

red (orange-ferruginous); second segment entirely clear red; third red, with a large, suffused, dusky, dorsal shade; remaining segments black; third and following segments with apical bands of white tomentum, such bands also at sides of second; hair at apex of abdomen white; fourth ventral with a prominent median apical lobe.

*Hab.* Nasik, India (*E. Comber*). British Museum.

Runs in Bingham's table to *N. pilipes*, Smith, but the colour of the pubescence and wings is so different that it cannot be the male of that species. There is a striking superficial resemblance to *N. phenacura*, Ckll., also found at Nasik, but the sculpture of the thorax is entirely different, especially that of the metathoracic area.

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LXI. — *A Revision of the Pæciliid Fishes of the Genera Rivulus, Pterolebias, and Cynolebias.* By C. TATE REGAN, M.A.

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THE three closely related genera here dealt with are the neotropical Fundulinæ\*. In them the snout is short, the margin of the eyes is not free, and the gill-membranes are separate. The mouth is rather wide and transverse, with the præmaxillaries protractile, but not produced, and the lower jaw prominent and very oblique; the teeth are sub-conical, in bands, with an outer series of enlarged and spaced teeth, more or less canine-like, a lateral pair in the lower jaw being usually the strongest. The membrane connecting the præmaxillary with the lower jaw folds when the mouth is closed so as to fit into the right angle formed by the very narrow vertical præorbital and the horizontal nasal. The pectorals are placed low and the pelvics are not far in advance of the anal.

I give a list of the specimens in the British Museum collection, including the types of four species now described as new. Two of these, *Rivulus strigatus* from the Amazon and *Cynolebias nigripinnis* from the La Plata, have been

\* Except that a few species of the nearctic genus *Fundulus* occur in Central America.

I take this opportunity of proposing the new generic name *Petalurichthys*, to replace *Petalosoma*, Regan, 1908, as Mr. C. O. Waterhouse has kindly called my attention to the fact that this is preoccupied in Coleoptera (Lewis, Ann. & Mag. Nat. Hist. (7) xii. 1903, p. 418). There are two species of this neotropical Pæciliid genus, viz. *Petalurichthys cultratus*, Regan, 1908, and *P. amazonum*, Regan, 1911.



presented by Herr J. Paul Arnold, one, *Rivulus brevis* from Colombia, by Dr. W. Wolterstorff, and the fourth, *Cynolebias melanotaenia* from Paranagua, by Herr A. Rachow.

# RIVULUS.

*Rivulus*, Poey, Mem. Cuba, ii. 1861, p. 307.

*Cynodonichthys*, Meek, Publ. Columbian Mus. Zool. v, 1904, p. 101.

In this genus the dorsal is shorter and further back than the anal. D. 6-11. A. 8-17. The pelvic fins are small. In the typical species the head is depressed and the body is subcylindrical anteriorly, moderately compressed posteriorly; sometimes (e. g. *R. brevis*) the fish is compressed throughout.

Twenty-two species from Central and South America, ranging from Cuba and Southern Mexico to the La Plata.

## Synopsis of the Species.

### I. 45 to 52 scales in a longitudinal series.

- |  |                       |
|--|-----------------------|
| D. 10-11. A. 14-16. Dorsal origin twice as distant from eye as from base of caudal .....                 | 1. <i>peruanus</i> .  |
| D. 9. A. 16-17. Dorsal origin twice or more than twice as distant from head as from base of caudal ..... | 2. <i>holmice</i> .   |
| D. 8-9. A. 11-12 .....   | 3. <i>ocellatus</i> . |

### II. 36 to 42 scales in a longitudinal series.

#### A. Anal ending below anterior part or middle of dorsal.

##### 1. D. 6-8.

- |   |                          |
|---|--------------------------|
| A. 11-13. Dorsal origin more than twice as distant from head as from base of caudal. Caudal with ocellus in ♀, without pale or dark lower edge in ♂ .....                 | 4. <i>urophthalmus</i> . |
| A. 12-15. Dorsal origin about twice as distant from head as from base of caudal. Caudal without ocellus in ♀, with dark lower edge in ♂ .....                             | 5. <i>elegans</i> .      |
| A. 11-12. Dorsal origin less than twice as distant from head as from base of caudal. Caudal with ocellus in ♀, with pale lower edge and dark intramarginal stripe in ♂ .. | 6. <i>godmani</i> .      |
| A. 11-12. Dorsal origin more than twice as distant from head as from base of caudal. Caudal as in <i>R. godmani</i> .....   | 7. <i>tenuis</i> .       |

