



XIV. *An account of the Fishes of the States of Central America, based on collections made by Capt. J. M. DOW, F. GODMAN, Esq., and O. SALVIN, Esq. By ALBERT GÜNTHER, M.A., M.D., Ph.D., F.R.S., F.Z.S.*

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[PLATES LXIII. to LXXXVII.]

§ 1. *Introductory Historical Remarks on the Collections forming the basis of this Memoir.*

BEFORE proceeding to the enumeration and description of the fishes known to exist in the States of Central America, I may be permitted briefly to notice the circumstances which enable me to submit to the Society the results contained in the present memoir.

Mr. Salvin started in the year 1859 on his second excursion to Guatemala, chiefly with the intention of working out the ornithological fauna of that country. But having had his attention directed by me to the fact that its cold-blooded vertebrates were almost entirely unknown, he made and brought home a small collection of reptiles and fresh-water fishes, which proved to be of sufficient interest to encourage him to pay still more attention to this subject on a third excursion, which he undertook in company with Mr. Godman in the year 1861. By far the greater part of the materials which form the basis of this memoir were obtained on this occasion. Not only did the two travellers extend their excursions to various parts of Guatemala, but Mr. Salvin also visited Panama, where he met and collected in company with Capt. Dow, of the Panama Railway Company's Steamer 'Guatemala.'

Capt. Dow, indeed, had commenced to collect fishes previously to this, having sent several collections to the Smithsonian Institution in Washington, and to the Zoological Society of London, whence they were transferred to the British Museum; and for the last three years he has continued his researches with such zeal and liberality that I cannot abstain from acknowledging here the great services he has rendered to the cause of science.

The collections made by these gentlemen contained not less than about 1500 examples, in a perfect state of preservation, many of considerable size. In addition to these, I have examined a few which had been purchased of a dealer for the British Museum having been collected at Puerto Cabello in the Bay of Honduras, and, finally, those collected by Dr. Seemann, originally deposited in the Collection of Haslar Hospital, and now in the British Museum. The latter have lost much of their scientific value, as, unfortunately, no record was kept of the localities where they were obtained; and only in a few cases have I been able to avail myself of specimens of this collection, viz. where the original label, with the name of the collector, has been accidentally preserved.

§ 2. *Topographical Features of the Localities explored.*

As regards the topographical features of the localities explored by Messrs. Dow, Godman, and Salvin, I have been favoured by the latter gentleman, by whom also the accompanying map has been prepared, with the following notes:—

Lakes.

AMATITLAN.—The Lake of Amatitlan is situated in lat. $14^{\circ} 29' N.$, long. $90^{\circ} 35' W.$, in the Republic of Guatemala. Its elevation above the sea-level is about 4500 feet. Being only a short distance on the southern side of the main ridge, it collects the waters of a few small streams, which it discharges at its southern extremity, into the river Michatoya, a mountain-torrent for half its course, then expanding, like all the rivers of Guatemala which flow into the Pacific, into a broad shallow stream with a shifting sandy bed. The lake is very deep, and its water clear. The volcanoes of Pacaya and Agua rise amongst the mountains of its southern border, the whole forming a landscape of great beauty. Fish are caught during the rainy season near the outlet into the river Michatoya, and are sent to the market of the City of Guatemala.

ATITLAN.—The Lake of Atitlan is elevated 5000 feet above the sea. Like the last-mentioned it lies in Guatemala on the southern side of the main ridge, in lat. $14^{\circ} 43' N.$, long. $91^{\circ} 14' W.$ It has no visible outlet. The water is clear and fresh, and the lake of great depth. The hills on three sides attain to a height of 2000 feet above the lake. On its southern border the two large volcanoes of Toliman and S. Pedro rise, their bases being washed on one side by the lake, giving one the idea that one of them (that called Toliman) has in rising acted as a dam and stopped the outflow of the waters of a mountain-valley. A few small streams enter the lake, the water of which rises during the rainy season, to fall again in the dry. On the mountain-slope below, several streams take their rise, supplied probably by the filtration of water from the lake; but it would appear, from the alteration of the water-level in accordance with the season of the year, that it is chiefly influenced by evaporation. A number of Indian villages surround the lake; at one of them, Panajachel, a small collection of fish was made. Fish never seem to grow to any size in this lake, the Mojara (*Heros*) being quite diminutive. The Indians fish with round nets amongst the reeds that grow at the mouths of small streams. The lake itself is about twenty-two miles long, and twelve miles wide.

