

## EIGHT NEW SPECIES OF POECILIID FISHES OF THE GENUS *Limia* FROM HISPANIOLA<sup>1</sup>

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**ABSTRACT:** Pending revision of the genus, eight new species of *Limia* are described to make the names available. The genus is divided into two subgenera, one of which, *Odontollmia*, is proposed as new. The two subgenera are characterized and the number of species in *Odontollmia* is six and in *Limia* 13.

Pending a revision of the genus *Limia*, eight new species are herein described to make the names available to other workers. In the last revision of the family Poeciliidae (Rosen and Bailey, 1963) *Limia* was synonymized with *Poecilia* but retained as a valid subgenus. Recently, however, I discussed the status of *Limia* and reinstated it as a valid genus (Rivas, 1978). In that study I also indicated that I was preparing a revision of the genus *Limia* and that four new species would be described. Further study and additional material recently acquired have now increased the number of new species to eight. Because each of these must be distinguished from others in the genus, the status of each of the nominal species is discussed in the next paragraph.

Based on my examination of types of all the species previously described and pending completion of my revision, the taxonomic status of the nominal species of *Limia* as interpreted by me, is as follows. As listed by Rosen and Bailey (1963), *L. vittata*, *L. perugiae*, *L. melanotata*, *L. nigrofasciata*, *L. ornata*, *L. melanogaster*, *L. dominicensis*, *L. zonata*, and *L. versicolor* stand as valid species.

However, *L. caudofasciata* is a synonym of *L. melanogaster*, *L. nicholsi* is a synonym of *L. zonata*, and *L. tridens* is a valid species, not a synonym of *L. versicolor*. Original references to all these nominal species were given by Rosen and Bailey and, therefore, will not be repeated here. The status of *L. caymanensis*, subsequently described by Rivas and Fink (1970) remains unchanged and this species stands as valid.

The holotypes and paratypes have been deposited in the National Museum of Natural History (USNM) and/or in the Museum of Comparative Zoology (MCZ). Paratypes of some of the new species also have been deposited in the University of Michigan Museum of Zoology (UMMZ), the American Museum of Natural History (AMNH), and the Florida State Museum (FSM).

Measurements and counts were made according to the methods recently described by me (Rivas, 1978). In the diagnoses the meristic characters for the holotype are given first, followed in parentheses by those of the male and female paratypes combined. There is no sexual dimorphism in meristic characters. The number of anal and pelvic rays is always 9 and 6, respectively, in *Limia*, and

<sup>1</sup> Contribution number 80-02M, Southeast Fisheries Center, Miami Laboratory.

the number of scales around the caudal peduncle is always 16. These characters, therefore, are not given in the diagnoses. The adverb "usually", when preceding the range of variation of a character, indicates that 70 percent or more of the specimens are within that range. Omission of the adverb indicates that all the specimens are within the given range.

The combination of its meristic characters is sufficient to distinguish any given species of *Limia* from all the others in a subgenus. The descriptions, therefore, consist mostly of these characters combined with a few other diagnostic features of the dentition, body shape, relative position of fins, and color pattern.

The 19 known species of *Limia* form two distinct groups that may be interpreted as subgenera. The first, herein named *Odontolimia* (in reference to the large conical teeth) is designated as a new subgenus and *Limia grossidens*, new species as the type species. The second group constitutes the subgenus *Limia* Poey and *L. vittata* (Guichenot) is designated the type species. These two subgenera are diagnosed below.

#### ***Odontolimia* n. subgenus**

Preopercular pores 8 or 9, or the preopercular canal forming an open groove. Teeth of outer row, in both jaws, conical or incisorlike, fewer than 25 in upper jaw and fewer than 30 in lower jaw. Teeth of inner row, in both jaws, unicuspid, irregularly uniserial, not forming a patch on each side of symphysis. Rami of both jaws firmly united at symphysis.

#### ***Limia* Poey.**

Preopercular pores 7, the preopercular canal not forming an open groove. Teeth of outer row, in both jaws, not conical, strongly compressed, spatulate, 25 or more in upper jaw and more than 30 in lower jaw. Teeth of inner row, in both

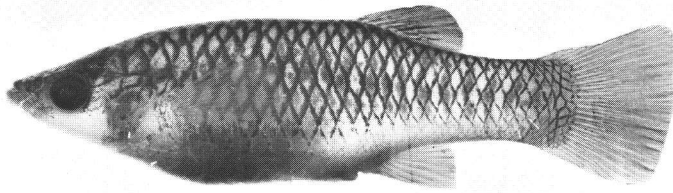
jaws, tricuspid, multiserial, forming an elongate patch on each side of symphysis. Rami of both jaws weakly united at symphysis.

The subgenus *Odontolimia* comprises the following six species. *Limia grossidens*, new species, *L. fuscomaculata*, new species, *L. ornata* Regan, *L. garnieri*, new species, *L. immaculata*, new species, and *L. miragoanensis*, new species, all confined to Lake Miragoane, Haiti.

