

A review of *Callopanchax monroviae* (Roloff & Ladiges, 1972) - With notes on the type locality, distribution, natural life cycle, and phenotypes

By Karsten Dinesen

Since Roloff and Ladiges formally described *Callopanchax monroviae* in 1972, it has been collected from at least ten locations in the area surrounding Monrovia, Liberia. However, the exact location of the type locality of *Cal. monroviae* has, until now, been a mystery. The purpose of this article is to shed light on this mystery, present facts about the distribution of this species, and describe its biology and phenotypic variability in the wild.

History

In November, 1971 the late Erhard Roloff of Karlsruhe, Germany, undertook what was to be his last journey to the tropics. Roloff flew to the Robertsfield airport near Monrovia, the capital of the West African republic of Liberia. He made several trips by taxi to a number of locations, where he collected various species of fish, mainly killifish. Several

were either new species or, at least, species unknown to the hobby. These included *Archiaphyosemion viridis*, *Arch. jeanpoli*, *Arch. maeseni*, *Epiplatys lamottei*, *Ep. roloffi*, and *Rhexipanchax nimbaensis*.

During one day of his stays in Liberia, Roloff visited Charles Steiner, a Swiss citizen then working as a taxidermist at the University of Liberia. Steiner had an aquarium in his home, where he kept several species of freshwater fish which he had collected at different locations in Liberia. Among these fish were specimens of what was later to be described as *Cal. monroviae*. Steiner had caught this new fish for the first time some years earlier, between 1962 and 1969. He agreed to take Roloff to the location where he had collected them.

At the locality they succeeded in catching approximately 20 specimens of the new species. Half of these were preserved shortly after capture. Roloff



About the Author: Karsten Dinesen lives in Denmark, where he is employed by the Royal Danish Airforce as an electronics technician. He has kept killies continuously since 1988, when he joined the Scandinavian Killifish Association (SKS). A few years later he also joined DKG and AKA. His introduction to the hobby came during a visit to the fish room of Mr. O. Bangsmark (one of the best "*Roloffia*" breeders in Europe). As a result, he became so fascinated in the subtribe *Callopanchina*, formerly known as *Roloffia*, that he has specialized in it ever since. Apart from the keeping and breeding of a few species, he spends much of his time studying the history, distribution, and species relationships of this group.



Distribution map of *Callopanchax* species in Liberia.

returned to Germany in early December, 1971. The following year Roloff and Ladiges (1972) described this as a new species.

In 1968, Piet Busink succeeded in importing this new, then still undescribed, species to Holland from a location close to the Robertsfield airport (Nieuwenhuizen, 1974). These two locations formed the basis for the aquarium strains available during the seventies.

Type locality

The exact location of the type locality of *Cal. monroviae* has always been surrounded by mystery. Roloff and Ladiges (1972) gave the following

description of the type locality: "Collected by E. Roloff in November, 1971, in a forest water hole approximately 25 miles [~40 km] from Monrovia in Liberia."

However, this is not very accurate. The area covered by this description is approximately 1,000 square miles, about half the known distribution range of *Cal. monroviae*. A study of the correspondence between E. Roloff and Paul Hoppe during 1974 (Hoppe, personal communication, 2002) provided the following explanation: "I wasn't able to give an exact location in the description because first we drove approximately 30 miles [~48 km] along a road (not the road to Robertsfield!) and then criss-cross for



Habitat of *Callopanchax monroviae* RL 22 near Ta south of Klee. Photo by Vollrad Etzel.

quite a while along narrow jungle roads. I won't be able to find this location again without the aid from Charles Steiner." This meant that the only person who knew the exact location was Charles Steiner. So, contacting him was crucial to solving this mystery.

A request to the Swiss authorities yielded no result as to the whereabouts of Steiner, but an extensive Internet search finally provided one address in Liberia and another in Switzerland. The Liberian address was a dead-end but the Swiss address was a success. Charles Steiner was now living in Bern, Switzerland. He was kind enough to provide information about the actual location of the type locality: Behind Mount Barclay, approximately 12 miles [~19 km] from Monrovia. "The disagreement between the distance from Monrovia, as given in the original description, compared with that as

revealed by Steiner cannot be explained. Steiner also provided a map showing this area, and some photos of himself and Roloff. He still remembered that very day, 35 years earlier: "I still remember well, when I took Roloff to that particular place. The water was very shallow, 4 to 6 inches deep, and there were a lot of grass bundles growing. We tried for a long time with the nets and did not catch a single fish. Roloff started getting angry, telling me that I was fooling him. I felt bad. Then, suddenly we caught the first killifish, and then a couple more. He did not know right away that it was a new species." (Steiner, personal communication, 2005).

