cm, but mine never grew up to this size, 9-10 cm in my tanks. This very decorative and handsome species lives in the rain forest along the coast of tropical West Africa from Nigeria to Cameroon. Boulenger described it in 1901 as a variety of the *Aph. gularis* and later (1915) as a subspecies of this species. Myers used him as type for his subgenus *Fundulopanchax* (1924) within the genus of *Aphyosemion*, which he established the same year. 1928-33 Rachow, Meinken and Myers often used the name *Aphyosemion coeruleum* (or *Fundulopanchax c.* or *Nothobranchius c.*) showing that they now considered this fish to be a valid species. The species name is sometimes (Myers) given as "caeruleum".

The Blue Gularis was imported to Germany in 1905 and often in the following years. The present stock came in after 1945, but it is not known where it was collected, nor do I know if there have been several importations of this species.

Only little is known about its life in nature. Books say that the species is found in the rain forest areas in Nigeria and Cameroon, often in connection with the "gularis" which should be more rare than "coeruleum". It is said that it lives in stagnant waters and also in slow running waters and in blind arms of the larger rivers, where the vegetation in water is plentiful. Also it is said to live in the swampy lagoons near the coast. The area is very rainy indeed. Not less than 2500-10 000 mm a year and the rain is very evenly distributed over the whole year at least in the eastern part of the area. There may be two rainy seasons and two more dry seasons but rarely the dry months (near the coast) give less than 50 mm of rain. The mean temperature of the year is from 25 to 28 C and does not change much during the year.

In adult males the anal fin has a particular shape that we do not see in other aquarium-kept species of *Aphyosemion*. The first about 7 rays of this fin are considerably longer than the other rays of this fin. The fin therefore looks as if somebody had cut away some part of the hindmost edge of the fin. Also the longer rays often prolong outside the fin membrane as short "hairs". This particular shape of the anal fin of the male may play a part in the spawning act. Also the caudal fin of the male has a shape that we do not find in any other aquarium-kept *Aphyosemion*. The upper and lower rays prolong into filaments (in males which are kept isolated) forming a "lyretail", but also the midmost rays are prolonged, just as we often find it in *Epiplatys*. The rays of the dorsal fin also prolong outside the fin membrane forming short

"hairs". The dorsal fin is inserted just above the anal fin and has many rays. In all the species within the subgenus of *Fundulopanchax* the dorsal fin is inserted like this. The ground color is greenish brown, more green in males and more brown in females. Handsome males have a brilliant tint of metallic blue to greenish blue on side of body and head, but also often (at least in some males) the brilliant metallic color extends all over the back of the fish. On head and body sides there are many rather large reddish brown dots and streaks which in some way may diffuse into broken horizontal reddish lines on the body in front of the dorsal-anal fins. Behind the dorsal-anal-fin-line the reddish dots diffuse into vertical reddish bars. The dorsal fin has a fine red line just above the fin base. The whole fin is greenish yellow with a regular pattern of reddish dots. The upper part of the fin has a very characteristic bronze cast. The anal fin is colored like the dorsal fin at the upper part, perhaps a little more yellowish. In the lower part there is a broad blue band with spots and streaks of deep violet color. The caudal fin has three zones of coloration. The upper third of the fin has a coloration like the dorsal fin, but here the reddish spots are forming unbroken horizontal thin lines. The center third of the fin has a more or less visible yellow to orange even color. The lower third of the fin has a coloration like the lower part of the anal fin. The lip is brilliant blue.

The female is evenly brownish. Often one may see faint brown crossbars on the sides behind the anus.

