

# *Notropis mekistocholas*, a New Herbivorous Cyprinid Fish Endemic to the Cape Fear River Basin, North Carolina

FRANKLIN F. SNELSON, JR.

*Notropis mekistocholas* is described as a new species. It is unusual within the genus in exhibiting herbivorous adaptations—an elongate, convoluted intestine and black peritoneum. It is compared with *N. alborus* and *N. procne*, two sympatric relatives that differ in lacking herbivorous modifications, in having seven rather than eight anal rays, and in numerous other features.

*N. mekistocholas* is the first known endemic species from the Cape Fear drainage in North Carolina. It has a very restricted distribution in the east-central Piedmont province, being known from only four streams in Chatham and Harnett counties.

Intestinal modifications suggestive of an herbivorous diet are reported for *N. anogenus* and some species of the subgenus *Luxilus*. There is no evidence to suggest that *N. mekistocholas* should be aligned with the south-western genus *Dionda*, which contains herbivorous species superficially similar to *Notropis* species. Closest relatives of *N. mekistocholas* appear to be *N. procne* and *N. stramineus*.

## INTRODUCTION

THE genus *Notropis* usually has been characterized as having a short, S-shaped alimentary tract, distinguishing it from closely related groups containing herbivorous forms with elongate intestines. Discovery of a unique new species of *Notropis*, closely related to *N. procne* (Cope), with an elongate gut tends to obscure further the already-vague limits of certain North American cyprinid genera.

This new minnow was first discovered in 1962 in a poorly collected region of the Cape Fear River drainage in east-central North Carolina. Subsequent collecting has revealed that it is endemic to a very restricted area within that system. Although its situation at present is not precarious, its limited distribution and the constant threat of habitat alteration suggest that this new form should be added to the growing list of endangered species.

## METHODS

Counting and measuring procedures followed Hubbs and Lagler (1958:19-26) except as noted. Expression of meristic data in the form (8)9-11 (13) indicates that extreme values for this character were 8 and 13, and that 85-95% of the observed counts were between 9 and 11.

The number of predorsal scale rows includes all oblique scale rows crossing an imaginary line between the anterior insertion of the dorsal fin and the cleithrum. The first row counted was the one including the first predorsal scale; the last row counted was the one including the first (anterior-most) lateral line scale. Single scales interposed between two otherwise regular rows were not counted. However, two or more scales in a regular oblique series were considered a row even if that series terminated before crossing the dorsal midline or the lateral line.

The breast was defined as that triangular-shaped area forward of an imaginary line joining the most posterior point of the bases of the pectoral fins. Extent of breast scalation was estimated to the nearest 5%. Height and width of the exposed portion of the third lateral line scale behind the head were determined under a dissecting microscope equipped with an ocular micrometer; the results were expressed in a height-to-width ratio. Gill rakers on the lower limb of the first branchial arch were enumerated on the right side for ease of handling. Any raker that straddled the angle of the arch was included in the count. Vertebral numbers were determined from radiographs. The Weberian apparatus was included as four and the hypural as one.

