

CARPIODES CYPRINUS HINEI, A NEW SUBSPECIES  
OF CARPSUCKER FROM THE OHIO AND UPPER  
MISSISSIPPI RIVER SYSTEMS.

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In 1817 Le Sueur (1817, p. 91-92) described *Catostomus cyprinus*, the carpsucker, from specimens obtained from the Elk River and other Cheasapeake Bay tributaries. Three years later Rafinesque (McCall's reprint, 1899, p. 113-14) in his "Ichthyologia ohioensis" erected the subgenus *Carpiodes* in which he placed his two newly described species of carpsuckers, namely, *Catostomus velifer* and *Catostomus carpio*, the *Catostomus cyprinus* of Le Sueur, and *Catostomus selosus* which he erroneously credited to Le Sueur as the describer. In 1855 Agassiz (1855, p. 76) gave *Carpiodes* generic rank and described a carpsucker from Lake Champlain, naming it *Carpiodes thompsoni*.

In 1896 Jordan and Everman (1896, p. 166-67) recognized *Carpiodes cyprinus*, restricting it to the Cheasapeake Bay tributaries and the Potomac River, *C. velifer* to the Mississippi valley and southwestward to the Rio Grande, and *C. thompsoni* to the Great Lakes and tributary waters. These three species and their respective ranges were generally accepted by ichthyologists until 1930, when in a revision of some catostomid fishes Hubbs (1930, p. 14-16) placed *thompsoni* in the synonymy of *C. cyprinus*, demonstrated that the name *velifer* belonged to the species long known as *Carpiodes difformis* Cope (1870, p. 480), and relegated *difformis* to the synonymy of *velifer*. Hubbs believed that the populations of *cyprinus* inhabiting the Atlantic coastal streams, Great Lakes waters and the Mississippi River system were identical. In the same publication Hubbs gave the new species name of *Carpiodes forbesi* to the description and figure of *Carpiodes thompsoni* in Forbes and Richardson's "Fishes of Illinois" (1909 and 1920, p. 79, fig. 20) and the type locality as the Illinois River drainage of Illinois.

In 1930 Osburn, Wickliff and Trautman (1930, p. 169-71) recognized only *Carpiodes cyprinus* in their revised list of Ohio fishes but in the following year Trautman (1931, p. 1) reaccepted *C. thompsoni* of the Great Lakes—St. Lawrence system as distinct from *C. cyprinus* of the Atlantic coastal and Ohio River valley drainages. In 1934 Wickliff and Trautman (1934, p. 1) reduced *C. thompsoni* to subspecific status.

In 1947 Hubbs and Lagler (1947, p. 46 and 50) first recognized two forms of *C. cyprinus*, indicating that *C. c. cyprinus* ranged from the Roanoke system of the Atlantic seaboard, northward to Lake Champlain and the St. Lawrence—Great Lakes (Lake Superior excepted) system, thence westward to southern Alberta. Realization that the Cheasapeake Bay tributaries and Lake Champlain populations were similar necessitated the placing of the name *thompsoni* in the synonymy of *C. c. cyprinus*. Unfortunately that action apparently left the population of the Ohio and Mississippi valleys without a recognizable name, despite the fact that several names for some "species" of *Carpiodes* exist. Reasons why these names are not applicable are as follows:

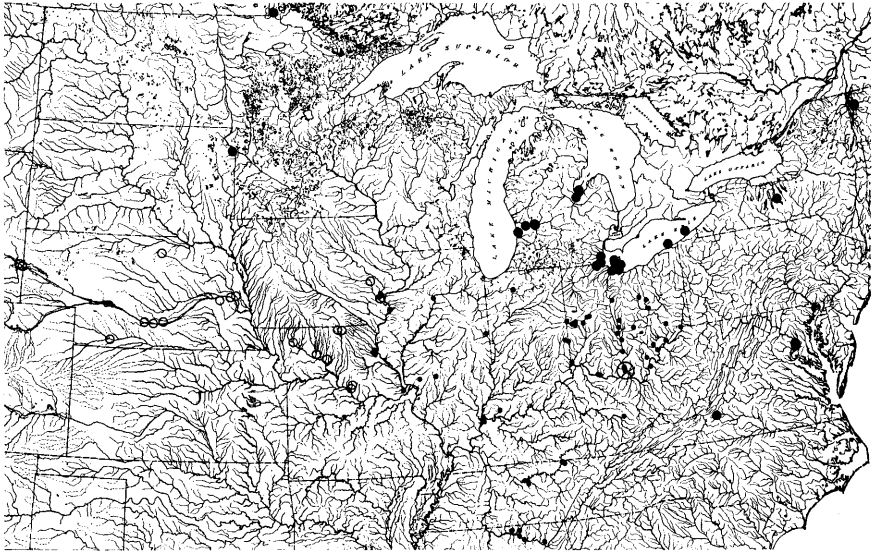
The description of *Cotostomus* (sic) *anisopterus* Rafinesque (McCall's reprint, 1899, p. 111) is unidentifiable, Hubbs (1930, p. 16) suggesting that it may refer to *Carpiodes velifer*. The great length of the dorsal fin suggests that possibility. Rafinesque described it "from a drawing of Mr. Audubon."

