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PIMELODELLA AND TYPHLOBAGRUS.<sup>1</sup>

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(PLATES XXIX-XXXV.)

*Pimelodella* and *Typhlobagrus* are two closely related genera of Siluridæ of the fresh waters of South America. *Pimelodella* is a widely distributed genus with many species. *Typhlobagrus* is an offshoot from *Pimelodella*. Eyes have disappeared in this genus and it is confined, so far as known, to the caves near Iporanga in southeastern Brazil.

**Pimelodella Eigenmann & Eigenmann.**

*Pseudorhamdia* STEINDACHNER (*non* Bleeker), Sb. Akad. Wiss. Wien, LXXIV, 1876, Süswasserf. Südöstl. Bras., III, p. 46 (*lateristriga*).

*Pimelodella* EIGENMANN & EIGENMANN, Proc. Cal. Acad. Sci., (2), I, 1888, p. 131; Occasional Papers Cal. Acad. Sci., I, 1890, pp. 99 and 147.

Type, *Pimelodus cristatus* Müller & Troschel.

Nares remote; teeth villiform, in bands; gill-membranes free from the isthmus; dorsal short, with a feeble, pungent spine; anal short, with 11-15 rays; pectoral with a strong pungent spine variously armed with thorn-like teeth on its posterior (inner) edge; a long, adnate, adipose fin; caudal fin deeply forked, one or the other lobe frequently wider, or longer; well-developed maxillary barbels reaching to end of pectoral, or beyond the caudal; two pairs of mental barbels, sometimes in a nearly straight line; a frontal and a parietal fontanel, the latter reaching to the

<sup>1</sup> Contribution from the Zoölogical Laboratory of Indiana University, No. 154.

base of the occipital process, which is narrow and reaches, or nearly reaches, the plate in front of the dorsal; humeral process spine-like; roof of mouth without teeth; head covered with thin skin.

*Distribution.*—All rivers from Buenos Aires to Guiana and Venezuela and to the base of the Andes (1,800 feet in places); west of the Andes from northern Peru to the Chagres river in Panama.

DISTRIBUTION OF PIMELODELLA AND TYPHLOBAGRUS.

	Rio S. Francisco.	Rio Itapicuru.	Rio Pardo to Rio de Janeiro.	Rio de Janeiro to Paranagua.	Drainage Basin Lago de Patos.	Uruguay Basin.	La Plata Basin.	Upper Parana Basin.	Paraguay Basin.	Rio Guaporé to Rio Madeira.	Amazon Basin of Brazil.	Marañon Basin (Peruvian Part of Amazon Basin).	Paranahyba Basin.	Guiana.	Orinoco Basin.	Magdalena Basin.	Chagres Basin, Eastern Panama.	Pacific Side of Panama.	Rio San Juan.	Rio Dagua.	Rio Patia and Northwestern Ecuador.	Basin of Guayaquil Bay.	Northwestern Peru.
<i>P. serrata</i> . . . . .										+													
<i>cristata</i> . . . . .			+							+	+	+											
<i>steindachneri</i> . . . . .													+										
<i>gracilis</i> . . . . .							+		+	+	+												
<i>avanhandave</i> . . . . .								+															
<i>rocca</i> . . . . .												+											
<i>puruensis</i> . . . . .												+											
<i>buckleyi</i> . . . . .												+											
<i>pectinifera</i> . . . . .			+																				
<i>hasemani</i> . . . . .										+	+												
<i>cyanostigma</i> . . . . .												+											
<i>megalops</i> . . . . .														+									
<i>brasiliensis</i> . . . . .			+																				
<i>laticeps</i> . . . . .									+														
<i>australis</i> . . . . .					+	+																	
<i>notomelas</i> . . . . .									+														
<i>metæ</i> . . . . .															+								
<i>boliviana</i> . . . . .										+													
<i>lateristriga</i> . . . . .	+		+																				
<i>vittata</i> . . . . .	+		+																				
<i>itapicuruensis</i> . . . . .		+																					
<i>macturki</i> . . . . .														+									
<i>eigenmanni</i> . . . . .			+																				
<i>hartti</i> . . . . .			+																				
<i>transitoria</i> . . . . .				+				+															
<i>meecki</i> . . . . .								+															
<i>griffini</i> . . . . .									+														
<i>mucosa</i> . . . . .									+	+													
<i>grisea</i> . . . . .																							
<i>modesta</i> . . . . .																			+	+			
<i>yuncensis</i> . . . . .																						+	
<i>chagresi</i> . . . . .															?	+	+	+					
<i>clongata</i> . . . . .																					+	+	
<i>eutenia</i> . . . . .																			+	+			
<i>T. kronci</i> . . . . .				+																			
	2	1	7	2	1	1	1	3	5	6	4	5	1	3	3	1	1	1	2	2	4	1	1

The species of this well-marked genus differ from each other in the length of the adipose fin, the length of the barbels, the length of the pectoral spine, the

armature of the pectoral spine, the shape of the caudal lobes, and a number of other minor characters.

The length of the barbels in the same species differs with age. In the young the barbels are relatively short. They grow disproportionately longer with the growth of the fish and then lag behind again in their increase in length. The length of the barbels of the same species not only differs with age, but sometimes also with locality. The pectoral spines also vary somewhat with growth. With age the thorns increase in number by the addition of new ones toward the tip and come to occupy a larger portion of the length of the spine. The spine increases in length by the addition of new sections at the end which are marked off by notches or hooks on the outer margin of the spine. As the color and the size of the eye also vary with age and with locality, and, as all of these characters vary independently, the defining of species of *Pimelodella* becomes a delicate and difficult task. The following definitions, especially as far as they concern species of the Amazon Basin, are therefore more or less tentative.

Most of the species are small. The largest species of the Atlantic slope is *P. cristata* with a recorded length of 340 mm. The largest species from the Pacific slope is *P. eutania* of which I have examined specimens 188 mm. long.

The following notes may help to identify the species. Species in which the barbel extends to caudal are: *gracilis*, *notomelas*, *serrata*, *mucosa*, *boliviana*.

Species in which the pectoral spine is smooth or very feebly serrate are: *rocceæ*, *filamentosa*, *eigenmanni*, *meeki*, *vittata*, *buckleyi*, *boliviana*, *eutania*, *notomelas*, *metæ*, *itapicuruensis*, *hartti*.

Species in which the pectoral thorns are moderate are: *cristata*, *gracilis*, *avanhandavæ*, *puruensis*, *laticeps*, *australis*, *vittata*, *mucosa*.

Species in which the pectoral thorns are very strong are: *lateristriga*, *serrata*, *hasemani*, *mucosa*, *chagresi*, *macturki*, *megalops*, *modesta*, *grisea*, *pectinifera*, *cyano-stigma*, *transitoria*.

#### KEY TO THE CIS-ANDEAN SPECIES OF PIMELODELLA.<sup>2</sup>

- a. Head without conspicuous mucous pores.
  - b. Adipose fin usually less than three in the length, extending beyond the tip of the anal fin.
    - c. Pectoral spine with strong teeth both in front and behind; maxillary barbel extending beyond base of anal or caudal. . . . . 1. *serrata* Eigenmann.
    - cc. Pectoral spine with moderate thorns on the posterior margin, but slightly serrate or roughened along the anterior margin.
      - d. Lower caudal lobe much broader than the upper, upper lobe not produced, the lower frequently the longer; lateral band if present narrow, linear; 13-14 teeth

<sup>2</sup> The species found east of the eastern Andes of Colombia and the Atlantic slope of Ecuador and southward. See in this connection *P. chagresi*, p. 253.

- on the posterior face of the pectoral in specimens 83 mm. long, about 20-30 much more feeble ones in large specimens, the more distal thorns sometimes with a broad base and a long free outer edge; maxillary barbels reaching origin, or beyond tip of adipose. . . . . 2. *cristata* (Müller & Troschel).
- dd.* Caudal lobes subequal, always longer than the head; 18-29 thorns on the posterior face of the pectoral spine; maxillary barbels reaching tip of adipose or beyond tips of middle caudal rays; adipose fin 2.33 in the length; pectoral spine about equal to the dorsal spine, sometimes shorter; dorsal spine 1-1.25 in the head.
3. *steindachneri* Eigenmann.
- ddd.* Upper caudal lobe normally greatly prolonged, but subequal in the young, not much narrower than the lower lobe; maxillary barbel always extending at least beyond base of anal; lateral band, if present, broad; pectoral spine a little longer or a little shorter than the dorsal spine with a variable number of strong teeth on over half its posterior margin. . . . . 4. *gracilis* (Cuvier & Valenciennes).
- dddd.* Upper caudal lobe not produced; maxillary barbels reaching to tip of ventrals or to middle of anal; about 11 teeth on the pectoral spine; adipose fin 2.75-3.25 in the length. . . . . 5. *avanhandavae* Eigenmann.
- ddddd.* Upper caudal lobe not greatly produced; maxillary barbel reaching beyond tip of ventrals; numerous minute teeth on the pectoral spine; lateral band ill-defined.
6. *rocca* Eigenmann.
- dddddd.* Upper caudal lobe not prolonged beyond the lower; maxillary barbels reaching origin of ventrals; pectoral spine smooth in front, with about nine thorns on the inner margin, the largest a little more than half the greatest width of the spine. No lateral band. . . . . 7. *puruensis* Fowler.
- ccc.* Pectoral spine smooth or but slightly roughened behind; upper caudal lobe prolonged; maxillary barbels reaching anal; lateral band narrow, well defined; dorsal spine equals pectoral spine. . . . . 8. *buckleyi* (Boulenger).
- bb.* Adipose fin 3 or more than 3 in the length. (See also number 3).
- c.* Dorsal spine not produced into a filament.
- f.* Pectoral spine with thorns along all but the very tip of the posterior margin; interorbital three-fourths as wide as eye.
- g.* Maxillary barbel extending to the origin of the adipose fin, nearly to tip of ventral; pectoral spine equals length of head; eye 4 in the head, interorbital 5.
9. *pectinifera* Eigenmann & Eigenmann.
- gg.* Maxillary barbel extending beyond base of anal; pectoral spine much shorter than head; eye 3.33 in the head, interorbital 5.5; inner pectoral thorns large; a narrow dark band. . . . . 10. *hasemani* Eigenmann.
- ggg.* Maxillary barbel extending to end of the adipose; pectoral spine minutely serrate within and without. . . . . 11. *cyanostigma* Cope.
- ff.* Pectoral spine with 18 or fewer teeth, except in the very old.
- h.* Eye large, 2.5 in the head; interorbital much smaller than the eye, 5.5 in the head; lower caudal lobe much the longer; pectoral spine but little shorter than the head; maxillary barbel reaching origin or end of base of anal.
12. *megalops* Eigenmann.
- hh.* Eye smaller, more than 3 in the head.
- i.* D. I.7; pectoral spine reaching ventrals, which reach to the anal.
13. *brasiliensis* Steindachner.