##### 2. D. 9-10. A. 12-14 .....

##### 8. *flabellicauda*.

#### B. Anal ending below posterior part of dorsal.

- |   |                          |
|---|--------------------------|
| D. 10-11. A. 13 .....   | 9. <i>cylindraceus</i> . |
| D. 9. A. 14. Dorsal origin $2\frac{1}{2}$ head-lengths behind head .....    | 10. <i>micropus</i> .    |
| D. 8-10. A. 15-17. Dorsal origin less than 2 head-lengths behind head ..... | 11. <i>hartii</i> .      |



## III. 28 to 35 scales in a longitudinal series.

A. D. 6. 29 to 31 scales in a longitudinal series.

- A. 10-11, ending below first ray of dorsal, which is twice as distant from base of pectoral as from base of caudal ..... 12. *ornatus*.  
 A. 9-10; dorsal origin 3 times as distant from occiput as from base of caudal ..... 13. *atratus*.  
 A. 8; dorsal origin above middle of anal, 3 times as distant from middle of eye as from base of caudal ..... 14. *obscurus*.

B. D. 7-9. A. 10-13, ending below middle of dorsal. 32 to 35 scales in a longitudinal series.

- Dorsal origin twice as distant from head as from base of caudal ..... 15. *strigatus*.  
 Dorsal origin twice as distant from some part of eye as from base of caudal ..... 16. *geayi*.  
 Dorsal origin three times as distant from eye as from base of caudal ..... 17. *punctatus*.

C. D. 8-10. A. 11-14, ending below posterior part of dorsal.

a. A. 11 to 12. 31-33 scales in a longitudinal series.

- Dorsal origin twice as distant from head as from base of caudal ..... 18. *isthmensis*.  
 Dorsal origin equidistant from middle of pectoral and base of caudal; head  $3\frac{1}{2}$  in length of fish; pectoral nearly reaching pelvics ..... 19. *brasiliensis*.  
 Dorsal origin equidistant from middle of pectoral and base of caudal; head 4 in length of fish; pectoral not nearly reaching pelvics ..... 20. *breviceps*.

b. A. 14.

- 34 scales in a longitudinal series ..... 21. *balzanii*.  
 30 scales in a longitudinal series ..... 22. *brevis*.

1. *Rivulus peruanus*.

*Haplochilus peruanus*, Regan, Ann. Mag. Nat. Hist. (7) xii. 1903, p. 626.

Depth of body about 5 in length, length of head about 4. Head broader than deep. Diameter of eye  $3\frac{1}{2}$  in the length of head. 45 to 47 scales in a longitudinal series. Dorsal 10-11; origin above middle of anal, twice as distant from eye as from base of caudal. Anal 14-16, ending below last 2 or 3 rays of dorsal. Pectoral  $\frac{2}{3}$  or  $\frac{3}{4}$  length of head, not reaching pelvics, which do not or barely reach the vent. Brownish, with darker longitudinal stripes along the series of scales and small dark spots on the vertical fins.

Peru.

1-2 (types). 55 mm.

Perim, Peru, 800 metres.

Simons.



2. *Rivulus holmiae*.

*Rivulus holmiae*, Eigenm. Ann. Carnegie Mus. vi. 1909, pp. 49, 50;  
Mem. Carnegie Mus. v. 1912, pp. 452, 453, pl. lxiii. figs. 2, 3.

*Rivulus waimacui*, Eigenm. l. c. & t. c. pp. 452, 454, pl. lxiii. figs. 4, 5.

Depth of body about 5 in the length, length of head 4 to  $4\frac{3}{4}$ . Head broader than deep. Diameter of eye  $3\frac{1}{2}$  to 4 in the length of head. 46 to 50 \* scales in a longitudinal series. Dorsal 9; origin above posterior part of anal, at least twice as distant from head as from base of caudal. Anal 16-17, ending below middle or posterior part of dorsal. Pectoral  $\frac{3}{4}$  length of head, not extending to pelvics, which just reach vent. In spirit brownish, with darker spots which may become confluent to form longitudinal stripes, of which 3 on the tail are most prominent; vertical fins with series of small spots; caudal ocellus sometimes present. In life the back olive, sides olive or blue, belly white, yellow, or orange, spots or stripes red, brown, or purplish.

British Guiana.

1-2 (co-types). 50-60 mm.  
3-4 (co-types of *R. waimacui*).

Holmia.  
Shrimp Creek.

Eigenmann.  
"

3. *Rivulus ocellatus*.

*Rivulus ocellatus*, Hensel, Arch. f. Nat. xxxiv. 1868, p. 365.