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Cope's (1870, p. 481-82) description of *Carpiodes selene* might be construed as being referable to the *cyprinus* complex, but Cope questions his type locality of "Root River, Michigan" because "the label which accompanied them [3 specimens] has disappeared." If the type locality were Michigan it would be in the Great Lakes drainage and therefore in the range of *C. c. cyprinus*, or intergrades between it and the Mississippi River system population.

*Carpiodes culisanserinus* Cope (1870, p. 481) is clearly a synonym of *C. velifer*. Dr. Henry W. Fowler kindly sent me an enlarged photograph of the type which is deposited in the Academy of Natural Sciences of Philadelphia.

*C. bison* Agassiz (1854, p. 356), *C. damalis* Girard (1856, p. 170), *C. grayi* and *C. nummifer* (Cope, 1870, p. 482 and 484 respectively) appear to be synonyms of *C. carpio* as has long been supposed and as Hubbs (1930, p. 13-16) has indicated.



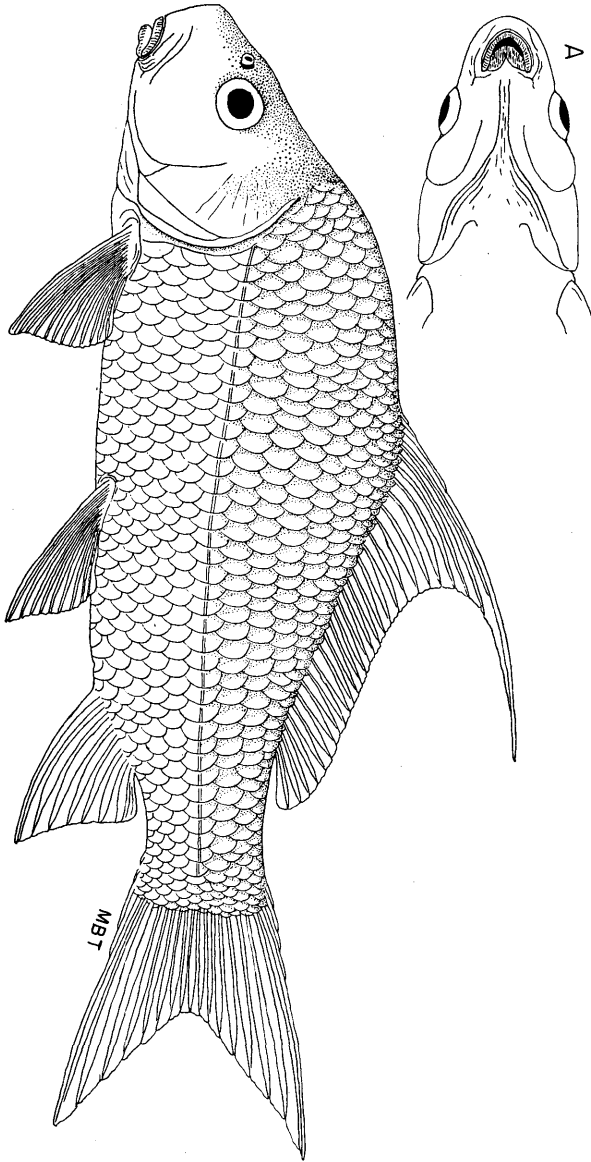
MAP 1. The type locality of *Carpiodes cyprinus hinei* is represented by a very large hollow circle. Localities for the remaining *C. c. hinei* are represented by small solid circles. Localities for *C. c. cyprinus* are represented by larger solid circles. Localities for *C. forbesi* are represented by medium-sized hollow circles.