DUEÑAS.—This lake is little more than a depression in one of the elevated (5000 ft.) plains forming the tablelands of Guatemala. Its depth is nowhere more than 6 feet, and its banks are everywhere clothed with reeds. A small stream connects the lake with the river Guacalate. Here, too, fish are caught by the Indians in round nets, which are held by both hands, pushed in amongst the reeds, and suddenly brought to the surface.

HUAMUCHAL.—This name applies properly to a series of small lakes situated in about lat. $14^{\circ} 32' N.$, long. $92^{\circ} 13' W.$, close to one another, about six miles from the mouth of the river Tilapa on the Pacific coast. The place is not shown on any map; but it is near

the large Lake of Tamachian, with which, in the rainy season, all these smaller lakes are connected. During this period of the year the river Tilapa overflows its banks and inundates the whole country round. In the dry season water remains in depressions of the land, forming the lagoons of Huamuchal; but in years of great drought even these dry up, the fish being destroyed; but a fresh supply finds its way from Lake Tamachian during the next inundation. The water is slightly brackish. The fish are taken in drag-nets, salted, and sold to Indians coming from the Altos of Guatemala.

MANAGUA.—According to Mr. J. Bailey this lake is about fifty or sixty miles long, by thirty-five miles wide. Its depth varies from 2 to 10 and 15 fathoms, but in its deepest part reaches to as much as 40 fathoms. Its elevation above the sea is 156 feet. On its south-western border the lake is separated from the Pacific by a series of comparatively low hills, the lowest section of which, through the Plain of Leon, is only 230 feet above the ocean-level. The high mountains of the Republic of Honduras approach the north-eastern border of the lake. On its south-eastern side an opening communicates with the Lake of Nicaragua. Commencing with the Fall of Tipitapa, of 22 feet height, the river widens into the Estero of Panaloya, and thence into the larger lake.

NICARAGUA.—The same authority gives a length of one hundred and five miles to this lake, and a width of about forty-five, its depth being about 15 fathoms. The surface of the lake is studded with numerous islands, some of them, as Omotepec, being volcanic cones. The elevation of the lake above the mean ocean-level is given as 128 feet. The same line of low hills which divides Lake Managua from the Pacific separates Lake Nicaragua from the same ocean; but at no point is the elevation so low as at that above indicated. The river San Juan, a deep stream with several rapids, flows out of the south-eastern end of the lake, and falls into the Atlantic Ocean, at the port of Greytown, or San Juan del Norte.

PETEN.—The Lake of Peten is situated in lat. $17^{\circ} 10' N.$, long. $90^{\circ} W.$, and is one of several lakes formed at the base of the Promontory of Yucatan. Its length is about thirty miles, its width eight miles, and elevation above the sea 500 feet. The water is quite fresh, clear, and of considerable depth. Neither the Lake of Peten nor the adjoining Lake of Yasha has any outlet; and in both the water is rapidly increasing in expanse—so much so that several streets of the town of Flores, which stands on an island in Lake Peten, have been absorbed within a few years, and the posts of huts, which formerly were on dry ground, may now be seen standing in deep water. This increase of water can only be accounted for by supposing that a common subterranean outlet has been stopped up, or that the land of this district is experiencing a gradual subsidence. All the fish obtained here were caught with a hook and line, or speared. All the natives, even quite small children, are very expert in using a light spear formed of bamboo cane with an iron barb at the end.

YZABAL.—This lake, which is also called the Golfo Dulce, is about thirty or forty miles long, and ten to fifteen miles wide, and has a tolerably uniform depth of about 35

to 40 feet. It is situated in lat. $15^{\circ} 30' N.$, long. $89^{\circ} 15' W.$, at the bottom of the Bay of Honduras. One large river, the Polochic, enters this lake; and it has a narrow but deep outlet to the sea, called the Rio Dulce, which is navigated by small schooners plying between Belize and the town of Yzabal. It was near this last-mentioned place that a few species of fish were obtained.

Rivers.

BAYANO.—This is a river which rises in the narrow part of Central America, and flows into the Pacific a little to the southward of the Bay of Panama.

CAHABON.—The town of Cahabon, where a few fishes were obtained, is situated on an affluent of the river which bears this name. The main stream rises in the same marsh as the Polochic, but takes another valley, in Vera Paz, and again joins the Polochic, when they both flow into the Lake of Yzabal, and thence into the Atlantic.