In alkaline and hard water the fish is considered to be a feeble one. Adding one level teaspoon of coarse rock salt (NaCl) (impure) to each 10-15 liters of water will help. But in the rain forest biotope aquarium, the fish is not at all feeble and rarely falls ill. This species, as all other aquarium kept species of this genus, do like the soft, slightly acid water and the soft peat bottom layer. Even in dirty tanks with cloudy water (too much dry food offered) there were no problems and fishes live for 2 years in sound conditions. They thrive at temperatures from about 16 C to about 25 C. Warmer or colder may hurt the fish. I keep my stock at 18-22 C and they do very well. They take all sorts of food, preserved (dry) and live food. They like big earthworms very much and are able to swallow very big worms and then they get so corpulent that they hardly can swim. Also they like to take small fishes. When they have been in their tank for some weeks they are not at all shy and I use to catch my breeding pairs (even in my 320 liters *Aphyosemion* tank) with hands, not using a net. If you put your finger into the water they will try to eat it. By far they are not as quarrelsome as people often say. In my biggest tank I have several males and females up to 4 inches, together with adults of *A. sjoestedti*, *Aphyosemion* hybrids, *Aph. calliurum*, *Aplocheilus lineatus*, Golden Tail Rivulus, *Aph. cognatum*, *E. petersi* and *E. chaperi*, *Procatopus* and many other fishes. Many of these fishes are so small that the big "gularis" easily could eat them if he'd like it, but this very rarely happens. Within the tank a sort of "hierarchy" is established and one 4-inch male "blue gularis" is the master. All other fishes retreat slowly when he comes, but he never attacks any fish except when it flees.

Even when females of the various species are present in this or another tank, after some time, all killies in the tank will get accustomed to each other and, like in the chicken-run, the "pecking preference" or "hierarchy" will be formed. In my *Aphyosemion* tank (320 liter) I am quite sure that the biggest "gularis" male is the "king", but it is difficult to find out which of the slightly smaller males and females of "coeruleum", "sjoestedti" or hybrid "calliurum/coeruleum" is the "second in command". Very often it seems to be the biggest hybrid, which is very active, but at other times it seems to be the biggest female "coeruleum" but at any time every fish seems to know his "rank in the hierarchy". Therefore the putting

in of a "new" fish to this well established community will release some fighting until the newcomer has found his place within the group. Just now all females are taken out, because they shall be used in the breedings and the males are caught for spawning which normally takes about 4-5 hours. When they are put back into the big tank they are still in "breeding activity" and then, once they are released, some fighting occurs, particularly with males of the same species or with related males. But very soon and in less than 24 hours they find themselves comfortable among their well known fellows and no fighting occurs.

Also try feeding small guppies to adult "blue gularis". As they never lived in a community with small guppies, they will consider them to be a "food" and they will eat them all. Also the guppies which never before saw such big fishes will be frightened and try to escape and this behavior of the small fish no doubt releases the "eating instinct" of the "coeruleum" (as in most other aquarium fishes). Then try to overfeed the "blue gularis" by offering them many more small guppies than they are actually able to eat, keep the guppy supply at level during some days and you will see how quickly the guppies get accustomed to the "gularis" and the "gularis" to the guppies. The guppies will retreat slowly when the "gularis" come too close, but he will not fly, and very often he will not release the "eating instinct" of the bigger fish. In that way I have been able to keep guppies and "gularis" together even in small aquariums for a certain time. Just the same happened when I fed my breeding pair of *Polycentropsis abbreviata* with too many guppies a few years ago. People often made "killers" out of "killies" by isolating the males and females for too long a time during the spawning season. Then they put male and female together, very often even in small tanks without any cover for the females, and they wonder why the poor females are killed, often in less than one hour. If they have several females in one tank and several males in another tank, this very rarely would happen. But never be sure that one of the fishes suddenly will turn out to be a "killer". Keep an eye on that tank, every quarter of an hour.

These simple rules, so unknown to aquarists (else not so many aquarists would turn in, asking for a new female and a new female and so on) do not only hold for "the blue gularis", nor only for *Aphyosemion* or other killies. They seem to hold for most aquarium fishes.

Breeding the Blue Gularis

This species, in my opinion, does not prefer to spawn in the mud over spawning in fine plants. It spawns everywhere. The male swims just above the body of the female and gently presses her down. The spawning act takes place very quietly and rarely I saw any fighting and chasing. The female chooses the place where she wants to deposit the eggs and the spawning act takes place in just the same manner as in other non-bottom spawning species. My half grown breeding females spawned up to 100 eggs within a few hours when they have been isolated from males for one week. Eggs (in my stock) are 1.35-1.45, most are 1.35 mm. The yolk ball mostly is very big as commonly in *Aphyosemion*. The egg membrane is very tough. It is covered by two sorts of dots. Small dots and big dots, not very regularly distributed over the whole surface. There are many very slender filaments all over the surface. I did not find any special concentration of these filaments in one or more poles, but on the other hand they seem not to be evenly distributed, nor of equal length. The egg adheres very much to all material (peat, plants, etc.) and it is very difficult or impossible to wash them out of coarse peat. Therefore I use screened mud (less than one

millimeter in diameter) if peat is used and eggs should be collected, but as the species freely spawns on "perlon", it is easier to give them only this material, if eggs should be collected.