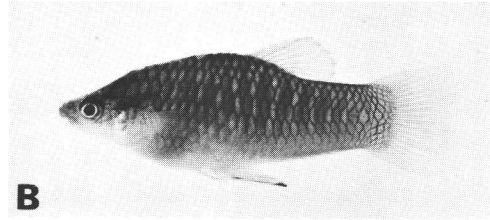
The subgenus *Limia* comprises the following 13 species. *L. nigrofasciata* Regan, confined to Lake Miragoane, *L. melanotata* Nichols and Myers, Hispaniola, *L. perugiae* (Evermann and Clark), Hispaniola, *L. vittata* (Guichenot), Cuba, *L. caymanensis* Rivas and Fink, Grand Cayman Island, *L. zonata* (Nichols), *L. versicolor* (Gunther), Hispaniola, *L. melanogaster* (Gunther), Jamaica, *L. pauciradiata*, new species, Hispaniola, *L. yaguajali*, new species, Hispaniola, *L. sulphurophila*, new species, Hispaniola, *L. dominicensis* (Valenciennes), Hispaniola, and *L. tridens* (Hilgendorf), Hispaniola.

#### ***Limia grossidens* n. sp. Figure 1 (A,B)**

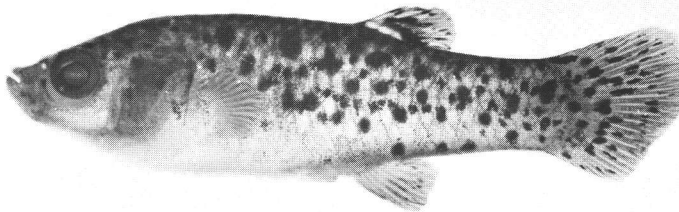
**Types.**— The holotype (USNM 220523) is an adult male 48.2 mm SL collected by Luis R. Rivas at the north end of Lake Miragoane, Dept. de l'Ouest, Haiti, on March 7, 1979. Paratypes (USNM 220524), collected with the holotype, comprise 10 juveniles 21.4–27.5 mm, 22 undeveloped males 24.8–37.9 mm, 19 adult males 27.5–39.2 mm, and 41 adult females 29.6–39.5 mm. Also designated as paratypes are 6 juveniles 17.7–22.4 mm, one undeveloped male 32.7 mm, 8 adult males 25.5–42.7 mm, and 22 adult females 25.2–49.2 mm collected by Luis R. Rivas in the southwest bight of Lake Miragoane, Dept. de l'Ouest, Haiti, on March 7, 1979 (MCZ 54408) and a series, collected in the same locality by Luis R. Rivas, on April 12, 1951,



A



B



C

**Figure 1.** A. Adult 42 mm female paratype of *Limia grossidens*, new species from southwest bight of Lake Miragoane, Haiti (UMMZ 204195). B. Adult 48 mm male holotype of *L. grossidens*, new species from north end of Lake Miragoane, Haiti (USNM 220523). C. Adult 32 mm female paratype of *L. fuscomaculata*, new species from southwest bight of Lake Miragoane, Haiti (USNM 220526).

comprising 2 juveniles 18.4 and 25 mm and 13 adult females 26.0–44.7 mm (UMMZ 204195).

**Name.**— The name *grossidens* refers to the very large teeth, larger than in the other species of the genus. The vernacular name “targetooth limia” is proposed for this species.

**Diagnosis.**— Dorsal rays 9 (8 or 9, usually 9). Pectoral rays 16 (15 or 16, rarely 14 or 17). Branched caudal rays 16 (15 to 17, rarely 14 or 18). Lateral scales 27 (26 to 28, usually 26 or 27). Predorsal scales 13 (13, rarely 14). Gill rakers 19 (16 to 20, usually 17 to 19). Ray 4p serrae of gonopodium 13 (12 to 15, rarely 16). Segments distal to ray 4p serrae 20 (18 to 21,

rarely 17 or 22). Preorbital pores 4 (0 to 4, usually 3). Preopercular pores 8 (8 or 9, usually 8). Teeth of outer row 13 to 15 in each jaw. Chin very prominent, bulbous. Origin of dorsal fin of females above or slightly in advance of origin of anal fin, nearer to insertion of pectoral fin than to middle of caudal base. Caudal fin truncate or slightly convex and symmetrical in both sexes. There are no significant diagnostic features of the coloration.

**Comparisons.**— This species belongs to the subgenus *Odontolimia* and it differs from all the other members of this group by the fewer preorbital pores (3 vs. 4), fewer outer row teeth (13 to 15 vs. 16 to

28), more numerous ray 4p serrae (usually 13 to 15 vs. usually 9 to 12), and the very prominent, bulbous chin.

**Distribution.**— Known only from Lake Miragoane, Haiti to which it is apparently confined and where it occurs syntopically with the other five species of the subgenus. It also occurs syntopically with *Limia nigrofasciata* (subgenus *Limia*) which also is confined to Lake Miragoane.