CHAGRES.—This is the principal river of the Isthmus of Panama. It flows into the Atlantic. The fish were obtained near the railway bridge at Barbacoas, about halfway across the isthmus.

CHISOY.—Of the numerous names this river bears, I have chosen this for the principal stream which forms the large river that flows out into the Laguna de los Terminos, in the Bay of Campeachy. This branch is also known as the Rio Negro; and after receiving the water of the Rio de la Pasion, or Rio de Santa Isabel, as it is also called, the two are usually called the Usumacinta. Fishes were collected from this river near the Indian village of Cubulco; and a number were also procured by poisoning with herbs a small stream near Saouchil, an Indian village below the town of Coban, in Vera Paz.

GUACALATE.—Is one of the numerous rivers which drain the southern watershed of the main ridge into the Pacific. It flows past Antigua, the old capital of Guatemala. Fishes were obtained about 3500 feet above the sea, where the river is still quite a torrent.

MOTAGUA.—This river, the second largest in Guatemala, rises in the main ridge, and flows, with high mountains on either side, nearly due eastward into the Atlantic. Fishes abound in this river; and nearly every year a considerable length is poisoned, and a large quantity obtained. On one of these occasions a collection was made a little below the bridge over which the highroad from Guatemala to Vera Paz passes. Another collection came from lower down the stream, below the village of Tocoy.

SAN GERONIMO.—Is a tributary of the Chisoy before mentioned. A small collection was made near the village of San Geronimo, in a plain at the foot of the mountains whence it takes its rise.

SANTA ISABEL.—A small stream flowing into this river, one of the principal branches of the Usumacinta, was poisoned, and a number of small fishes obtained.

SAN SALVADOR.—A few small fishes were caught by Capt. Dow in a warm stream near the capital town of this republic.

Marine localities.

BELIZE.—All fishes from Belize were from the market, and were caught amongst the coral reefs which line this coast.

CARDON¹ ISLAND.—Is situated at the mouth of the fine harbour of Realejo, in Nicaragua. Fishes were found at low tide in the pools amongst the rocks, and caught with a landing-net.

CHIAPAM.—The whole coast of Guatemala, bordering the Pacific Ocean, is studded with a number of lagoons formed at the mouths of the numerous rivers which flow down from the neighbouring mountains. All these rivers are charged with volcanic sand, which is thrown back by the heavy surf that rolls in on this coast. The body of water brought down during the dry season is often insufficient to reduce this sandbar; and it frequently happens that all outlet to the sea is stopped. The accumulation of water during the rainy season breaks this barrier; but it again forms when the water subsides. About the period of the cessation of the rains the natives cut an artificial channel, which, at first widening of itself, often remains open some months, each tide bringing a great quantity of fishes into the lagoon, which are there netted by drag-nets. The water is almost salt, but varies in this respect according to the size of the river which enters it. A few fishes were also obtained by a hook and line from a canoe in the open sea.

LIBERTAD.—This is an open roadstead, the port of the City of San Salvador. Whilst we were lying at anchor here a few fishes were caught with a hook and line.

PANAMA.—Most of the fishes taken in the Bay of Panama were found in the pools amongst the rocks at low tide. A reef running out from the town was an excellent locality; one spring tide Capt. Dow and I secured twenty-four species in the course of half an hour.

SAN JOSÉ.—Is the port of Guatemala on the Pacific side; a few fishes were caught here in the open sea in a canoe.

§ 3. *Definition of the Boundaries of the Fauna treated of in this Memoir.*

Although we may presume that our account contains a tolerably complete list of the species inhabiting the localities visited, particularly as on several occasions poison (the best means for securing a complete series of the fishes of a certain locality) was resorted to, yet there is still a wide field for future explorers in a country where several forms (such as *Heros*, *Pimelodus*, and the *Cyprinodontes*) are so much developed and specialized. Of the fishes of Yucatan we still know absolutely nothing. The list of the marine fishes of the Atlantic coast will, without doubt, be considerably swelled, as the gentlemen mentioned paid much less attention to the Atlantic marine fauna (which would have yielded comparatively few novelties) than to the freshwater fauna. And knowing how little advantage is derived from, and how much confusion is caused by, receiving into a

¹ This name is misspelt "Cardova" in several places in the 3rd volume of the 'Catalogue of Fishes.'—A. G.

fauna species which may be *expected* to belong to it, although they are not yet discovered within its limits, I have excluded all species not actually known from Guatemala, although they have been obtained north and south of it. A collection made by Mr. Godman at Belize was of great value in determining this part of the fauna.

