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THE SCIENTIFIC NAME OF TWO SUNFISHES,
HELIOPERCA MACROCHIRA (RAFINESQUE)
AND *EUPOMOTIS MICROLOPHUS*
(GÜNTHER)

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A fifteen-year study of the North American fresh-water percoids known as sunfishes has provided a sufficient familiarity with the species to allow their systematics to be treated with some confidence. Some of the conclusions from this study, especially those pertaining to generic classification, have been given in works by Hubbs (1926), Ortenburger and Hubbs (1927), and Jordan (1929). The determination by Hubbs (1920) and by Hubbs and Hubbs (1931 to 1933) that certain rare forms thought to be species are in reality interspecific hybrids has cleared the systematics of the group of many doubts, leaving the real species standing out in clearer relief.

The purpose of this paper is to present evidence that the bluegill should be assigned the scientific name *Helioperca macrochira* (Rafinesque), and that the southern representative of the pumpkinseed, currently called *Eupomotis holbrookii*, should be named *Eupomotis microlophus* (Günther). The southern form heretofore called *Eupomotis heros* is perhaps subspecifically distinct from *E. microlophus*, but the

original *Pomotis heros* Baird and Girard is a synonym of *Helioperca macrochira*.

1. *HELIOPERCA MACROCHIRA* (RAFINESQUE)

In the light of the clearer knowledge of the present time, it may be definitely affirmed that Rafinesque must have had the bluegill in mind when he named a sunfish *Lepomis macrochira* (1819) = *Ichthelis macrochira* (1820). The description given in the *Ichthyologia Ohioensis* (p. 74 of 1899 reprint) is in fact one of that erratic author's clearest diagnoses. The short flexuose opercle with marginal black spot, long and narrow pectoral fins, acute head, concave margin of dorsal fin, and broad anal fin are clear-cut characters of the species now called *Helioperca incisor* (Cuvier and Valenciennes). Rafinesque's name has long priority and should be adopted. What led Jordan to identify *macrochira* first (1876: 236) with a species of *Xenotis* and then (1877: 19, and subsequent papers) with certain apparent hybrids cannot be understood.

The repeated descriptions of *Lepomis macrochirus* by Jordan seem to have been based largely on some fish which he kept in an aquarium during his early studies of American fishes. The color description best fits the common hybrid *Apomotis cyanelus* × *Eupomotis gibbosus*, which for some years passed as a distinct species, *Lepomis euryorus* McKay (1881: 81) = *Eupomotis euryorus* Jordan and Evermann (1896: 1008, and 1900: 3267, pl. 161, fig. 428). Perhaps other hybrid combinations or even other species have been identified as *Lepomis macrochirus*. *Lepomis nephelus* Cope (1868: 222), which has almost always been quoted as a synonym of *L. macrochirus*, and has been so regarded by Fowler, is indicated by Fowler's redescription and figure (1907: 518, fig. 4) to be a hybrid, probably of the combination *Apomotis cyanelus* × *Helioperca macrochira*.

The use of the specific name *macrochira* for the bluegill presupposes that Jordan and Evermann (1896: 1005) and most authors have erred in associating Mitchill's name *Labrus palladus* (1814: 407) with this species. The argument for

adopting or rejecting the name *palladus* (or *pallidus*) has largely revolved about the problem of whether the bluegill occurred in 1814 about New York. It seems to me, however, that such a discussion is aside the point, as there is virtually nothing in the original account to indicate that Mitchill had a bluegill at hand. In the hope of permanently retiring the name *palladus*, preferably as a synonym of *Lepomis auritus*, I quote the original account of Mitchill:

Pale Labrus. (*Labrus palladus*). With uniform pale brown sides; a dusky tinge on the posterior edge of the gill-covers; and an inky stain on the tips of the hinder dorsal and anal rays, and on the middle rays, and toward the extremity of the tail.

Length of the specimen under consideration, rather less than three inches and a half; depth one inch and a quarter, without measuring the fins. Is a deep fish, and shaped much like the pond sun-fish, or *Labrus auritus*. Caught near New York.

There is a marked uniformity in the color of this fish. A light, or pale brown, prevails from head to tail, and from back to belly; with no other interruption than a smutty dash at the hinder margin of the gill-cover, and a dark shading at the extremities of the posterior dorsal, anal, and caudal rays.