***Limia fuscomaculata* n. sp. Figure 1 (C)**

**Types.**— The holotype (USNM 220525) is an adult female 39.0 mm SL collected by Luis R. Rivas in the southwest bight of Lake Miragoane, Dept. de l'Ouest, Haiti, on April 12, 1951. Paratypes (USNM 220526), collected with the holotype, comprise three adult females 25.4, 30.0, and 32.0 mm.

**Name.**— The name *fuscomaculata* refers to the dark spots and blotches on sides of body, a character unique to this species. The vernacular name "blotched limia" is suggested for this species.

**Diagnosis.**— Dorsal rays 8 (9,8,8). Pectoral rays 17 (16). Branched caudal rays 17 (16,17,18). Lateral scales 28 (27,29,27). Predorsal scales 14 (13,13,14). Gill rakers 19 (17,16, 18). Preorbital and preopercular pores absent, the canals each forming an open groove. Teeth of outer row 16 or 17 in upper jaw, 19 to 21 in lower jaw. Origin of dorsal fin of females above or slightly in advance of origin of anal fin, much nearer to insertion of pectoral fin than to middle of caudal base. Caudal fin very convex, asymmetrical, mottled and speckled with dark. Sides of body with conspicuous, irregularly scattered dark spots and blotches.

**Comparisons.**— This species differs from all the others in the subgenus *Odontolimia* by the lack of preorbital and preopercular pores, the canals forming open grooves. It further differs from *Limia grossidens* by the smaller, more numerous teeth, lack of a prominent, bulbous chin,

and the very convex, asymmetrical caudal fin. *L. fuscomaculata* is further distinguished from *L. ornata*, *L. garnieri*, *L. immaculata*, and *L. miragoanensis* by the larger and fewer teeth, more numerous branched caudal rays (usually 17 or 18 vs. usually 15 or 16) and the mottled and speckled caudal fin vs. hyaline or only speckled in females.

**Distribution.**— Same as that of *L. grossidens* described above.

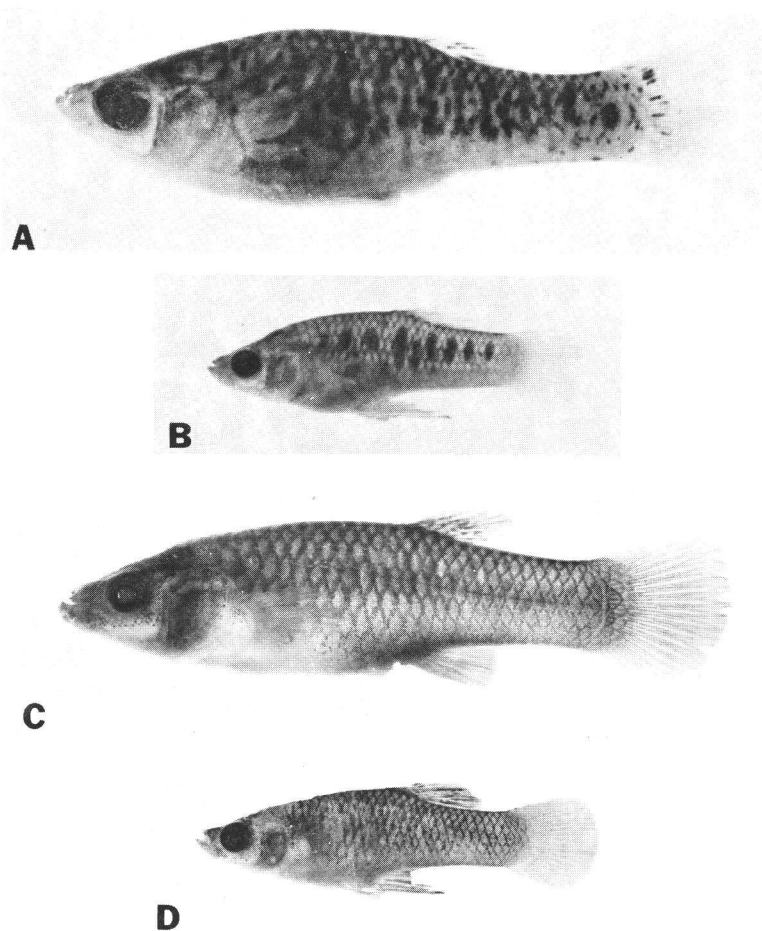
***Limia garnieri* n. sp. Figure 2 (A,B)**

**Types.**— The holotype (USNM 220527) is an adult male 26.0 mm SL collected by Luis R. Rivas at the north end of Lake Miragoane, Dept. de l'Ouest, Haiti, on April 12, 1951. The paratype (USNM 220528) and only other known specimen is an adult female 28.8 mm collected with the holotype.

**Name.**— I take pleasure in naming this species after Mr. Emmanuel Garnier, Director, Fisheries Service of Haiti, in recognition of his assistance during my 1951 expedition. The vernacular name "Garnier's limia" is proposed for this species.