Numerous species of fishes have been described from Mexico¹; and if we were better acquainted with their geographical distribution, it would have been useful to treat at least of the southern portion of them, in conjunction with the Guatemalan species. Unfortunately but a small proportion of the exact localities are known, so that at present no line can be drawn to indicate where the preponderance of nearctic types over tropical ones terminates. Thus, confining myself to the fishes occurring between the political boundary of Guatemala in the north and the Isthmus of Darien in the south, I would repeat that, previously to the receipt of the collections forming the basis to this Memoir, only a small number had been described, as will be seen from the following remarks:—

§ 4. *Historical account of Publications previous to this Memoir.*

It would be of but little advantage to enumerate the few isolated species incidentally described in general works or memoirs as occurring in Guatemala or Panama. However, I must mention that the first traveller who collected fishes in these states appears to have been Baron von FRIEDRICHSTHAL. I am not aware that any account of his travels has been published; but in a paper published by the late JACOB HECKEL in 'Annalen des Wiener Museums,' vol. ii. 1840, a single species is described, which is stated to be from Friedrichsthal's Central-American Collection, and which I have recognized as belonging to the Lake-Peten fauna (*Heros friedrichsthalii*). The greater part of the collection made by this gentleman evidently remained unpublished until 1864, when Dr. F. STEINDACHNER determined from it four other species (Denkschr. Akad. Wiss. Wien, xxiii.), viz.:—*Heros urophthalmus* (Gthr.), *Heros triagramma*=*H. salvini* (Gthr.), *Heros melanopogon*, and *Petenia splendida* (Gthr.). As we have received four of these species from Lake Peten, it is very probable that Baron Friedrichsthal visited and collected in that locality.

In the second place I have to mention Dr. SEEMANN, who, as naturalist attached to the expedition of the 'Herald,' brought to England a collection of Central-American fishes. These, as I have mentioned above, were originally deposited in the collection of Haslar Hospital, but no record as regards the origin of the specimens was kept, so that most of them are lost for the purposes of this Memoir.

In the year 1861 I received the first collections from Mr. SALVIN and Capt. Dow. The species belonging to the families treated of in the 3rd volume of the 'Catalogue of Fishes' were described therein; and a separate account of those sent by the latter

¹ Prof. Troschel enumerates some 130 freshwater and marine species in Müller's 'Reisen in den Vereinigten Staaten,' &c.

gentleman from the Pacific Coast of Central America was published in the Society's 'Proceedings' for 1861 (Nov. 26); it contained fourteen species, ten of which were new.

In the following year the 4th volume of the 'Catalogue of Fishes' was published, containing the descriptions of those species of Pharyngognaths and Anacanthines which had arrived from our travellers, who were then engaged in collecting.

In the year 1863 Mr. GILL published a descriptive enumeration of a collection of "Fishes from the western coast of Central America, presented to the Smithsonian Institution by Capt. J. M. Dow." He distinguished in it the following twenty-five species, of which I consider eighteen to have been new to science (Proc. Ac. Nat. Sc. Philad. 1863, p. 162):—

1. *Diapterus dowii*, sp. n.=*Gerres dovii*.
2. *Pomacanthodes zonipectus*, Gill.
3. *Centropomus armatus*, sp. n.
4. *Epinephelus analogus*, sp. n.=*Serranus analogus*.
5. *Promicropterus decoratus*, sp. n.=*Rhypticus decoratus*.
6. *Bairdiella armata*, sp. n.=*Corvina armata*.
7. *Ophioscion typicus*, sp. n.=*Corvina ophioscion*.
8. *Amblyscion argenteus*, sp. n.
9. *Caranx panamensis*, Gill,=*Caranx speciosus* (Forsk.).
10. *Carangoides dorsalis*, sp. n.
11. *Carangus marginatus*, Gill,=*Caranx hippos*, L., var.
12. *Oligoplites inornatus*, sp. n.=*Chorinemus inornatus*.
13. *Exocetus dowii*, sp. n.
14. — *albidactylus*, sp. n.?=*E. bahiensis* (Ranz.).
15. *Upeneus grandisquamis*, sp. n.
16. *Trichidion opercularis*, sp. n.=*Polynemus opercularis*.
17. — *approximans*=*Polynemus approximans* (Lay & Benn.).
18. *Mugil guentherii*, Gill,=*M. brasiliensis* (Agass.).
19. *Batrachoides pacifici*=*Batrachus pacifici* (Gthr.).
20. *Dormitator microphthalmus*, Gill,=*Eleotris maculata* (Bl.).
21. *Leptarius dowii*, sp. n.=*Arius dovii*.
22. *Sciades troschelii*, sp. n.=*Arius troschelii*.
23. *Ælurichthys panamensis*, sp. n.
24. *Atractosteus tropicus*, sp. n.=*Lepidosteus tropicus*.
25. *Urotrygon mundus*, sp. n.