Depth of body  $4\frac{1}{2}$  to 5 in the length, length of head  $3\frac{3}{4}$  to 4. Head broader than deep. Diameter of eye  $3\frac{1}{3}$  to 4 in the length of head. 47 to 50 scales in a longitudinal series. Dorsal 8-9; origin above posterior part of anal, twice as distant from base of pectoral as from base of caudal. Anal 11-12, ending below anterior part of dorsal. Pectoral  $\frac{2}{3}$  or  $\frac{3}{4}$  the length of head, not extending to pelvics, which reach the vent. A dark spot (ocellated in ♀) on upper part of base of caudal, another above the pectoral; vertical fins more or less distinctly spotted; male with irregular dark cross-bands on body and with a blackish margin and pale intramarginal band to vertical fins.

Rio Janeiro; Santos.

1. 60 mm.  
2-3. 40-45 mm.

Santos  
"

Arnold.  
Bartsch.

Dr. Pappenheim has very kindly informed me that the type has 48 to 50 scales in a longitudinal series, not 39 as stated in the original description.

\* Eigenmann counts 43 scales in *holmiae*, 46 to 52 in *waimacui*, but in co-types of the former I count 46 and 47, of the latter 47 and 50.



4. *Rivulus urophthalmus*.

*Rivulus urophthalmus*, Günth. Cat. Fish. vi. p. 327 (1866).

*Rivulus poeyi*, Steind. Sitzungsab. Akad. Wien, lxxiv. 1877, p. 165.

*Rivulus brasiliensis* (non Val.), Garman, Mem. Mus. Comp. Zool. xix. 1895, p. 135.

*Rivulus stagnatus*, Eigenm. Ann. Carnegie Mus. vi. 1909, pp. 49, 50; Mem. Carnegie Mus. v. 1912, pp. 453, 454, pl. lxiii. figs. 6, 7.

*Rivulus lanceolatus*, Eigenm. t. c. pp. 49, 51 & t. c. pp. 453, 455, pl. lxiv. fig. 1.

*Rivulus frenatus*, Eigenm. l. c. & t. c. pp. 453, 455, pl. lxiv. fig. 2.

Depth of body  $4\frac{1}{2}$  to  $5\frac{1}{2}$  in the length, length of head 4 to  $4\frac{1}{2}$ . Head broader than deep. Diameter of eye 3 to  $3\frac{2}{3}$  in the length of head. 37 to 42 scales in a longitudinal series. Dorsal 6-7; origin above last rays of anal, more than twice as distant from head, and  $2\frac{3}{4}$  to  $3\frac{1}{2}$  as distant from eye as from base of caudal fin. Anal 11-13, ending below anterior part or middle of dorsal. Pectoral  $\frac{3}{4}$  the length of head, not extending to pelvics, which just reach the vent. Olivaceous; each scale sometimes with a dark spot; sometimes longitudinal stripes between series of scales on sides; dorsal, caudal, and sometimes anal with series of small dark spots; caudal ocellus sometimes present (♀).

Amazon; Guiana.

1-5 (types). 35-50 mm.

Para.

6-8. 35-45 mm.

Eigenmann.

7-9 (co-types of *R. stagnatus*). 35-38 mm. Christianburg.

„

This description was written from the Para specimens and was found to need no modification to include the co-types of *R. stagnatus*. *R. lanceolatus* is evidently the same species, the apparently different form of the caudal fin being due to the fact that it is less expanded. *R. frenatus* is said to have only 23 scales in front of the dorsal and the anal origin equidistant from base of caudal and præoperculum, but from the figure it would seem that there are about 29 scales from head to origin of dorsal fin and that the anal origin is equidistant from base of pectoral and base of caudal, as in small specimens of *R. urophthalmus* from Para, or in the co-types of *R. stagnatus*.

5. *Rivulus elegans*.

*Rivulus elegans*, Steind. Denkschr. Akad. Wien, xlii. 1880, p. 85, pl. vi. fig. 6.

Depth of body about 5 in the length, length of head about 4. Head broader than deep. Diameter of eye 3 to  $3\frac{1}{2}$  in the length of head. 36 to 40 scales in a longitudinal series. Dorsal 6-8; origin above posterior  $\frac{1}{3}$  of anal, about



twice as distant from head as from base of caudal, or  $2\frac{2}{5}$  to  $2\frac{3}{4}$  as distant from eye. Anal 12–15, ending below anterior part or middle of dorsal. Pectoral about  $\frac{2}{3}$  the length of head, not extending to pelvics, which usually just reach the vent. Olivaceous; often with dark longitudinal stripes between the series of scales; males with 3 dark longitudinal stripes on back from occiput and eyes to dorsal fin, which, in the females, are broken up into series of spots that generally extend transversely, forming a zigzag pattern; vertical fins plain, the caudal and anal with lower edge dark ( $\sigma$ ) or dorsal and caudal with series of small spots ( $\varphi$ ).

Colombia.

1–10. 25–55 mm.