- ii. D. I.6 or I.7; interorbital 3-3.5 in the head; adipose 4-4.3 in the length; barbels reaching tip of the depressed dorsal or middle of anal; pectoral spine equals head without opercle, its posterior face smooth on the distal four-tenths, 10 or 11 small thorns on the proximal six-tenths.
- j. Maxillary barbel reaching tip of depressed dorsal.  
14. *laticeps* Eigenmann.
- jj. Maxillary barbel extending to end of ventral or middle of anal.  
15. *australis* Eigenmann.
- iii. D. I.6; interorbital smaller than the eye, except in one specimen of *itapicuruisis*.
- k. Dorsal with a black wedge entering the fin from the middle in front, or with a hyaline base followed by black and shading to the tip of the fin.
- l. Maxillary barbel reaching middle of caudal; pectoral spine a little longer than snout and eye, with very few feeble teeth on its posterior face; adipose 3 in the length; interorbital 3.5-4 in the head.  
16. *notomelas* Eigenmann.
- ll. Maxillary barbel reaching anal; pectoral spine equals snout and eye, the dorsal spine equals snout and half the eye; adipose 3-3.25 in the length; interorbital 4-5 in the head. . . 17. *metæ* Eigenmann.
- lll. Dorsal with a black blotch on its middle anterior portion; maxillary barbel extending to middle of ventrals or to near anal; adipose 3.6-4 in the length; eye 4.5-5 in the head, interorbital about equal to the eye; upper caudal lobe the longer. See No. 26, *meekei* Eigenmann.
- kk. Dorsal without a black blotch, its tip usually dark.
- m. Maxillary barbel extending to near base or beyond tip of caudal; interorbital 3.5-4.7 in the head.
- n. Pectoral spine equals head less opercle, with 12-21 strong teeth on the posterior face; adipose 3.66 in the length; interorbital 3.75 in the length of the head; length of adipose equals its distance from the dorsal spine or very little more; anal extends to or beyond tip of adipose. See No. 28, *mucosa* Eigenmann.
- nn. Pectoral spine a little longer than snout and eye, with 7 scarcely perceptible teeth on its posterior face. Adipose 3 in the length; interorbital 4.3-5 in the head; dorsal dark; a basal light bar through it. . . . . 18. *boliviana* Eigenmann.
- mm. Maxillary barbel extending to or beyond the origin of the anal.
- o. Maxillary barbel extending beyond tip of anal; pectoral spine equals head without opercle; width of head equals snout and eye. Eye 3.25 in the head; snout a little longer than postorbital portion of head; interorbital 5.5 in the length of the head; distance between snout and dorsal fulcrum 3.2 in the length; width of occipital process 3 in its length; pectoral spine with 14 very strong graduate

teeth on the basal two-thirds of its posterior margin, about 5 hooks in front. (Based on specimen from Penedo 72 mm. long to base of caudal.)

19. *lateristriga* (Müller & Troschel).

oo. Maxillary barbel extending to the adipose or middle of anal; pectoral spine terete, curved, 1-1.25 in the head; width of head 1.33 in its length; eye 4 in head, 1.5 in the snout, about equal to the interorbital; pectoral thorns much smaller than in *P. lateristriga*.....20. *vittata* (Kröyer).

ooo. Maxillary barbel extending to origin of anal; pectoral spine equals snout and eye; width of head equals snout and three-fourths of the eye; eye 3.25 in the head; snout a little longer than postorbital portion of the head; interorbital 5 in the length of the head; distance between snout and dorsal fulcrum 3.4 in the length; dorsal spine nearer snout than anal; width of occipital process 3.5 in its length; pectoral spine with very feeble teeth on the basal half of its posterior margin, 12 hooks in front. (Based on specimen from Queimadas 72 mm. long to base of caudal.).....21. *itapicuruensis* Eigenmann.

oooo. Maxillary barbel reaching origin or end of base of anal; pectoral spine equals snout and eye or a little longer; eye 3.33-4, in middle of the head; interorbital 4.5; distance between snout and dorsal fulcrum about 3 in the length; pectoral spine with twelve long recurved thorns along the middle of its posterior margin.

22. *macturki* Eigenmann.

ooooo. Maxillary barbel extending beyond origin of anal; pectoral spine equals snout and eye, with about 7 very strong hooks. See No. 32, *chagresi* (Steindachner).

oooooo. Maxillary barbel extending beyond origin of anal; pectoral spine equals head less one-half of opercle; width of head 1.4 in its length; eye 3.5-4 in the head; interorbital 4.4-5.33 in the head; center of eye in center of head; dorsal spine equidistant from snout and anal; width of occipital process 3 in its length; pectoral spine with feeble teeth not more than one-fifth or one-sixth the width of the spine. Caudal not split between the middle rays. (Based on the types 130-180 mm. long, from Rio Parahyba.)

23. *eigenmanni* Boulenger.

mmm. Maxillary barbel not extending to the anal.

p. Maxillary barbel extending slightly beyond origin of ventrals; pectoral spine equals length of head less opercle; width of head a little greater than snout and eye; eye 4 in the head; snout equals postorbital part of head; interorbital 4.5 in the head; distance between snout and the process not

quite reaching the dorsal plate; pectoral spine with about 9 feeble spines on its posterior margin, about 9 hooks in front, the upper ones sharp, the lower obscure. (Based on specimen from Rio Doce 72 mm. long to base of caudal.)

24. *hartii* (Steindachner).

*pp.* Maxillary barbels extending to end of ventrals;<sup>3</sup> pectoral spine equals length of head without opercles; width of head equals snout and eye; eye 4 in the head; snout longer than postorbital portion of head; interorbital 5 in the length of the head; distance between snout and dorsal fulcrum 3 in the length; width of occipital process 3 in its length; pectoral spine with 12 very strong graduate teeth on over half of its posterior margin, about 5 hooks in front; adipose 3.4 in the length. (Based on a specimen from Xiririca 91 mm. long to base of caudal.) . . . . . 25. *transitoria* Ribeiro.

*ppp.* Maxillary barbel extends to middle of ventrals (on one side of the paratype to near anal); pectoral spine equals snout and eye or shorter; width of head equals length of head without opercles; eye 4.5-5 in the head; snout longer than postorbital portion of head; interorbital 5 in the head; distance between snout and dorsal fulcrum 2.8 in the length; width of occipital process 3 in its length; pectoral spine with 12 very feeble teeth on the basal half of the posterior face; 9-11 recurved hooks near the tip in front; adipose 3.6-4 in the length (largely based on a specimen from Sapina 89 mm. long, and on the types) . . . . . 26. *meeki* Eigenmann.

*ee.* Dorsal spine frequently prolonged into a filament extending considerably beyond the rest of the fin; interorbital 5 in the head; maxillary barbel reaching tip of ventrals or shorter; pectoral spine with 9-11 teeth on the basal two-thirds of the posterior face; adipose 3.5-4.5 in the length. . . . . 27. *griffini* Eigenmann.

*aa.* Lower cheeks and mandible with conspicuous cavities; lower caudal lobe the longer; maxillary barbel reaching to near origin or middle of caudal; pectoral spine with straight, feeble teeth on its posterior surface; eye 3.5-4.5 in the head; adipose extending a very little beyond tip of anal.

28. *mucosa* Eigenmann & Ward.

### 1. *Pimelodella serrata* sp. nov. (Plate XXIX, fig. 1).

6967a C. M., type, 67 mm. 6966a C. M., paratype, 110 mm., San Joaquin, Bolivia, Sept. 5, 6, 1909. Haseman.

Distinguished by its numerous pectoral thorns and the length of the barbels.

Head 3.9-4.33; depth about 7. D. I.6; A. 13; eye 4-4.2 in head, equal to or slightly greater than interorbital; snout a little greater than postorbital; maxillary barbels extending to the end of the base of the anal or beyond the base of the caudal; postmental barbels to the tip of the pectoral. Adipose about 2.5 in the length.

<sup>3</sup> To end of base of anal in No. 6979.

Dorsal spine straight, slender, equal to length of head less opercle, 17 minute teeth on the upper two-thirds of the posterior surface, the anterior margin smooth; pectoral spine heavy, little longer than dorsal spine; 18–21 strong retrorse teeth along nearly the entire posterior margin, longest near the middle of the spine; 25–50 shorter, mostly antrorse teeth along all but a short space near the tip along the anterior face. Caudal lobes nearly equal, about 3.5 in the length.

Occipital process of nearly the same width throughout, firmly united with the dorsal plate. No color-markings.

2. *Pimelodella cristata* (Müller & Troschel) (Plate XXIX, fig. 2).

*Pimelodus cristatus* MÜLLER & TROSCHER, in Schomb. Reisen in Brit. Guiana, III, 1848, p. 628 (Takutu and Mahu Rivers); Horæ Ichth., III, 1849, p. 4 (Essequibo); GÜNTHER, Cat. Fishes Brit. Mus., V, 1864, 117 (Guiana; Essequibo; River Capin; Para); VAILLANT, Bull. Soc. Philom. (7), 1880, p. 152 (Calderon); STEINDACHNER, Flussfische Süd-am., IV, 1882, p. 4 (Rio Huallaga); ? PERUGIA, Ann. Mus. Genova (2), X, 1891, p. 631 (Tucuman).

*Pimelodella cristata* EIGENMANN & EIGENMANN, Proc. Cal. Acad. Sci. (2), I, 1888, p. 132 (San Gonçallo; Avary; Villa Bella; Jutahy; Tapajos; Rio Mucuri;<sup>4</sup> Tabatinga; Hyavary; Coary); Occasional Papers Cal. Acad. Sci., I, 1890, p. 150; Proc. U. S. Nat. Mus., XIV, 1891, p. 29; EIGENMANN & BEAN, Proc. U. S. Nat. Mus., XXXI, 1907, p. 660 (Amazon); EIGENMANN, Reports Princeton Univ. Exped. Patagonia, III, 1910, p. 388; Mem. Carnegie Mus., V, 1912, p. 168 (Tumatumari; creek below Potaro Landing; Rockstone; Kona-waruk; below Packeo Falls; Twoca Pan); FOWLER, Proc. Acad. Nat. Sci. Phila., 1915, p. 214 (type of *ophthalmicus*).

*Pimelodus agassizii* STEINDACHNER, Sb. Akad. Wiss. Wien, LXXIV, 1876, Flussf. Südöstl. Bras., III, p. 56, footnote (Essequibo).

