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HADROPTERUS NASUTUS, A NEW DARTER FROM
ARKANSAS¹

BY REEVE M. BAILEY

IT HAS long been apparent that the Ozarkian upland is a region of marked endemism for fishes, particularly among the Cyprinidae and Percidae. Another species, presumably confined to this area, is herein described from the White River basin in Arkansas under the name *Hadropterus nasutus*. It is allied to the recently described *H. oxyrhynchus* Hubbs and Raney (1939) from the Cheat and New rivers in Virginia and West Virginia.

Employing ratios based upon differences in snout length and other head proportions among several species of *Hadropterus*, Hubbs and Raney (1939: 3) stated that, "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." In the elongation of the head and snout *nasutus* is even more specialized than *oxyrhynchus*, and should follow that species if inserted in the above sequence. Essential similarities in coloration, especially the uniform possession of a subterminal orange band in the spinous dorsal fin, and various common structural characters,

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indicate a close interrelationship of *phoxocephalus*, *oxyrhynchus*, and *nasutus* as contrasted with other species of *Hadropterus*. *H. oxyrhynchus* and *nasutus* are both upland forms, each with an apparently restricted geographic range, whereas *phoxocephalus* occurs at lower elevations and is more widely distributed, ranging from western Pennsylvania and Tennessee to Wisconsin, Iowa, Kansas, and Oklahoma. It seems probable that the marked similarity between *oxyrhynchus* and *nasutus* is due to common ancestry, but possibly they were independently derived from *phoxocephalus* or a *phoxocephalus*-like form.

The presence of seven branchiostegal rays in *nasutus* is a remarkable feature. Six branchiostegal rays have heretofore been considered characteristic of the Etheostomatinae. In an examination² of all other species of *Hadropterus* and of many species of other darter genera variations in branchiostegal-ray counts from the normal number, six, were found in only two species. One of thirteen specimens of *H. roanoka* had five rays on each side; the others 6-6. In twenty-three specimens of *H. oxyrhynchus* one had 7-7, one 6-7, and twenty-one 6-6. The presumably normal presence of seven rays in *nasutus* and the occasional occurrence of this number in *oxyrhynchus* may be considered as genetic holdovers from the condition in the ancestral Percinae, and thus as further evidence of the generalized or primitive condition of *Hadropterus* among the Etheostomatinae. On the other hand, the transition from six rays in *phoxocephalus*, to six or seven in *oxyrhynchus*, and finally to seven in *nasutus* may represent a specialization independent of the condition in the Percinae. The additional ray is of obvious adaptive significance because the region of the branchiostegal membrane is unusually elongated. The latter view, which appeals to me as the more plausible, tends neither to prove nor to disprove the primitiveness of *Hadropterus*. In recognition of the close similarity between *nasutus* and certain species of *Hadropterus* and in view of the observed variation

² Dr. Carl L. Hubbs has examined several species not available to me and has offered suggestions in the preparation of this paper.

in branchiostegal-ray count in *oxyrhynchus*, it seems unwise to erect a new genus for the reception of *nasutus*.

Hadropterus nasutus,³ new species

(Pl. I, Figs. 1 and 3)

Longnose Darter

TYPES.—The holotype is an adult male (U.M.M.Z.⁴ No. 132,-898), 65.5 mm. in standard length, collected in the Middle Fork of the Little Red River (tributary to the White River) near the bridge at U. S. Highway 65, 1.5 miles southeast of Leslie, Searcy County, Arkansas, on August 17, 1940, by Reeve M. Bailey and Max E. Davis (field number B40: 37). The single paratype (I.S.C. No. 2), an adult female, 63.0 mm. long, was taken with the holotype.

DIAGNOSIS.—A slender species of *Hadropterus* allied to *phoxocephalus* and *oxyrhynchus*, and, like those species, with a conspicuous submarginal orange band in the spinous dorsal. Snout very long and narrow, 3.05 in head (including opercular membrane) and 1.7 times length of orbit. Head longer than in other species of *Hadropterus*, 3.0 to 3.2 in standard length. In the excessive prolongation and compression of the snout *nasutus* (for comparative photographs with *phoxocephalus* see Pl. I) is approached only by *oxyrhynchus*. From that species *nasutus* differs in several proportionate measurements: the upper jaw is contained 3.0 to 3.05 times in the head length in *nasutus*, 3.2 to 3.5 in *oxyrhynchus*; the least depth of the caudal peduncle is contained 3.7 times in the head length in *nasutus*, 3.0 to 3.4 in *oxyrhynchus*; the median fins are proportionately lower and the paired fins relatively shorter in *nasutus* (compare values in following description with those given in Hubbs and Raney's Table II); the snout and the head are relatively longer in *nasutus*; and the midventral scales of the belly are less well developed. The scales are rather small, 73 to 83 along lateral line; nape and cheek with small scales,

³ *Nasutus* = long nose.