R. Condoto, R. San Juan,  
S.W. Colombia.

Palmer.

### 6. *Rivulus godmani*.

*Rivulus godmani*, Regan, Ann. & Mag. Nat. Hist. (7) xix. 1907, p. 65, and Biologia Centr.-Am., Pisces, p. 82, pl. x. fig. 5.

Depth of body  $4\frac{1}{2}$  to 5 in the length, length of head  $3\frac{3}{4}$ . Head broader than deep. Diameter of eye 3 in the length of head. 36 scales in a longitudinal series. Dorsal 8; origin above posterior part of anal,  $2\frac{1}{5}$  to  $2\frac{1}{3}$  as distant from eye as from base of caudal fin. Anal 11–12, ending below middle of dorsal. Pectoral  $\frac{2}{3}$  length of head, not extending to pelvics, which reach the vent. Olivaceous, marbled with darker; a dark spot on each scale; operculum blackish; caudal with an ocellus ( $\varphi$ ) or with a pale lower margin and dark intramarginal stripe ( $\sigma$ ).

Guatemala.

1–2 (types). 40 mm.

Guatemala.

Godman.

### 7. *Rivulus tenuis*.

*Cynodonichthys tenuis*, Meek, Publ. Columbian Mus. Zool. v. 1904, p. 101, fig. 27.

*Rivulus tenuis*, Regan, Biologia Centr.-Am., Pisces, p. 82 (1907).

Depth of body  $4\frac{1}{2}$  to 5 in the length, length of head 4 to  $4\frac{1}{2}$ . Head broader than deep. Diameter of eye  $3\frac{1}{3}$  to 4 in length of head. 38 scales in a longitudinal series. Dorsal 7–8; origin  $2\frac{3}{5}$  to 3 times as distant from eye as from base of caudal fin. Anal 11–12, ending below middle of dorsal. Pectoral  $\frac{2}{3}$  length of head, not extending to pelvics, which may reach vent. Olivaceous; back and sides sometimes marbled; operculum blackish; caudal with an



ocellus (♀) or with rather broad pale lower edge and dark intramarginal stripe (♂).

Southern Mexico.

1-2. 30-40 mm.

Coaxacoalcos.

Arnold.

3. 40 mm.

„

Bartsch.

### 8. *Rivulus flabellicauda*.

*Rivulus flabellicauda*, Regan, Ann. & Mag. Nat. Hist. (7) xix. 1907, p. 64; Biologia Centr.-Am., Pisces, p. 81, pl. x. fig. 6 (1907).

Depth of body  $4\frac{1}{2}$  in the length, length of head  $3\frac{4}{5}$ . Head broader than deep. Diameter of eye  $3\frac{1}{3}$  to 4 in the length of head. 40 to 42 scales in a longitudinal series. Dorsal 9-10; origin above posterior part of anal, twice as distant from præoperculum as from base of caudal fin. Anal 12-14, ending below middle of dorsal. Pectoral  $\frac{2}{3}$  the length of head; pelvics just reaching vent. Brownish; scales dark-edged; vertical fins with small spots; a caudal ocellus.

Costa Rica.

1 (type). 70 mm.

Juan Vinas.

Underwood.

2. 30 mm.

San José.

Biolley.

### 9. *Rivulus cylindraceus*.

*Rivulus cylindraceus*, Poey, Mem. Cub. ii. 1861, p. 308; An. Soc. Esp. v. 1876, p. 140, pl. v. fig. 4, and ix. 1880, p. 247, pl. viii. fig. 1; Günth. Cat. Fish. vi. p. 327 (1866); Garman, Mem. Mus. Comp. Zool. xix. 1897, p. 134.

*Rivulus marmoratus*, Poey, Ann. Soc. Esp. ix. 1880, p. 248.

Depth of body about  $4\frac{1}{2}$  in the length, length of head  $3\frac{1}{2}$ . Head broader than deep. Diameter of eye  $4\frac{1}{2}$  in length of head. 38 or 39 scales in a longitudinal series. Dorsal 10-11; origin over middle of anal, twice as far from occiput as from base of caudal. Anal 13, extending back nearly as far as dorsal. Olivaceous, uniform or marbled; centres of scales darker; a caudal ocellus.

Cuba.

Total length 45 mm.

### 10. *Rivulus micropus*.

*Fundulus micropus*, Steind. Sitzungsab. Akad. Wien, xlviii. 1863, p. 184.

Depth of body about 5 in the length, length of head about  $4\frac{1}{3}$  ( $5\frac{1}{2}$  in total). Head broader than deep. Diameter of eye 4 in length of head. 41 scales in a longitudinal series. Dorsal 9; origin  $2\frac{1}{2}$  head-lengths from gill-opening. Anal 14, ending somewhat before the end of dorsal.