*Pimelodus (Pseudorhamdia) wesseli* STEINDACHNER, Sb. Akad. Wiss. Wien, LXXIV, 1876, Süßwasserf. Südöstl. Bras., II, p. 56 (Essequibo).

*Rhamdia wesseli* RIBEIRO, Faun. Bras., Peixes, IV, 1912, p. 268.

*Pimelodus ophthalmicus* COPE, Proc. Am. Phil. Soc., XVII, 1876, p. 675 (Upper Amazon).

*Habitat*.—Guiana, Amazon Basin to the Huallaga, and the Guaporé. Rio Mucuri.

My reference in former papers of Schomburgk's *insignis* to this species is wrong.

<sup>4</sup> In three of the four specimens from Santa Cruz, Rio Mucuri (No. 7412 Mus. Comp. Zool.) the caudal is considerably longer than in specimens from the Amazon, 4–4.5 in the length. The upper caudal lobe is usually narrower and more pointed than the lower.



- 6933a C. M., 127 mm., San Joaquin, Bolivia, September 4, 1909. Haseman.  
 6934a C. M., 131 mm., Villa Bella, Oct. 5, 1909. Haseman.  
 6936a-f C. M., 77-220 mm., Santarem, Dec. 8, 9, 1909. Haseman.  
 6937a-e<sup>5</sup> C. M., 85-258 mm., Maciél, Rio Guaporé, July 23, 1909. Haseman.  
 ???? Field M., 94 mm. to base of caudal, Serra da Lua, near Boa Vista, Amazon.  
 M. P. Anderson and R. N. Becker.  
 7586a M. C. Z., 154 mm., Rio Puty, Paranahyba basin. Thayer Expedition.  
 7475a<sup>6</sup> M. C. Z., 232 mm., Coary. Thayer Expedition.  
 7492a<sup>7</sup> M. C. Z., 265 mm., Tapajos. Thayer Expedition.  
 7541a-b M. C. Z., 127 and 152 mm., São Gonçallo. Thayer Expedition.  
 7412a-d<sup>8</sup> M. C. Z., 232-305 mm., Santa Cruz, Rio Mucuri. Thayer Expedition.  
 7444a<sup>9</sup> M. C. Z., 300 mm., Villa Bella. Thayer Expedition.  
 7576a-b<sup>10</sup> M. C. Z., 66-103 mm., Iça. Thayer Expedition.  
 7569a<sup>11</sup> M. C. Z., 95 mm., Hyavary. Thayer Expedition.

### 3. *Pimelodella steindachneri* nom. nov.

*Pimelodella wessellii* EIGENMANN & EIGENMANN (*non* Steindachner), Proc. Cal. Acad. Sci. (2), Vol. I, 1888, p. 132 (Cudajas; Pará; Marajo; Rio Madeira; Rio Puty; Santarem); Occasional Papers, Cal. Acad. Sci., I, 1890, p. 152; EIGENMANN, Rep. Princeton Univ. Exped. Patagonia, III, 1910, p. 389.  
*Habitat*.—Amazon Basin.

The species described by Steindachner as *P. wessellii* from the Essequibo is identical with *P. cristata* (Müller & Troschel) from the same place. It is doubtful whether the specimens enumerated by E. and E. in the papers quoted above belong to the same species, and they are here set apart under a new name. The species, if distinct, is very closely related to *P. gracilis* and *P. cristata*. Its caudal is more like that of *gracilis*. Its maxillary barbel is longer than that of *cristata*.

<sup>5</sup> Maximum number of pectoral thorns 30.

<sup>6</sup> Pectoral thorns 24.

<sup>7</sup> Pectoral thorns 22.

<sup>8</sup> a. 232 mm., pectoral thorns 25, upper caudal lobe 39 mm., lower 44, maxillary barbel to end of base of anal. b. 262 mm., pectoral thorns 24, upper caudal lobe 52 mm., lower 51, maxillary barbel to middle of base of anal. c. 300 mm., pectoral thorns 32, caudal broken, maxillary barbel not to origin of the anal. d. 305 mm., pectoral thorns 29, upper caudal lobe 57 mm., lower 60 mm., maxillary barbel beyond tip of anal.

<sup>9</sup> Pectoral thorns 25, upper caudal lobe 45 mm., lower lobe 55 mm., maxillary barbel to middle of base of anal.

<sup>10</sup> Pectoral thorns 14 and 11, maxillary barbel beyond base of anal in the larger specimen, to near tip of the caudal *a* in the smaller.

<sup>11</sup> Pectoral thorns 17, maxillary barbel extending beyond caudal.

The pectoral thorns are 17, 18, 22, and 23 in different specimens, the largest number being found in 7542 M. C. Z. from Manacapurú. It is quite possible that most of the specimens from north of the Paraguay basin heretofore referred to *P. gracilis* really belong to this species. The specimens at present in the Museum of Comparative Zoölogy are:

7566a-b. 95-126 mm. to base of caudal, Maues, Rio Madeira. Thayer Expedition.

7487a.<sup>12</sup> 190 mm., Para. Thayer Expedition.

7472a. 172 mm., Cudajas. Thayer Expedition.

7567a. 137 mm., Santarem. Thayer Expedition.

7588a. 154 mm., Rio Puty. Thayer Expedition.

7542a. 212 mm., Manacapurú. Thayer Expedition.

#### 4. *Pimelodella gracilis* (Cuvier & Valenciennes).

*Pimelodus gracilis* CUVIER & VALENCIENNES, His. Nat. Poiss., XV, 1840, p. 181 (Buenos Ayres; Paraná at Corrientes); VALENCIENNES, Voy. d'Orbigny, Vol. V, 1847, Poissons, p. 6, plate II, fig. 5; KNER, Sb. Ak. Wiss. Wien, XXVI, 1857, p. 418 (Caiçara, Mattogrosso; Rio Guaporé; Cujaba); GÜNTHER, Cat. Fishes Brit. Mus., V, 1864, p. 121; BOULENGER, Trans. Zoöl. Soc., 1896, p. 27 (Descalvados).

*Pimelodus (Pseudorhamdia) gracilis?* STEINDACHNER, Flussfische Süd-am., I, 1879, p. 9 (Orinoco near Ciudad Bolivar).

*Pimelodella gracilis* EIGENMANN & EIGENMANN, Proc. Cal. Acad. Sci., (2), I, 1888, p. 132 (Goyaz); ? Occasional Papers Cal. Acad. Sci., I, 1890, p. 153; Proc. U. S. Nat. Mus., XIV, 1890, p. 29; Ann. Carnegie Mus., IV, 1907, p. 114, pl. XXXII, fig. 2 (Corumbá; Laguna Ypagarai); EIGENMANN, Reports Princeton Univ. Exped. Patagonia, III, 1910, p. 389.

*Rhamdia gracilis* RIBEIRO, Fauna Bras., Peixes, IV, 1912, p. 269.

*Pimelodus lateristriga* BOULENGER (*non* Müller & Troschel), Trans. Zoöl. Soc. Lond., 1896, p. 27 (Descalvados).

*Pimelodus (Pimelodella) teniophorus* REGAN, Ann. and Mag. Nat. Hist. (7), XII, 1903, p. 625 (Descalvados).

*Habitat.*—La Plata Basin; Uruguay Basin; ? Amazon; ? Orinoco. More abundant in the La Plata Basin than elsewhere.

In 6947 the maxillary barbel in specimens between 78 and 112 mm. long extends beyond the base of the caudal; in the specimens 97 mm. long to the end of the

<sup>12</sup> In this specimen the dorsal spine is very high, equal to the length of the head. Pectoral thorns 22.

lower lobe. In the largest specimens it extends a little beyond the base of the anal. The pectoral spine in the smallest has 9 spines on half of the length, 12 in the next in size, 15 in the next (125 mm.), 24 on the largest on all but the distal fourth of the spine. The lateral band extends from snout to caudal. The back is similar in color to the band, the space between the back and the lateral band being lighter in color. In the most highly developed the upper caudal lobe is 2.5 in the length; the distance between snout and dorsal fulcrum 3.4 in the length.

## SPECIMENS EXAMINED.

Catalogue Number.	Length in Mm.	Location.	Date.	Collector.
6941a C. M. . . . .	100	Villa Bella, Amazon	Oct. 5, 1909	Haseman
6942a-b C. M. . . .	74-103	San Joaquin, Bolivia	Sept. 4, 1909	Haseman
6943a C. M. . . . .	77	Asuncion, Rio Paraguay	Mar. 29, 1909	Haseman
6944a-f C. M. . . .	58-135	Corumba, Paraguay Basin	Apr. 28, May 2, 1909	Haseman
6945a-g C. M. . . .	35-110	Rio Jauru, Paraguay Basin	June 2, 4, 1909	Haseman
6946a-e C. M. . . .	75-110	San Luiz de Caceres, Paraguay Basin	May 24, 1909	Haseman
6947a-h C. M. . . .	82-180	Villa Hays, Rio Paraguay	Apr. 13, 1909	Haseman
10133a I. U. M. . .	About 70	Corumba		Anisits
10792a I. U. M. . .	About 160	Parana, Entre Rios		von Ihering
10200a I. U. M. . .	About 170	Laguna Ypagarai, Paraguay		Anisits
6961a-b C. M. . . .	67- 68	Arequa, Paraguay	April 8, 1908	Haseman
6935a-i C. M. . . .	55-140	Uruguayana	Feb. 5 and 7, 1909	Haseman
6939a C. M. . . . .	100	Rio Paranahyba (into Parana) at bridge to Goyaz	Aug. 14, 1908	Haseman

The size of the pectoral teeth varies greatly with the locality, the maxillary barbel to a less extent. In 6939, 100 mm. long, it extends about to the end of the base of the anal.

Only one of the twelve specimens recorded by E. & E. from Goyaz (8196 M. C. Z.) is still extant. I am in doubt whether we were correct in referring it to *P. gracilis*. The caudal is broken off near the base so that it cannot be determined whether it possesses one of the most characteristic features of the species, the prolonged upper caudal lobe. The maxillary barbel extends only to near the tip of the ventrals and is therefore much shorter than in typical specimens of *P. gracilis*. The eye is smaller than in the average given for the twelve specimens by E. & E., otherwise their description holds. The pectoral spines measured from above average slightly longer than the snout and eye. The dorsal spine is slightly less in length than the snout and eye; it is smooth in front and only very slightly roughened behind. The pectoral spine has nineteen thorns, the longest one being one third the width of the spine.

A large series of similarly preserved specimens are necessary to properly define this and the preceding species, if the two are really different.

5. *Pimelodella avanhandavæ* sp. nov. (Plate XXIX, fig. 3).

6969a C. M., type, 85 mm., 6970a-x C. M., paratypes, 57-96 mm., Rio Tieté at Salto Avanhandava, above the fall, Sept. 14, 1908. Haseman. 7062a-g, 56-77 mm., same place, Sept. 15, 1908.