The forest area mentioned in the original description was a rubber plantation, so the type locality of *Cal. monroviae* may be defined as follows: A waterhole on a rubber plantation north of Mount Barclay, about 12 miles (~19km) from Monrovia in Liberia (approximately 6° 22' 10" N; 10° 40' 30" W).

Distribution

The known distribution of *Cal. monroviae* can be defined by a triangle formed by Lake Piso (east of Robertsport), the Gibi Range of hills, and Robertsfield. The northwestern border is presumably just southeast of Lake Piso. *Callopanchax monroviae* is apparently replaced by *Cal. occidentalis* at Robertsport, a town on the coast northwest of Monrovia. One unidentified specimen of *Callopanchax* which, based on meristic data, is considered most likely to be *Cal. occidentalis*, was collected by C. R. Matlock, Jr. in 1946 near Robertsport (Roloff, 1979). The only positive record of *Cal. occidentalis* from Liberia was reported by Etzel (1992). Etzel and F. J. Butz collected one female of this species near Tienii, close to the Sierra Leone border. *Callopanchax monroviae* is easily distinguished from the other

#	Location	Collector(s)	Date	Coordinates (DMS)
1	Mount Barclay, 12 miles (~19 km) from Monrovia (type locality)	C. Steiner	1962-1969	6° 22' 10" N; 10° 40' 30" W
2	Robertsfield airport	P. Busink	1968	6° 14' N; 10° 21' W
3	Robertsfield airport (biotope arid)	P. Busink, Snijders & A.v.d. Nieuwenhuizen	14 Jan -1 Feb, 1972?	6° 14' N; 10° 21' W
4	Mount Barclay, 12 miles (~19 km) from Monrovia (type locality)	E. Roloff & C. Steiner	November, 1971	6° 19' N; 10° 48' W
5	Liberia, No. mnhn 1978-0162 iMuseum national d'Histoire naturelle, Paris	G. Schmitt & ?	1976-78	
6	South of Klee (Kle), 330 yds. SW of Ta (RL 22)	V. Etzel & F.J. Butz	26 Nov, 1978	6° 36' N; 10° 53' W
7	Road to Robertsport, Fanah (RL 27)	V. Etzel & F.J. Butz	28 Nov, 1978	(RL 22<->RL28)?
8	Road from Bomi to Robertsport, coll. 12.5 miles from the city (RL 28)	V. Etzel & F.J. Butz	28 Nov, 1978	6° 40' N; 11° 10' W
9	Rubber plantation at Harbel, Logan-Town (RL 65)	V. Etzel & W. Pütz	6 Nov, 1982	6° 16' N; 10° 21' W
10	Gibi Range of hills, between Kakata and Totota (RL 119)	T. Muhle & J. Lempert	July, 1983	6° 40' N; 10° 12' W
11	Paynesville L 97	Associates of E. Busch?	1997	6° 16' N; 10° 42' W
12	Waterholes at Tienii (RL 1)	V. Etzel & F.J. Butz	20 Nov, 1978	6° 58' N; 11° 18' W
13	Probably in the vicinity of Robertsport	C. R. Matlock, Jr.	1946	6° 44' N; 11° 22' W

The table above shows known collection sites of *Callopanchax* species in Liberia. The first 11 represent *Callopanchax monroviae*; number 12 and, most likely, number 13 represent *Callopanchax occidentalis*. Geographical coordinates are approximate and in degrees/minutes/seconds. Data derived from: Berkenkamp and Etzel (2003); database of Museum nationale d'Histoire naturelle, Paris; Etzel (1992, 1993 and personal communication, 2005); Mehm (personal communication, 2005); Nieuwenhuizen (1973); Roloff and Ladiges (1972); Roloff (1979); Steiner (personal communication, 2005).

Callopanchax species, by the position of the first dorsal fin ray in relation to the first anal fin ray. In *Cal. occidentalis*, *Cal. huwaldi* and *Cal. toddi* the insertion of this dorsal fin ray is clearly anterior to that of the anal fin. This is in contrast to their relative positions on *Cal. monroviae*, where the first anal fin ray insertion is anterior to that of the dorsal fin.

The southeastern border of the known range of distribution is close to the Robertsfield Airport, which is located immediately southeast of Monrovia. It can be theorized that this species might also occur further southeastward along the coast, as suitable biotopes do exist there; that is, if *Cal. monroviae* is not replaced

there by a closely related but yet to be discovered species.