Pectoral as long as head without snout; pelvics not nearly reaching anal. Brownish above, yellowish below; vertical fins with series of small dark spots.

Rio Negro.

### 11. *Rivulus hartii*.

*Rivulus micropus* (non Steind.), Günth. Cat. Fish. vi. p. 327 (1866); Garman, Mem. Mus. Comp. Zool. xix. 1895, p. 136.

*Haplochilus hartii*, Bouleng. Ann. & Mag. Nat. Hist. (6) vi. 1890, p. 190; Regan, Proc. Zool. Soc. 1906, i. p. 389, pl. xxi. fig. 2.

Depth of body  $4\frac{1}{2}$  to  $5\frac{1}{3}$  in the length, length of head  $3\frac{1}{2}$  to 4. Head broader than deep. Diameter of eye 3 to 4 in the length of head. 37 to 42 scales in a longitudinal series. Dorsal 8-10; origin above middle or posterior part of anal, twice as distant from some part of operculum as from base of caudal fin. Anal 15-17, ending below posterior  $\frac{1}{2}$  of dorsal. Pectoral about  $\frac{3}{4}$  the length of head, not extending to pelvics, which reach vent or origin of anal. Olivaceous; sides with a red spot on each scale; vertical fins usually orange, with or without small dark spots; caudal ocellus often present.

Venezuela and neighbouring islands.

1-10 (types). 70 mm.	Trinidad.	Hart.
11, 12-15. 35-95 mm.	"	Guppy.
16-25. 75 mm.	Granada.	Wilton.
26-27. 35 mm.	Venezuela.	Dyson.

### 12. *Rivulus ornatus*.

*Rivulus ornatus*, Garman, Mem. Mus. Comp. Zool. xix. 1895, p. 139.

Form of the majority of the species. Length of head 4 in that of the fish. Diameter of eye 4 in length of head. 31 scales in a longitudinal series. Dorsal 6; origin twice as distant from base of pectoral as from base of caudal. Anal 10-11, ending below first ray of dorsal. Pectoral as long as head, nearly reaching pelvics, which do not reach anal. Puncticulations form blotches along the back, streaks along the sides, series of small spots on the fins, a band on the lower lip, and a streak backward from below each eye; sometimes pale bands on the back meet dark vertical bars on sides.

Amazon.

Total length 35 mm.



13. *Rivulus atratus*.

*Rivulus atratus*, Garman, Mem. Mus. Comp. Zool. xix. 1895, p. 140.

Depth of the body 6 in the length, length of head 4. Head broader than deep. Diameter of eye  $3\frac{1}{2}$  in length of head. 31 scales in a longitudinal series. Dorsal 6; origin 3 times as distant from occiput as from base of caudal; base its length further back than that of anal. Anal 9-10. Pectoral nearly as long as head; pelvics very small, not reaching vent. Brownish; blackish below, with three vertical bands ascending respectively behind the pectorals, between pelvics and anal, and to the base of the dorsal; a dark stripe from eye round chin.

Jutahy.

14. *Rivulus obscurus*.

*Rivulus obscurus*, Garm. Mem. Mus. Comp. Zool. xix. 1895, p. 140.

Moderately slender, with the head broader than deep. Diameter of eye 3 in length of head. 29 scales in a longitudinal series. Dorsal 6; origin above middle of anal, 3 times as distant from middle of eye as from base of caudal. Anal 8, about half its base in front of dorsal. Pelvics hardly reaching anal. Back brownish, sometimes with darker blotches, among which there may be two series of pale blotches.

L. Hyauary, Amazon.

15. *Rivulus strigatus*, sp. n.

Depth of body 5 in the length, length of head 4. Head broader than deep. Diameter of eye  $3\frac{1}{2}$  in the length of head. 33 scales in a longitudinal series. Dorsal 8; origin twice as distant from head as from base of caudal. Anal 12, ending below middle of dorsal. Pectoral  $\frac{2}{3}$  the length of head, not reaching pelvics, which extend to origin of anal. Olivaceous above, orange below; dark longitudinal stripes along series of scales on sides; irregular spots on back; dorsal, caudal, and posterior part of anal barred.

Amazon.

1 (type). 37 mm.

Amazon.

Arnold.

16. *Rivulus geayi*.

*Rivulus geayi*, Vaill. Bull. Mus. Paris, 1899, p. 156.

Depth of body  $4\frac{1}{2}$  to 5 in the length of head, length of



head  $3\frac{1}{2}$  to 4. Head broader than deep. Diameter of eye 4 in the length of head. 33 or 34 scales in a longitudinal series. Dorsal 7-9; origin twice as distant from some part of eye as from base of caudal. Anal 10-12, ending below middle of dorsal. Pectoral  $\frac{3}{4}$  length of head, not extending to pelvics, which reach origin of anal. A few dark bars or vertically expanded spots on the tail; dorsal and caudal fins usually spotted or barred.