*Habitat*.—Tieté Basin.

Very similar to *P. gracilis* and characterized by the long adipose and comparatively short barbels.

Head 4.5; depth 5.6; D. 1.6; A. 11-12; eye 4-4.25 in the head; interorbital 4; adipose 2.75-3.25 in the length. Maxillary barbel extending nearly to tip of ventrals or the middle of anal; postmental beyond base of pectoral; pectoral spine equal to or a little longer than snout and eye; dorsal spine a little less than snout and eye; about 11 thorns, half as wide as the spine along the basal .7 of the posterior margin of the pectoral spine, 4-6 recurved hooks and numerous tubercles along the anterior margin; a narrow dark band along the middle of the sides, faintly continued on the head; a hyaline band through the basal half of the dorsal.

6. *Pimelodella roccæ* Eigenmann MS.

*Pimelodella roccæ* EIGENMANN, Mem. Comp. Zoöl., 1917, (Unpublished April, 1917) (Lower Urubamba Valley).

*Habitat*.—Urubamba Valley.

7. *Pimelodella puruensis* Fowler.

*Pimelodella puruense* FOWLER, Proc. Acad. Nat. Sci. Phila., 1915, p. 214, fig. 4 (Peruvian Amazon).

This species is known only from the type, which is 52 mm. long. It is quite possible that it is the young of one of the other known species.

8. *Pimelodella buckleyi* (Boulenger).

*Pimelodus lateristriga* (non Müller & Troschel) COPE, Proc. Acad. Nat. Sci. Phila., 1871, p. 270 (Ambyiacu River).

*Pimelodus buckleyi* BOULENGER, Proc. Zoöl. Soc., 1887, p. 275, pl. XX, fig. 1 (Canelos).

*Pimelodella buckleyi* EIGENMANN, Reports Princeton Univ. Exp. Patagonia, III, 1910, 389.

*Pimelodella copei* FOWLER, Proc. Acad. Nat. Sci. Phila., 1915, p. 216, fig. 5 (based on Cope's specimens of *lateristriga*).

*Habitat*.—Marañon Basin.

Boulenger was the first to recognize that Cope's specimens belonged to a species distinct from *P. lateristriga*. There is little doubt but that *P. copei* is a synonym of *P. buckleyi*. The *P. buckleyi* of E. & E. is a distinct species called *P. Eigenmanni* by Boulenger, and *P. Eigenmanniorum* by Ribeiro.

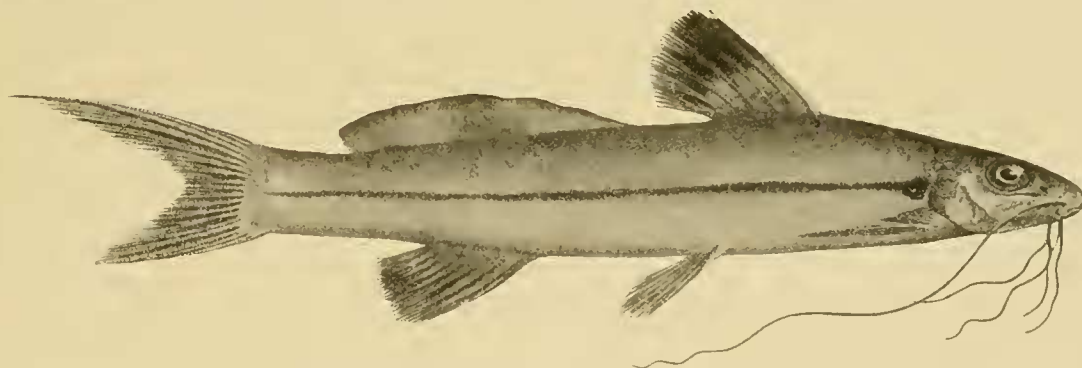


FIG. 1. *Pimelodella buckleyi* (Boulenger). Reproduced from P. Z. S. London, 1887, Pl. XX, fig. 1.

Known from two specimens from Canelos 150 mm. long and now in the British Museum, and two specimens 160 mm. long collected by Hauxwell in the Ambyiacu and now in the collections of the Philadelphia Academy of Sciences.

#### 9. *Pimelodella pectinifera* Eigenmann & Eigenmann.

*Pimelodella pectinifer* EIGENMANN & EIGENMANN, Proc. Cal. Acad. Sci. (2), I, 1888, p. 132 (Campos); Occasional Papers Cal. Acad. Sci., I, 1890, p. 154; Proc. U. S. Nat. Mus., XIV, 1891, p. 29; EIGENMANN, Reports Princeton Univ. Exp. Patagonia, III, 1910, p. 389.

*Rhamdia pectinifer* RIBEIRO, Fauna Bras., Peixes, IV, 1912, p. 270.

This species is known only from the types from the Parahyba Basin.

#### 10. *Pimelodella hasemani* sp. nov. (Plate XXX, fig. 7).

*Pimelodella lateristriga* EIGENMANN & EIGENMANN (part), Occasional Papers Cal. Acad. Sci., I, 1890, p. 156 (the specimens in the M. C. Z. and I. U. M. enumerated below).

*Habitat*.—Madeira and Amazon Basin.

6968a C. M., type, 81 mm., San Antonio de Rio Madeira. Haseman.

4259a-c I. U. M., largest 57 mm., Iça. William James.

7577 M. C. Z., fifty, largest 67 mm., Iça. William James.

7579-7581 M. C. Z., twelve, largest 72 mm., Obidos. William James.

7502 M. C. Z., three, largest 51 mm., Obidos. Col. Bentos.

7572 M. C. Z., one, 64 mm., Jutahy. James Thayer and Talisman.

Head 4.5; depth 6.6; D. 1.6; A. 12; eye 3.33 in the head, interorbital 5.5; center of eye a little behind the middle of the head; adipose 3.5 in the length. Maxillary barbel extending to middle of adipose on one side, to near its end on the other. Distance between snout and dorsal fulcrum 3.2 in the length; dorsal spine a little more than snout and eye. Pectoral spine very little longer than dorsal spine, with 16-18 recurved teeth on about the basal three-fourths of the posterior face of the spine. Anterior face with 4 hooks near the tip and about 40 short teeth along the rest of the spine. Humeral spine extending considerably beyond the middle of the pectoral spine. Lower caudal lobe longer than the head. Occipital process of the same width throughout, its width 3 in the length. A narrow, dark, lateral band; dorsal without a light band.

#### 11. *Pimelodella cyanostigma* (Cope).

*Rhamdia cyanostigma* COPE, Proc. Am. Phil. Soc., 1870, p. 569 (Pebas); EIGENMANN & EIGENMANN, Occasional Papers Cal. Acad. Sci., I, 1891, p. 164.

*Pimelodus cyanostigma* COPE, Proc. Am. Phil. Soc., 1878, p. 675.

*Pimelodella cyanostigma* FOWLER, Proc. Acad. Nat. Sci. Phila., 1915, p. 218. (Note on the relationship.)

*Habitat.*—Marañon Basin.

Known only from the types. A specimen in the Field Museum, originally about 65 mm. long, collected by Anderson and Becker at Boa Vista, Serra da Lua, Feb., 1913, may belong to this species. The pectoral spines have been broken off, and a definite identification is impossible.

#### 12. *Pimelodella megalops* Eigenmann.

*Pimelodella megalops* EIGENMANN, Repts. Princeton Univ. Exp. Patagonia, III, 1910, p. 389; Mem. Carnegie Mus., Vol. V, 1912, p. 169, plate XV, fig. 2 (Tumatumari, Potaro River; Crab Falls, Essequibo River).

*Habitat.*—Near mouth of the Potaro River, British Guiana.

#### 13. *Pimelodella brasiliensis* (Steindachner).

*Pimelodus (Pseudorhamdia) brasiliensis* STEINDACHNER, Sb. Ak. Wiss. Wien, LXXIV, 1876, Süßwasserf. Südöstl. Bras., III, p. 50, pl. VII (Rio Parahyba).

*Pimelodella brasiliensis* EIGENMANN & EIGENMANN, Proc. Cal. Acad. Sci., (2), I, 1888, p. 133; Occasional Papers Cal. Acad. Sci., I, 1890, p. 162; Proc. U. S. Nat. Mus., XIV, 1891, p. 29; EIGENMANN, Reports Princeton Univ. Exped. Patagonia, III, 1910, p. 389.

*Rhamdia brasiliensis* RIBEIRO, Fauna Bras., Peixes, IV, 1912, p. 275. Known only by the types from the Rio Parahyba.

14. *Pimelodella laticeps* sp. nov. (Plate XXX, fig. 2).

6957a C. M., type, 62 mm., 6958a-c C. M., paratypes, 75-90 mm., Sapueay, Paraguay, April 2, 1909. Haseman.

Head 4; depth about 4.66; D. I.6 in two, I.7 in the other two; A. 14 or 15; eye in middle of the head, 4.33-5; interorbital very broad, 3-3.5 in the head; maxillary barbel reaching nearly to tip of the depressed dorsal or slightly beyond it; postmental slightly beyond base of last pectoral ray.

Adipose fin 4-4.3 in the length, the space between the dorsal equal to eye and snout; pectoral spine equal to head without the opercle; 7 recurved notches in the distal four tenths of the anterior face, the proximal portion with minute

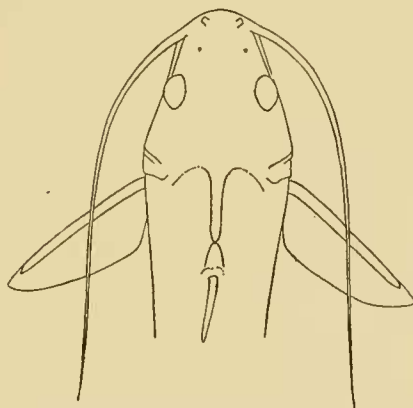


FIG. 2. *Pimelodella laticeps* Eigenmann. Dorsal view of head,  $\times 2$ .

tubercles; posterior face smooth opposite the notches of the anterior face and with 10-11 small thorns, the largest about half the width of the spine on the basal six-tenths of the spine. Dorsal spine equals snout and eye, with very few faint recurved notches near the tip in front, otherwise smooth; a large dusky blotch behind the gill-opening, a dark band along the middle of the sides from below the dorsal to the caudal; dorsal dusky; a hyaline band through the basal half of the fin; a dark stripe along the middle of the back.

15. *Pimelodella laticeps australis* var. nov.

*Pimelodus lateristriga* BOULENGER, Proc. Zoöl. Soc., 1891, p. 232 (Rio Grande do Sul).