**Diagnosis.**— Dorsal rays 8 (8). Pectoral rays 15 (15). Branched caudal rays 14 (16). Lateral scales 27 (27). Predorsal scales 13 (13). Gill rakers 18 (21). Ray 4p serrae of gonopodium 12. Segments distal to ray 4p serrae 16. Preorbital pores 4 (4). Preopercular pores 8 (8). Origin of dorsal fin of female above origin of anal fin, nearer to insertion of pectoral fin than to middle of caudal base. Caudal fin convex and symmetrical in male, convex and asymmetrical in female. Dark crossbars on sides of body of male 9, oblong, irregular in size.

**Comparisons.**— This species differs from all the others in the subgenus *Odontolimia* by the color pattern of the male as described above. It further differs from *Limia grossidens* by the smaller, more



**Figure 2.** A. Adult 29 mm female paratype of *Limia garnieri*, new species from north end of Lake Miragoane, Haiti (USNM 220528). B. Adult 26 mm male holotype of *L. garnieri*, new species from the same locality (USNM 220527). C. Adult 38 mm female paratype of *L. immaculata*, new species from north end of Lake Miragoane, Haiti (USNM 220530). D. Adult 21 mm male holotype of *L. immaculata*, new species from same locality (USNM 220529).

numerous teeth, fewer dorsal rays (8 vs. usually 9), and the lack of a prominent, bulbous chin. From *L. fuscomaculata* it is further distinguished by the presence of preorbital and preopercular pores, fewer pectoral rays (15 vs. 16 or 17), and the absence of dark blotches on sides of body. *L. garnieri* further differs from *L. ornata* by the fewer dorsal rays (8 vs. usually 9), fewer pectoral rays (15 vs. 16 or 17), and by the convex vs. truncate caudal fin. The body is not mottled or speckled and the caudal fin is hyaline or lightly

speckled in *L. garnieri*. In *L. ornata* the body and caudal fin are strongly mottled and speckled. *L. garnieri* is further distinguished from *L. immaculata* and *L. miragoanensis* by the fewer predorsal scales (13 vs. usually 14), more numerous ray 4p serrae (12 vs. 8 to 11), and the asymmetrical vs. symmetrical caudal fin of females.

**Distribution.**— Same as that of the preceding two species.

***Limia immaculata* n. sp. Figure 2 (C,D)**

**Types.**— The holotype (USNM 220529) is an adult male 21.3 mm SL collected by Luis R. Rivas at the north end of Lake Miragoane, Dept. de l'Ouest, Haiti, on April 12, 1951. Paratypes (USNM 220530), collected with the holotype, comprise three adult females 23.9, 33.8, and 37.7 mm.

**Name.**— The name *immaculata* refers to the absence of crossbars, blotches, spots, mottling, and speckling on the body, a character unique to this species. The vernacular name "plain limia" is suggested for this species.

**Diagnosis.**— Dorsal rays 8 (8). Pectoral rays 15 (15,16,16). Branched caudal rays 16 (16,16,15). Lateral scales 27 (27). Predorsal scales 14 (14). Gill rakers 16 (17,22,21). Ray 4p serrae of gonopodium 9. Segments distal to ray 4p serrae 15. Preorbital pores 3 (4,4,5). Preopercular pores 8 (9,8,8). Origin of dorsal fin of females above origin of anal fin, nearer to insertion of pectoral fin than to middle of caudal base. Caudal fin convex and symmetrical in both sexes. No crossbars, blotches, spots, mottling, or speckling in both sexes.

**Comparisons.**— This species differs from all the others in the subgenus *Odontolimia* by the absence of markings on the body, as described above. It is further distinguished from *L. grossidens* by the fewer dorsal rays (8 vs. usually 9), more numerous predorsal scales (14 vs. usually 13), fewer ray 4p serrae (9 vs. usually 12 to 15), fewer segments distal to ray 4p serrae (15 vs. usually 18 to 20), and the lack of a prominent, bulbous chin. From *L. fuscumaculata* it is further distinguished by the presence of preorbital and preopercular pores. *L. immaculata* further differs from *L. ornata* by the fewer dorsal rays (8 vs. usually 9), more numerous predorsal scales (14 vs. usually 13), fewer ray 4p serrae (9 vs. usually 11 to 13), and fewer segments distal to ray 4p

serrae (15 vs. 19 to 22). *L. immaculata* is further distinguished from *L. garnieri* by the more numerous predorsal scales (14 vs. 13), fewer ray 4p serrae (9 vs. 12), and the symmetrical vs. asymmetrical caudal fin in females. The fewer segments distal to ray 4p serrae (15 vs. usually 16) and the longer gonopodium (30 vs. 26 to 29 percent of SL) further distinguish *L. immaculata* from *L. miragoanensis*.