French Guiana.

1-5 (co-types). 25-35 mm. Carsevenne. Paris Mus. (Coll. Geay).

### 17. *Rivulus punctatus*.

*Rivulus punctatus*, Bouleng. Boll. Mus. Torino, x. 1895, no. 196, p. 3.

Depth of body  $4\frac{1}{4}$  to  $4\frac{3}{4}$  in the length, length of head about 4. Head nearly as deep as broad. Diameter of eye about 4 in length of head. 32 to 35 scales in a longitudinal series. Dorsal 7-8; origin above posterior part of anal, 3 times as distant from eye as from base of caudal. Anal 12-13, ending below middle of dorsal. Pectoral  $\frac{3}{4}$  the length of head or a little more, sometimes almost reaching pelvics, which extend to the vent. A dark longitudinal band from chin through eye, sometimes continued to the tail; brownish above, yellowish below the band; small dark spots on sides, mostly forming series running obliquely downward and forward; vertical fins with series of spots; anal usually dark-edged.

La Plata.

1 (type). 20 mm.	Colonia Risco, Paraguay.	Borelli.
2. 30 mm.	Valenzuela, "	Barbero.
3-4. 30 mm.	Arroyo Yacá, "	"
5-7. 23-35 mm.	Urucu, Matto Grosso.	Genoa Mus.

### 18. *Rivulus isthmensis*.

*Rivulus isthmensis*, Garman, Mem. Mus. Comp. Zool. xix. 1895, p. 140.

Length of head  $3\frac{1}{3}$  in length of fish. Head depressed. Diameter of eye 3 in length of head. 32 scales in a longitudinal series. Dorsal 9; origin over middle of anal, twice as distant from head as from base of caudal. Anal 11, last ray nearly as far back as that of dorsal. Olivaceous; a dark blotch at base of dorsal, another on back above or in front of origin of anal.

Rio San José, Costa Rica.



19. *Rivulus brasiliensis*.

*Fundulus brasiliensis*, Val. in Humboldt, Observ. Zool. ii. p. 163, pl. lii. fig. 2 (1828); Cuv. & Val. Hist. Nat. Poiss. xviii. 1846, p. 200.

Depth of body 4 in the length, length of head  $3\frac{1}{2}$ . Diameter of eye about  $3\frac{2}{3}$  in the length of head. 30 or 31 scales in a longitudinal series. Dorsal 8; origin above anterior part of anal, equidistant from middle of pectoral and base of caudal. Anal 11, ending below end of dorsal. Pectoral almost reaching pelvics, which reach anal. Brownish; 9 or 10 blackish bars on lower part of body, from pelvic fin to caudal; dorsal dusky.

Brazil.

Total length  $2\frac{1}{2}$  inches.

I am indebted to Dr. Pellegrin for kindly informing me that he counts 30 or 31 scales in a longitudinal series in the types; this is quite a different species from *R. urophthalmus*.

20. *Rivulus breviceps*.

*Rivulus breviceps*, Eigenm. Ann. Carnegie Mus. vi. 1909, pp. 48, 49; Mem. Carnegie Mus. v. 1912, pp. 452, 453, pl. lxiii. fig. 1.

Depth of body  $4\frac{1}{3}$  in the length, length of head 4. Head broader than deep. Diameter of eye  $3\frac{1}{2}$  in length of head. 33 scales in a longitudinal series. Dorsal 9–10; origin above anterior part of anal, equidistant from middle of pectoral and base of caudal. Anal 11–12, ending below posterior part of dorsal. Pectoral  $\frac{5}{7}$  length of head, not extending to pelvics, which just reach anal. Brownish; a few vertical bars across middle rays of caudal.

British Guiana.

1 (co-type). 35 mm.

Shrimp Creek.

Eigenmann.

21. *Rivulus balzanii*.

*Haplochilus balzanii*, Perugia, Ann. Mus. Genova, (2) x. 1891, p. 653.

Depth of body 4 in the length, length of head 3. Head depressed. Diameter of eye 3 in length of head. 34 scales in a longitudinal series. Dorsal 9, originating above seventh ray of anal. Anal 14. Sides with 4 or 5 brownish longitudinal stripes, each covering a series of scales; dorsal and anal with 3 series of brown spots.

Villa Maria, Matto Grosso (Rio Paraguay).

22. *Rivulus brevis*, sp. n.