At later periods Mr. Gill has described some other species incidentally, which will be referred to in the general list.

A small collection made by Prof. M. WAGNER on the Isthmus of Panama, between 7° and 9° lat. N., and 77° and 83° long. W., was examined by Messrs. KNER & STEIN-

DACHNER, who gave a preliminary account of it in 'Sitzgsber. bayer. Akad. Wiss.' 1863, pp. 220-230, and more detailed descriptions in 'Abhandl. bayer. Akad. Wiss.' 1864(1865), pp. 1-61. Prof. M. Wagner added, besides, a detailed account of the hydrographical peculiarities of this part of Central America (pp. 65-92). The species treated of in these Memoirs are the following:—

1. *Pristipoma humile*, sp. n.
2. *Dajaus elongatus* (K. & St.)=*Agonostoma nasutum* (Gthr.).
3. *Dajaus monticola* (C. & V.).
4. *Acara cæruleopunctata*, sp. n.
5. *Heros altifrons*, sp. n.
6. *Heros sieboldii*, sp. n.
7. *Eleotris pictus*, sp. n.
8. *Engraulis macrolepidotus*, sp. n.
9. — *poëyi*, sp. n.
10. *Xiphophorus gillii*, K. & St.,=*Pæcilia*, sp. ?
11. *Macrodon brasiliensis*, K. & St.,=*M. microlepis* (Gthr.).
12. *Saccodon wagneri*, sp. n.
13. *Pseudochalceus lineatus*, sp. n.
14. *Chalcinopsis striatulus*, sp. n.
15. — *chagrensis*, sp. n.
16. *Chalceus atrocaudatus*, sp. n.
17. *Tetragonopterus æneus* (Gthr.).
18. — *gronovii* (C. & V. ?).
19. *Bagrus* (?) *arioides*, sp. n.=*Arius multiradiatus* (Gthr.).
20. *Pimelodus modestus* (Gthr.).
21. — *cinerascens* (K. & St.)=*P. wagneri* (Gthr.).
22. *Loricaria uracantha*, sp. n.
23. — *lima* (Kner).
24. *Hypostomus plecostomus* (K. & St.)=*Plecostomus*, sp.
25. *Ancistrus cirrhosus* (C. & V.).
26. *Acanthias vulgaris* (Risso ?).

Finally, having received in 1864 the last collections made by Messrs. Godman & Salvin, I gave preliminary notices of the new species in the 'Proceedings' of this Society, embodying the numerous contributions to our knowledge of the Siluroids and Characinoids in the fifth volume of the 'Catalogue of Fishes,' to which were added the Cyprinodontes and Scombresocides in the sixth (1865-66).

§ 5. General List of Central-American Fishes.

After these introductory remarks on the contributions to the ichthyology of Central

America preceding this Memoir, I at once proceed to give a list of all the species known to exist in these countries. There are comparatively few which I do not know from autopsy; their names are printed in italics. An asterisk (*) marks those which are described or remarked upon. The second column contains chiefly the names of the localities where they have been found within the limits of Central America. The localities of species occurring on both sides of the Isthmus are printed in italics; of these I shall treat again subsequently. Finally, the letter M signifies that a species is marine, B that it is known from brackish, and F that it is from fresh water.

ACANTHOPTERYGII.

Fam. PERCIDÆ.

CENTROPOMUS, *Cuv.*

1. **appendiculatus*, *Poey* Chagres R. (Cuba, Mex., Surin.) F. & M.
2. **medius*, *Gthr.* Chiapam B.
3. **nigrescens*, *Gthr.* Chiapam B.
4. **parallelus*, *Poey* Chagres R. (W. Indies, Bahia) F. & M.
5. **armatus*, *Gill* Chiapam B.
6. **ensiferus*, *Poey* Belize (Cuba, Jamaica, Guyanas) B.

CENTROPRISTIS, *Bris. de Barnev*

7. **macropoma*, *Gthr.* Panama M.