*Pimelodella lateristriga* EIGENMANN, Ann. N. Y. Acad. Sci., VII, 1894, p. 632.

6950 C. M., type, 75 mm., 6951a-s C. M., 50-87 mm., Uruguayana, Feb. 5, 1909. Haseman.

6952a-p C. M., 52-76 mm., Cacequy, Rio Ibicuhy, into the Rio Uruguay, Feb. 13, 1909. Haseman.

6953a-b C. M., 55 mm., Cachoeira, Rio Jacuhy, into Lago de Patos, Jan. 26, 1909.

Haseman.

6954a-d C. M., 53-60 mm., Porto Alegre, Rio Grande do Sul, Jan. 19, 1909. Haseman.

man.

4876a-c I. U. M., 97-123 mm., Rio Grande do Sul. Von Ihering.

*Habitat.*—Basins of the Uruguay and of the Lago de Patos.

These specimens have longer barbels than the ones from Sapucay and are much lighter in color, the dark along the back being interrupted at the dorsal plate and the end of the dorsal, the occipital process is also much lighter than the area bordering it. Only one of these specimens has the dorsal 1.7, the rest all 1.6. A.  $\frac{1.2}{1}$ ,  $\frac{1.3}{1}$ ,  $\frac{1.5}{1}$ ; the maxillary barbel always longer, extending to end of ventral or middle anal. Adipose fin 3.75-4.25.

16. *Pimelodella notomelas* sp. nov. (Plate XXX, fig. 3).

6955 C. M., type, 51 mm.; 6956a-f C. M., paratypes, 37-53 mm., San Luiz de Caceres, May 24-27, 1909. Haseman.

6971a-d C. M., 35-60 mm., Rio Jauru, June 2-4, 1909. Haseman.

*Habitat.*—Upper Paraguay Basin.

Distinguished by the black spot on the dorsal.

Head 4.2; depth 4.5-5; D. 1.6; A. 12 or 13; eye 3-3.5 in the head, a little greater than the interorbital; maxillary barbel extending to tip of middle caudal rays or a little shorter, postmental barbel to near tip of pectoral; adipose 3 in the length, its origin in advance of the tip of the dorsal; dorsal spine slender with a few retrorse hooks near the tip in front, its height not quite equal to snout and eye; pectoral spine very little greater than snout and eye, with a very few short, feeble teeth behind; caudal very deeply forked, the lobes equal, about 3 in the length; a black wedge through middle of dorsal, the black on the first three membranes forming a conspicuous blotch, otherwise plain. No lateral band.

17. *Pimelodella metæ* sp. nov. (Plate XXXI, fig. 1).

13768a I. U. M., 48 mm., Quebrada Cramalote, Villavicencio. Gonzales.

7441a C. M., type, 77 mm., Rio Negro, Villavicencio. Gonzales.

7442a-b C. M., 13769a-c I. U. M., 80-100 mm., Barrigona, Rio Meta. Gonzales.

*Habitat.*—Upper Meta of the Orinoco Basin.

Head 4.8; depth over 6; eye 4 in the head, intraorbital 4-5; D. 1.6; A. 11 or 12; depth of caudal peduncle equal to postorbital part of head. Maxillary barbel almost or quite reaching origin of anal; outer mental barbel to middle of pectoral



or a little farther. Adipose fin 3–3.25 in the length; upper caudal lobe distinctly the longer, 3 in the length; dorsal spine equals snout and half the eye; pectoral spine equals snout and eye, with numerous recurved notches in front, very few feeble teeth or smooth along posterior face. A narrow, well-defined, lateral streak from eye to caudal; base of dorsal hyaline, then black, shading to the tip of the rays.

This species is closely allied to *P. buckleyi*, in which the dorsal and pectoral spines are of equal length, and to *P. notomelas* with a much longer barbel.

18. *Pimelodella boliviana* sp. nov. (Plate XXXI, fig. 2).

6964a C. M., type, 90 mm. over all, Santa Cruz de la Sierra, Bolivia. Steinbach.  
6965a C. M., 67 mm. to base of caudal, Prov. del Sara, Jan.–Oct., 1911. Steinbach.

*Habitat*.—Central Bolivia; Madeira Basin.

Head 4.5–4.6; depth 6.3–6.5; D. 1.6; A. 13; eye 3.75 in the head; interorbital 4.3–4.7; eye in middle of the head; adipose fin 3 in the length; maxillary barbel extending to or beyond the base of the caudal; outer mental to or near to tip of pectoral; pectoral spine a little longer than snout and eye; dorsal spine less than snout and eye. Pectoral spine with 10 retrorse hooks along the distal half of the anterior margin, about 7 scarcely perceptible thorns on the posterior margin; caudal 3.5 in the length; a narrow band from snout to end of middle of caudal rays, heaviest just behind gill-openings. Dorsal dusky except along base.

19. *Pimelodella lateristriga* (Müller & Troschel).

*Pimelodus lateristrigus* MÜLLER & TROSCHER, *Horæ Ichthyol.*, III, 1849, p. 3 (Brazil).

*Pimelodus lateristriga* GÜNTHER, *Cat. Fish. Brit. Mus.*, V, 1864, p. 118 (Brazil); ? HENSEL, *Wieg. Arch.*, 1870, I, p. 69 (Porto Alegre); STEINDACHNER, *Sb. Ak. Wiss. Wien*, LXXIV, 1876, *Süsswasserfische Südöstl. Bras.*, III, p. 45 (Rio Parahyba; Rio Doce; Rio Jequintinhonha; Cannavieras; Muriahe and Rio Janeiro); VAILLANT, *Bull. Soc. Philom.* (7), IV, 1880, p. 52 (Calderon).

*Pseudorhambia lateristriga* LÜTKEN, *Velhas-Flodens Fiske*, *Dan. Vidensk. Selsk. Skr.*, 1875, p. 171, fig. (Rio das Velhas).

*Pimelodella lateristriga* EIGENMANN & EIGENMANN (part), *Proc. Cal. Acad.* (2), I, 1888, p. 133 (Santa Clara; Rio Mucuri; Rio Doce; Cannavieras; San Matheos; Mendez; Rio Trombetas); *Occasional Papers Cal. Acad. Sci.*, I, 1890, p. 156; *Proc. U. S. Nat. Mus.*, XIV, 1891, p. 29; EIGENMANN, *Reports Princeton Univ. Exped. Patagonia*, III, 1910, p. 389.

? *Rhamdia lateristriga* RIBEIRO, Fauna Bras., Peixes, IV, 1912, p. 271 (Calderão, Amazonas).

*Habitat.*—Amazon Basin; especially eastern Brazil from the Rio São Francisco to Rio de Janeiro.

A number of references to the name *lateristriga* have been distributed among the species to which they actually belonged.

Of this species there appear to be specimens from the Rio São Francisco:

6982*a-e* C. M., 37–85 mm., Penedo, near mouth of the Rio São Francisco, March 20, 1908. Haseman.

6983*a-c* C. M., 45–55 mm., Joazeiro, Nov. 28, 1907. Haseman.

6987*a-c* C. M., 71–82 mm., Lagoa Pereira, Dec. 23, 1907. Haseman.

and specimens from the Rio Parahyba:

6981*a* C. M., 60 mm., São João da Barra, June 23, 1908. Haseman.

6984*a-d* C. M., 70–95 mm., Campos near the mouth of the river, June 15, 1908.

6985*a* C. M., 72 mm., Lagoa Feia, a swamp on a sugar plantation south of the mouth of the Parahyba.

From the Rio Itapemerim we have the following lot:

6986*a-f* C. M. 60–71 mm., Muniz Freire, June 18, 1908. Haseman.

Of the above No. 6981 has the barbels extending to the middle of the base of the anal. The pectoral spine is equal to the head less the opercle and has 11 teeth on the basal three-fourths of the spine; the teeth are graduated from the second, which is longer than the spine is wide. Width of occipital process 4.5 in the length; caudal 4 in the length; lateral band faint. With this 6984 and 6985 agree in almost every particular; the lateral band is sometimes conspicuous, continued on both head and caudal. Those nearest them in the character of pectoral spines are 6986. The barbels extend to near the tips of the ventrals or a little beyond them. The pectoral spine is equal to the snout and eye and has 6–8 teeth on the basal two-thirds of the posterior face; the teeth are graduated from the last, or the one next to the last, and the longest is greater than the width of the spine; width of occipital process 3–4 in its length; lateral band well defined, continued on head and caudal.

In 6982 and 6983 the maxillary barbel extends to the middle of the base of the anal or beyond, on one side of one individual approaching the caudal. The pectoral spine is equal to the snout and eye, plus or minus, and has 9 or 10 spines in 6983 and 11–14 in 6982; teeth not as wide as the spine, on the basal half or two-thirds of the posterior face. In the smallest they are graduated from the tip to

the base, in the larger from the middle both ways. Width of occipital process 4 in its length. Caudal 4 in the length. Lateral band variable, continued or not continued to snout and on the tail.

In 6987 the teeth of the pectoral spines, 7 in the smallest, 12 in the two larger, are distinctly smaller than in 6982, but they are otherwise very similar, and the teeth are much larger than in the specimens from the Itapicuru = *itapicuruensis*.

#### 20. *Pimelodella vittata* (Kröyer).

*Pseudorhamdia vittata* (KRÖYER) LÜTKEN, Velhas-Flodens Fiske; Dan. Vidensk. Selsk. Skr., 1874, p. 34 (Rio das Velhas); l. c., 1875, p. 173, with fig.

*Pimelodella vittata* EIGENMANN & EIGENMANN, Proc. Cal. Acad. Sci. (2), I, 1888, p. 133; Occasional Papers Cal. Acad. Sci., I, 1890, p. 159 (Rio São Francisco; Minas Geraes, São Matheo; Rio Jequitinhonha); Proc. U. S. Nat. Mus., XIV, 1891, p. 29; EIGENMANN, Reports Princeton Univ. Exped. Patagonia, III, 1910, p. 389.

*Rhamdia vittata* RIBEIRO, Fauna Bras., Peixes, IV, 1912, p. 272 (Rio das Velhas; Jaguará).

*Habitat*.—Eastern Brazil from the Rio São Francisco to São Matheo.

Mr. Haseman secured no specimens recognized as belonging to this species.

4258 I. U. M., 69 mm., Rio São Francisco, Thayer Expedition.

#### 21. *Pimelodella itapicuruensis* sp. nov. (Plate XXXI, fig. 3).

6974a C. M., type, 80 mm.; 6974b-m, paratypes, 72-104 mm., Queimadas, Rio Itapicuru, March 2, 1908. Haseman.

6938a C. M., 76 mm., Rio de Jacobina into Rio Itapicuru, Nov. 9, 1907. Haseman.