**Distribution.**— Same as that of the preceding three species.

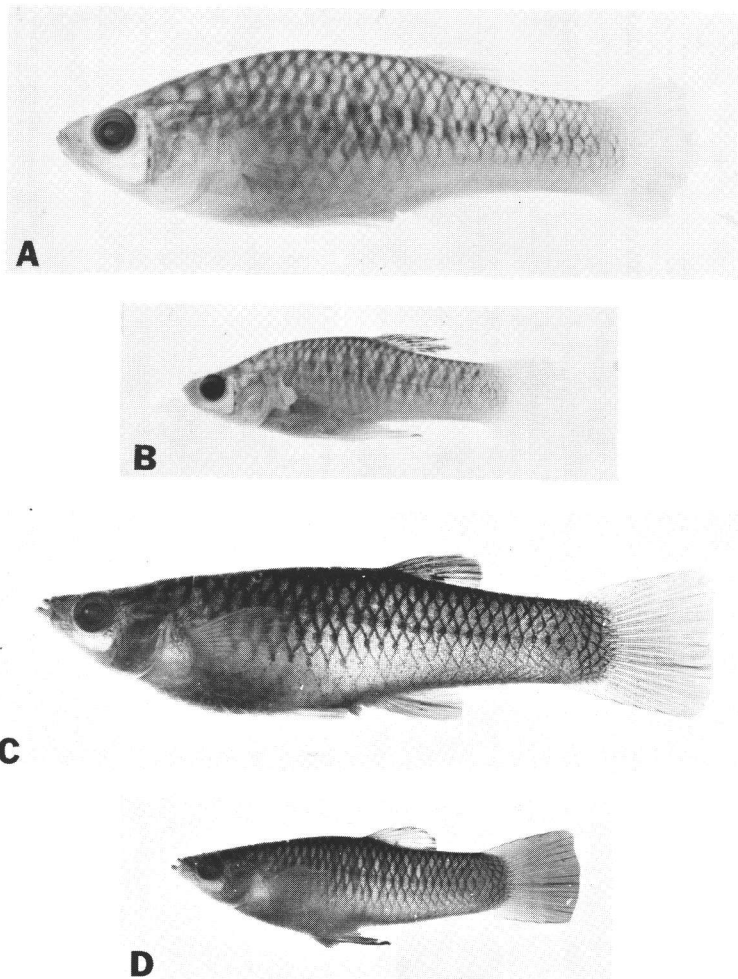
***Limia miragoanensis* n. sp. Figure 3 (A,B)**

**Types.** The holotype (USNM 220531) is an adult male 30.2 mm SL collected by Luis R. Rivas at the north end of Lake Miragoane, Dept. de l'Ouest, Haiti, on April 12, 1951. Paratypes (USNM 220532), collected with the holotype, comprise four juveniles 19.3–20.9 mm, two adult males 23.3 and 29.5 mm, and nine adult females 22.5–39.6 mm.

**Name.** Named after Lake Miragoane to which this species is apparently confined. The vernacular name "*Miragoane limia*" is proposed for this species.

**Diagnosis.** Dorsal rays 8 (8 or 9, usually 8). Pectoral rays 16 (14 to 17, usually 16). Branched caudal rays 16 (14 to 16, usually 16). Lateral scales 27 (26 to 28, usually 27). Predorsal scales 14 (13 to 15, usually 14). Gill rakers 18 (17 to 21, usually 17 to 20). Ray 4p serrae of gonopodium 11 (8,8). Segments distal to ray 4p serrae 16 (15,16). Preorbital pores 4 (4, rarely 3). Preopercular pores 8 (8 or 9). Origin of dorsal fin of females above origin of anal fin, nearer to insertion of pectoral fin than to middle of caudal base. Caudal fin convex and symmetrical in both sexes. There are no distinctive diagnostic features of the coloration.

**Comparisons.** This species was compared above with each of the other species of the subgenus *Odontolimia*,



**Figure 3.** A. Adult 40 mm female paratype of *Limia miragoanensis*, new species from north end of Lake Miragoane, Haiti (USNM 220532). B. Adult 30 mm male holotype of *L. miragoanensis*, new species from same locality (USNM 220531). C. Adult 45 mm female paratype of *L. pauciradiata*, new species from Grand Riviere du Nord at Grand Riviere, Haiti (USNM 220534). D. Adult 37 mm male paratype of *L. pauciradiata*, new species from same locality (USNM 220534).

except *Limia ornata*. It is distinguished from the latter by the fewer dorsal rays (usually 8 vs. usually 9), more numerous predorsal scales (usually 14 vs. usually 13), fewer ray 4p serrae (8 to 11 vs. usually 12 or 13), fewer segments distal to ray 4p serrae (15 or 16 vs. 19 to 22), the convex vs. truncate caudal fin, and the absence of mottling and speckling on the body.

**Distribution.** Same as that of the preceding four species.

***Limia pauciradiata* n. sp. Figure 3 (C,D)**

**Types.** The holotype (USNM 220533) is an adult male 35.0 mm SL collected by Luis R. Rivas and Emmanuel Garnier in Grand Riviere du Nord at town of Grand Riviere, Dept. du Nord, Haiti, on April 10, 1951. Paratypes, collected with the holotype, comprise 542 juveniles and young 11.1-32.8 mm, 62 undeveloped males 19.2-30.7 mm, 65 adult males 20.3-35.0 mm,

and 124 adult females 33.0–51.8 mm. The paratype series has been divided into five lots deposited in the following museums: USNM 220534, UMMZ 204196, MCZ 54409, AMNH 38233, and FSM 29823.

