

AMERICAN MUSEUM NOVITATES

Number 150

Published by
THE AMERICAN MUSEUM OF NATURAL HISTORY
NEW YORK CITY

Nov. 13, 1924

59.7(59.1)

ON A SMALL COLLECTION OF FISHES FROM UPPER BURMA

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This paper is concerned with a small collection of fishes made in Upper Burma in 1923 by Mr. Barnum Brown, field palæontologist of the American Museum. The localities are Monywa, on the Chindwin River, and a "small stream tributary to the Irrawaddy near Myaing." In identifying the collection, practically all the papers dealing with Burmese fishes were consulted. On this account and because few of the many excellent papers give bibliographies, I have listed all the works I have examined. While the list is not meant to be a complete bibliography of Burmese fishes, few important papers subsequent to Day's "Fishes of India" are omitted. The most important contribution to Burmese ichthyology is that of Vinciguerra (1890).

I am able to identify three specimens of a species of *Garra* from Myaing with none of the described species. As I have at present only African members of this difficult genus for comparison, notes upon them will be left for a future date.

Gudusia variegata (Day)

Head $3\frac{3}{4}$ in length to caudal base. Depth $2\frac{1}{2}$. Eye $3\frac{3}{4}$ in head, $\frac{2}{3}$ of its diameter from snout tip. Scales lateral 94 to caudal base, becoming very large and irregular in the abdominal area; caudal finely scaled for more than half its length, particularly along the central rays. Serræ before the base of the ventrals 17, behind 11; serrations gradually growing stronger posteriorly. Dorsal fin composed of a very short spine; another twice as long; an articulated, unbranched ray almost twice again as long; another the full height of the fin; and $11\frac{1}{2}$ branched rays.¹ Anal fin with a short spine; an articulated, unbranched ray; and $26\frac{1}{2}$ branched ones. Dorsal originating an eye length nearer snout tip than caudal base. Pectorals just not reaching pelvics, which originate exactly beneath dorsal origin. Teeth on tongue only.

One specimen, 78 mm. in length to caudal base, from Monywa.

Danio strigillifer, new species

Head 4 in length to caudal base. Depth $2\frac{2}{3}$ to 3. Eye 3 in head, $1\frac{1}{3}$ in interorbital, $\frac{3}{4}$ of its diameter from snout tip. Interorbital $2\frac{1}{4}$ in head. Scales transverse 10, 37 in the lateral line, which is $2\frac{1}{2}$ scales above the pelvic fins. Dorsal fin 12. Anal fin $16\frac{1}{2}$ to $17\frac{1}{2}$. Dorsal originating midway between opercle edge and caudal

¹The last ray, split to the base, is counted as $1\frac{1}{2}$.

base. Anal originating under the fourth dorsal ray. Pectoral fins as long as head, scarcely or not reaching pelvics, which scarcely reach vent. Rostral barbels half as long as orbit. Maxillary barbels minute, scarcely $\frac{1}{8}$ orbit. Lower jaw slightly longer, with a knob at symphysis. Caudal forked less than half its length.

In life the prevailing tones and shades of color are probably similar to *D. malabaricus*, and the pattern is of the same style—blue and yellow lines breaking up anteriorly into spots and streaks. In spirit, all of the scales with a bluish gun-metal sheen. Back brownish; belly yellow, approaching orange towards the edge. From above the pelvics, on the fifth scale row, a yellow line (undoubtedly golden in life), runs down to the upper part of the caudal base. Above, this is bounded by a faint blue line of similar width, and below by a blue band twice the width, this wide band running out through the central caudal rays. The latter band is in turn bounded below by a yellowish area covering the lower part of the sides posterior to the peritoneum. The yellow area is finely speckled with minute dark (blue?) chromatophores, with the exception of a strip immediately below the blue band. This strip thus forms another yellow band bounding the wide blue one below. This is probably not golden in life. The wide blue band expands and fades anteriorly, suffusing the mid-sides with blue and forming the background for a few faint yellow spots representing the two yellow lines anteriorly. There is a dark fleck behind the upper part of the opercle. Anal and dorsal fins with a dark shading.

Two specimens (A. M. N. H. No. 8351), 48 and 40 mm. in length to caudal base, from Myaing, March, 1923.

The species of *Danio* may be distinguished as follows. (The genus *Brachydanio* Weber and de Beaufort, with a short dorsal and incomplete lateral line, is recognized as distinct.)