Habitats

Three different habitats can be identified:

(1) The type locality, Mount Barclay, 12 miles from Monrovia: Collectors, C. Steiner and E. Roloff; date: November, 1971, in the afternoon; habitat: A pool in the forest area, with the only water supply being rain. The water was only 4 to 6 inches (~10 to 15 cm) deep, and there were many tufts of grass growing out of the water. *Cal. monroviae* was found beneath, or close to, roots and



A pair of *Callopanchax monroviae* "blue" from the type locality. Photo by E. Roloff.

overhanging grass. There were no other fish present, and the locality contained only a small volume of water, which dried completely during the dry season, which occurred in January. The temperature of the water in this pool during the afternoon was 75°F (24°C), the pH was 6.7 and the total hardness measured 2DH (Roloff, 1973). There were many small creeks in the close vicinity containing *Scriptaphyosemion liberiense* and *Epiplatys* species.

(2) The Robertsfield location:

Collectors, P. Busink (1968) and Snijders and A. v. d. Nieuwenhuizen (1972); date:

several times, first in 1968; habitat: The collection sites of Busink were in the immediate vicinity of Robertsfield in the Harbel Firestone Plantation. These were not far from the swamp at Robertsfield, but in a different drainage system. The habitat consisted of forest pools that dry up completely during the dry season. The fish that Busink caught every time he visited the site were only half grown. The first *Cal. monroviae* can be caught shortly after the beginning of the rainy season. The water temperature averages 75°F (24°C). The range of hardness was from less than 0.5DH to 2DH (Nieuwenhuizen, 1974).

A pair of *Callopanchax monroviae* "red" from Robertsfield. Photo by E. Roloff.





A blue male *Callopanchax monroviae* derived from a Robertsport population. Photo by J. P. Vandersmissen.

A close-up view of the habitat at Logan-Town RL65, where *Callopanchax monroviae* with a beautiful red color hid beneath the submerged leaves when the collectors approached. Photo by V. Etzel.



(3) Rubber plantation at Harbel, Logan-Town: Collectors, V. Etzel and W. Pütz; collecting code: RL 65; date, November 6, 1982, 12.05 p.m.; habitat: Coffee-brown, clear water surrounding individual trees, 1 to 2 inches (~2.5 to 5 cm) deep. *Callopanchax monroviae* was seen at the water surface, as is common for most *Epiplatys* species. When approached, the fish immediately disappeared into a 1-inch (~2.5 cm) thick layer of leaves, from which they could be scooped. The males were extremely colorful, predominantly bright red-orange. The water temperature was 76°F (25 °C), the pH was 5.5, the carbonate hardness was 1.2°KH, and total hardness was less than 1°DH. Air temperature was 75°F (24°C). *Epiplatys fasciolatus tototaensis* with golden backs and *Epiplatys dagei monroviae* were also caught in shaded to partially-shaded areas of the same habitat.

When the water quality data for six localities is considered, the following ranges are apparent: Water temperature, 75 to 76°F (24°C); pH 5.2 to 6.7 (five were acidic and only the type locality was neutral); hardness equal to, or less than 2DH (Etzel, 1993).

Natural life cycle

From Nieuwenhuizen (1974) and Roloff (Hoppe, personal communication, 2002) it is known that the habitats are dry in January. In Liberia there is a rainy season and a dry season. The rainy season is approximately from May to October. This indicates an incubation time of approximately four to five months (January to May). Nieuwenhuizen (1974) reports the occurrence of *Cal. monroviae* shortly after the beginning of the rainy season, and Etzel (1993) reports the collection by Muhle and Lempert in July. Most collections were made in the month of November, when young but sexually mature specimens could be caught.

Reports of fully grown specimens in the wild are very rare.

One observation made by Steiner (personal communication, 2005) is that: "During the last 20 years the seasons are not as precise as they used to be". This raises concern for the future of annual killifish in West Africa because climate change may threaten many populations.

Breeding

The following brief notes about breeding *Cal. monroviae* are based primarily on experiences with the Paynesville population. In the early breeding reports, an incubation time of 10 weeks to 3 months was recommended. However, Kadlec (personal communication, 2005) recommended an incubation time of 4 to 5 months, which is the same duration as the expected natural dry period. For the best results, the peat moss containing the eggs during incubation should be quite wet. When harvested from the breeding tank, the

Epiplatys dageti was one of several *Epiplatys* species that Etzel and Pütz caught in the Logan-Town habitat where they captured a red-colored *Callopanchax monroviae*. Photo by Greg Niedzielski.



peat moss should be squeezed to remove excess water but not dried any further before placing in a bag. It should be about 3 to 4 on the Langton peat moss wetness scale (Langton, 1979).

The eggs are quite large, 1.4 to 1.5 mm in diameter, and fine particles of peat or mud will adhere to them. The fry are very large, are able to eat *Artemia* nauplii as their first food, and they grow rapidly. In my fish-room I raised the fry on a combination of live *Artemia* and *Cyclops*, and later frozen and living mosquito larvae and frozen *Mysis* (tiny shrimp caught in the ocean). Sexual maturity is reached at an age of two or three months and fullsize, of 3 to 4 inches (~7.5 to 10 cm), a couple of months later.