The posterior lamina of the gill-cover is somewhat silvery. The body well coated with scales disposed in regular rows.

There is one dorsal fin consisting of twenty-one rays; the first ten of which are spinous, and the remaining eleven bristly and elongated. The anal has thirteen rays, of which the three first are spinous, and the rest elongated, to correspond with the dorsal. Caudal rather rounded, and consisting of about nineteen rays. The ventral fin has six rays, of which the first is spinous. The pectoral has ten rays, considerably lengthened, and tapering to a point. The branchial fin has five rays.

The tail is stout and broad. The mouth is moderate, and the jaws furnished with small teeth. The nostrils are double; and the lateral line curved upward to correspond with the arch of the back.

The fish has very much the habit of a perch, but has no serrae, or points on the gill plates.

Only a careless reading or interpretation of the statements "an inky stain on the tips of the hinder dorsal and anal rays, and on the middle rays," and "a dark shading at the extremities of the posterior dorsal, anal, and caudal rays," would give one the impression that Mitchill was describing the submedian

black blotch of the dorsal fin—a diagnostic feature of *Helio-perca*. Neither this character nor any other in the description fits the bluegill any better than it does *Lepomis auritus*, which without question originally occurred about New York.

Jordan and Evermann also quote *Lepomis appendix* Mitchill (a slip for *Labrus appendix* Mitchill) as a synonym of their "*Lepomis pallidus*," but the original account of *appendix*, indicating a fish with larger opercular flap, larger mouth, and more rounded pectorals than *Eupomotis gibbosus*, may be referred without hesitation to *Lepomis auritus*.

After reëxamining the types of *Pomotis speciosus* Baird and Girard (1854: 24) and of *Pomotis obscurus* Agassiz (1854: 302) in the National and Harvard collections, respectively, I can affirm the treatment of these names as further synonyms of *Helio-perca macrochira*. *Pomotis luna* Girard (1857: 201, and 1858: 22, pl. 8, figs. 1-4) is without question another synonym. Three further names, given by Cope, have been confirmed as additional synonyms by Fowler (1907: 519), who has examined the types.

The name *Pomotis heros* Baird and Girard (1854: 25) is currently regarded as having been based on a southern representative of the pumpkinseed, *Eupomotis gibbosus*. That southern form has consequently been known as *Eupomotis heros* (Baird and Girard). I find, however, that Baird and Girard's types were bluegills and that *Pomotis heros* is another synonym of *Helio-perca macrochira*. The type lot of *Pomotis heros*, No. 438, is now represented in the United States National Museum by two of the four original specimens. Both are clearly referable to *Helio-perca*. The smaller one has a large black dorsal blotch, and the larger one shows a distinct trace of the blotch, still more evident on the specimen than on the type figure (Girard, 1859: pl. 2, fig. 1), which was certainly drawn from this fish, as the agreement in size and character details is perfect. In both specimens the opercle is frayed out to a very flexible flap which at once eliminates the possibility that this name was based, as currently assumed, on a southern form of *Eupomotis*. The lower

pharyngeals in this large fish it is true are, for the species, very heavy and provided with blunt teeth, as shown in the figures of Bean and Weed (1911: pl. 47, figs. 1-2); but other large bluegills show in some degree a coarsening of the arch and teeth. The teeth seem enlarged chiefly because truncated by wear. Bean and Weed's plates show the contrast between the arch and teeth of the type of *heros* and the heavier arch and larger teeth with more rounded crowns of a true *Eupomotis*.

Other non-type specimens of *Pomotis heros*, from Dry Creek, near Victoria, Texas, have been examined in the National and Harvard collections, and most of these too represent *Helioperca*. Lot No. 443 in the National Museum, from "Rio San Juan and near Cadereita, N. L.," is a mixture of *Helioperca macrochira* and *Xenotis megalotis haplognathus*, the two sunfishes which occur in that region. Since the series now contains 19 specimens rather than 12 as originally stated, it is likely that the specimens of the *Xenotis* have been included by error in the series. The one specimen to which the field number of the lot (19) is sewed, is a *Helioperca*. The specimen from Rio Blanco, Texas (No. 444), figured by Girard (1858: 24, pl. 9, figs. 13-16) as the young of *Pomotis heros*, seems unidentifiable from the figure. Its identity, however, in no way affects the disposition of the name *heros*. There is no reasonable doubt as to the necessity of transferring the name *Pomotis heros* to the synonymy of *Helioperca macrochira*.

