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fourth joint, as in other species of the group. Extremity of the abdomen truncated, or slightly excavated. Color in life deep blue beneath the silvery or pearly pubescence.

Length 0·8; greatest breadth 0·29 inch.

Its nearest ally is *I. margaritacea* Dana, found in the ocean between Australia and New Zealand, in which the abdomen is regularly rounded at the extremity, while in our species there is a well-marked angle on either side.

On the West African genus **HEMICHROMIS** and descriptions of new species in the Museums of the Academy and Smithsonian Institution.

BY THEODORE GILL.

Mr. P. DuChaillu, the African traveller, obtained among other objects of natural history, specimens of several species of fishes, one of which is a new form of Peters' genus *Hemichromis*.

The genus *Hemichromis* was proposed, in 1857, by Dr. Peters for Chromoids, having the habit of *Chromis* or *Tilapia*, and with a row of conic, brown tipped teeth in each jaw, the two median of which in the upper were considerably larger, and also with an interior row of smaller teeth in the upper jaw. The only species was obtained in Guinea by Pel.

Recently, M. August Duméril has described and figured a species as a new generic type under the name of *Chromichthys elongatus* Guichenot. It agrees in every respect with *Hemichromis*, except in the presence of only one row of teeth in the upper jaw. As, however, the inner row of *Hemichromis* is formed by very small teeth, it is probable that it has been overlooked by Guichenot and Duméril, and that their species is therefore a genuine *Hemichromis*. That genus will then embrace four species, which may be distinguished as follows:

HEMICHROMIS FASCIATUS Peters.

Hemichromis fasciatus Peters, Monatsberichte der Königlichen Preuss. Akademie die Wissenschaften zu Berlin, 1857, p. 403.

"Fasciis transversis fuscis sex, macula operculari nigra; pinna dorsali et anali oblique fasciatis, albo marginatis; pinna caudali supra infraque albo marginata; pinnis ventralibus externe fuscis."

D. XIV. 11—12. A. III. 9—10.

Habitat. Guinea. (Peters.)

HEMICHROMIS AURITUS Gill.

Fasciis quinque, latere medio expansis, macula operculari nigra, margaritacea supra infraque marginata; pinnis ventralibus externe fusco-purpureis.

D. XIV. 11. A. III. 8.

Habitat. Gaboon River?

HEMICHROMIS BIMACULATUS Gill.

Unicolor, macula corporis latere unica et operculi apice nigris.

D. XIV. 1. $8\frac{1}{1}$. A. III. $6\frac{1}{1}$. Squam. ser. $25\frac{3}{9}$.

HEMICHROMIS ELONGATUS Gill.

Chromichthys elongatus (Guich.,) Dum., Archives du Museum, tome x. p. 257, pl. xxii. fig. 3.

Fasciis quinque (macula operculari nulla): squamis buccis quinquieseriatas.

D. XIII. 9. A. III. 8.

Habitat. Gaboon River.

[March,

HEMICHROMIS AURITUS Gill.

The body is oblong and arched from the interorbital region to the end of the dorsal, both of which are at the same horizon; the height is greatest under the seventh dorsal spine where it nearly equals three-tenths ($\cdot 29$) of the length; behind the dorsal fin, it exceeds an eighth ($\cdot 13$), and at the lowest part nearly equals a ninth ($\cdot 11$) of the length. The greatest thickness is nearly equal to a seventh of the length.

The head forms three-tenths ($\cdot 30$) of the total length; its height at the preopercular margin bears a proportion to the same length of 23-100, and at the pupil of 18-100. The profile above is perfectly rectilinear, and little oblique along the intermaxillary groove, from the region above the pupil to the symphysis of the jaw. The snout is acutely conical and nearly equals a third of the head's length (9-100 of total.) The preorbital bone is highest behind, and exceeds half the diameter of the eye, while between that point and the nostrils it equals the same half. The preoperculum is vertical behind, slightly prominent at its angle and obliquely curved forwards. The operculum forms less than a third (9-30) of the head's length, and its angle is rounded. The subopercular border behind is nearly vertical, and has a shallow emargination, while below it is very obliquely rounded; the height of the operculum and suboperculum combined exceeds half (16-30) of the head's length. The interorbital region is flattened, and the sinus for the pedicles of the intermaxillary bones is indicated by a semielliptical outline, terminating at the vertical of the front border of the pupil.

