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*HADROPTERUS OXYRHYNCHUS*, A NEW PERCID  
FISH FROM VIRGINIA AND WEST VIRGINIA

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IN collecting fishes from various rivers in Virginia and West Virginia, the authors and Mr. John Addair have independently encountered a new darter of the genus *Hadropterus*. In reference to its extraordinarily sharp snout, the species is named *Hadropterus oxyrhynchus*.

With the exception of the holotype and one other specimen which were obtained in the Cheat River, a tributary of the Monongahela River in West Virginia, all of the type specimens were seined in New River, in Virginia and West Virginia. The species thus seems to be characteristic of the faunally distinctive Upper Kanawha system,<sup>1</sup> although it is not confined to that drainage basin. It is probably to be regarded as a relict form.

Like most of the North American Percidae, the new species inhabits riffles. According to the evidence afforded by the 5

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<sup>1</sup> Preliminary discussions of the peculiar fish fauna confined to the Kanawha (New) River system above the Falls have been given by Hubbs (1931) and Hubbs and Trautman (1932). It may be noted here that *Parewoglossum lawrae*, one of the species which was thought to be confined to the Upper Kanawha system, has recently been found to occur in the Allegheny River system in New York (Greeley, 1938: 68) and Pennsylvania (Raney, MS.).

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collections at hand, it lives under large stones and boulders, on sandy riffles, and in vegetation, in more or less swift water in rivers.

The holotype, an adult male 80 mm. in standard length, was collected by the junior author in Cheat River at Cheat Bridge, Randolph County, West Virginia, on June 25, 1935. It was seined among rubble and large stones on a rather fast riffle about 1.5 feet deep, where the river was approximately 75 to 100 feet wide and contained almost no vegetation. The Cheat River here is a clear trout stream. Common associates were *Rhinichthys cataractae*, *R. atratulus obtusus*, *Nocomis micropogon* and *Hypentelium nigricans*. Repeated efforts over a period of several days failed to yield a second specimen of the new darter.

Another adult specimen (U. S. National Museum No. 56862) was taken in the Cheat River at Raines, West Virginia. This paratype, 63 mm. long, was collected by W. P. Hay during the West Virginia investigations of the United States Fish Commission, on September 12, 1899, and was recorded by Goldsborough and Clark (1908: 38) as *Hadropterus macrocephalus*. The specimens recorded under the same name by these authors from Elk Creek at Quiet Dell prove on re-examination to represent *H. maculatus*; those from "Shavers Fork of Cheat" could not be relocated.

Four paratypes, 43.5 to 54 mm. long, were secured by the senior writer and family in New River, just above Jacksons Ferry, Wythe County, Virginia. They were taken on August 21, 1936, during a low-water stage when the riffle which was fished scarcely exceeded 2 feet in depth across its entire width of about 300 feet. Three specimens came from under boulders on bedrock in rather rapid water about one foot deep; the fourth fish was in a patch of pondweeds, in a moderate current where the water was only 8 inches deep. Unlike the Cheat River at Cheat Bridge, and despite the low water, New River was so yellow with silt that the bottom visibility was only about 8 inches. The only fish taken on the riffle with the new darter was one *Hadropterus maculatus*.

Nine additional paratypes, 20 to 33 mm. long, were seined by John Addair on sandy riffles of the muddy New River farther downstream, in West Virginia. Seven were taken at Prince on July 26, 1935; the others, two miles below Hinton on July 18, 1935. The fish were caught in 2 to 2.5 feet of water about 15 to 20 feet offshore in channels between islands of water-willow (*Dianthera*).

We thank Mr. Addair for permission to report on these specimens, which he has generously deposited in the Museum of Zoology. We also thank the authorities of the United States National Museum for the loan of three specimens, including one of the types of the new species.