Since none of the above names may be applied with any degree of certainty to the interior population of *C. cyprinus* I propose the name *Carpiodes cyprinus hinei*.

Before proceeding I wish to thank Drs. Leonard P. Schultz and Ernest A. Lachner of the U. S. National Museum (USNM), Drs. Reeve M. Bailey and Robert R. Miller of the Museum of Zoology of the University of Michigan (UMMZ) and Dr. Edward S. Thomas of the Ohio State Museum (OSM) for the privilege of examining carpsuckers preserved in their museums; Dr. Henry W. Fowler for having a photograph taken of the type of *C. culisanserinus*; Dr. T. H. Langlois for advice; Dr. Mary A. Trautman for assistance in the taking and tabulating of all measurements, typing, etc; and particularly to Dr. Carl L. Hubbs, who since 1925 has given much encouragement to my studies of catostomid fishes and who has "gently shoved" me into describing this form.

*Carpiodes cyprinus hinei*, new subspecies  
Central Quillback Carpsucker  
(Pl. Central figure)

*Types.* The holotype, OSU 1889, a female, 272 mm. standard length, was collected by Theodore Maag and Russel E. Ruh, August 14, 1940, in the Scioto River, northeastern Rush Township, Scioto County, Ohio. Its body depth is



CENTRAL FIGURE: *Carpiodes cyprinus hinei* side view of the holotype.

FIGURE A: Ventral surface of head showing the absence of a knob on the symphysis of the lower jaw.

contained 2.9, its head length 3.6, and its caudal peduncle depth 7.6 times in the standard length. Its eye is contained 4.9 times in the head length and 1.6 times in the snout length. There are 7.5 scales above the lateral line and 37 scales in the lateral line.

Following are all of the paratypes, together with data:

*USNM collection.* 41036: 1 sp., 103 mm.,<sup>1</sup> Big Kanawha R., (West Virginia), 1888.

*OSM collections.* F81: 2 sp., 65 and 66 mm., Scioto R., Scioto Co., O., Sept. 25, 1927. F120: 2 sp., 85 and 172 mm., Scioto R., Scioto Co., O., July 14, 1928. F178: 4 sp., 65 to 75 mm., Muddy Fk., Wayne Co., O., Sept. 22, 1928. F567: 7 sp., 93 to 122 mm., Stillwater Cr., Darke Co., O., July 19, 1930. F568: 19 sp., 41 to 52 mm., Mississinawa Cr., Darke Co., O., July 19, 1930. F580: 2 sp., 90 and 108 mm., Miami R., Logan Co., O., July 26, 1930. F594: 4 sp., 51 to 57 mm., Leading Cr., Meigs Co., O., Aug. 3, 1930. F621: 6 sp., 70 to 162 mm., Scioto R., Franklin Co., O., Nov. 8, 1930. F651: 1 sp., 288 mm., Scioto R., Pike Co., O., May 18, 1931. F656: 1 sp., 171 mm., Scioto R., Pike Co., O., May 3, 1930. F659: 1 sp., 230 mm., Scioto R., Pike Co., O., May 24, 1930. F664: 1 sp., 388 mm., Buckeye Lake, Fairfield Co., O., July 1, 1930. F666: 5 sp., 213 to 253 mm., Stillwater Cr., Darke Co., O., July 19, 1930. F669: 3 sp., 331 to 335 mm., Scioto R., Pike Co., O., Sept. 14, 1930. F671: 1 sp., 257 mm., Scioto R., Franklin Co., O., Nov. 7, 1930. F676: 1 sp., 205 mm., Ohio R., Brown Co., O., Apr. 21, 1931.