Depth of body  $3\frac{2}{3}$  in the length, length of head  $3\frac{2}{3}$ . Head



a little deeper than broad. Diameter of eye 3 in the length of head. 30 scales in a longitudinal series. Dorsal 9; origin in advance of middle of anal, twice as distant from eye as from base of caudal. Anal 14, ending below last 2 or 3 rays of dorsal. Pectoral  $\frac{3}{4}$  the length of head, extending beyond base of pelvics, which extend beyond origin of anal. Brownish, with a darker spot on each scale of upper part of sides; dorsal and anal barred; caudal dusky.

Colombia.

1 (type). 45 mm.

Colombia.

Wolterstorff.

#### PTEROLEBIAS.

Garman, Mem. Mus. Comp. Zool. xix. 1897, p. 141.

This genus appears to differ from *Rivulus* in the deep, strongly compressed tail, with sharp lower edge, and in the elongate fin-rays, the pelvics extending to the posterior end of the anal.

##### 1. *Pterolebias longipinnis*.

*Pterolebias longipinnis*, Garman, Mem. Mus. Comp. Zool. xix. 1897, p. 142.

Dorsal 9-10. Anal 19-20. 31 or 32 scales in a longitudinal series. Brownish; fins spotted.

Santarem.

Total length 80 mm.

#### CYNOLEBIAS.

Steind. Sitzungsab. Akad. Wien, lxxiv. 1876, p. 172.

This genus differs from *Rivulus* in the subequal many-rayed dorsal and anal fins; the species are deeper and more compressed than most of the *Rivuli*.

#### *Synopsis of the Species.*

I. Pectoral fin not extending beyond origin of anal, which is nearly below that of the dorsal, nearer to base of caudal fin than to end of snout.

A. Pelvics not reaching anal.

28 scales in a longitudinal series. D. 16-18. A. 17-20. 1. *melanotænia*.  
45 to 50 scales in a longitudinal series. D. 17. A. 20. 2. *elongatus*.

B. Pelvics extending beyond origin of anal; 28 to 30 scales in a longitudinal series. D. 17-19. A. 22-26. . . . 3. *maculatus*.



## II. Pectoral fin extending beyond origin of anal.

A. Dorsal origin behind that of anal, nearly equidistant from end of snout and base of caudal, or nearer the latter.

- D. 18. A. 20. 40 scales in a longitudinal series . . . . 4. *porosus*.  
 D. 22. A. 24. 33 scales in a longitudinal series . . . . 5. *robustus*.  
 D. 21-24. A. 26-30. 28 to 30 scales in a longitudinal series . . . . . 6. *bellottii*.

B. Dorsal origin a little in advance of that of anal, nearer to end of snout than to base of caudal. D. 26. A. 25. 28 scales in a longitudinal series . . . . . 7. *nigripinnis*.

1. *Cynolebias melanotænia*, sp. n.

Depth of body  $3\frac{1}{2}$  to  $4\frac{1}{2}$  in the length, length of head  $3\frac{1}{4}$  to  $3\frac{1}{2}$ . Caudal peduncle longer than deep. Diameter of eye 3 in the length of head. 28 scales in a longitudinal series. Dorsal 16-18, origin above that of anal, equidistant from some part of eye and base of caudal. Anal 17-20. Dorsal and anal rather elevated posteriorly. Pectoral shorter than head, not reaching anal; pelvics small, not reaching anal. A blackish lateral band from lower jaw through eye to base of caudal, another at base of anal continued forward to base of pectoral, sometimes a third on the back; vertical fins usually spotted.

S.E. Brazil.

1-9 (types). 32-37 mm.

Paranagua.

Rachow.

2. *Cynolebias elongatus*.

*Cynolebias elongatus*, Steind, Denkschr. Akad. Wien, xliv. 1882, p. 11.

Depth of body  $3\frac{1}{3}$  in the length, length of head 3. Caudal peduncle longer than deep. Diameter of eye 6 in length of head. 45 to 50 scales in a longitudinal series. Dorsal 17; origin equidistant from præoperculum and base of caudal; posterior rays longest,  $\frac{1}{2}$  length of head. Anal 20; origin scarcely in advance of that of dorsal; middle rays longest, rather shorter than longest rays of dorsal. Pectoral as long as postorbital part of head, extending to middle of pelvics, which reach the vent. Brownish; a dark vertical bar through eye; vertical fins spotted.

La Plata.

1. 140 mm.

La Plata.

Arnold.



### 3. *Cynolebias maculatus*.

*Cynolebias maculatus*, Steind. Denkschr. Akad. Wien, xlv. 1882, p. 10, pl. v. fig. 2; Garman, Mem. Mus. Comp. Zool. xix. 1897, p. 145.