**Name.** The name *pauciradiata* refers to the caudal rays which are fewer than in any other species of the subgenus *Limia*, except *L. zonata* and *L. versicolor*. The vernacular name "fewrayed limia" is suggested for this species.

**Diagnosis.** Dorsal rays 7 (7). Pectoral rays 16 (15 or 16, usually 15). Branched caudal rays 14 (14, rarely 15 or 16). Lateral scales 27 (26 to 28, usually 27). Predorsal scales 14 (14 or 15, usually 15). Gill rakers 20 (18 to 22, usually 19 or 20). Ray 4p serrae of gonopodium 11 (8 to 11, usually 9 or 10). Segments distal to ray 4p serrae 15 (14 to 16, rarely 17). Preorbital pores 4 (4, rarely 3). Preopercular pores 7 (7, rarely 8). Preorbital free, the skin covering it folded under its ventral edge. Origin of dorsal fin of females behind origin of anal fin, nearer to middle of caudal base than to posterior margin of orbit. Caudal fin convex. Dorsal fin of males not mottled or speckled. Midsides of body of females with two longitudinal rows of dark spots, the lower row much shorter than the upper.

**Comparisons.** This species belongs to the subgenus *Limia* and it differs from *L. nigrofasciata*, *L. melanonotata*, *L. perugiae*, *L. vittata*, and *L. caymanensis* by the fewer dorsal rays (7 vs. usually 8, 9, or 10), fewer branched caudal rays (usually 14 vs. usually 16 or 17), fewer predorsal scales (usually 15 vs. usually 12, 13, or 14), and fewer gill rakers (usually 19 or 20 vs. usually 21 to 25). In *L. pauciradiata* the origin of the dorsal fin of females is behind the origin of the anal fin but in the others mentioned above, it is in advance of the origin of the anal fin. In these species the dorsal fin of males is mottled and/or speckled but not in *L. pauciradi-*

*ata*. The fewer dorsal rays (7 vs. usually 8), fewer lateral scales (usually 27 vs. usually 28 or 29), and more numerous gill rakers (usually 19 or 20 vs. usually 16 to 18) distinguish *L. pauciradiata* from *L. zonata* and *L. versicolor*. In addition, the preorbital is free in *L. pauciradiata* but not in *L. zonata* and *L. versicolor* and the caudal fin has a medial, transverse row of dark spots in *L. zonata* and *L. versicolor* but not in *L. pauciradiata*. The fewer dorsal rays (7 vs. usually 8), fewer branched caudal rays (usually 14 vs. usually 15 to 17), more numerous predorsal scales (usually 15 vs. usually 13 or 14), the absence of cross bars on the sides of body of females, and the lack of a darkened caudal base further distinguish *L. pauciradiata* from *L. melanogaster*. The fewer dorsal rays (7 vs. usually 8), fewer branched caudal rays (usually 14 vs. usually 15 to 17), and the convex vs. broadly rounded caudal fin further distinguish *L. pauciradiata* from *L. dominicensis*. Also, in *L. pauciradiata*, the basal dark spot on hind rays of dorsal fin of females is much smaller than in *L. dominicensis* which lacks the longitudinal rows of dark spots on midsides of body of females. *L. pauciradiata* is further distinguished from *L. yaguajali*, *L. sulphurophila*, and *L. tridens* by the fewer branched caudal rays (usually 14 vs. usually 15 to 17) and the longitudinal rows of dark spots on midsides of body of females, absent in the others. Also, the caudal fin is convex in *L. pauciradiata*, truncate in *L. yaguajali*, and broadly rounded in *L. sulphurophila* and *L. tridens*.

**Distribution.** Known only from Grand Riviere du Nord, a river on the northern drainage of Haiti.

***Limia yaguajali* n. sp. Figure 4 (A,B)**

**Types.** The holotype (USNM 220535) is an adult male 35.8 mm SL collected by



Luis R. Rivas and Burton P. Hunt in Rio Yaguajal at Santiago Rodriguez (Sabaneta), Prov. of Rodriguez, Dominican Republic, on April 23, 1949. Paratypes, collected with the holotype, comprise 64 juveniles and young 10.6-25.0 mm, 61 undeveloped males 21.9-34.9 mm, 79 adult males 21.-36.3 mm, and 197 adult females 25.4-54.2 mm. The paratype series has been divided into five lots deposited in the following museums: USNM 220536, UMMZ 204197, MCZ 54410, AMNH 38234, and FSM 29824.

**Name.** Named after Rio Yaguajal where this species was first collected. The vernacular name "Yaguajal limia" is proposed for this species.

**Diagnosis.** Dorsal rays 7 (7). Pectoral rays 15 (15 or 16, usually 15). Branched caudal rays 17 (15 to 17, usually 16). Lateral scales 27 (27 or 28). Predorsal scales 14 (14 or 15, usually 15). Gill rakers 19 (18 to 22, usually 19 or 20). Ray 4p serrae of gonopodium 12 (9 to 13). Segments distal to ray 4p serrae 17 (14 to 18, usually 15 to 17). Preorbital pores 1 (1 to 4, usually 4). Preopercular pores 7 (7). Preorbital free, the skin covering it folded under its ventral edge. Origin of dorsal fin of females behind origin of anal fin, nearer to middle of caudal base than to posterior margin of orbit. Caudal fin truncate. Dorsal fin not mottled or speckled. Mid-sides of body of females without longitudinal rows of dark spots.