*UMMZ collections.* 65070: 1 sp., 44 mm., Big Cr., Posey Co., Ind., Aug.-1924. 73242: 2 sp., 41 and 48 mm., Quicksand Cr., Breathitt Co., Ky., July 13, 1925. 81415: 1 sp., 72 mm., Great Pigeon Cr., near Elberfeld coal mine (Warrick Co?), Ind., Aug. 20, 1927. 87418: 1 sp., 131 mm., Little Scioto R., Crawford Co., O., May 5, 1929. 87624: 6 sp., 49 to 64 mm., Federal Cr., Athens Co., O., Aug. 17, 1929. 87639: 1 sp., 56 mm., Seneca Fk., Noble Co., O., Aug. 18, 1929. 87648: 1 sp., 205 mm., Scioto R., Pickaway Co., O., Aug. 10, 1929. 87652: 1 sp., 38 mm., Killbuck Cr., Holmes Co., O., Aug. 24, 1929. 87681: 1 sp., 67 mm., Opossum Cr., Monroe Co., O., Sept. 1, 1929. 87732: 1 sp., 208 mm., Scioto R., Pike Co., O., Sept. 22, 1929. 87807: 1 sp., 56 mm., Paint Cr., Ross Co., O., Oct. 5, 1929. 102986: 7 sp., 222 to 402 mm., Indian Lake, Logan Co., O., Aug. 15, 1932. 104300: 2 sp., 152 and 248 mm., Ohio R., Brown Co., O., Mar. 27, 1937. 104510: 6 sp., 48 to 60 mm., Mill Cr., Davidson Co., Tenn., June 20, 1936. 105687: 2 sp., 201 and 231 mm., Cumberland R., Davidson Co., Tenn., Apr.—1939. 105728: 1 sp., 102 mm., Hoops Cr., Macoupin Co., Ill., Aug. 29, 1937. 105890: 1 sp., 37 mm., Dismal Cr., Fayette Co., Ill., Oct. 4, 1937. 106467: 1 sp., 81 mm., Whitewater R., Wayne Co., Ind., Aug. 21, 1934. 106468: 1 sp., 100 mm., Noland Fk., Wayne Co., Ind., June 21, 1934. 107275: 6 sp., 198 to 247 mm., Stillwater Cr., Darke Co., O., June 19, 1930. 107276: 3 sp., 251 to 258 mm., Scioto R., Pike Co., O., Sept. 14, 1930. 107277: 3 sp., 191 to 322 mm., Scioto R., Pike Co., O., May 24, 1930. 107279: 2 sp., 275 and 295 mm., Scioto R., Franklin Co., O., Nov. 17, 1930. 107280: 1 sp., 237 mm., Scioto R., Pike Co., O., May 4, 1930. 107282: 1 sp., 315 mm., Buckeye Lake, Fairfield Co., O., Apr. 6, 1929. 107283: 1 sp., 415 mm., Buckeye Lake, Fairfield Co., O., Aug. 4, 1930. 109357: 4 sp., 37 to 50 mm., Swamp Cr., Darke Co., O., July 19, 1930. 111520: 6 sp., 61 to 107 mm., Undercliff Beach, 5 mi. N. of Henry, Putman Co., Ill., May 10, 1926. 122429: 2 sp., 138 and 146 mm., Elk R., Limestone Co., Ala., July 14, 1938. 122566: 1 sp., 138 mm., Second Cr., Lauderdale Co., Ala., July 29, 1938. 122574: 2 sp., 45 and 48 mm., Cumberland R., Clay Co., Tenn., June 22, 1939. 122590: 1 sp., 167 mm., Flint Cr., Wheeler Res., Madison Co., Ala., Sept. 10, 1938. 122596: 1 sp., 43 mm., Kettle Cr., Clay Co., Tenn., July 21, 1939. 122718: 3 sp., 141 to 166 mm., Stockton Br., Wheeler Res., Ala., Oct. 4, 1938. 122781: 1 sp., 160 mm., Sugar Cr., Wheeler Res., Limestone Co., Ala., Oct. 12, 1938. 124143: 1 sp., 39 mm., Mill Cr., Coshocton Co., O., Aug. 10, 1938. 127626: 1 sp., 325 mm., Crystal Lake, Henderson Co., Ill., July 3, 1934. 139888: 1 sp., 263 mm., Fooths Pond, Gibson Co., Ind., Aug. 14, 1940. 160885: 2 sp., 58 and 66 mm., Jordan Cr., Vermilion Co., Ill., Aug. 24, 1950. 167891: 1 sp., 59 mm., Yellow R., Starke Co., Ind., Nov. 18, 1936.

*OSU collections.* 1085: 1 sp., 267 mm., Scioto R., Scioto Co., O., Dec. 6, 1939. 1100: 1 sp., 240 mm., Hocking R., Athens Co., O., June 29, 1939. 1133: 1 sp., 245 mm., Hocking R.,

<sup>1</sup>Standard length: This measurement is more desirable for preserved specimens than is fork or tail length because of the frequency of broken tails in preserved specimens.

