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## THREE NEW MINNOWS OF THE GENUS *BARBUS*, AND A NEW CHARACIN FROM THE VERNAY ANGOLA EXPEDITION

By J. T. NICHOLS AND RUDYERD BOULTON

In 1925, through the generosity of Mr. Arthur S. Vernay, The American Museum of Natural History sent a zoological expedition to Angola, Portuguese West Africa. Herbert Lang represented the department of mammals and Rudyerd Boulton the department of birds. The collections from Angola, in which country little or no work had previously been done by American zoologists, filled an important gap in the American Museum's African material. Only a small collection of fresh-water fishes was made, due to the limited amount of time for fish collecting, but it has proved to be interesting, especially in relation with other African fresh-water fishes in the Museum. The expedition was fortunate in having Mr. Vernay himself as leader. The three members of the expedition worked both independently and together during four months in the field and it so happened that Boulton did not personally touch the Cuanza River, and has not the same first-hand knowledge of that region as of the other collecting localities.

Nichols and Griscom (1917) include Angola in their West Tropical African fish-faunal region. This view was based on the species listed from there, rather than on any Angolan collections at hand, or personal knowledge of the country. Now that we come to study two small collections from the upper Cuanza drainage (Chitau) and Cunene (Cape-longo) River in the light of some field experience (Boulton) and further study of the distribution of old-world fresh-water fishes (Nichols), the problem becomes more interesting, and a somewhat different interpretation is suggested.

The fish fauna of the Congo is exceedingly rich and diversified, with primitive, peculiarly tropical, and highly specialized elements, evidently long established. The fish fauna of East Africa is poor, dominated by Cyprinidæ, especially of the genus *Barbus* (the most recent element to enter Africa, from Asia). From Angola lying immediately south of the Congo there are listed (due to propinquity) sufficient Congo elements

to have outweighed (on paper) what is more properly its own meagre fauna with East African affinities, but not to outweigh it in nature if one is to take the collections at hand as in any way representative.

Of the 24 species herein identified, 4 are mormyrids, and 2 characins, representing the Congo fauna. Two are catfish, ten belong to the genus *Barbus*, a modern cyprinid genus very abundant in southern Asia and dominant in East and South Africa, one is a cyprinodont and 5 are cichlids. That is, we have 25% mormyrids and characins; 8½% catfish; 41½% *Barbus*; 20% cichlids; and 4¼% cyprinodonts. Counting by individuals, these ratios would merely be exaggerated, except that the mormyrids and characins would stand much lower.

Of the 234 species identified by Nichols and Griscom from the Congo collections 42 are mormyrids and 42 characins; 64 are catfish; 22 are cichlids; and 9 belong to *Barbus*. That is, we have 36% mormyrids and characins; 27% catfish; 4% *Barbus*; 9% cichlids; and 24% otherwise distributed.

These figures give a certain tangible expression to the conditions which lead us to remove Angola from the West African area dominated by the Congo fauna and to place it with the East African. The Congo fauna is primarily a lowland one and the physiography of Angola is primarily upland, which would account for this separation. The headwaters of the streams from which our collections were made all lie south of the Congo rain forest, and, although the contours in the interior are not steep (a plateau to the east at about 4000 ft., and a series of benches to the west), flood plains are in general lacking, and the streams are clear, direct, often parallel, and remarkably swift. The country through which they flow is chiefly grass savannah, dotted here and there with more or less dense growths of thorn-bush and acacia. The prevalence of cichlids in the clear rather swift streams of the Cunene system is a surprise. The greatest abundance of these fishes is in Lake Tanganyika, which because of open water connection with the Congo is included in the West African or Congo area, a view which possibly should be revised. Practice in delimiting faunal areas varies with the viewpoint of the individual worker. We would consider the fauna (named from a usually rather uniform, comparatively limited area where it is most dominant) the essential unit, and extend the limits of the faunal area so far as that fauna was clearly dominant over adjacent faunæ which are sufficiently well marked to be worth naming.

## MORMYRIDÆ

The mormyrids in the collection are confined to a few specimens of generalized species of *Marcusenius* and *Gnathonemus*. From Chitau there is *Marcusenius ansorgii* Boulenger, up to 80 mm. standard length; and from Capelongo a *Gnathonemus angolensis* Boulenger of 105 mm., two *Gnathonemus macrolepidotus* (Peters), 143 and 195 mm., and a *Marcusenius pappenheimi* Boulenger, of 62 mm. This last is the only one which requires comment. It agrees well with the description except for fin-count which is low: dorsal, 18; anal, 23. It is a form which seems to us to be related to *M. kingsleyæ* from Old Calabar, and *M. nigricans* from Lake Victoria, and the former of these, at least, has an equal latitude in fin-count.