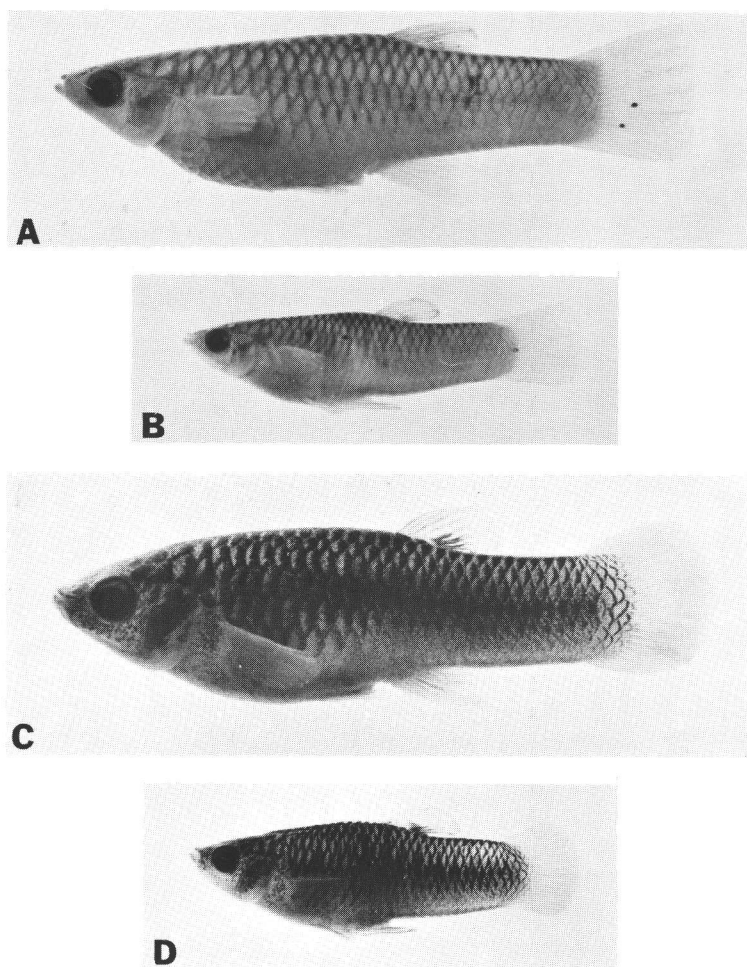
**Comparisons.** This species belongs to the subgenus *Limia* and it differs from *L. nigrofasciata*, *L. melanonotata*, *L. perugia*, *L. vittata*, and *L. caymanensis* by the fewer dorsal rays (7 vs. usually 8, 9, or 10), fewer predorsal scales (usually 15 vs. usually 12, 13, or 14), fewer gill rakers (usually 19 or 20 vs. usually 21 to 25), and the absence of mottling and speckling on the dorsal fin of males. In *L. yaguajali* the origin of the dorsal fin of females is behind the origin of the anal fin but in the

others mentioned above, it is in advance of the origin of the anal fin. *L. yaguajali* is distinguished from *L. zonata* and *L. versicolor* by the fewer dorsal rays (7 vs. usually 8), more numerous branched caudal rays (usually 16 vs. usually 14), and the more numerous gill rakers (usually 19 or 20 vs. usually 16 to 18). In addition, the preorbital is free in *L. yaguajali* but not in *L. zonata* and *L. versicolor* and the caudal fin has a medial, transverse row of dark spots in *L. zonata* and *L. versicolor* but not in *L. yaguajali*. The same distinguishing characters given above for *L. pauciradiata* separate *L. yaguajali* from *L. melanogaster*. Also given above, under *L. pauciradiata* are the characters distinguishing that species from *L. yaguajali*. The more numerous predorsal scales (usually 15 vs. usually 14) and the truncate vs. broadly rounded caudal fin distinguish *L. yaguajali* from *L. dominicensis*, *L. tridens*, and *L. sulphurophila*. The fewer dorsal rays (7 vs. usually 8) further distinguish *L. yaguajali* from *L. dominicensis*.

**Distribution.** Rio Yaguajal, a left tributary of Rio Yaque del Norte, Dominican Republic. A series collected by Luis R. Rivas and E. Garnier in Riviere du Limbe at Limbe, Dept. du Nord, Haiti, on April 10, 1951 may be referred to this species. This series (USNM 220575) comprises 32 young 21.7-31.8 mm SL, 28 undeveloped males 22.8-37.2 mm, 25 adult males 23.0-37.5 mm, and 197 adult females 32.0-50.6 mm. Riviere du Limbe is on the northern drainage of Haiti.