Athens Co., O., June 27, 1939. 1135: 1 sp., 285 mm., Buckeye Lake, Licking Co., O., June 16, 1939. 1591: 1 sp., 188 mm., Scioto R., Scioto Co., O., Nov. 6, 1939. 1815: 1 sp., 253 mm., Muskingum R., Washington Co., O., Apr. 4, 1940. 1825: 1 sp., 128 mm., Muskingum R., Washington Co., O., Apr. 16, 1940. 1838: 1 sp., 215 mm., Muskingum R., Washington Co., O., Apr. 5, 1940. 1846: 1 sp., 262 mm., Muskingum R., Washington Co., O., May 9, 1940. 1850: 1 sp., 210 mm., Scioto R., Scioto Co., O., Nov. 6, 1939. 1876: 2 sp., 232 and 255 mm., Scioto R., Scioto Co., O., June 6, 1940. 6925: 7 sp., 38 to 53 mm., Whitewater R., Hamilton Co., O., Aug. 14, 1946. 7607: 10 sp., 22 to 27 mm., Yellowbud Cr., Pickaway Co., O., July 3, 1948. 9135: 1 sp., 277 mm., Big Walnut Cr., Franklin Co., O., May 10, 1950.

*Diagnosis.* As indicated in Table 1, when measured into standard length *C. c. hinei* differs from the average from *C. c. cyprinus* in having a less deep and more rounded body, a slightly longer head, and a less deep caudal peduncle. Measured into head length the eye of *C. c. hinei* is larger, and when the eye is measured into snout length the snout is shorter in *C. c. hinei* than in *C. c. cyprinus*. The number of scale rows extending obliquely backward and upward from the lateral line to the dorsal fin origin averages 7.4<sup>2</sup> in *C. c. hinei* and 8.0 in *C. c. cyprinus*; the number of scales in the lateral line averages 36.8 in *C. c. hinei* and 37.5 in *C. c. cyprinus*.

No significant differences between *C. c. hinei* and *C. c. cyprinus* were noted in the length of the upper jaw when measured into head length, the number of rays in the dorsal fin, or in the length of the anterior rays of the dorsal fin.

As a species *C. cyprinus* differs from *C. forbesi* in having the anterior rays of the dorsal fin in large young and adults extending nearly to or beyond the posterior end of the dorsal fin base, whereas in *C. forbesi* the anterior rays extend little if any beyond the middle of the fin. When measured into the standard length *C. cyprinus* differs from *C. forbesi* in having a deeper body, a shorter head and a less deep caudal peduncle. Measured into head length the eye of *C. forbesi* averages slightly longer than in *C. c. hinei* and definitely longer than in *C. c. cyprinus*, and when the eye of *C. forbesi* is measured into snout length, the snout length averages the same as in *C. c. hinei* but is shorter than in *C. c. cyprinus*.

*C. forbesi* may have a slightly shorter upper jaw than has *C. cyprinus* when measured into head length. The number of scales above the lateral line in *C. forbesi* averages 7.0; it is 7.4 in *C. c. hinei* and 8.0 in *C. c. cyprinus*. The number of scales in the lateral line in *C. forbesi* averages 36.6 which is comparable to 36.8 in *C. c. hinei* and fewer than 37.5 in *C. c. cyprinus*.

*C. forbesi* and *C. cyprinus* differ from *C. carpio* and *C. velifer* in lacking the knob, present in large young and adults, on the symphysis of the lower jaw.

*Variations in body proportions.* Species in the genus *Carpiodes* have few specific and subspecific characters and under different environmental conditions these few are subject to extreme variations. Furthermore, these characters are undeveloped in some young less than 40 mm. in standard length making identification of some of these as to species impossible.

Variations in body proportions and length-weight relationships within a species are especially great and often are very marked in specimens between one body of water and another and from one season or year to another. These variations have caused great diversity of opinion among ichthyologists as to the number of species within the genus, and which of the available "species" descriptions should or could be recognized.

When growth is unusually rapid and/or conditions appear to be optimum, some specimens of *C. c. hinei* approximate *C. c. cyprinus* in body proportions, and especially in autumn when their coefficient of condition is greatest. However, these extremely fat, robust individuals of *C. c. hinei* differ from *C. c. cyprinus* in having thicker, broader bodies which are broadest above or along the lateral lines

<sup>2</sup>When the scale nearest the dorsal fin or ridge is smaller than the others its depth is compared with the normal-sized scale immediately below and is measured to the nearest tenth.