## CHARACINIDÆ

Two small specimens of *Sarcodaces odoe* (Bloch) from Capelongo, the largest 90 mm. standard length; and a somewhat damaged small specimen of *Nannocharax*, seemingly undescribed, were collected.

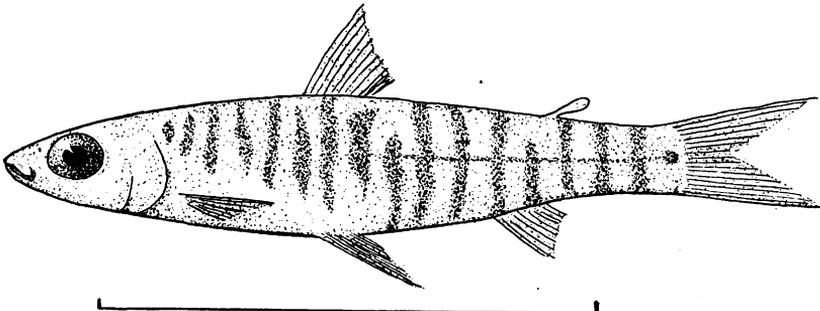


Fig. 1. *Nannocharax fasciolaris*, type.

***Nannocharax fasciolaris*, new species**

DESCRIPTION OF TYPE.—No. 8683, American Museum of Natural History, from Capelongo, Angola, July 22, 1925; collected by the Vernay Angola Expedition.

Length to base of caudal, 34 mm. Depth in length, 4.5; head, 3.8. Eye in head, 3; snout, 3.5; maxillary, 4.3; interorbital, 4.5; width of body, 2.5; width of head, 3.5; its depth, 1.6; length of peduncle, 1.6; its depth, 2.6; pectoral, 1.7; ventral, 1.5; longest dorsal ray, 1.8; longest anal ray, 2.5; caudal lobe, 1.2.

Dorsal 13; anal 10. Scales (lacking) about 48.

Ventral origin about under first third of dorsal; dorsal origin equidistant from end of snout and middle of peduncle; caudal forked, with sharply pointed lobes.

Body pale, with about 17 dark cross-bars, best marked behind, 9 behind dorsal; and a small blackish spot on the base of the middle caudal rays. A dark streak in the center of the side posteriorly.

This seems to be a representative form of *Nannocharax multifasciatus* Boulenger (1923, Ann. So. Afr. Mus., XIII, p. 437) from the Zambesi in northern Rhodesia. As its higher scale-count is somewhat uncertain, due to the poor condition of our only specimen, the very different smaller spot at the caudal base is perhaps the most tangible of several characters which separate *fasciolaris* from *multifasciatus*.

#### SILURIDÆ

Two species only were collected: several *Clarias dumerilii* Steindachner from Chitau, the largest 109 mm. standard length; and four *Clarias gariepinus* (Burchell) from Capelongo, the smallest of which, so identified, 135 mm. standard, has the top of the head smooth, and the largest, with very rugose head, measures about 720 mm. standard length.

It may also be mentioned that two specimens of a *Chrysichthys* (*C. ansorgii* Boulenger) were taken with marine species at a third locality, the lower Cuvali River near Hanha, but are not considered in the present discussion.

#### CYPRINIDÆ

Of ten species collected, all belong to the genus *Barbus*, as follows. From Chitau, *Barbus kessleri* (Steindachner) in large number, up to about 68 mm. standard length. This is evidently a very abundant species, outnumbering in our collection all others from the two localities combined. *Barbus amphigramma* Boulenger, a number of specimens up to 51 mm. standard length. This species, evidently a small one, previously known only from the types from East Africa (Nairobi River, 6500 ft.) is one of those fishes showing the faunal affinity between East Africa and Angola. A third species from Chitau, *Barbus puellus*, new, is a very small one, easily mistaken for the young of *B. kessleri*, with which on close examination it is found to have little in common.

#### *Barbus puellus*, new species

DESCRIPTION OF TYPE.—No. 8681, American Museum of Natural History, from Chitau, Angola, August, 1925; Vernay Angola Expedition.

Length to base of caudal, 34 mm. Depth in length, 3.5; head, 3.5. Eye in head, 3.5; snout 3.6; interorbital, 2.6; maxillary, 4.5; width of body, 1.8; least depth of peduncle, 1.7; its length, 1.5; longest dorsal ray, 1.1; pectoral, 1.6; ventral, 1.5; longest anal ray, 1.3; caudal lobe, 1.

Dorsal with 7 branched rays; anal with 5. Scales, 27; 12 around peduncle.