#### ***Limia sulphurophila* n. sp. Figure 4 (C,D)**

**Types.** The holotype (MCZ 54401) is an adult male 33.4 mm SL collected by E.E. Williams, S.M. Case, and J.R. Rosado in Balneario (spa) La Zurza, a sulfur spring 5 km WNW of Duverge, Prov. of Independencia, Dominican Republic, on August 19, 1978. Paratypes, collected with the



**Figure 4.A.** Adult 45 mm female paratype of *Limia yaguajali*, new species from Rio Yaguajal at Sabaneta, Dominican Republic (USNM 220536). **B.** Adult 34 mm male paratype of *L. yaguajali*, new species from same locality (USNM 220536). **C.** Adult 40 mm female paratype of *L. sulphurophila*, new species from Balneario La Zurza near Duverge, Dominican Republic (MCZ 54402). **D.** Adult 32 mm male paratype of *L. sulphurophila*, new species from same locality (MCZ 54402).

holotype, comprise 23 young 22.4-32.3 mm, 16 undeveloped males 27.3-36.6 mm, 51 adult males 25.0-39.2 mm, and 43 adult females 33.4-42.7 mm. The paratype series has been divided into five lots deposited in the following museums: MCZ 54402, USNM 220537, UMMZ 204198, AMNH 38235, and FSM 29825.

**Name.** The name *sulphurophila* refers to the sulfur spring to which this species is well adapted and apparently confined. The vernacular name "sulfur limia" is suggested for this species.

**Diagnosis.** Dorsal rays 7 (7 or 8). Pectoral rays 14 (14 or 15). Branched caudal rays 16 (14 to 18, usually 15 or 16). Lateral scales 27 (27 to 29, usually 27 or 28). Predorsal scales 14 (14 or 15, usually 14). Gill rakers 20 (19 to 23, usually 19 to 22). Ray 4p serrae of gonopodium 11 (9 to 12, usually 10 or 11). Segments distal to ray 4p serrae 16 (13 to 16, usually 13 to 15). Preorbital pores 4 (0 to 4, usually 2 or 3). Preopercular pores 7 (7). Preorbital free, the skin covering it folded under its ventral edge. Origin of dorsal fin of

females above, or slightly behind origin of anal fin, about midway between middle of caudal base and posterior margin of orbit. Caudal fin broadly rounded. Dorsal fin not mottled or speckled, with a conspicuous, basal dark spot on hind portion. Midsides of body with a conspicuous, longitudinal dark band.

**Comparisons.** This species belongs to the subgenus *Limia* and it differs from *L. nigrofasciata*, *L. melanonotata*, *L. perugiae*, *L. vittata*, and *L. caymanensis* by having the origin of the dorsal fin of females above or behind, instead of in advance of the origin of the anal fin, the broadly rounded caudal fin, the absence of mottling and speckling on the dorsal fin of males, and the presence of a conspicuous, longitudinal dark band on midsides of body. *L. sulphurophila* further differs from *L. nigrofasciata*, *L. melanonotata*, and *L. vittata* by the fewer dorsal rays (7 or 8 vs. usually 9 or 10) and from *L. perugiae* by the fewer preorbital pores (usually 2 or 3 vs. usually 4), more numerous predorsal scales (usually 14 vs. usually 12 or 13), and the fewer gill rakers (usually 19 to 22 vs. usually 23 to 25). *L. sulphurophila* differs from *L. zonata* and *L. versicolor* by the fewer preorbital pores (usually 2 or 3 vs. usually 4), more numerous branched caudal rays (usually 15 or 16 vs. usually 14), the free preorbital, the broadly rounded caudal fin, the absence of a transverse, medial row of dark spots on the caudal fin, and the presence of a conspicuous, longitudinal dark band on midsides of body. *L. sulphurophila* differs from *L. melanogaster* by the shape of the tip of ray 4p of gonopodium, the broadly rounded caudal fin, and the very dissimilar color pattern and from *L. dominicensis* and *L. tridens* by the fewer preorbital pores (usually 2 or 3 vs. usually 4), shorter caudal fin (18 to 23 vs. 24 to 32 percent of SL), and the conspicuous, longitudinal dark band on midsides of

body. Characters distinguishing *sulphurophila* from *L. pauciradiata* and *L. yaguajali* have already been given above under each of these species. *L. sulphurophila* is further distinguished from these two species by the fewer preorbital pores (usually 2 or 3 vs. usually 4).

**Distribution.** Known only from the sulfur spring at Balneario La Zurza near the southeastern shore of Lake Enriquillo, Dominican Republic.

## ACKNOWLEDGMENTS

I am grateful to William L. Fink, Assistant Curator of fishes, MCZ, for the loan of the *Limia sulphurophila* material and permission to name the species. I am also grateful to Leonce Bonnefil (former Director) and Emmanuel Garnier (present Director) of the Fisheries Service of Haiti for their assistance during my 1951 expedition. Special thanks are due to Burton P. Hunt, Professor of Biology, University of Miami, for his help in the field during the 1949 expedition to the Dominican Republic.

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