The teeth are tipped with brown and in a regular row in each jaw, about twenty-five on each side in the upper (25 I. I. 25), and sixteen in the lower 16(-3, 4)-16; the two front teeth of the upper are two or three times as long as the others, and that on each side is also rather larger than the others. The three or four teeth on each at the front are somewhat larger and separated from the others. The second series of small teeth, which are also tipped with brown, is separated by a wide interval in front, but gradually approaches the outer row towards the side.

The dorsal fin commences over the end of the operculum; its base is one and a half times longer than the head ($\cdot 44\frac{1}{2}$ of length); the spinous portion exceeds the head's length ($\cdot 31$), and the soft is considerably less than half as long ($\cdot 13\frac{1}{2}$). The spines rapidly and regularly increase in a curved line from the first to the fifth, and behind the latter very slowly increase towards the last; the first spine nearly equals the lesser height of the preorbital bone ($\cdot 3\frac{1}{2}$), and is much less than half as long as the fifth ($\cdot 8$) and less than a third as long as the last one ($\cdot 11$). The soft portion is acuminate at the middle or sixth ray, which exceeds by half the length of the longest spine as well as the last ray.

The anal fin commences under the third ray of the dorsal fin, and ends under or nearly under or slightly behind its last; its base exceeds an eighth ($\cdot 12$) of the total length; the three spines regularly increase ($\cdot 4$; $\cdot 7\frac{1}{2}$; $\cdot 9$) towards the soft part; the latter is acuminate like the dorsal, its longest ray equalling that of the dorsal ($\cdot 16$), and twice the length of its last ray ($\cdot 8$).

The caudal fin, when expanded, is almost truncated, the median rays forming almost a fifth ($\cdot 19$), and the longest quite equalling a fifth ($\cdot 20$) of the total length.

The pectoral fins are slender and equal the longest dorsal and anal rays ($\cdot 16$). The ventral fins are immediately behind the vertical of the lower axillæ of the pectorals. The spine equals a third ($\cdot 10$) of the head's length, and is as long as the fifth ray; the first ray is simply bifurcated, and equals $\cdot 23$ of the total length; the other rays doubly or triply subdivided.

The scales are nearly equal, except on the abdomen, where they are much smaller. There are twenty-five oblique rows, and at its deepest portion thirteen longitudinal rows, three of which are above and nine below the lateral
1862.]

line, while on the caudal peduncle there are seven rows, three above and three below. The anterior portion of the lateral line runs along eighteen scales, and the posterior along nine. A row from the front of the anus would end above, near the seventh dorsal spine. The scales of the cheeks are in three regular rows, without including those in the limb.

D. XIV. 11. A. III. 8. C. $\frac{3}{3}$. I. 7. 7. I. 3. P. I. 1. 13. V. I. 5.

The color of alcoholic specimens is purplish brown above, fading into lighter on the sides, where margaritaceous spots on each scale form faint, interrupted longitudinal lines. The sides have five ovate black spots terminating in lighter processes above and below, and forming indistinct vertical bands. The first is above the base of the pectoral fin; the second on the seventh to ninth oblique rows of scales; the third above the spines of the anal fin; the fourth nearly behind the fins, and the fifth at the base of the caudal. The head is uniform and like the body, except at the angle of the operculum, where there is a rhomboidal black spot, and bordered before and behind, below the angle, with margaritaceous. The fins are immaculate; the ventrals only having the external half dark purple.

This species is closely allied to the *Hemichromis fasciatus* of Peters, but is distinguished from it by the uniform color of the fins, the presence of only five vertical bands, the margaritaceous margination of the opercular spot and the presence of only eight anal rays, the last two of which are simple, but entirely separated. Dr. Peters attributes to his species the formula for the

$\frac{3}{9}$ scales 28 -, I do not know whether this indicates the actual number of rows

or the sum of those pierced for the two parts of the lateral line. If the latter is the case, it would nearly agree with the *H. auritus*.