Mouth very small, slightly oblique, maxillary not reaching to vertical of front of eye; no barbels. Dorsal with no spinous ray; its origin equidistant between middle

of snout and base of caudal; ventral origin under that of dorsal. Pectorals falling well short of ventrals, but ventrals reaching almost to anal origin. Scales with radiating striæ; the incomplete lateral line present on the seven anterior.

Color in alcohol grayish, paler below, an indistinct dark lateral streak; a sharp vertically somewhat oval black spot, a little smaller than eye, bordered with paler, at the base of the caudal. Fins grayish.

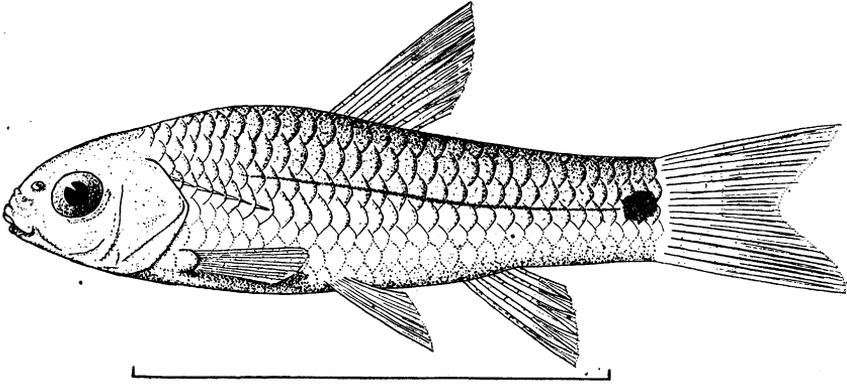


Fig. 2. *Barbus puellus*, type.

We have numerous specimens with the same data. As this is one of the largest, the species is presumably of small size.

From Capelongo, *Barbus paludinosus* Peters is the most abundantly represented in the collection, a species with wide range from East Africa to Angola and southeast Africa. Our largest specimen measures 59 mm. standard length. There are several specimens of *Barbus trimaculatus* Peters, up to 48 mm., which species occurs from southern Angola to southeast Africa. Three or four specimens of *Barbus eutænia* Boulenger, up to 47 mm., a species from Angola, Rhodesia and the Transvaal. There are two specimens of *Barbus fasciolatus* Günther of about 40 mm. (strikingly and prettily marked with red when fresh), and one of *Barbus rogersi* Boulenger, 45 mm. standard length. On a half-dozen specimens not otherwise identifiable we are basing two new species.

The somewhat singular fact that our collections from Chitau and Capelongo contain not one species in common is probably due in part to these collections not being more comprehensive. Considering the ten species of *Barbus* which they do contain, several of them wide-ranging fishes, it is evident that this is only a contributory cause, that a faunal line of some definiteness cuts across Angola between these two drainages, that south of this line we enter the South African fish fauna, quite like the

East African, but with species tending to be different, *Barbus* from *Barbus*, etc., on the two sides of the line. Notice also that there is no notable physiographic difference here (as exists between Angola in general and the Congo), nothing which one might postulate as a barrier, and that, allowing for altitude, the latitude corresponds to the outer edge of the tropics where some sort of a faunal demarkation is usually found to exist even in fresh-water fishes.

We are inclined to consider East and South Africa subdivisions of a single faunal region for fresh-water fishes and we would extend the line between them through central Angola.

***Barbus inermoides*, new species**

DESCRIPTION OF TYPE.—No. 8679, American Museum of Natural History, collected at Capelongo, Angola, July 22, 1925, by the Vernay Angola Expedition.

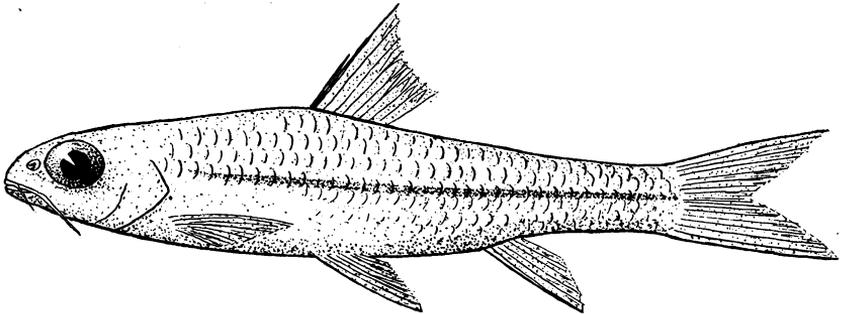


Fig. 3. *Barbus inermoides*, type.