*Hadropterus oxyrhynchus*, new species

(Plate I)

This darter combines characteristics of *Hadropterus phoxocephalus* and *H. macrocephalus*, but in some respects is more extreme than either. Like those species, it has a very long, terete head, but with even more forceps-like muzzle: the width of the snout is about two-thirds its length, instead of being of subequal dimension. The gill-membranes are somewhat more conjoined than in *phoxocephalus*, which the new species most resembles in color. Outstanding is the great distance from the tip of the mandible to the point of the union of the gill-membranes at the isthmus. A valuable differential ratio is obtained when this distance is divided by that from the union of the gill-membranes to the insertion of the pelvic fin, because as the one measurement increases, the other decreases (Table I). Even sharper differences are indicated when the distance from the tip of the mandible to the union of the gill-membranes is divided by the length of the eye, since the eye is smaller in the species having the longer distance along the lower side of the head (ratios also given in Table I). In respect to these ratios, as well as in certain other characters, the species *maculatus*, *macrocephalus*, *phoxocephalus*, and *oxyrhynchus* form a graded series, in which *oxyrhynchus* stands at the extreme end of the line of specialization.

TABLE I  
COMPARATIVE MEASUREMENTS ON SPECIES OF *HADROPTERUS*

	SPECIES OF <i>HADROPTERUS</i>			
	<i>macu- latus*</i>	<i>macro- cephalus</i>	<i>phoxo- cephalus</i>	<i>oxy- rhynchus</i>
Distance from insertion of pelvic fin to union of gill-membranes, measured into distance from tip of mandible to union of gill-membranes . . . . .	0.5 to 1.0	0.8 to 1.2	1.1 to 1.5	1.5 to 1.8
Length of eye in distance from tip of mandible to union of gill-membranes	1.5 to 2.2	2.2 to 2.6	2.5 to 3.2	3.3 to 4.0

\* Probably a complex of subspecies.

As indicated in Table II the characters of this species, as represented by the 5 type series, are relatively constant. This table, the previous remarks, and the photographs portray most of its characteristics.

The preopercle is entire and evenly curved, with a markedly extended lower (anterior) arm, which is nearly twice as long as the vertical arm. The fleshy premaxillary frenum is about half as wide as the eye, and the rather thick upper lip is about one-third as wide as the eye. The very slender mandibles expose an extremely narrow V-shaped space. The lower lip is full anteriorly, near the point where the forwardly converging margins of the 2 lips again diverge to form a frenum almost symmetrical with that of the upper jaw. The lower jaw is included within the rounded front of the upper lip. The gill-rakers number 5 + 9 in the holotype; the 5 on the upper limb and about 3 below are short.

The lateral canal of the head, as is usual, gives off 5 pores, of which the posterior ones are at the end of narrow tubes directed downward and backward. The supratemporal commissure is complete, and the median pore is at the end of a backward extension; the lateral pore of each side is at the end of a narrow tube. The interorbital pores are present, and the two nasals are widely separated, as the anterior one lies well in advance

## ERRATUM

*Occasional Papers of the Museum of Zoology, University of Michigan, No. 396.*

Page 6, Table II (Cont.):

The fifth figure in the first column should read 14 rather than 40.