I feed my breeding fishes on earthworms that they like very much and this food very quickly will fill the females with roe. Then I take a 4 liter glass-aquarium, half filled with clear water of the common rainwater type (from one of the bigger tanks) 20-22 C, no bottom layer, only a little tuft of "perlon". Then I catch one female and one male (which are kept apart from the other sex) and place them together in this little aquarium. Cover on. They jump. The spawning tank I place rather dark, because the fish come from dark and well-planted tanks. In most cases the male begins to flirt within seconds or minutes after he has been placed together with the female, and soon the spawning starts. After a few hours I catch the fish by hand and put them back to the tank where they used to be. If water in the breeding tank is cloudy (from the sperm of the male) I add little methylene blue or trypaflavine in order to keep down the growth of bacteria. After another few hours I take out the perlon. Shake it in order to free it from water. Using a pair of scissors I cut out the eggs one by one and place them together with little perlon in small and low glasses with pure water of the same type (same electrical conductivity, same pH value). This special water holds methyleneblue in the concentration of 1 gram to 1000 liters (rarely more concentrated) or (seems to be a little better) a mixture of methylene blue and Euflavine (same as trypaflavine or acriflavine) each in the concentration of 1 gram to 1000 liters (in severe cases I use the double concentration). Eggs are inspected every day with light from the bottom of the glass and from the side and any "white" egg is removed. In my opinion all eggs spawned by this species will develop under these conditions. Fry will be ready for hatching after about 4 weeks if kept at 18-20 C (Foersch) or after 2 weeks if eggs are kept at 30 C (Foersch). Then they may be hatched, using the dry-food-method or dried up in some moist peat for a week or two, and then hatched using rain water. Foersch found that fry which were hatched (dry food?) at 30 C and have been at that temperature through their whole development were feeble and not very viable. But if he, after the fully development at 30 C, decreased the temperature slowly to normal room temperature within a few days, he could hatch sound fry.

Fry just hatched measured 4.8-5.0 mm in my stock. Caudal fin included.

I dried up one spawning in peat just after spawning, kept it at 23-26 C (26 during day, 23 during night) for 35 days and hatched all eggs (85). Not a single "resting egg".

After 3 weeks my fry measured 20 mm, after 6 weeks I was able to separate the first true males. At 26 C and with a good supply of live food, after 6 months they had reached 7-8 cm, but now the growth is very slow. I had one brood divided into two portions, just after hatching. One was raised at 22 C and the other at 26 C. Growth was much quicker at 26 C.

My stock came from my friend Claus Petersen, Charlottenlund. He had his breeding pair from Griem, Aquarium Hamburg, 1957, 1958. I hatched and raised one fry (male) from some frozen (gray) eggs that came in from Jack, Philadelphia. Emmens crossed his German aquarium stock with specimens from an USA stock and found that this "cross" gave much sounder fry. No doubt the European stock is more or less degenerated and feeble.

This species may have been crossed with the true "gularis" (*Aph. gulare*) in Wien (1911 by M. Fischer),

but little is known about this cross. In 1958 I crossed the female to the "new" *Aph. calliurum calliurum* male and found this to be very easy indeed. Here is the data.

- 11 Jan. 58 gave only 2 eggs,
- 12 Jan. 58 gave 9 eggs,
- 13 Jan. gave 89 eggs. All eggs spawned on perlon by one female.
- 15 Jan. 58, no development seen in the microscope.
- 16 Jan. 58, fine development of an embryo in all eggs inspected (the 2 and 9 from 11-12 Jan.).
- 20 Jan. pigmentation on body had started, blood circulation also had started. Eggs are kept during the whole period of development at 23-26 C (26 at daytime).
- 01 Feb. 58 embryos in eggs seem to be hatchable, removed from the water (500 ppm of NaCl, by electrical measurement) and put into distilled water, no hatching. Ice more into their normal water.
- 04 Feb. 58 one fry hatched out without any help, normal fry, not "belly slider", 5.0 mm long, caudal included.
- 05 Feb. 58 another fry, same size.
- 06 (?) Feb. 58 added dry food, 56 fry hatched within a few hours, forgot to look after the hatching water gets stinky, all the rest of the fry and eggs with fry were killed. Totally. I had 58 live fry, 10 more fry hatched 2, 8, 89 = 100 eggs. 56, 2, 10, 17 = 85 eggs which developed. That is not too bad. The fry were all sound, no "belly sliders". They grew rather quickly and were not attacked by any disease. They proved to be sounder than the "coeruleum" and just as hard fishes as "calliurum".
- On 06 May 58 I had my first controlled spawning on perlon by brothers and sisters from this brood. One female gave 19 eggs. Males grew up to very handsome fishes, the biggest reached about 7-8 cm, they were very hard and had much more brilliance on side as have "coeruleum". There were traits from both species in these hybrids. Live and preserved material was sent to Dr. Hoedemann for further examination.