Measurement of the two subspecies of *Carpiodes cyprinus* and of *Carpiodes forbesi*. In the body of the table figures without parentheses for each rubric are extremes, those immediately following in parentheses are averages

Length class (mm.)	20-35	36-100	101-200	201-300	301-420	20-420
Specimens*						
<i>cyprinus</i> .....	10	35	15	28	15	103
<i>hinei</i> .....	10	94	37	44	9	194
<i>forbesi</i> .....	8	27	11	1	1	48
Standard length (mm.):						
<i>cyprinus</i> .....	22-25 (23)	45-95 (75)	122-200 (168)	203-295 (257)	303-420 (338)	22-420 (171)
<i>hinei</i> .....	22-27 (24)	37-100 (57)	101-198 (140)	202-295 (245)	311-415 (349)	22-415 (127)
<i>forbesi</i> .....	26-35 (32)	37-97 (54)	114-195 (135)	258	332	26-332 (86)
Body depth in standard length: †						
<i>cyprinus</i> .....	2.9-3.4 (3.1)	2.3-2.9 (2.7)	2.2-2.7 (2.5)	2.3-2.8 (2.6)	2.3-2.8 (2.5)	2.2-3.4 (2.6)
<i>hinei</i> .....	3.1-3.7 (3.4)	2.5-3.9 (3.0)	2.5-3.2 (2.8)	2.5-3.2 (2.8)	2.7-3.1 (2.9)	2.7-3.9 (2.9)
<i>forbesi</i> .....	3.2-3.7 (3.5)	2.9-3.5 (3.3)	2.9-3.3 (3.1)	3.4	3.2	2.9-3.7 (3.2)
Head length in standard length:						
<i>cyprinus</i> .....	2.6-2.8 (2.7)	2.9-3.6 (3.3)	3.3-3.7 (3.5)	3.4-3.9 (3.7)	3.6-3.8 (3.7)	2.6-3.9 (3.4)
<i>hinei</i> .....	2.5-2.7 (2.6)	2.7-3.8 (3.0)	3.1-3.7 (3.4)	3.4-4.0 (3.6)	3.6-4.3 (3.9)	2.5-4.3 (3.2)
<i>forbesi</i> .....	2.5-2.8 (2.7)	2.6-3.3 (3.0)	3.1-3.5 (3.3)	3.8	3.7	2.5-3.8 (3.0)
Eye length in head length:						
<i>cyprinus</i> .....	4.1-4.6 (4.4)	4.0-5.6 (4.5)	4.8-6.1 (5.4)	5.0-7.0 (5.9)	4.9-8.8 (6.2)	4.0-7.0 (5.3)
<i>hinei</i> .....	3.0-3.6 (3.4)	3.1-4.9 (3.9)	3.8-4.9 (4.4)	4.4-5.6 (4.9)	4.8-5.8 (5.3)	3.0-5.8 (4.3)
<i>forbesi</i> .....	3.3-4.2 (3.8)	3.7-4.8 (4.2)	4.1-5.6 (4.6)	4.9	4.9	3.3-4.9 (4.2)
Eye length in snout length:						
<i>cyprinus</i> .....	1.2-1.4 (1.3)	1.1-1.7 (1.3)	1.5-1.9 (1.7)	1.6-2.3 (1.9)	1.7-2.7 (2.1)	1.1-2.7 (1.6)
<i>hinei</i> .....	1.0-1.2 (1.1)	0.8-1.3 (1.1)	1.1-1.7 (1.3)	1.2-1.8 (1.5)	1.6-1.8 (1.7)	0.8-1.8 (1.2)
<i>forbesi</i> .....	1.0-1.2 (1.1)	1.0-1.3 (1.2)	1.1-1.7 (1.4)	1.6	1.8	1.0-1.8 (1.2)
Upper jaw length in head length: ‡						
<i>cyprinus</i> .....	3.6-4.4 (3.8)	3.9-5.4 (4.6)	4.4-6.1 (5.1)	4.0-6.2 (5.1)	4.5-5.7 (5.1)	3.6-6.2 (4.8)
<i>hinei</i> .....	3.7-3.9 (3.8)	3.7-5.7 (4.6)	4.3-5.8 (5.1)	4.1-5.4 (4.9)	4.3-5.5 (5.1)	3.7-5.8 (4.7)
<i>forbesi</i> .....	4.0-5.3 (3.4)	4.2-5.6 (5.0)	4.8-7.3 (5.8)	4.9	4.5	4.0-7.3 (5.0)
Caudal peduncle depth in standard length:						
<i>cyprinus</i> .....	5.9-6.9 (6.3)	5.9-7.9 (6.8)	6.1-7.6 (6.9)	6.6-7.9 (7.1)	6.7-7.9 (7.2)	5.9-7.9 (6.9)
<i>hinei</i> .....	6.7-7.4 (6.8)	6.4-8.4 (7.3)	6.5-7.9 (7.3)	7.0-8.4 (7.7)	7.2-8.1 (7.9)	6.4-8.4 (7.4)
<i>forbesi</i> .....	6.7-8.3 (7.6)	7.1-8.5 (7.7)	7.7-8.6 (8.0)	8.3	7.5	6.7-8.6 (7.7)