TABLE II  
 MEASUREMENTS AND COUNTS ON 9 TYPES OF *HADROPTERUS OXYRHYNCHUS*

	U.M.M.Z. No. 118422 Cheat R., W. Va.	U.S.N.M. No. 56862 Cheat R., W. Va.	U.M.M.Z. No. 118482 New R., Wythe Co., Virginia				U.M.M.Z. No. 119268 New R., Prince, W. Va.	U.M.M.Z. No. 119246 New R., below Hinton, W. Va.	
Standard length, mm. ....	80	63	54	47	46	43.5	33	31	29.5
In standard length:									
Depth of body .....	6.3	6.5	6.4	6.8	6.7	6.9	6.9	6.6	6.9
Length of head, including opercular membrane .....	3.35	3.4	3.4	3.3	3.3	3.3	3.3	3.1	3.3
In length of head:									
Depth of caudal peduncle ..	3.2	3.0	3.2	3.2	3.3	3.3	3.4	3.3	3.3
Highest dorsal spine .....	3.2	2.9	3.0	2.9	3.0	3.0	3.2	3.0	3.1
Highest dorsal soft ray ....	2.2	2.3	2.2	2.5	2.3	2.4	2.5	2.3	2.5
Highest anal ray .....	2.0	1.8	1.9	2.2	2.0	2.25	2.3	2.2	2.2
Longest caudal ray .....	1.7	1.65	1.7	1.8	1.7	1.7	1.8	1.75	1.75
Longest pectoral ray .....	1.35	1.35	1.4	1.4	1.4	1.5	1.35	1.6	1.5
Length of pelvic fin .....	1.5	1.4	1.5	1.6	1.5	1.6	1.6	1.7	1.7
Depth of head .....	2.4	2.4	2.4	2.4	2.3	2.5	2.2	2.2	2.2
Width of head .....	2.4	2.4	2.6	2.6	2.5	2.7	2.7	2.6	2.5
Length of eye .....	5.5	5.6	5.4	5.1	5.1	5.2	4.7	4.6	4.4
Length of snout .....	3.4	3.3	3.4	3.4	3.5	3.3	3.3	3.2	3.5
Length of upper jaw .....	3.3	3.4	3.4	3.5	3.4	3.5	3.2	3.4	3.3

U.M.M.Z. No. 118422  
 TABLE II—(Continued)  
 MEASUREMENTS AND COUNTS ON 9 TYPES OF *HADROPTERUS OXYRHYNCHUS*

	U.M.M.Z. No. 118422 Cheat R., W. Va.	U.S.N.M. No. 56862 Cheat R., W. Va.	U.M.M.Z. No. 118482 New R., Wythe Co., Virginia				U.M.M.Z. No. 119268 New R., Prince, W. Va.	U.M.M.Z. No. 119246 New R., below Hinton, W. Va.	
In length of snout:									
Length of eye .....	1.6	1.7	1.5	1.4	1.5	1.5	1.5	1.5	1.4
In length of eye:									
Least fleshy interorbital width .....	1.8	1.6	1.5	1.7	1.6	1.9	1.8	1.6	1.6
In distance from tip of mandi- ble to union of gill-mem- branes:									
Distance from insertion of pelvic fin to union of mem- branes .....	1.8	1.5	1.7	1.6	1.7	1.65	1.6	1.6	1.5
Length of eye .....	4.0	3.4	3.8	3.6	3.7	3.5	3.5	3.3	3.4
Dorsal spines .....	40 <sup>14</sup>	14	14	13	13	13	13	13	12
Dorsal soft rays .....	14	14	14	13	13	13	13	13	13
Anal soft rays .....	9	8	9	9	9	9	9	9	9
Pectoral rays .....	14-14	14-14	14-14	14-14	14-14	14-14	14-14	14-14	13-13
Scales above lateral line* .....	9	9	10	10	10	10	10	10	10
Scales along lateral line .....	77	74	77	74	73	77	80	73	77
Scales below lateral line* .....	14	14	14	15	14	15	15	16	15

\* The scales above the lateral line were counted downward and backward from the origin of the second dorsal fin. Those below the lateral line were enumerated from the scaleless area about origin of anal fin upward and forward.



of the anterior, tubular nostril. The infraorbital canal is complete, with 8 pores, of which the posterior ones are at the end of progressively longer, narrow side tubes extending downward and backward. The posteriormost of the 4 anterior infraorbital pores lies on the canal far back of the 2 which open at the end of long narrow tubes extending toward the mouth. Of the 10 operculomandibular pores, those on the preopercle are at the end of narrow side tubes. (See Hubbs and Cannon, 1935: 10.)

The genital papilla of the adult male is a very short, broad, longitudinally rugose cone.

As in other species of the genus a row of somewhat enlarged, strongly spined scales extends along the mid-line of the belly. In the adult male the spines are suberect and especially strong (though less enlarged than in *Hadropterus peltatus*). Some of the spines are half as long as the scale. Posteriorly the scales remain in a row but become weak toward the pelvic fins, except for one much enlarged scale just behind the base of those fins. As usual in the genus, there is another enlarged, spiny scale near the middle of the breast. In the adult a few other scales, partly embedded, occur behind this scute, but the breast is virtually scaleless. The nape and opercles are covered with small, partly embedded scales. The cheeks bear deeply embedded, more or less scattered scales. The lateral line is very slightly elevated anteriorly.