Length to base of caudal, 45 mm. Depth in length, 4.4; head, 3.8. Eye in head, 2.8; snout, 3.5; maxillary, 3.2; interorbital, 3.5; posterior barbel, 3.4; width of mouth, 4; greatest width of body, 2.2; least depth of peduncle, 2.4; its length, 1.3; longest dorsal ray, 1.2; pectoral, 1.5; ventral, 1.5; longest anal ray, 1.4; caudal, 0.8.

Dorsal with 8 branched rays; anal with 5. Scales (lacking) about 35.

Body not greatly compressed, the head bluntly pointed. Mouth small, horizontal, slightly inferior, maxillary extending to under the front of the large eye. Dorsal without spinous ray; its origin equidistant from end of snout and tip of depressed anal; ventral origin behind the origin of, and its axil under the center of dorsal; caudal well forked.

Color in alcohol, pale; dark lengthwise streak from shoulder to center of caudal base; a dark stripe in center of back before the dorsal; and top of dorsal dusky.

**Barbus vernayi**,<sup>1</sup> new species

DESCRIPTION OF TYPE.—No. 8680, American Museum of Natural History, from Capelongo, Angola, July 22, 1925; Vernay Angola Expedition.

Length to base of caudal, 29 mm. Depth in length, 3.6; head, 3.7. Eye in head, 2.8; snout, 3.5; interorbital, 2.8; maxillary, 4.5; width of body, 2.3; least depth of peduncle, 2.2; its length, 1; dorsal spine, 1.1; longest dorsal ray, 1; pectoral, 1.5; ventral, 1.4; caudal lobe, 0.7.

Dorsal II, 7; anal with 5 branched rays. Scales, 29; 12 around peduncle.

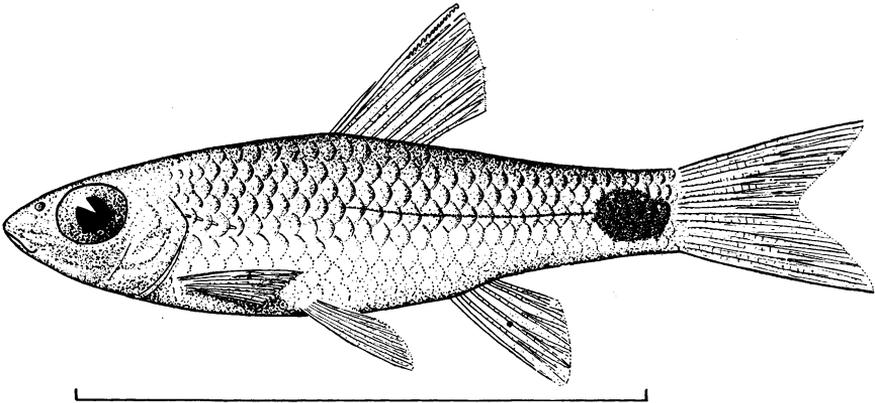


Fig. 4. *Barbus vernayi*, type.

Mouth moderately inferior, oblique, very small, the maxillary not reaching front of eye; no barbels. Dorsal with a strong, serrate spine. Its origin equidistant from tip of snout and base of caudal, over ventral axil. Scales with a few radial striations; lateral line on anterior 4 or 5 scales only.

Color in alcohol pale, a little darker along the back. Upper lip and chin dusky; a large oval black blotch on the peduncle near the caudal base, the long diameter of which is equal to that of eye. A dark lengthwise thread extending forward from this in the middle of the side.

Four additional specimens of about the same size with the same data.

## CYPRINODONTIDÆ

Two specimens only, 27 to 30 mm. in standard length, from Cape-longo, provisionally identified with *Aplocheilus macrurus* (Boulenger), may be more slender with slightly higher scale count (about 30), but are in too poor condition to separate from this species.

<sup>1</sup>We take pleasure in naming this species in honor of the leader of the expedition, Mr. Arthur S. Vernay, who has also taken an interest in the study of the fresh-water fishes and the preparation of this report.

## CICHLIDÆ

A number of cichlids, all from Capelongo represent three species of *Tilapia* and two of *Paratilapia*. *Tilapia steindachneri* Boulenger (largest 88 mm. standard length) is an Angolan form; *Tilapia melanopleura* A. Duméril (up to 110 mm.) is of very wide distribution, South and East Africa, Congo and Niger, common; and *Tilapia acuticeps* (Steindachner), up to 54 mm., is known from Angola and the upper Zambesi. These are each represented by a comparable number of specimens in this order of abundance. We have about as many *Paratilapia angusticeps* Boulenger (up to 210 mm.) as of the last named; and three *Paratilapia thumbergii* (Castlenau), 73 mm. and less, and two larger, one of which measures 300 mm. in standard length. Both forms are known from Angola and south-east Africa.