6940a-e C. M., 61-74 mm., Bom Fin, Rio Itapicuru, 6 miles north of Fazenda Amaratu, Nov. 2, 1908. Haseman.

6975a-b C. M., Agua Branca, into Itapicuru, Nov. 6, 1907. Haseman.

*Habitat*.—Rio Itapicuru, Eastern Brazil.

Head 4.3-4.5; depth 6.5-7.5; D. 1.6; A. 12; eye 3.26-3.5; width of head 1.5 in its length, depth of head at base of occipital process 1.66 in its length; adipose 2.8-3.33; usually a little over 3 in the length; maxillary barbel extending to caudal in one, to end of adipose in one, to tip of pectorals in another, usually to some point above the base of the anal. Dorsal spine nearer the snout than anal; distance between tip of snout and dorsal fulcrum 3.33-3.16 in the length. Dorsal spine slender, not equal to snout and eye; about 8 hooks in front, slightly roughened behind; pectoral spine about equal to snout and eye, with 8-12 short teeth along

the basal half or six-tenths of its posterior margin; sharp hooks along the distal portion of its anterior face; pectoral not nearly reaching ventrals, which are inserted below the end of the dorsal; ventrals not nearly reaching anal the tip of which does not extend to the end of the adipose; humeral spine reaching middle of pectoral spine; upper caudal lobe much longer; a distinct band from snout to caudal; base of dorsal hyaline.

6974*m* differs in having the dorsal 1.7; the adipose very short, 6 in the length, but extending beyond the tip of the anal; caudal lobes nearly equal in length, the upper 3.75 in the length. Eye larger than in specimens of *P. vittata* in the Museum of Comparative Zoölogy.

#### 22. *Pimelodella macturki* Eigenmann.

*Pimelodella macturki* EIGENMANN, Repts. Princeton Univ. Exp. Patagonia, III, 1910, p. 389; Mem. Carnegie Mus., Vol. V, 1912, p. 170, plate XVI, fig. 1 (Creek in Mora Passage, trenches at Morowhanna, and Georgetown).

*Habitat*.—British Guiana near the coast.

#### 23. *Pimelodella eigenmanni* Boulenger.

*Pimelodella buckleyi* EIGENMANN & EIGENMANN (*non* Boulenger), Occas. Papers Cal. Acad. Sci., I, 1890, p. 158 (Rio Parahyba; Macacos).

*Pimelodella eigenmanni* BOULENGER, Proc. Zoöl. Soc. London, 1891, p. 232 (based on *P. buckleyi* of Eigenmann & Eigenmann); EIGENMANN, Reports Princeton Univ. Exped. Patagonia, III, 1910, p. 389.

*Rhamdia eigenmanniorum* RIBEIRO, Fauna Bras., Peixes, IV, 1912, p. 213. Based on Eigenmann & Eigenmann *l. c.*

*Habitat*.—Eastern Brazil.

Head 4.5–5; depth 5.5–6.5; D. 1.6; A. 12–14 in the head, eye 3.5–4 in the head, in middle of the head; interorbital 1.33 in the eye, 5.3–6 in the head; maxillary barbel extending to the origin of the anal; postmentals to middle of pectoral; dorsal spine equidistant from snout and anal, its height 1.33 in the head; adipose 3.4–4 in the length, its distance from the dorsal equals the base of the latter. Caudal lobes of equal width, the upper longer, 4 in the length. Anal rounded; pectoral spine a little less than the length of the head, with teeth which are not more than one-fifth or one-sixth the width of the spine. A dark lateral band.

#### 24. *Pimelodella hartti* Steindachner.

*Pimelodus hartti* STEINDACHNER, Sb. Akad. Wiss. Wien, LXXIV, 1876, Süßwassf. Südöstl. Bras., III, p. 53 (Rio Parahyba).

*Pimelodella hartti* EIGENMANN & EIGENMANN, Proc. Cal. Acad. Sci., (2), I, 1888, p. 133; Occasional Papers Cal. Acad. Sci., I, 1890, p. 158; Proc. U. S. Nat. Mus., XIV, 1891, p. 29; EIGENMANN, Reports Princeton Univ. Exped. Patagonia, III, 1910, p. 389.

*Rhamdia hartti* RIBEIRO, Fauna Bras., Peixes, IV, 1912, p. 270.

*Habitat*.—Eastern Brazil in Rio Doce and Rio Parahyba.

6973a-x C. M., 42–100 mm., Rio Doce, May 24, 1908. Haseman.

This species is allied to *lateristriga*. The barbels are shorter, the pectoral spine with much more feeble teeth behind, and the head is more depressed and broader. The snout is rounded, the mouth inferior.

#### 25. *Pimelodella transitoria* (Ribeiro) = *lateristriga*?

*Rhamdia transitoria* RIBEIRO, Fauna Bras., Peixes, IV, 1912, p. 274 (R. Alambary, Iporanga).

6976a-d C. M., 110–about 130 mm., Xiririca, Rio Ribeira do Iguape, Dec. 5–8, 1908. Haseman.

6977a-f C. M., 35–106 mm., Morretes, on Rio Marunhy, into Rio Nhundiaquara into ocean at Paranagua, Jan. 2, 1909. Haseman.

6979a C. M., 115 mm., Piracicaba, Rio Tieté, Sept. 9, 1908. Haseman.

*Habitat*.—Southeastern Brazil.

These specimens representing the *P. transitoria* of Ribeiro can scarcely be separated from *P. lateristriga*. The largest are, however, larger than the largest of the typical *P. lateristriga*. The left maxillary extends to the end of the ventrals in the four specimens of 6976, in two others to the middle of the ventrals, and a little beyond the tip of the ventrals; the pectoral spine is about as long as the head less the opercle and provided with about 13 long recurved teeth along the basal three-fifths of the spine. The tip of the dorsal is dark.

In 6979 the maxillary barbel extends to the end of the base of the anal. In the largest of 6977 it extends just about to the middle of the ventrals; eye 4–4.5; interorbital 4.66–5.

#### 26. *Pimelodella meeki* Eigenmann. (Plate XXXII, figs. 1–2).

*Pimelodella eigenmanni* MEEK (*non* Boulenger), Proc. Biol. Soc. Washington, XVIII, 1905, p. 241 (São Paulo, Brazil).

*Pimelodella meeki* EIGENMANN, Reports Princeton Univ. Exped. Patagonia, III, 1910, p. 389 (São Paulo).

*Habitat*.—Rio Tieté, São Paulo, Brazil.

6980a-c C. M., 87–117 mm., Sapina, Rio Tieté, São Paulo, July 23, 1908. Haseman.

6978*a-y* C. M., 37–51 mm., Mogy das Cruzes, Rio Tieté, July 19, 1908. Haseman.

Allied to *P. lateristriga* and *P. transitoria*.

Head 4.25; depth 5; D. 1.6; A. 11; eye 4.5 in the head; interorbital equals eye; maxillary barbel reaching a little beyond base of ventrals; adipose 3.8 in the length; caudal 5; distance from snout to dorsal fulcrum 3 in the length; fins all small; pectoral spine equals snout and eye; 11 hooks on over half of the distal anterior face of the spine; 12 feeble teeth not over one-third as wide as the spine on a little over half of the posterior face of the spine; pectoral fin equals length of head less opercle; ventral fin equals snout and half the eye; base of anal equals length of snout; dorsal spine equals snout and half eye; a well-developed band from snout to caudal.

27. *Pimelodella griffini* sp. nov. (Plate XXXII, fig. 3).

6962 C. M., type, 87 mm.; 6963*a-c* C. M., paratypes, 55–88 mm., mountain rills near Sapucay, Paraguay, April 2, 1909. Haseman.

Distinguished by the filamentous dorsal ray.

Head 4–4.5; depth 5–5.5; depth of caudal peduncle one-half of greatest depth; D. 1.6; A. 13 counting everything; eye 1.6 in snout, 4 in head; 8 in interorbital; adipose 3.5–4.5 in the length; maxillary barbel reaching tip of ventrals or shorter; outer mentals but little if any beyond base of pectoral. Dorsal spine about equal to the pectoral spine, prolonged into a filament, spine and filament sometimes equal one-third of the length, the filamentous portion being sometimes longer than the spine. Pectoral spine with 9–11 spinules on the basal two-thirds of the posterior edge; the anterior edge with retrorse hooks near the tip and minute serrations the rest of the way; dorsal spine nearly smooth; upper caudal lobe the longer, the lower as long as the head; a dark band from anterior nares to end of middle caudal rays.

One specimen has a light band through the dorsal, the dorsal 1.7; the eye less than the interorbital.

28. *Pimelodella mucosa* Eigenmann & Ward. (Plate XXXIII, fig. 1).

*Pimelodella lateristriga* (non Müller & Troschel) EIGENMANN, part.<sup>13</sup> Ann. Carnegie Mus., IV, 1907, p. 114 (Villa Rica).

*Pimelodella mucosa* EIGENMANN & WARD, Ann. Carnegie Mus., IV, 1907, p. 114, plate XXXII, fig. 1; EIGENMANN, Reports Princeton Univ. Exp. Patagonia, III, 1910, p. 389.

<sup>13</sup> One of the small specimens referred to *Pimelodella lateristriga* seems to belong to this species; the others certainly do not.

*Habitat*.—Paraguay Basin.

10125 I. U. M., type, 126 mm., Bahia Negra, Paraguay, Anisits.

10200 I. U. M., part, 50 mm., Villa Rica, Anisits.

6959a C. M., 135 mm., Puerto Suarez, Paraguay, May 7, 1909. Haseman.

6960a-f C. M., 63-86 mm., Laguna Ypacary, Arequa, Paraguay, April 7, 1909. Haseman.

6972a C. M., 112 mm., near Berlin, Bolivia, Rio Mamoré, Sept. 14, 1909. Haseman.

Very similar to *P. gracilis* but the adipose distinctly shorter, the tip of the anal extending to or beyond the tip of the adipose.

Head 4; depth 5; D. I.6; A. 10-12; eye 3.5-4.5 in the head; interorbital 3.75-4; maxillary barbel to within an orbital diameter of the caudal or middle of caudal; adipose 3-3.66 in the length. Pectoral spine equal to length of head less opercle, with 5-9 recurved hooks near tip in front, these followed by about 30-40 tubercles, most of which are antrorse; 11-21 recurved teeth along most of the posterior margin; dorsal spine equal to snout and half of the eye. Caudal deeply forked, the lower lobe broader and longer, 3.5 in the length; the tip of the anal extends to or beyond the vertical from the tip of the adipose. A well-developed lateral band, heaviest behind the gill-opening. The maxillary barbel extends to near the base of the caudal and may extend beyond its tip. Eye 4 + in the head; interorbital equal to the eye. The adipose is 3-3.66 in the length.