As shown in the figure, the verticle fins of the adult male are considerably expanded. Each anal ray is lined on either side by a rather sharply edged ridge of tissue.

The one male obtained at or near maturity (the holotype) showed no noticeably bright colors in life, except for a yellow-orange submarginal band on the spinous dorsal (much as in *H. phoxocephalus*). The same feature was observed on the smaller fish caught in the New River in Virginia. These were pale yellowish between greenish bars, saddles, and other dark markings. A brilliant silver-blue streak extended along each mandible to its posterior end, and backward along the pre-

opercle. There was some yellow on each interspinal membrane of the first dorsal. The dorsal soft rays were marked with golden amber crossbars. The caudal fin was largely watery orange-yellow; the pectoral was washed with the same color toward its base, and the pelvic and anal fins showed a bare trace of this color. The specimen taken in a patch of pondweeds was distinctly greener than specimens from under boulders.

In alcohol the color is brownish to light tan. The dark markings are less intense than in related species. There are about 10 to 12 squarish blotches in a rather even lateral row. In some specimens faint vertical bars pass through the blotches. Numerous narrow light bars alternate with wider dark ones to form an axial streak in some half-grown examples. The dark lateral blotches are not bounded above by a definite lengthwise light streak. The rather faint squarish dorsal saddles are about as numerous as the lateral blotches. Indefinite dusky markings lie in between. A pair of prominent dark streaks, forming a V, extends from the tip of the snout backward through the eye, fading out above the blackish opercular region. On the head the lower half of the sides and the undersurface are pale; the subocular bar is lacking or obsolescent. The spinous dorsal shows a rather weak dark streak on either side of the wide submarginal light band, and the extreme edge is light. In the half-grown, the second dorsal is pale, with traces of crossbars toward the front margin and base, and the lower fins are whitish. In the adult male the second dorsal is dark, with a bare trace of a broad submarginal light band, and the pelvic and anal are dusky with a cream margin; the pelvic is not barred as in some adults of *H. macrocephalus*. The caudal fin is rather light with 2 or 3 submedian vertical dark bars in the half-grown, and is blotched with dusky in the adult. Toward the base each edge of the fin is whitish, as a margin to a dusky streak. Behind the rounded, blackish basal spot the fin is pale (more prominently above than below); the caudal spot and the ventral dusky streak tend to be connected.

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PLATE I

FIG. 1. *Hadropterus oxyrhynchus*, new species. The holotype.

FIG. 2. Top view of the anterior part of the same specimen, to show the very narrow snout.



FIG. 1

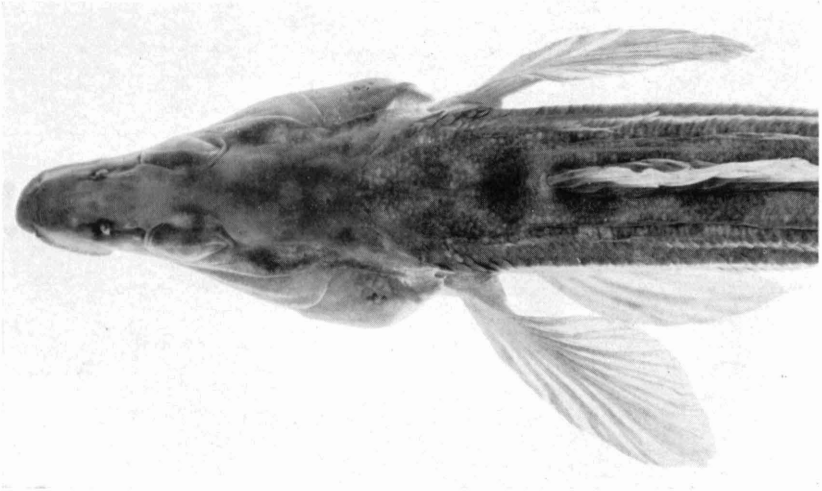


FIG. 2