- 1.—Anal fin entirely behind dorsal; barbels absent.....
*chrysops*¹ (Cuvier and Valenciennes).
Part of anal fin under dorsal; barbels present.....2.
- 2.—Lateral line with 55 or more scales.....*spinus* Day.
Lateral line 45 to 50.....*annandalei* Chaudhuri.
Lateral line with less than 45 scales.....3.
- 3.—Rostral barbels nearly length of head; colors in a more or less reticulated pattern;
l.l. 38=.....*dagila* (Hamilton Buchanan).
Rostral barbels not longer than eye; colors in longitudinal bands or streaks...4.
- 4.—Dorsal fin originating midway between opercular edge and caudal base; l.l.
37.....*strigillifer* Myers.
Dorsal originating midway between tip of snout and caudal base; l.l. 35 to 37.
neilgherriensis (Day).
Dorsal originating midway between caudal base and a point somewhere between
the preopercle and anterior border of eye.....5.
- 5.—Dorsal rays 17 to 19; l.l. 33 to 37; head $3\frac{1}{2}$ to 4...*devario* (Hamilton Buchanan).
Dorsal rays 10 to 15.....6.
- 6.—Lateral line 40 to 42; eye 4; dorsal 10.....*naganensis* Chaudhuri.
Lateral line 38 or less.....7.

¹Perhaps not a *Danio*.

- 7.—Dorsal originating midway between vertical limb of preopercle and caudal base; l. 30 to 34; d. 11 to 13. *browni* Regan.
 Dorsal originating midway between some part of eye and caudal base 8.
 8.—Eye 3 in head; barbels 2 (?); l. 32; d. 11; a. 14. *kakhienensis* Anderson.
 Eye 4 in head; barbels 4. 9.
 9.—Anal originating under about the ninth dorsal ray; dorsal originating midway between center of eye and caudal base; rostral barbels as long as eye. *equipinnatus* (McClelland).
 Anal originating under about the sixth dorsal ray; dorsal originating midway between posterior border of eye and caudal base; rostral barbels half as long as eye. *malabaricus* (Jerdon).

Rohtee roeboides,¹ new species

Head $4\frac{3}{4}$ in length to caudal base.² Depth $2\frac{1}{8}$. Eye 3 in head, $\frac{2}{3}$ of its diameter from the snout tip, $1\frac{1}{2}$ in the interorbital. Scales 49 in the lateral line, transverse $10\frac{1}{2}$. Dorsal fin composed of a very small, almost hidden spine; a second one longer; a third serrated on its posterior edge, as high as the fin; and $7\frac{1}{2}$ branched rays. Anal fin with a single unbranched, articulated ray and $27\frac{1}{2}$ branched ones. Dorsal originating midway between the insertion of the pelvics and of the anal, and slightly nearer the snout than to the caudal base. Height of serrated dorsal spine $3\frac{3}{4}$ times in the body length, exceeding the head by a snout length. Pectoral fins not reaching pelvics by $\frac{1}{8}$ their own length. Pelvics just reaching anal fin. Body very compressed. Abdomen rounded before pelvics. Profile at nape very concave, as in *R. cotio* and *R. duvaucelii*. Mouth rather inferior, but both jaws the same length. Barbels none. Silvery, with violet reflections. Fins plain.

A single specimen (A. M. N. H. No. 8350), 80 mm. in length to caudal base, from Monywa, April, 1923.

Related to *Rohtee cotio* (Hamilton Buchanan), *R. duvaucelii* (Cuvier and Valenciennes), and *R. cunma* (Tickell) (in Day, 1888, p. 807). Differs from *cotio* and *duvaucelii* in the fewer scales³ and shorter pectorals, and from *cunma* in the deeper concavity at the nape, the serrated dorsal spine, and the more numerous scales.

Barbus nicholsi,⁴ new species

Head $4\frac{2}{3}$ in length to caudal base. Depth 3, greatest at dorsal insertion. Least depth of caudal peduncle is $\frac{2}{3}$ head length. Eye 4 in head, $1\frac{1}{2}$ in interorbital, posterior border of pupil in center of head length. Interorbital $2\frac{3}{4}$ in head. Scales in lateral line 45 to the caudal base, with 3 more on the caudal. Transverse $15\frac{1}{2}$, 9 above the lateral line series to the dorsal, $5\frac{1}{2}$ below to the pelvics. Predorsal 14. Dorsal and anal bases in a scaly sheath. Dorsal fin composed of a short, almost hidden spine;

¹Named for its resemblance to the American characin genus *Roboidea*.

²Great care should be used in comparing Day's descriptions, as he usually includes the caudal fin in the length.