\*Measurements of *C. c. cyprinus* and *C. forbesi* are from specimens deposited in the OSM, UMMZ, USNM and OSU collections. Measurements of *C. c. hinei* are from the paratypes mentioned above together with measurements of specimens, not paratypes, collected west of the Mississippi River; these latter were tabulated separately but when no significant differences between these and specimens taken east of the Mississippi were found they were included in the table.

†All measurements and counts were taken to the nearest tenth of a mm. The division of the measurement of one body part into a larger body part was done with the aid of a calculating machine and therefore is an arithmetic ratio, not a "step" measurement. (Step measurement is taken with dividers by measuring a body part, then "stepping off" with dividers this part into a larger part, such as head length into standard length.) In this group of fishes the arithmetic ratio can be used as a step measurement for identification of the average specimen of moderate or large size.

‡Upper jaw length was measured carefully by inserting one point of the dividers through the skin to the posterior-most point of the maxillary and then firmly pressing the other point against the tip of the upper lip (with mouth closed) so that it pressed against the anterior-most point of the premaxillary.

and their predorsal ridges are broadly rounded, whereas individuals of *C. c. cyprinus* have more slab-sided bodies with the broadest portions slightly below the lateral lines and the predorsal ridges are rather sharply angular.

On the other hand, when growth is retarded and/or conditions are submarginal, as when individuals are trapped in pools of non-flowing waters, some specimens of *C. c. hinei* approximate *C. forbesi* in body proportions. These individuals have very slender bodies and large eyes. It was from such specimens that Dr. Carl L. Hubbs and I concluded in 1934 that *C. forbesi* was present in some streams in Ohio and so they were recorded (Wickliff and Trautman, 1934, p. 1). Later we realized our mistake and *C. forbesi* was removed from the list of Ohio fishes.

*Ranges and Intergradations.* As partly shown on Map 1, *C. c. hinei* inhabits in typical form all of the Ohio River system, and the Mississippi River system in Illinois and the eastern parts of Missouri and Iowa.

*C. c. cyprinus* ranges from the Roanoke River system northward along the Atlantic coastal drainages to Lake Champlain and the St Lawrence River system, thence westward through the four southernmost Great Lakes. Intergradation between *C. c. cyprinus* and *C. c. hinei* occurs in the southern tributary streams and embayments of Lake Erie. No well-marked intergradation was noted in the Ohio River drainage of northern Ohio. Examination of the scanty material from west of the Great Lakes indicates that specimens from the Lake of the Woods in Minnesota and from northeastern South Dakota appear to be referable to *C. c. cyprinus* and that specimens from the upper Mississippi River drainage of northern Iowa, southern Minnesota and southern Wisconsin seem to be intergrades. More specimens are needed to determine the subspecific status of individuals from this region. I have seen no specimens of *C. cyprinus* from southern Missouri southwestward.

*C. forbesi* appears at present to be largely restricted to the lower Missouri River drainage, including the Platte, and to Mississippi tributary streams in Iowa.

It is with deepest appreciation that I name this form in memory of the late Professor James Stewart Hine (Kennedy, 1931, p. 510-11). From 1922 until his death on December 22, 1930, and particularly between 1925 and 1930 while he was Curator of Natural History of The Ohio State Museum, he unstintingly gave of his time and energy to teach me the fundamentals of biology and aided in many ways in my investigations of Ohio waters.

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