Specimens of this species were obtained by Mr. DuChaillu in the Gaboon River,* and are preserved in the Museums of the Academy of Natural Sciences of Philadelphia and of the Smithsonian Institution.

| | |
|---|-----------------|
| Length from snout to end of median caudal rays $4\frac{1}{2}$ | 100 |
| Body—Greatest height..... | 29 |
| Height behind dorsal fin..... | 13 |
| Height of caudal peduncle..... | 11 |
| Length “ “ | $10\frac{1}{2}$ |
| Greatest thickness..... | $13\frac{1}{2}$ |
| Head—Length laterally. | 30 |
| Height at preopercular margin..... | 23 |
| “ “ pupil..... | 18 |
| “ of preorbital end of jaw..... | $4\frac{1}{2}$ |
| “ “ near nostril..... | $3\frac{3}{4}$ |
| Length of snout..... | 9 |

* Many specimens of a new Cyprinodont allied to the African *Poecilia* of A. Dumeril were also collected. It may be called *Epiplatys sexfasciatus* Gill. Allied to *E. homalonotus*, but the head above is *oblong*, with the snout transversely semicircular and the lower jaw little but uniformly prominent. The caudal peduncle is not constricted, and its length equals the height behind the dorsal.

$\frac{3}{5}$
D. 3. 7. (3. 8.) A. 3. 12. Scales 28 -.

The color is reddish, with six bands below the lateral line; 1s', behind the pectoral; 2d. close before the ventral; 3d. close before the anal; 4th, over ninth to eleventh anal rays; 5th, behind dorsal; 6th, at end of caudal peduncle.

The name of *Epiplatys* is proposed for the present species and the *Poecilia omalonota*, *P. spylargyrea* and *P. spilanchen* of A. Dumeril, which differ from the true *Poecilia* (? *P. vivipara* Schneid., *P. Surinamensis* Val.) by the longer anal, whose hinder portion is opposite to the dorsal, &c. *Mollinesia* is distinguished by the difference of the sexes and the large dorsal.

[March,

| | |
|---|--------|
| Length of front operculum..... | 9 |
| Height of operculum and suboperculum..... | 16 |
| Width of interorbital area..... | 8½ |
| Eye—Diameter..... | 7½ |
| Dorsal—Origin from snout..... | 32 |
| Length of base..... | 31+13½ |
| Height at first spine..... | 3½ |
| “ “ fifth spine..... | 8 |
| “ “ last spine..... | 11 |
| “ “ longest ray..... | 16 |
| “ “ last ray..... | 9 |
| Anal—Origin from snout..... | 57 |
| Length of base..... | 12 |
| Height at first spine..... | 4 |
| “ “ second spine..... | 7½ |
| “ “ third spine..... | 9 |
| “ “ longest ray..... | 11 |
| “ “ last ray..... | 8 |
| Caudal—Length of median rays..... | 19 |
| “ “ longest rays..... | 20 |
| Pectoral—Length..... | 16 |
| Ventral—Length of spine..... | 10 |
| “ “ first ray..... | 23 |
| “ “ fifth ray..... | 10 |

HEMICHROMIS BIMACULATUS Gill.

The form is similar to that of its congeners, and is highest under the fifth and sixth dorsal spines, the height there somewhat exceeding a quarter (.26) of the extreme length; that of the caudal peduncle, behind the anal fin, equals half of the greatest height, and that of the lowest part exceeds a ninth (.11½) of the total length, and is considerably greater than the length of the peduncle. The thickness of the body at the pectoral region equals half the height (.13).

The head forms three-tenths (.30) of the length; its height at the preopercular margin exceeds a fifth (.22), and that at the pupil nearly equals a sixth (.16) of the total length of the fish. The length of the snout equals an eleventh (.09) of the same, and exceeds twice the height of the preorbital bone (.4). The length of the operculum is twice as great as the height of preorbital (.8). The eyes are oval, and the longitudinal diameter equals the length of the operculum (.8), and is greater than the width of the forehead between them; the latter is plain, the emargination for the intermaxillary processes being very shallow and extending little beyond the anterior borders of the orbits. The mouth is small and oblique; the supramaxillars extend backwards to the anterior borders of the orbits.