⁴ U.M.M.Z. = University of Michigan Museum of Zoology; I.S.C. = Iowa State College.

opercle with rather large, ctenoid scales; midventral scales of belly moderately enlarged in males, not differentiated in females. Dorsal XIII-12 or 13; anal II, 8 or 9; pectorals 13 or 14. Preopercle entire, the lower limb much longer than upper. Gill-membranes moderately united; the distance from their union to insertion of pelvic fins 1.8 to 1.9 in distance from tip of mandible to union of gill-membranes. Branchiostegal rays 7, a number characteristic of no other darter so far as known.

DESCRIPTION.—Many features of form and coloration are illustrated in Plate I, Figures 1 and 3. The body is slightly compressed and elongate, width 2.7 (2.9)⁵ in head length and depth 6.0 (6.5) in standard length. The head (including opercular membrane) is longer than in any other species of *Hadropterus*, 3.0 (3.2) in standard length. The caudal peduncle is rather slender, its least depth 3.7 in head length. The median fins are low: highest dorsal spine 4.0 (3.4) in head; highest dorsal soft ray 2.75 (2.8) in head; longest caudal ray 2.0 (1.9) in head; and highest anal ray 2.45 (2.3) in head. The short pectoral fin extends back as far as the tip of the pelvic fin, its longest ray 1.6 (1.55) in head, and the pelvic fin extends about half the distance from its insertion to origin of anal, its length 1.85 (1.8) in head. The depth of the elongate head is contained 2.3 (2.2) times in its length, and its width 2.6 (2.7) in the length. The eye is not unusually small for a species of *Hadropterus*, but because of the great length of the head the orbital length⁶ is contained 5.3 (5.0) times in the head length. The greatly produced snout presents a gently sloping lateral profile and a sharply angulate outline from above (see Pl. I, Figs. 1 and 3); its length is contained 3.05 times in the head length. The mouth is large: the maxilla extends to below

⁵ Body proportions and numerical counts are those of the holotype; if the paratype differs from the holotype the figure is given in parenthesis.

⁶ At least in this group it is felt that an orbital measurement is more satisfactory than an eye measurement. The length of the orbit is obtained by placing the tips of the dividers at the edges of the eye and spreading them with a gentle pressure. The orbital measurement is not comparable with the eye length employed by Hubbs and Raney.

the anterior margin of the orbit, and the upper jaw length is contained 3.0 (3.05) times in the head length. The orbit is contained 1.7 times in the snout length; the narrow, fleshy interorbital, 2.1 (1.9) times in the orbital length. The orbital length is received 3.4 (3.3) times in the distance from the tip of the mandible to the union of the gill-membranes, a measurement reflecting the great length along the lower side of the head and the wide connection of the gill-membranes. The distance from the insertion of the pelvic fins to the union of the gill-membranes is contained 1.8 (1.9) times in the distance from the tip of the mandible to the union of the membranes. The comparable measurement ratios are 0.8 to 0.95 in *palmaris* (Bailey, 1940), 0.5 to 1.0 in *maculatus*, 0.8 to 1.2 in *macrocephalus*, 1.1 to 1.5 in *phoxocephalus* and 1.5 to 1.8 in *oxyrhynchus*.

The spinous and soft dorsals are slightly separated. The dorsal rays number XIII-12 (13).⁷ The two anal spines are subequal in length, but the first is considerably stronger than the second; there are 9 (8)⁷ anal soft rays. The caudal is slightly emarginate, with 17 principal rays, of which 15 are branched. The pelvic fins are separated by a space about equal to four-fifths of the pelvic base. The pectoral rays (both sides) number 13-13 (14-14).