³Day's figure of *duvaucelii* (*alfrediana*) shows only 45 scales. Fowler (1924, p. 76) finds the scales in this species 54 to 64 in 80 specimens from various localities in northern India.

⁴Named for Mr. John Treadwell Nichols, in slight appreciation of his generous help and interest in my work at the American Museum.

one four times as long; a strong articulated spine, serrated posteriorly, as high as the fin; and 8 branched rays. Anal fin composed of a very short spine; a spine twice as long, articulated toward the tip; a strong articulated but not serrated spine as high as the fin; and 5 branched rays. Dorsal originating nearer snout tip than caudal base by a distance equal to the head posterior of eye. Distance from occipital process to dorsal origin goes $3\frac{1}{2}$ times in the body length. Serrated dorsal spine equal to head length. Pectoral fin $\frac{3}{4}$ head length, not reaching the pelvics by $\frac{2}{3}$ its own length. Pelvics not nearly reaching vent. Caudal fin well forked. Body, and especially head, much compressed. Upper profile of head slightly convex, snout rounded down. Mouth inferior. Premaxillaries well protractile. Barbels 4, both pairs equal, slightly more than $\frac{1}{2}$ eye; the anterior coming out from under anterior edge of the large preorbital plate, the posterior at end of maxillary. Nostrils together, a third of orbital diameter anterior of eye. No pores on snout. Plain silvery, darker above. Edges of dorsal and caudal with a blackish shade.

A single specimen (A. M. N. H. No. 8352), 135 mm. in length to caudal base, from Monywa, April, 1923.

Closely related to *Barbus chagunio* (Hamilton Buchanan) and to *B. clavatus* McClelland,¹ differing in the position of the dorsal, the depth, and the number of both lateral and transverse scale rows.

Gagata gagata (Hamilton Buchanan)

Head $3\frac{3}{4}$ to 4 in length to caudal base. Eye $3\frac{1}{4}$ to $3\frac{3}{8}$ in head. Dorsal I, $5\frac{1}{2}$. Anal III, 11.

Four young specimens, 75 to 96 mm. in length to caudal base, from Monywa.

Mastacembelus oatesii Boulenger

A single specimen, 255 mm. in length, from Monywa. It appears to agree with *oatesii* in Boulenger's key (Boulenger, 1912, p. 198).

Rhinomugil corsula (Hamilton Buchanan)

Head $4\frac{1}{4}$ in length to caudal base. Depth $5\frac{1}{2}$. Eye $6\frac{1}{8}$ in head, snout in same $5\frac{1}{8}$, interorbital $5\frac{1}{8}$. Eye in interorbital $1\frac{1}{8}$. First dorsal with 4 spines. Second with a small spine; an unbranched, articulated ray; and $6\frac{1}{2}$ branched ones. Anal with two short spines; an unbranched, articulated ray; and $7\frac{1}{2}$ branched ones. Scales lateral 54; around body before first dorsal 38. Scales on side oblong, half as wide as long, less than $\frac{1}{3}$ of the length exposed. Tip with a triangular patch of small denticles and a ridge down the center of this portion. Concentric striae running lengthwise and rounding towards the denticled tip. Scales on abdomen considerably shorter. Pectorals with a short spine; an unbranched ray, articulated towards the tip; and 13 branched rays. Ventrals with a spine and 5 rays. Caudal 17. First dorsal originating midway between the caudal base and the posterior border of the eye. Second dorsal originating 4 times as far from center of eye as from caudal base. Anal inserted

¹See Hora, 1922a, p. 185 and Pl. ix.

midway between caudal base and occiput. Pectoral fin $\frac{15}{16}$ head length, reaching the middle of the appressed pelvics, which do not reach the anal fin by $\frac{3}{4}$ their own length. Ventral bases set in a V, contiguous but not confluent posteriorly, at its apex. Orbital arch impinging far inward upon upper surface of head, thus reducing the interorbital width and leaving a considerable portion of the upper eye exposed. Preorbital serrated, the terminal serræ being beneath the anterior border of the pupil.

A single specimen, 128 mm. in length to caudal base, from Monywa.

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¹Judging by the "Zoölogical Record," this same article by Arnold, with the description, appeared first in the 'Wochenschrift für Aquarien- und Terrarienkunde' a few weeks earlier. Unfortunately there are no complete files of the 'Wochenschrift' available to me.

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¹See Regan, *Ann. Mag. Nat. Hist.*, (9) XI pp. 608-610, and Annandale, *idem*, (9) XII, pp. 593-597.

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