The opercular membrane was excluded

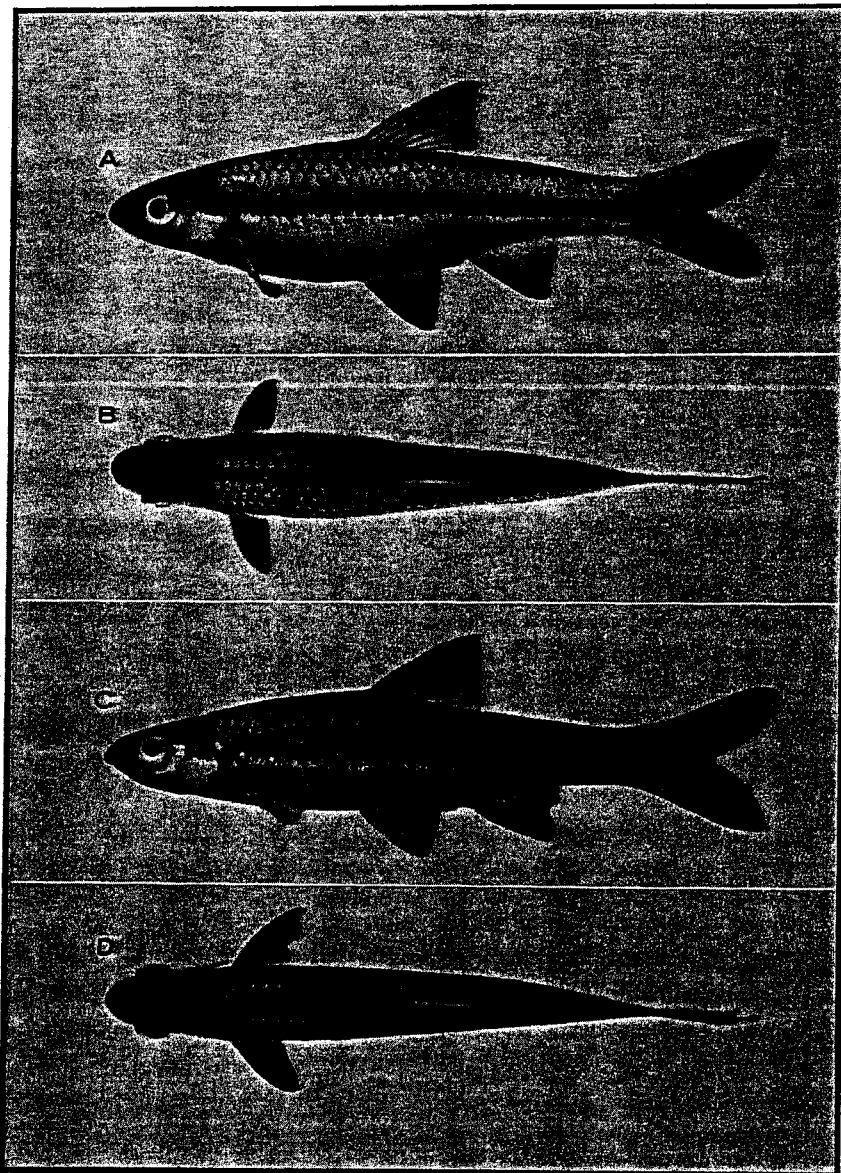


Fig. 1. A and B. Lateral and dorsal views of *Notropis mekistocholas*, gravid adult female 45.4 mm SL, NCSM 3105. C and D. Lateral and dorsal views of *Notropis procne*, tuberculate adult male 47.2 mm SL, NCSM 2974. (The slightly deeper body of the *N. mekistocholas* specimen is due to enlarged ovaries.)

from head length and postorbital head length measurements. Fleshy orbit length was the greatest transverse distance between the fleshy margins of the orbit, excluding any marginal skin that grew inward to cover the cornea. Distance from the dorsal fin origin to the lateral line was measured in a vertical

plane. Body width was the maximum dimension, measured between the pectoral and pelvic fin bases. Distance between the dorsal fin origin and the occiput was measured along the dorsal midline. Postdorsal length was taken from the origin of the dorsal fin to the caudal base. Prepelvic and

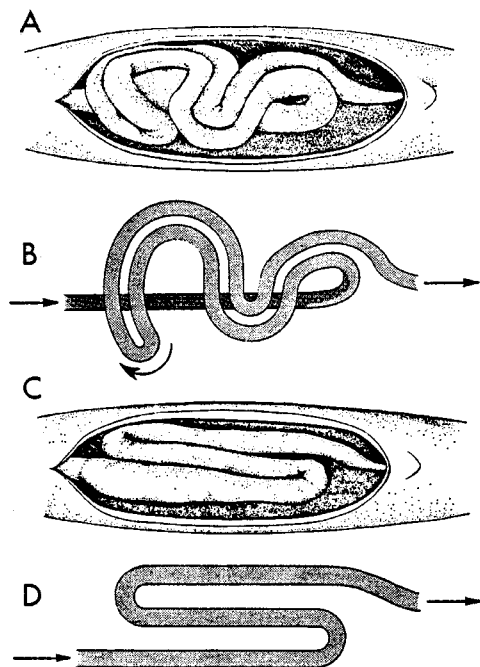


Fig. 2. A. Ventral view of the alimentary tract of *Notropis mekistocholas* with ventral body wall, viscera, and mesenteries removed. B. Alimentary tract of *N. mekistocholas*, diagrammatic. C. Ventral view of the alimentary tract of *Notropis procne* with ventral body wall, viscera, and mesenteries removed. D. Alimentary tract of *N. procne*, diagrammatic. Anterior to the left.

peranal measurements were taken from the insertion of the first ray of those fins to the tip of the upper lip. The distance between the anal fin origin and caudal fin base is self-explanatory.

In determining the length of the alimentary tract, the gut was severed immediately behind the transverse septum and at the anus; and all the viscera were removed. Connective tissue and organs were dissected away; and the alimentary tract was straightened, without stretching, along a steel millimeter rule.