Phenotype and variability

Shortly after the introduction of *Cal. monroviae* to the hobby some confusion arose as to the various phenotypes (Hoppe, 1973a, 1973b). The variability of *Cal. monroviae* can generally be described by two varieties that normally occur in the same biotope. These are

known as the "blue" and "red" varieties. The red is also often referred to as the "yellow" variety. The blue variety has a blue body coloration with blue margins to the caudal fin. The red variety has a red to orange body coloration (that may be blue in some populations) and a yellow lower margin in the caudal fin. This phenomenon of color variation is well known among the species *Fundulopanchax gardneri*, *Scriptaphyosemion chaytori*, *Scr. liberiense* and others.

Roloff distinguished between the two varieties in a very different manner. He distributed one strain designated as "blue" and one as "red". The "blue" originated from the type locality and the "red" originated from a location close to the Robertsfield Airport. In the Roloff "red" most males have uniformly red body coloration with yellow margins in caudal fin. However, blue males do occur in this population, although they are very rare.

During the 1980s a yellow strain was available in the hobby, most likely originating from the import made by Etzel

Like *Callopanchax monroviae*, *Scriptaphyosemion liberiense* occurs in a variety of color forms in the wild. In 1971 Steiner and Roloff found this variable species in several creeks near the *Callopanchax monroviae* type locality but not in the type locality itself. Photo by A. Terceira.



and Pütz in 1982 from Harbel (RL 65). The yellow body coloration was probably a result of a diet low in carotenes or due to keeping the fish in well-lit tanks with light-colored gravel. This strain, remarkably

enough, was still present in Germany in 2005. *Callopanchax* strains seldom survive in the hobby for that long.

One particular feature that distinguishes the male *Cal. monroviae*



Callopanchax occidentalis Mangata lacks the distinct black marks on the first few dorsal fin rays that are found on *Cal. monroviae* (below). This photo by A. Terceira.

This *Callopanchax monroviae*, derived from a population found near Paynesville, Liberia, bears the distinct black marks on the first few dorsal fin rays that all other *Callopanchax* species lack. Photo by Greg Niedzielski.





A male *Callopanchax occidentalis* Mangata (top) and a male *Cal. occidentalis* Teme Yellah displaying agonistic behavior when placed in the same aquarium. Many *Callopanchax* species are fairly aggressive in the aquarium. Photo by A. Terceira.

from males of other *Callopanchax* species is the dark marking located at the first two rays of the dorsal fin. This marking becomes jet-black during courting and agonistic behavior. The Paynesville and type locality populations have narrow red vertical bars on the posterior parts of the flanks. These are most obvious in juveniles but also visible in adult males and females. These markings are not present in the Logan-Town and Robertsfield populations. The male has a unique red throat coloration unlike other *Callopanchax* species, in which the throat is normally white or blue, but can turn black when the male is excited.

Although not confirmed, the populations in the northwestern parts of the distribution range — RL22, RL 27 and RL 28 — appear to be predominantly of the blue variety, and have very few red markings on the body sides. The central populations (type locality and Paynesville) appear to have a majority of the blue variety, although the red variety is also present. In the southeastern populations (Logan-Town and Robertsfield) the red variety is dominant by far, although a few of the blue variety can be found. The latter are incredibly beautiful, with their uniform red to orange coloration.

Phenotypic and meristic characters

indicate that *Cal. monroviae* occupies a very isolated position in the *Callopanchax* group.

About the discoverer of *Callopanchax monroviae*

Charles Steiner worked at the University of Liberia from 1962 to 1990. There he started scientific collections of mammals, birds, reptiles, amphibians, fishes, and insects. He also prepared teaching and demonstration materials for the biology department. Although he is a professional taxidermist, his love is for living animals. He reared orphaned baby animals and birds and, because of the great interest people had in seeing these creatures, often for the first time in their lives, he developed "Steiner's Zoo and Animal Orphanage". There he could explain to visitors about the lives and usefulness of the animals, and he could positively approach them on matters of conservation. In July, 1990 all the animals were killed. Charles and his Liberian wife Annie had to flee from Liberia in 1990 because of the civil war, leaving behind almost all their belongings. However, they hope to return some day and rebuild their zoo (Steiner, personal communication, 2005).

In spite of recent signs of improvement in the political situation in Liberia, new imports of killifish from that country are not likely to be available in the near future. Therefore, anyone who keeps killies from this part of Africa should make a determined effort to maintain them.

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