Males have been used in many spawnings with sisters, female "calliurum" and female "coeruleum" but not a single egg developed. They no doubt are 100% sterile. Females give away some eggs but these were very different in size. 6 eggs measured 1.78 mm, 1.65 mm, 1.33 mm, 1.23 mm, 1.18 mm, and 1.05 mm. The biggest eggs are the most normal looking. In the small ones the yolk ball is irregular in size and shape. Only the big eggs give embryos when bred with male "coeruleum" or "calliurum". In most eggs the development of the embryo (if any) is very abnormal, the development of the blood-system (just as in many other crosses) seems to be the "weak point" in the development of the whole embryo. Also some embryos curl up inside eggs. From possibly more than 100 eggs with embryos only one fry hatched out. This fry came from an egg, 1.7 mm, spawned in cross with "calliurum ahli" male, (?) on 30 Nov. 58. On 13 Dec. the embryo was rather promising, with heavy circulation of blood elements in a well developed system. But only on 22 Dec. 58 the fry hatched out. 5.4 mm and somewhat deformed in the vertebra. It was a belly slider, kept on shallow water for some days, and then it was able to swim. I raised this sole fry and it still lives (30 Apr. 59) but it is very deformed and only about 30 mm. It is much like a "calliurum calliurum" and a very aggressive fish and as he does not look a fish at all. The other fishes (*Nothobranchius melanospilus*) in the tank are very afraid of him. During Dec. 1958, I had two big females (one was the mother of this monster) together with a handsome "ahli" male spawning on coarse peat. But of this cross I only kept 2 males and one female, all other are preserved or jumped out of tanks.

A sjoestedti male to female "coeruleum" gave a few eggs, all caught fungus. The same happened to eggs in "spawning" with big *Nothobranchius guntheri*. 51 eggs were spawned.

- On 01 Feb. 58 I spawned *A. australe* to female *A. coeruleum*. 20 eggs
- 03 Feb. 58: methyleneblue-euflavine penetrates all eggs, they are very green inside.
- 06 Feb. 58: embryo in at least 4 eggs.
- 08 Feb. 58: only 4 eggs are fertile (of 20 eggs spawned), blood-circulation to be seen.
- 11 Feb. 58: eye and body begin to pigmentate.
- 21 Feb. 58: near the hatching point. Green water changed with rainwater type.
- 24 Feb. 58: first fry hatched, yolk sack.
- 25 Feb. 58: 2 more fry hatched.
- 28 Feb. 58: the last fry hatched. All fry removed to 16 liter glass aquarium with peat bottom, water ferns and the usual watertype. Temperature during development of eggs: 23-26_C.
- 19 Mar. 58: the males show colors, there are 2 males and one female (one fry dead?).
- 01 May 58 biggest male now about 6 cm. Males show traits from both parent species, they are more "australe" than "coeruleum". Not very colorful. The brilliance not very developed. The sole female is rather heavy, she possibly can be used for breeding now.
- 06 June 58 the 2 males and the one female are shipped alive to Dr. .J. Hoedemann; Amsterdam. Most males have been too big for crossings. Only one crossing has been tried with *Aph. calliurum* female. Only 8 eggs, but all sterile. Got fungus. But the spawning act was promising indeed.

Sex ratio in *Aphyosemion coeruleum* often is abnormal. Jack Scheidness once had about 200 females and one male in one brood. Also in my stock the females use to be plentiful, but always later on, when fishes are about 4-5 cm some males occur. Many of the males are not very colorful indeed. Just now I have more males than females but this indeed is not at all normal.