Terminology, abbreviations, and counting procedures for the cephalic lateral line follow Illick (1956) with these exceptions:

- 1) The broad separation of the supratemporal canal at the dorsal midline is indicated by a comma; otherwise, interruptions along the length of a canal are indicated by a plus (+) sign. 2) A common pore at the junction of the supratemporal canal and postocular commissure was not included in the pore

count of either canal. Unlike some recent authors (e.g. Reno, 1969), I follow Illick (1956) and include in the infraorbital canal those pores in the postocular commissure in addition to those in the infraorbital *sensu stricto*.

*Notropis mekistocholas* n. sp.  
Cape Fear Shiner  
Figs. 1A, B; 2A, B

Apparently there are no references to this species in the literature. All of the material that Jordan (1889) recorded as *N. procne* from the Cape Fear has been reexamined by Hubbs and Raney (1947) and myself and found to represent either *N. alborus* or *N. procne*.

*Holotype*.—U.S. National Museum (USNM) 205299 (formerly NCSM 4928); a tuberculate adult male 55.7 mm SL; Cape Fear (Deep) dr., N. C., Chatham Co., Rocky R., N. C. Hwy. 902 bridge, 7.0 air miles SW center Pittsboro; 2 June 1968; Franklin F. Snelson, Jr. and William M. Palmer (FFS-68-31).

*Paratypes*.—Thirty-six specimens collected with the holotype are distributed as follows: Cornell University (CU) 64397 (7 specimens); Tulane University (TU) 63272 (7); University of Florida (UF) 17303 (7); University of Michigan Museum of Zoology (UMMZ) 197680 (7); USNM 205300 (8).

*Other material*.—None of the following are designated as type material. All were collected in the Cape Fear drainage in North Carolina and are deposited in the North Carolina State Natural History Museum. NCSM 2078 (6 specimens); Harnett Co., Neal's Cr., Co. Hwy. 1441 bridge, 2.5 miles W Angier. NCSM 2770 (4), 2976 (30), 3105 (13), 4842 (13); Chatham Co., Robeson Cr., Co. Hwy. 1939 bridge, 4.5 air miles ESE center Pittsboro. NCSM 3278 (16); Harnett Co., Parker's Cr., Co. Hwy. 1450 bridge, 7.5 air miles WSW Fuquay-Varina. NCSM 3463 (17), 3707 (5); Chatham Co., Rocky R., Co. Hwy. 1010 bridge, 5.5 miles SW center Pittsboro. NCSM 3883 (15); Chatham Co., Rocky R., U. S. Hwy. 15-501 bridge, 6.75 miles S Pittsboro. NCSM 4126 (29), 5281 (32); Chatham Co., Rocky R., N. C. Hwy. 902 bridge, 5.5 air miles SW center Pittsboro.

A total of 276 specimens of the new species has been examined.

*Diagnosis*.—Distinguished from all members of the genus in having an elongate alimentary tract with two accessory convo-

TABLE 1. FREQUENCY DISTRIBUTIONS FOR SCALE COUNTS AND BREAST SQUAMATION INDEX IN *Notropis mekistocholas*, *N. proctae*, AND *N. alborus* FROM THE CAPE FEAR DRAINAGE. VALUES FOR THE HOLOTYPE OF *N. mekistocholas* ARE UNDERLINED.

Species and System	Lateral Line Scales							Predorsal Scale Rows							$\bar{x}$	
	31	32	33	34	35	36	37	N	$\bar{x}$	12	13	14	15	16		N
<i>N. mekistocholas</i>				6	<u>59</u>	<u>56</u>	3	124	35.5		9	<u>53</u>	85	3	150	14.5
<i>N. proctae</i>	4	22	37	22	1		86	33.9		6	38	40	6		90	14.5
<i>N. alborus</i>	1	10	29	11			51	33.0		13	44	4			61	12.9
	Predorsal Scales															
	12	13	14	15	16	17	18	19	20	21	20	21	20	21	N	$\bar{x}$
<i>N. mekistocholas</i>	6	<u>36</u>	<u>33</u>	37	21	8	2	3							146	14.5
<i>N. proctae</i>	4	11	14	28	18	10	3	-	-	1					89	15.1
<i>N. alborus</i>		4	9	10	14	14	2	2	2	1					58	15.9
	% of Breast Scaled															
	0	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	N				
<i>N. mekistocholas</i>																
Rocky R.									4	19	53		76			
Robeson Cr.			1	2	1	1	2	6	10	18	14		55			
Cape Fear tribs.							1	1	1	6	9		17			
<i>N. proctae</i>	29	54	6	-	2	-	1						92			
<i>N. alborus</i>			2	-	1	2	2	10	13	18	5		53			