There are 11 (12) scale rows as counted from the soft dorsal downward and backward to the lateral line, 76-73 (83-77) scale rows along the complete lateral line to base of caudal on left and right sides respectively, and 16 (15) rows as counted from the origin of anal upward and forward to the lateral line. The minimum enumeration of scale rows around the caudal peduncle is 29 (27). The nape is completely covered with minute scales. The upper portions of the cheeks are clearly scaled, but the lower parts appear to be scaleless, because the few, small, cycloid scales are embedded. The opercles are completely covered with ctenoid scales comparable in size to those of the body. The breast is naked except for a single, en-

⁷ The last ray of the soft dorsal and anal fins was counted as double at the base.

larged scale near its center. Between the pelvics there is a single, enlarged, median scale, followed posteriorly by an area of undifferentiated, embedded scales for half the length of the pelvic fins. In the holotype, a male, the remainder of the midline of the belly is provided with a series of moderately enlarged and strongly ctenoid scales. In the adult female of *H. nasutus* these scales are not differentiated. In the female of *H. phoxocephalus* these scales are hardly modified, and in other species they are weaker in that sex than in the male.

The preopercle is entire, and smoothly curved; the horizontal arm is almost twice the length of the vertical arm. The broad premaxillary frenum is much wider than the fleshy, terminal, upper lip, and equal to the length of the pupil. The slender mandibles diverge narrowly but regularly, forming a very sharp angle. The mandibular frenum is about half the width of the premaxillary frenum. Both upper and lower lips are greatly expanded and flaplike. The lower jaw is slightly included within the upper lip. The vomer bears a strong cluster of teeth, and the palatines are strongly toothed. The dentigerous surfaces of the premaxillae and dentaries are greatly expanded anteriorly. The branchiostegal rays number 7 on each side of both specimens.

The sensory pores and canals of the head agree with the description of those structures in *oxyrhynchus* (Hubbs and Raney, 1939: 4). Eleven operculomandibular pores were counted on the right side of the holotype, but only 10 in the other three counts. The complete lateral line is almost straight.

The genital papilla of the adult male is a subquadrate, depressed, longitudinally rugose flap; that of the adult female is slightly shorter and more rounded posteriorly.

COLORATION.—The most conspicuous character of the living specimens was the bright orange submarginal band on the spinous dorsal. The entire dorsal surface was dull yellow-orange. In preservation there is an enlarged, dark humeral spot, and a small but distinct black spot at the base of the caudal fin. Along the side there is a series of from 10 to

14 vertically elongate, dark lateral blotches, which are mostly narrower than the interspaces and tend to be narrower and higher anteriorly and more quadrate along the caudal peduncle. On the dorsal surface there are many irregular but distinct blotches and crossbands of brownish black (in preservation; see Pl. I, Fig. 3). A pronounced dark streak extends backward from the snout through the eye; it continues across the upper part of the cheek and opercle, but is here less intense and more diffuse. There is no trace of a subocular dark bar (such a bar is present in *phoxocephalus*).

The spinous dorsal is thickly sprinkled with dark chromatophores except in the area of the orange band. The soft dorsal and anal are faintly dusky in preservation and the caudal is crossed by three irregular vertical bars. A trace of pale yellow is still visible at the caudal base in the preserved specimens.

HABITAT.—*H. nasutus* is known only from the type locality. The Middle Fork of the Little Red River at this point presented a diversity of habitats, and yielded twenty-seven species of fish. The water was clear, colorless, and warm; the current varied from almost stagnant backwaters to swift riffles, and the width, from twenty-five to seventy-five feet. The bottom was composed largely of gravel and rubble, but there was some silt in quiet-water areas. The flow was estimated at ten cubic feet per second.

The two specimens of *nasutus* were seined in quiet water where there was an abundance of vegetation (*Potamogeton*, yellow pond lily, and algae). The bottom was of silt and the depth was about three feet. Associated species included *Erimyzon oblongus claviformis*, *Hyborhynchus notatus*, *Huro salmoides*, *Lepomis macrochirus*, *Lepomis megalotis*, and *Ambloplites rupestris*. An excellent rubble riffle nearby contained an abundance of darters of four other species.

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PLATE I

Comparative photographs of *Hadropterus nasutus* and *H. phoxocephalus*.

Fig. 1. *Hadropterus nasutus*, new species. The holotype.

Fig. 2. *Hadropterus phoxocephalus*, a specimen 46.5 mm. in standard length; from the Raccoon River, Dallas County, Iowa.