2. *EUPOMOTIS MICROLOPHUS* (GÜNTHER)

The disposition I am forced to make of the name *Pomotis heros* throws open the problem of the proper name for the southern species of *Eupomotis*. The various names applied to southern forms of *Eupomotis* may be considered in the order listed by Jordan and Evermann (1896: 1006-1008) in their synonymies of *E. pallidus*, *E. heros*, and *E. holbrookii*.

Pomotis pallidus Agassiz (1854: 303) from the Tennessee River at Huntsville, Alabama, was apparently based on a

hybrid of the combination *Apomotis cyanellus* × *Helioperca incisor*. The original description (repeated by Jordan and Evermann, 1896: 1006, footnote) can easily be construed as applying to such a hybrid. A specimen in the Harvard collection, No. 3202, labelled "Pomotis pallidus Huntsville Al Newman 153" and therefore presumably the type specimen, is almost certainly an *Apomotis* × *Helioperca* hybrid. Contrary to the statement by Bliss, quoted by McKay (1881: 89) and Jordan and Evermann (1896: 1007), the lower pharyngeals are slender and provided with conical teeth. The nominal species has therefore been misplaced in *Eupomotis*.

Bryttus albulus Girard (1857: 200, and 1858: 19, pl. 6, figs. 1-4), from Rio Blanco, Texas, has also been erroneously associated with this group, for it likewise does not have the *Eupomotis* type of lower pharyngeals (see Bean and Weed, 1911: 370, pl. 48, figs. 1-2).

Xystroplites gillii Jordan (1877a: 24), said to be from the impossible locality of Garden Key, Florida, is not clearly identifiable from the original account. The holotype also does not have the *Eupomotis* type of pharyngeals, according to Bean and Weed (1911: 370).

Lepomis lirus McKay (1881: 89) was merely a substitute name for *Pomotis pallidus* Agassiz.

Pomotis heros has already been disposed of.

By an examination of the type specimen, which has the pectorals slightly shorter than the head and a definite remnant of the red spot on the lower posterior border of the opercular flap, I find *Pomotis notatus* Agassiz (1854: 302), also from Huntsville, Alabama, to be a synonym of *Eupomotis gibbosus*.

There seems to be no good reason for thinking that *Pomotis holbroockii* Cuvier, in Cuvier and Valenciennes (1831: 466) was not based on *Eupomotis gibbosus*, which is the only species of the genus from about the type locality of Charleston, South Carolina, represented in the collections of the Charleston, Harvard, and Michigan museums. The original account contains no vestige of a statement which would serve to distinguish the species called *gibbosus* and *holbroockii* by Jordan

and Evermann (1896: 108, 109). Therefore, the name *holbroockii* must be regarded as a virtual *nomen nudum*, at least until Jordan expressed his opinion (1880: 224) that the name was based on the species called *Pomotis speciosus* by Holbrook. Despite that identification by Jordan, accepted by Bollman (1891: 576), Jordan and Evermann (1896: 1008), Fowler (1907: 520), and recent writers in general, it still seems probable that *Pomotis holbroockii* was based on *Eupomotis gibbosus*. Even though Jordan's identification should be validated, the name *holbroockii* is not regarded as available for the southern species of *Eupomotis*, because it was not definitely identifiable as such until 1880, before which time the species had thrice been recognizably described.

It is entirely clear that *Pomotis speciosus* Holbrook (1855: 48, pl. 5, fig. 2) was based on a distinct, southern form of *Eupomotis*. The name, however, was stillborn, a homonym of *Pomotis speciosus* Baird and Girard (1854: 24), which as noted above is a synonym of *Helioperca macrochira*.

Pomotis microlophus Günther, (1859: 264), a substitute for Holbrook's preoccupied name, is the oldest available name for a southern *Eupomotis*, which may therefore be known as *Eupomotis microlophus* (Günther).