The larger teeth are moderate, uniserial and nearly or quite contiguous in each jaw; there are about twenty on each side in the upper and seventeen in the lower jaw, besides the two larger on each side in front in the upper and one equal in size to the rest, but removed backwards on each side in the lower; the teeth of the inner, small, transverse row of the upper jaw are well developed, but much smaller than the outer, and two to four on each side separated by a wide interval from those of the opposite side.

The dorsal fin commences over the base of the pectoral, or at a distance from the snout exceeding the head's length (.31); its spinous portion equals .28 of the total length, and its soft nearly an eighth (.12); the former increases in a gradually curved line towards the soft portion, the first spine being very short (.2½), the fourth more than twice as long (.6), and the last nearly four times as long (.09). The soft portion is produced at the median
1862.]

This is a very distinct species, readily distinguished by the small mouth and short intermaxillary processes, as well as by its dimensions and the color.

A single specimen is in the collection of the Smithsonian Institution, to which it has been transferred from the former National Institute of the City of Washington. There is no indication of locality, but it is probable that it was sent from Liberia. With it are three other species, a foetal *Rhinobatus*, a new *Clarias** and a new *Mormyroid*,† all in a poor state of preservation.

Three African genera of Chromoids appear to be now known, all of which differ from the American ones. All have a regular form, interrupted lateral line, large scales and three anal spines. They may be briefly distinguished as follows :

TILAPIA A. Smith, A. Duméril.

Chromis Heckel, Müller, Peters, Günther, (nec Cuv.)
? Coptodon Gervais. (? = Haligenes Gthr.)

Corpus ovatum ; caput breve ; dentes apicibus oblique expansis, uni vel bi-emarginatis, in maxilla superiori triseriales, inferiori biseriales.

Type. *Tilapia nilotica*.

HALIGENES Günther.

Corpus ovatum ; caput breve ; dentes apicibus oblique expansis, uni vel biemarginatis ; in maxilla superiori biseriales, serie interna minores, inferiori uniseriales.

Type. *Haligenes Tristrami Günther*.

HEMICHROMIS Peters.

Corpus oblongum ; caput oblongo-conicum, acutum ; dentes conici, apicibus nigri, in maxilla superiori biseriales, serie interna minuti, inferiori uniseriales.

Type. *Hemichromis fasciatus Peters*.

* *Clarias laviceps* Gill.—Height at anus a tenth of length ; head (laterally) a sixth ; its breadth an eighth ; the surface smooth ; maxillary barbels twice as long as head.
D. 86. A 61.

† *Marcusenius brachyistius* Gill.—The height in front of the anal fin equals a fifth of the length, exclusive of the caudal, and scarcely exceeds the length of the head. The distance of the short dorsal from the snout is three and a half times (.69) greater than the head's length ; the anal has about ten rays before and four behind the dorsal. The pectorals are shorter than the head (15) and scarcely extend as far as the bases of the ventrals. The head is decurved and the snout convex. All the teeth (about six in each jaw) are emarginated.

D. II. 1. 14. A. II. 1. 24. Scales 50 ; between ventrals and lateral line 10 rows ; in front of anal $\frac{9}{9}$.

Widely distinguished from its congeners (*M. anguilloides*, *M. Tuckeyi* and *M. zambanense*) by the radial and scale formulæ.

The Mormyroids are divisible as follows :

- I. Dorsal very long. Vomer covered by anterior processes of palatine bones ; cerebellum entirely concealed above. MORMYRINÆ.
 - Muzzle tubuliform (*M. caschive* Has.) Mormyrus.
 - Muzzle obtuse (*M. Hasselquistii* Geoff.) Mormyroides.
- II. Dorsal more or less abbreviated. Vomer uncovered. Cerebellum and quadrigeminal bodies more or less exposed above. PETROCEPHALINÆ.
 - A. Snout not produced ; mouth not continued to vertical of eyes.
 - a. Anal (25—50), not more than twice as long as dorsal.
 - Lower jaw prominent, *M. anguilloides* L. Mormyrops.
 - Upper jaw longer, (*M. cyprinoides* L.) Marcusenius.
 - b. Anal three times as long as dorsal.
 - Palatal teeth pisiform (*M. dorsalis* Geoff.) Hyperopisus.
 - B. Snout produced. Mouth under eye, (*M. lane* Val.) Petrocephalus,