KEY TO THE TRANS-ANDEAN SPECIES OF PIMELODELLA.<sup>14</sup>

- a. Upper caudal lobe about equal to head in length; pectoral spine with thorns for more than two-thirds its length.
- b. Basal four-fifths of pectoral spine with very strong hooks on its posterior face, the hooks of the distal half longer than the width of the spine at its base. Dorsal spine with a few teeth on its posterior face. Adipose fin 4.25-5 in the length, pectoral spine very little longer than snout and eye, maxillary barbel reaching to somewhere about the ventrals. Head 4.25; depth 5; D. I.6; A. 11-12.....29. *grisea* Regan.
- bb. Basal three-fourths or four-fifths of the pectoral spine with hooks along its posterior face, the hooks less than the width of the spine, posterior face of dorsal spine rough; adipose fin  $3\frac{1}{4}$ - $3\frac{1}{2}$  in the length, pectoral spine about equal to snout and eye. Maxillary barbels reaching somewhere about middle of adipose, shorter in the young. Head 4.8, depth 5.5; D. I.6; A. 12; a sharply defined lateral band.....30. *modesta* (Günther).
- bbb. Basal two-thirds of the pectoral spine with eight (6-8 *fide* Steind.) hooks; posterior face of dorsal spine smooth; adipose fin 2.66 in the length; pectoral spine very little less than snout and eye; maxillary barbel reaching the last third of the ventrals; head 4.33; depth 5; D. I.6; A. 12; no sharply defined lateral band.....31. *yuncensis* Steindachner.

<sup>14</sup> This account is extracted from the MS. of my forthcoming monograph on the fishes of Colombia. It was prepared in collaboration with Mr. Homer G. Fisher.

- aa. Upper caudal lobe much longer than the lower, much longer than head.
- c. Distal one-third or one-fourth of pectoral spine without hooks, the hooks strong.
- d. Adipose fin 3-3.5 in the length; pectoral spine equal to length of snout and eye; maxillary barbels reaching beyond the base of anal. Head 4.5-4.8; depth 5-6; D. 1.6; A. 11-12.  
32. *chagresi* (Steindachner).
- dd. Adipose fin 2.66-2.75 in the length, pectoral spine a little longer than snout and eye, maxillary barbel reaching beyond origin of anal. Head 4.75; depth 5.5; D. 1.6; A. 11.  
33. *clongata* (Günther).
- cc. Distal half of inner face of pectoral spine without hooks; adipose fin 3.25-3.5 in the length; pectoral spine equal to head less half or whole of opercle; maxillary barbels reaching beyond tip of ventrals in the small or anal in the large; head 4-4.66; depth 5.5; D. 1, 6; A. 11-12.  
34. *cutania* Regan.

29. *Pimelodella grisea* Regan. (Plate XXXIII, fig. 2).

*Pimelodella griseus* REGAN, Ann. and Mag. Nat. Hist., Ser. 7, Vol. XII, 1903, p. 625 (Northwestern Ecuador); EIGENMANN, Reports Princeton Univ. Exped. Patagonia, III, 1910, p. 389; REGAN, Ann. and Mag. Nat. Hist., Ser. 8, Vol. XII, 1913, p. 467 (Rio San Juan).

6751a-j C. M., 13588, I. U. M., 41, largest 165 mm., Rio Dagua at Cordova. Eigenmann.

6752a C. M., 13589, I. U. M., 2, 152 and 155 mm., San Juan half-way between Puerto Negria and Istmina. Eigenmann.

13598 I. U. M., 1, 116 mm., Istmina. Eigenmann.

*Habitat*.—San Juan River, Colombia, south to Northern Ecuador.

30. *Pimelodella modesta* (Günther).

*Pimelodus modestus* GÜNTHER, Proc. Zoöl. Soc. Lond., 1860, p. 239, pl. X, fig. C (Esmeraldas); Cat. Fishes Brit. Mus., V, 1864, p. 117 (Esmeraldas); Fish. Cent. Amer., 1866, p. 393 (Rio Chagres, Esmeraldas).

*Pimelodella modestus* EIGENMANN & EIGENMANN, Proc. Cal. Acad. Sci., (2), Vol. I, 1888, p. 133 (name); Occasional Papers Cal. Acad. Sci., I, 1890, p. 155 (rivers of Western Ecuador); EIGENMANN, Reports Princeton Univ. Exped. Patagonia, III, 1910, p. 389.

*Habitat*.—Patia, River of southern Colombia to the Chone River in Ecuador.

6743a-e C. M., 13574 I. U. M., 42, largest 122 mm., Chone, Ecuador. Henn.

6744a-l C. M., 13575 I. U. M., 19, largest 72 mm., Portovicio. Henn.

6745a-i C. M., 13583 I. U. M., 54, largest 140 mm., San Lorenzo, Rio Telembi, Jan. 14, 1913. Henn and Wilson.

6746a-i C. M., 13584 I. U. M., 57, largest 135 mm., Patia, between Magui and Telembi. Henn.



- 6747a-d C. M., 13585 I. U. M., 7, largest 117 mm., Telembi above Barbacoas, Jan. 13, 1913. Henn and Wilson.
- 6748a-c C. M., 3, largest 125 mm., Telembi, above Barbacoas, Jan. 15, 1913. Henn and Wilson.
- 6750a-c C. M., 13587 I. U. M., Creeks above Barbacoas, Jan. 17, 1913. Henn and Wilson.
- 6764a-i C. M., 13597 I. U. M., Patia, at mouth of Rio Guaitara. Henn.
- 6749a-l C. M., 13586 I. U. M., 21, largest 137 mm., Telembi, 8 miles above Barbacoas, Jan. 16, 1913. Henn and Wilson.

### 31. *Pimelodella yuncencis* Steindachner.

*Pimelodella yuncencis* STEINDACHNER, Denkschr. K. Akad. Wiss. Wien, LXXII, 1912, p. 47 (Pacasmayo, Peru); EIGENMANN, Reports Princeton Univ. Exped. Patagonia, III, 1910, p. 389.

*Rhamdia gilli* STARKS, Proc. U. S. Nat. Mus., XXX, 1906, p. 769, pl. LXV, fig. 1 (Rio Eten, Peru); EIGENMANN, l. c., p. 389.

Field Mus., 74 mm., April 2, 1912. Osgood.

*Habitat*.—Northwestern Peru.

The single specimen at my disposal has the following characters: Head 4.33; depth 5; D. 1.6; A. 12; eye 4.66 in the head, interorbital 3.66; pectoral spine nearly equal to snout and eye, with 8 thorns on the basal two-thirds of its posterior margin; maxillary barbel reaching to last third of the ventrals; nearly uniform dusky, without lateral band; fontanel a very narrow slit; occipital process not quite reaching the dorsal plate.

This species greatly resembles *P. avanhandavae*, which, however, has a broader fontanel and the occipital process meeting the dorsal plate.

### 32. *Pimelodella chagresi* (Steindachner). (Plate XXXIII, fig. 3).

*Pimelodus (Pseudorhamdia) chagresi* STEINDACHNER, Sb. Ak. Wien, LXXIV, Ichthyol. Beitr., IV, 1876, p. 34 (Rio Chagres and its tributary, near Obispo).

*Pimelodella chagresi* EIGENMANN & EIGENMANN, Proc. Cal. Acad. Sci. (2), I, 1888, p. 134 (Obispo River); Occasional Papers Cal. Acad. Sci., I, 1890, p. 160 (Rio Chagres and its tributaries); EIGENMANN, Reports Princeton Univ. Exped. Patagonia, III, 1910, p. 389.

*Habitat*.—Both slopes of Panama, Atrato, and Magdalena Basins. ? Rio Meta Basin.

6753a C. M., 1, 145 mm., Tambo. Wilson.

- 13590 I. U. M., 1, 7 mm., Certegui. Eigenmann.  
 6754a-d C. M., 13591 I. U. M., 7, largest 96 mm., Bernal Creek. Eigenmann.  
 6755a-c C. M., 13592 I. U. M., 5, largest 103 mm., Quibdo. Wilson.  
 6756a C. M., 1, 21 mm., Truando. Wilson.  
 13599 I. U. M., 1, 63 mm., Puerto Wilehes. Eigenmann.  
 6765a-i C. M., 13600 I. U. M., 18, largest 69 mm., Peñas Blanca. Eigenmann.  
 6766a C. M., 51 mm., Villavicencio? (Loc. 7). Gonzales.  
 6767a-f C. M., 13543 I. U. M., largest 55 mm., Apulo. Gonzales.  
 6768a-b C. M., 13544 I. U. M., largest 467 mm., Girardot. Eigenmann.  
 6769a C. M., 1, 63 mm., Honda. Eigenmann.

If 6766 from Villavicencio belongs to this species, this species is found both east and west of the Andes. But it is a small specimen and the positive identification across the Andes may be left till larger specimens are available for examination.

Meek & Hildebrand found this species to be abundant on both slopes of the central range in Panama.

### 33. *Pimelodella elongata* (Günther).

*Pimelodus elongatus* GÜNTHER, Proc. Zoöl. Soc. Lond., 1860, p. 238, pl. X, fig. B (fresh waters of Esmeraldas); Cat. Fish. Brit. Mus., V, 1864, p. 118 (Esmeraldas).

*Pimelodella elongatus* EIGENMANN & EIGENMANN, Proc. Cal. Acad. Sci. (2), I, 1888, p. 133 (name); Occasional Papers Cal. Acad. Sci., I, 1890, p. 155 (rivers of Western Ecuador); EIGENMANN, Princeton Univ. Exped. Patagonia, III, 1910, p. 389.

*Habitat*.—Rivers of Western Ecuador.

- 6741a-b C. M., 13572 I. U. M., 5, longest 92 mm., Vices, Ecuador. Henn.  
 6742a C. M., 13572 I. U. M., 3, longest 81 mm., Colimes, Ecuador. Henn.

### 34. *Pimelodella eutænia* Regan. (Plate XXXIV, fig. 7).

*Pimelodella eutænia* REGAN, Ann. and Mag. Nat. Hist. (8), Vol. XII, 1913, p. 466 (Rio San Juan).

*Habitat*.—San Juan, Dagua, and Patia Basins of Western Colombia.

- 6757a-j C. M., 18593 I. U. M., 66, largest 157 mm., Istmina. Wilson.  
 6758a C. M., 160 mm., San Juan at mouth of Rio Cueurrupi. Henn.  
 6759a-b C. M., 2, larger 126 mm., Condoto. Wilson.  
 6760a-j C. M., 13594 I. U. M., 32, largest 170 mm., Cisnero. Eigenmann.  
 6761a-j C. M., 13595 I. U. M., 42, largest 188 mm., San Lorenzo, Rio Telembi.  
 Henn and Wilson.