Fig. 3. *Hadropterus nasutus*, the anterior portion of the holotype viewed from above, to show the slender, tapering snout and the color pattern of the dorsum.

Fig. 4. *Hadropterus phoxocephalus*, anterior portion of the specimen shown in Figure 2 viewed from above, to show the broader and more rounded snout and the characteristic color pattern of the dorsum. (Photographs by Max E. Davis.)

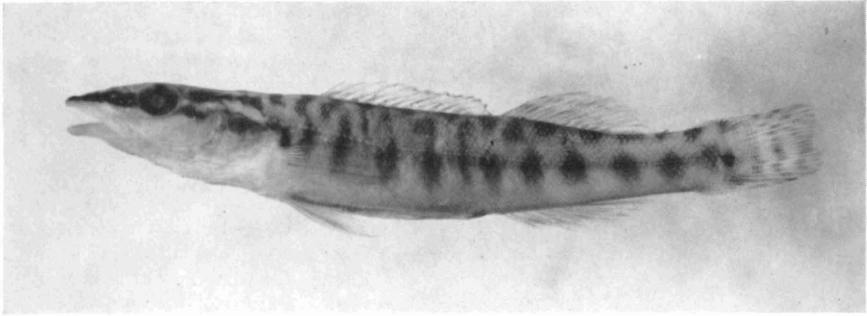


FIG. 1

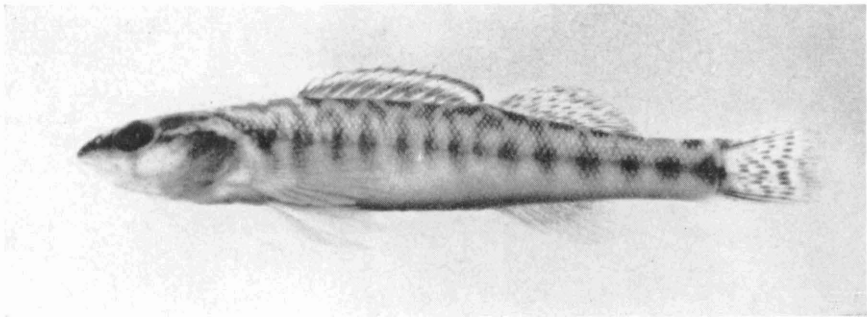


FIG. 2

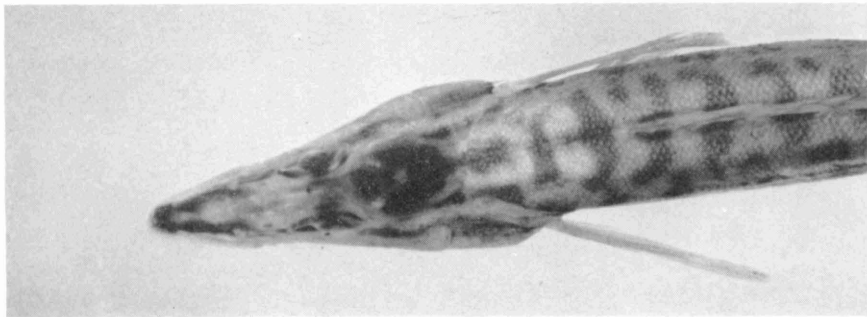


FIG. 3

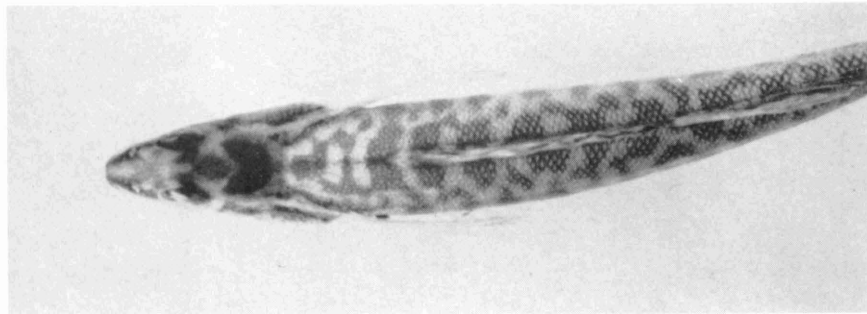


FIG. 4