Depth of body 3 in the length, length of head  $3\frac{1}{3}$  to  $3\frac{2}{3}$ . Caudal peduncle longer than deep. Diameter of eye nearly 4 in the length of head. 28 to 30 scales in a longitudinal series. Dorsal 17-19; origin nearly above that of anal, about equidistant from eye and base of caudal; posterior rays longest,  $\frac{3}{4}$  or  $\frac{4}{5}$  length of head. Anal 22-26; middle rays as long as longest of dorsal. Pectoral  $\frac{3}{4}$  length of head, extending to anterior part or middle of pelvics, which reach beyond origin of anal. Olivaceous; a dark stripe below eye; vertically expanded violet spots on body and vertical fins.

La Plata.

1-3. 55-60 mm.  
4. 47 mm.

La Plata.

„

Doria.  
Arnold,

### 4. *Cynolebias porosus*.

*Cynolebias porosus*, Steind. Sitzungsab. Akad. Wien, lxxiv. 1876, p. 173, pl. x. fig. 3; Garman, Mem. Mus. Comp. Zool. xix. 1897, p. 143.

Depth of body nearly equal to length of head, about 3 in the length of fish. Caudal peduncle nearly as long as deep. Diameter of eye 5 in length of head. 40 scales in a longitudinal series. Dorsal 18; origin equidistant from præoperculum and base of caudal; posterior rays longest,  $\frac{3}{5}$  length of head. Anal 20; origin equidistant from anterior margin of eye and base of caudal; posterior rays longest, nearly as long as head. Pectoral  $\frac{4}{5}$  length of head, extending beyond origin of anal; pelvics extending beyond origin of anal. Brownish; fins greyish.

Pernambuco.

Total length 75 mm.

### 5. *Cynolebias robustus*.

*Cynolebias robustus*, Günth. Ann. & Mag. Nat. Hist. (5) ii. 1883, p. 140.

Depth of body  $2\frac{2}{3}$  in the length, length of head  $3\frac{2}{3}$ . Caudal peduncle deeper than long. Diameter of eye  $5\frac{1}{2}$  in the length of head. 33 scales in a longitudinal series. Dorsal 22; origin equidistant from middle of eye and base of caudal; posterior rays longest,  $\frac{2}{5}$  length of head. Anal



24; origin considerably nearer to end of snout than to base of caudal; middle rays as long as longest of dorsal. Pectoral as long as postorbital part of head, extending beyond origin of anal. Brownish, with indistinct cross-bars; a dark bar below eye; small pale blue spots on dorsal and anal fins.

La Plata.

1 (type). 92 mm.

San Antonio.

Gibson.

#### 6. *Cynolebias bellottii*.

*Cynolebias bellottii*, Steind. Denkschr. Akad. Wien, xlv. 1882, p. 9, pl. v. fig. 3; Garman, Mem. Mus. Comp. Zool. xix. 1897, p. 144.

Depth of body  $2\frac{1}{3}$  to 3 in the length, length of head  $3\frac{1}{2}$  to  $3\frac{2}{3}$ . Caudal peduncle deeper than long. Diameter of eye 4 in the length of head. 28 to 30 scales in a longitudinal series. Dorsal 21-24; origin nearly equidistant from end of snout and base of caudal; posterior rays longest,  $\frac{1}{2}$  to  $\frac{2}{3}$  length of head. Anal 26-30; origin about equidistant from end of snout and end of its own base; middle rays as long as longest of dorsal. Pectoral  $\frac{3}{4}$  or  $\frac{4}{5}$  length of head, extending beyond origin of anal. Brownish; a dark vertical stripe through eye; fins violet; vertical series of pale spots sometimes present on body and fins.

La Plata.

1-2. 65 mm.

La Plata,

Doria.

3. Skel.

"

"

4-5. 55-60 mm.

"

Arnold.

#### 7. *Cynolebias nigripinnis*, sp. n.

Depth of body  $3\frac{1}{4}$  in the length, length of head  $3\frac{3}{4}$ . Caudal peduncle nearly as long as deep. Diameter of eye  $3\frac{1}{3}$  in the length of head. 28 scales in a longitudinal series. Dorsal 26; origin a little nearer to end of snout than to posterior end of its own base. Anal 25; origin a little behind that of dorsal. Dorsal and anal rays increasing in length posteriorly, the longest  $\frac{3}{4}$  the length of head. Pectoral a little shorter than head, extending beyond origin of anal. Olivaceous; a dark bar between and below eyes; fins bluish black; some small pale spots on body and fins.

La Plata.

1 (type). 45 mm.

La Plata.

Arnold.





Regan, C. Tate. 1912. "A revision of the poeciliid fishes of the genera Rivulus, Pterolebias and Cynolebias." *The Annals and magazine of natural history; zoology, botany, and geology* 10, 494–508.

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