6762a C. M., 1, 150 mm., Caldas. Eigenmann.

6763a-d C. M., 13596 I. U. M., 8, largest 150 mm., Barbaeoas. Henn and Wilson.

### **Typhlobagrus Ribeiro.**

*Typhlobagrus* RIBEIRO, Kosmos, No. 1, January, 1907.

Type, *Typhlobagrus kronei* Ribeiro.

In all characters but the eyes like *Pimelodella*. The eyes lost.

### 35. *Typhlobagrus kronei* Ribeiro. "Ceguinho."

*Typhlobagrus kronei* RIBEIRO, Kosmos, No. 1, January, 1907; EIGENMANN, Reports Princeton Univ. Exped. Patagonia, III, 1910, p. 387; RIBEIRO, Fauna Bras., Peixes, IV, 1912, p. 250, Pl. XLII, figs. 2, 2A and 2B (Cavernas das Areiras, Iporanga, São Paulo); HASEMAN, Ann. Carnegie Mus., VII, 1912, p. 323 (Cavernas das Areiras).

7443a-x C. M., 23, 74-202 mm., Caverna das Areiras, Nov. 28, 1908. Haseman.

Head 4-4.2; depth about 5.5; D. usually 1.6, in one case, 1.7; A. 12-15 (usually 14). Maxillary barbel reaching to near middle of ventrals in youngest and oldest, sometimes a little longer or a little shorter, postmentals a little beyond base of pectoral. Fontanel narrow, extending to base of occipital crest, which reaches to dorsal plate, width of occipital crest nearly 4 in its length. Dorsal spine half or a little more than half the length of the head, a little less than the length of the pectoral spine; 8-14 moderate-sized thorns on the pectoral spine. Adipose fin about 3.75 in the length, its tip extending beyond the tip of the anal; caudal lobes of about equal width, the upper lobe the longer by .25 or .2 of the length of the head.

A distinct trace of a dark lateral band on some of the specimens; margin of dorsal sometimes dusky.

The region of the eye varies. No trace of an eye or optic nerve can be noticed in ordinary dissections of the alcoholic material at my disposal. The skin over the vanished eye is invaginated in various degrees, a distinct free orbital margin being quite evident in some specimens, less distinctly so in others. They appear as though the eye had been removed without greatly altering the region of the skin over them.

Ribeiro says: "Dentre os exemplares que tivemos em mãos, um possui um olho desenvolvido.

"Este facto prova perfeitamente a reversão, por herança, á um caracter de seus antepassados; o organo mede 4 millimetros no maior diametro e o peixe 150 millimetros.

“Essa predominancia hereditaria, tão frisante aqui, é certamente um documento de valor para a theoria genealogica, quando se vê que em 35 outros exemplares de todos os tamanhos, apenas uma estricta fenda indica a posição que outr’ora occupou esse importantissimo orgão. No exemplar que nós dissecámos, não conseguimos encontrar, siquer, vestigios do nervo optico e o seu logar estava, ao contrario, occupado pelo grosso ramo nervoso do barbilhão maxillar.”

It seems evident from the fact that the skin and the bones near the eye have undergone little or no change, while the eye has vanished but occasionally develops, that the process of its degeneration was very rapid.

## EXPLANATION OF PLATES.

## PLATE XXIX.

- FIG. 1. *Pimelodella serrata* Eigenmann. Type, C. M. No. 6967, 67 mm. San Joaquin, Bolivia.
- FIG. 2. *Pimelodella cristata* (Müller & Troschel). I. U. M. No. 12064, 176 mm. Below Potato Landing.
- FIG. 3. *Pimelodella avanhandavae* Eigenmann. Type, C. M. No. 6969, 85 mm. Salto Avanhandava.

## PLATE XXX.

- FIG. 1. *Pimelodella hasemani* Eigenmann. Type, C. M. No. 6968, 81 mm. San Antonio de Madeira.
- FIG. 2. *Pimelodella laticeps* Eigenmann. Type, C. M. No. 6957, 62 mm. Sapucay, Paraguay.
- FIG. 3. *Pimelodella notomelas* Eigenmann. Type, C. M. No. 6955, 51 mm. Caeres,

## PLATE XXXI.

- FIG. 1. *Pimelodella metae* Eigenmann. Type, C. M. No. 7141, 77 mm. Rio Negro, Villavieencio.
- FIG. 2. *Pimelodella boliviana* Eigenmann. Type, C. M. No. 6964, 90 mm. Santa Cruz de la Sierra.
- FIG. 3. *Pimelodella itapicuruensis* Eigenmann. Type, C. M. No. 6974. Rio Itapicuru.

## PLATE XXXII.

- FIG. 1. *Pimelodella meeki* Eigenmann. Type, Field M. No. 3400. São Paulo.
- FIG. 2. *Pimelodella meeki* Eigenmann. C. M. No. 6980, 117 mm. São Paulo.
- FIG. 3. *Pimelodella griffini* Eigenmann. Type, C. M. No. 6962, 87 mm. Sapucay, Paraguay.

## PLATE XXXIII.

- FIG. 1. *Pimelodella mucosa* Eigenmann. C. M. No. 6959, 135 mm. Puerto Suarez.  
 FIG. 2. *Pimelodella grisea* Regan. I. U. M. No. 148 mm. Cordova, Rio Dagua.  
 FIG. 3. *Pimelodella chagresi* (Steindachner). U. S. N. M., about 145 mm.

## PLATE XXXIV.

- FIG. 1. *Pimelodella eutania* Regan. I. U. M. No. 13593, 147 mm. Istmina.  
 FIG. 2. *Typhlobagrus kronei* Ribeiro. C. M. No. 7443, 146 mm. Caverna das Areiras.

## PLATE XXXV.

(Figures 1-44, left pectoral spines of various species of *Pimelodella* as seen from above. Figures 3, 5, 6, 7, 10, 11, 16, 18, 19, 21, 22, 23, 24, 25, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37, and 38 are camera sketches drawn to the same scale.)

	Length of Spine in mm.	Length of Specimen in mm.
FIG. 1. <i>Pimelodella serrata</i> Eigenmann. Type, C. M. No. 6966		110
FIG. 2. <i>P. hasemani</i> Eigenmann. Type, C. M. No. 6968		81
FIG. 3. <i>P. hasemani</i> Eigenmann. I. U. M. No. 4259	7	57
FIG. 4. <i>P. mucosa</i> Eigenmann. C. M. No. 6959		135
FIG. 5. <i>P. mucosa</i> Eigenmann. I. U. M. No. 10200	6	50
FIG. 6. <i>P. mucosa</i> Eigenmann. Type, I. U. M. No. 10125	20	126
FIG. 7. <i>P. roccæ</i> Eigenmann. Type, in M. C. Z.	21	144
FIG. 8. <i>P. avanhandava</i> Eigenmann. Type, C. M. No. 6969		85
FIG. 9. <i>P. laticeps</i> Eigenmann. C. M. No. 6958	12	89
FIG. 10. <i>P. transitoria</i> (Ribeiro). C. M. No. 6976	16	118
FIG. 11. <i>P. lateristriga</i> (Müller and Troschel). C. M. No. 6982	14	93
FIG. 12. <i>P. itapicuruensis</i> Eigenmann. Type, C. M. No. 6974		80
FIG. 13. <i>P. meeki</i> Eigenmann. Type, Field M. No. 3400	14	12
FIG. 14. <i>P. meeki</i> Eigenmann. C. M. No. 6980	12	105
FIG. 15. <i>P. eigenmanni</i> Boulenger. M. C. Z. No. 7510	25	168
FIG. 16. <i>P. vittata</i> (Kröyer). I. U. M. No. 4258	9	60
FIG. 17. <i>P. vittata</i> (Kröyer). M. C. Z. No. 7576	10	90
FIG. 18. <i>Typhlobagrus kronei</i> Ribeiro. C. M. No. 7443	22	160
FIG. 19. <i>T. kronei</i> Ribeiro. C. M. No. 7443	11	105
FIG. 20. <i>Pimelodella griffini</i> Eigenmann. Type, C. M. No. 6962		87
FIG. 21. <i>P. metæ</i> Eigenmann. C. M. No. 7442	10	95

FIG. 22.	<i>P. metæ</i> Eigenmann. Type, C. M. No. 7441.....	8	77
FIG. 23.	<i>P. yuncensis</i> Steindachner. In Field Mus.....	8	74
FIG. 24.	<i>P. chagresi</i> (Steindachner). In U. S. N. M.....	8	70
FIG. 25.	<i>P. chagresi</i> (Steindachner). In U. S. N. M.....	14	143
FIG. 26.	<i>P. pectinifer</i> Eigenmann. M. C. Z. No. 7508.....		190
FIG. 27.	<i>P. macturki</i> Eigenmann. I. U. M. No. 12068.....	9	71
FIG. 28.	<i>P. megalops</i> Eigenmann. I. U. M. No. 12066.....	12	95
FIG. 29.	<i>P. hartti</i> (Steindachner). C. M. No. 6973.....	14	101
FIG. 30.	<i>P. boliviana</i> Eigenmann. Type, C. M. No. 6964.....		90
FIG. 31.	<i>P. griffini</i> Eigenmann. C. M. No. 6963.....	10	90
FIG. 32.	<i>P. grisea</i> Regan. I. U. M. No. 13588.....	19	163
FIG. 33.	<i>P. grisea</i> Regan. I. U. M. No. 13588.....	13	115
FIG. 34.	<i>P. modesta</i> (Günther). I. U. M. No. 13583.....	16	130
FIG. 35.	<i>P. eutænia</i> Regan. I. U. M. No. 13593.....	8	67
FIG. 36.	<i>P. eutænia</i> Regan. I. U. M. No. 13593.....	18	144
FIG. 37.	<i>P. gracilis</i> (Cuvier and Valenciennes). I. U. M. No. 10205.....	19	160
FIG. 38.	<i>P. cristata</i> (Müller and Troschel). I. U. M. No. 12064.....	25	204
FIG. 39.	<i>P. cristata</i> (Müller and Troschel). C. M. No. 6936...		92
FIG. 40.	<i>P. cristata</i> (Müller and Troschel). C. M. No. 6936...		77
FIG. 41.	<i>P. notomelas</i> Eigenmann. C. M. No. 6956.....	6	53
FIG. 42.	<i>P. steindachneri</i> Eigenmann. M. C. Z. No. 5767....	17	136
FIG. 43.	<i>P. steindachneri</i> Eigenmann. M. C. Z. No. 7472....	20	175
FIG. 44.	<i>P. steindachneri</i> Eigenmann. M. C. Z. No. 7542....	27	213