Xystroplites longimanus Cope (1877: 66) was also clearly based on the same species, and is consequently a synonym of *Eupomotis microlophus*.

The distinctive features of *Eupomotis microlophus* and *E. gibbosus* are fairly well indicated in the literature. The characters are not very trenchant, however, and some preserved specimens are difficult to identify. The variability of *gibbosus*, adding to the complexity, has probably led to the confusion of South Atlantic coast specimens of *gibbosus* with the Florida species. Thus the pectoral fin in some specimens of *gibbosus* is more than one-third the standard length, longer than in some examples of *microlophus*. In rhombic outlines and sharpness of snout, *gibbosus* often approaches *microlophus*. The red opercular spot of *gibbosus* occasionally broadens out to form a mere margin to the black spot, as typi-

cally in the other species. In *gibbosus* the cheeks stripes are faint at times; the coffee-colored flecks in the body sometimes obscured; the fin speckling may not be prominent. Despite the virtual breakdown of individual characters, the two forms can ordinarily be distinguished at a glance, by the sum of their differential characters.

The status and range of *Eupomotis microlophus* involves the question of how many valid species may be distinguished in this genus. It is clear from the discussion above that none of the several nominal species united by Jordan and Evermann as *E. pallidus* are referable to the genus. *Eupomotis euryurus* McKay (1881: 89) has been clearly proved to have been based on hybrids, *Apomotis cyanellus* × *Eupomotis gibbosus* (see Hubbs, 1920, and Hubbs and Hubbs, 1931 to 1933). The complex known as *Eupomotis gibbosus* varies greatly geographically, but the local forms will probably be ranked either as races or subspecies.

There remain for consideration the two nominal species named *Lepomis heros* and *L. holbrookii* by Bollman (1891: 569), and *Eupomotis heros* and *E. holbrookii* by Jordan and Evermann (1896: 1006–1008) and most recent ichthyologists. The supposed differential features of “*heros*” and “*holbrookii*,” as given by Bollman and by Jordan and Evermann, are:

	“ <i>heros</i> ”	“ <i>holbrookii</i> ”
Scales along lateral line...	34 to 39	42 to 44
Curvature of dorsal <i>ver-</i> <i>sus</i> ventral contour	About equal	Much greater
Height of highest dorsal spine reaching from tip of snout to:	Past posterior border of pupil	Posterior border of eye
Opercular flap	Smaller than eye	Broad
Border of flap	Blood red in male	Very broadly orange or white

On studying a rather large series of specimens from Florida, Alabama, Mississippi, Louisiana, Arkansas, and Missouri,

which surely should include both types if distinct, I find the border of the flap red to reddish in all specimens retaining fresh colors; the ear spot uniformly about as high as the eye and about two-thirds as long; the height of the highest dorsal spine reaching from tip of snout to any point between front and rear margins of pupil, without respect to locality, and the dorsal contour everywhere somewhat more strongly curved than the ventral. The number of scales in lateral line to end of hypural varies as follows:

		Scales in lateral line to caudal base												
		36	37	38	39	40	41	42	43	44	45	46	47	
"heros"—Mo., Ark., La., Miss.,														
Ala.	3	11	12	3	2	-	-	-	-	-	-	-	
"holbrookii"—Various parts of														
Fla.	-	-	-	-	1	1	1	3	5	1	4	1	

The pectoral rays are 13 or 14 in the specimens of "heros" counted, 14 or 15 in those of "holbrookii." The yellow fin rays of "holbrookii" may not be matched in "heros." Although several of the assigned characters seem invalid, these two nominal forms of the *Eupomotis microlophus* type may well be distinct subspecies, possibly even species. The problem will be further studied.

There is evidence that *Eupomotis microlophus* as a whole is fully differentiated from *E. gibbosus*, because the forms occur together in the upper Mississippi River (typical specimens of both types from Quincy, Illinois, and from Burlington, Iowa, are in the Museum of Comparative Zoology). There is on the contrary some evidence that intergradation between *gibbosus* and *microlophus* may occur: toward the south, as about Charleston, *gibbosus* distinctly approaches *microlophus* in the compressed rhombic form, long fins, etc.; toward the far north, the variation is in the opposite direction. The systematics of *Eupomotis* is far from final.

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