SERRANUS, *Cuv.*

8. **creolus*, *C. & V.* *Atl. & Pac.* M.
9. *striatus*, *Bl.* Atlant. M.
10. *coronatus*, *C. & V.* Atlant. M.
11. *undulosus*, *C. & V.* Atlant. M.
12. **sellicauda*, *Gill* Pacific Coast M.
13. **analogus*, *Gill* Pacific Coast M.?

PLECTROPOMA, *Cuv.*

14. **afrum*, *Bl.* *Atl. & Pac.* M.

RHYPTICUS, *Cuv.*

15. **decoratus*, *Gill* Pacific Coast M.

MESOPRION, *Cuv.*

16. *chrysurus*, *Bl.* Atlant. M.
17. *griseus*, *C. & V.* *Atl. & Pac.* M.
18. *uninotatus*, *C. & V.* *Atl. & Pac.* M.
19. **aratus*, *Gthr.* Chiapam, Panama M. & B.
20. *vivanus*, *C. & V.* Atlant. M.

APOGON, *Lacép.*

21. **dovii*, *Gthr.* Pacific Coast M.

Fam. PRISTIPOMATIDÆ.

PRISTIPOMA, Cuv.

22. *melanopterus, C. & V. Atl. & Pac. M.
 23. *virginicum, L. Atl. & Pac. M.
 24. *dovii, Gthr. Panama : M.
 25. *chalceum, Gthr. Panama M.
 26. *humile, Kner & Steind. Rio Bayano F.
 27. *macracanthum, Gthr. Chiapam B.
 28. croco, C. & V. Rio Motagua (Trop. Amer., Atlant.) . . . F., B., & M.
 29. *leuciscus, Gthr. San José, Chiapam, Panama B.

CONODON, C. & V.

30. *pacifici, Gthr. Chiapam B.

HEMULON, Cuv.

31. chromis, Brouss. Atlant. M.
 32. canna, C. & V. Atlant. M.
 33. xanthopterus, C. & V. Atlant. M.
 34. *brevirostrum, Gthr. Panama, Puerto Cabello M.
 35. *margaritifera, Gthr. Panama M.

LOBOTES, Cuv.

36. auctorum, Gthr. Atlant. (India) B.

Fam. SQUAMIPINNES.

CHÆTODON, Cuv.

37. striatus, L. Atlant. M.
 38. capistratus, L. Atlant. M.
 39. *humeralis, Gthr. Panama (Sandwich Isl.) M.

POMACANTHUS, Lacép.

40. paru, Gthr. Atlant. (Colon) M.
 41. *zonipectus, Gill Pac. M.

EPHIPPIUS, Cuv.

42. faber, Bl. Atlant. (Belize) M.

Fam. MULLIDÆ.

UPENEUS, C. & V.

43. *tetraspilus, Gthr. Panama M.
 44. *grandisquamis, Gill Panama M.

Fam. SPARIDÆ.

SARGUS, Cuv.

45. unimaculatus, Bl. Atlant. (Belize) M.
 46. aries, C. & V. Atlant. (Belize) M.

CHRYSOPHRYS, Cuv.

47. *calamus, C. & V. Atl. & Pac. (Panama) M.

PIMELEPTERUS, Cuv.

48. boscii, Lacép. Atl. & Pac. (Chiapam & Panama) M.

Fam. CIRRHITIDÆ.

CIRRHITICHTHYS, *Blkr.*

49. *rivulatus, *Val.* Galapagos Islands, Panama M.

Fam. SCORPÆNIDÆ.

SCORPÆNA, *Art.*

50. plumieri, *Bl., Schn.* Atl. & Pac. (Panama) M.

Fam. POLYNEMIDÆ.

POLYNEMUS, *L.*

51. *melanopoma, *Gthr.* San José M.
 52. *approximans, *Lay & Benn.* Pacif., Chiapam, Panama M.
 53. *opercularis, *Gill.* Pacif. M.

Fam. SCLÆNIDÆ.

LARIMUS, *C. & V.*

54. *breviceps, *C. & V.* Atl. & Pac. (Panama) M.

MICROPOGON, *Cuv. & Val.*

55. undulatus, *L.* Atlant. M. & F.
 56. *altipinnis, *Gthr.* Chiapam, San José, Panama M. & B.

UMBRINA, *Cuv.*

57. *elongata, *Gthr.* Chiapam B.
 58. *nasus, *Gthr.* Panama M.
 59. * analis, *Gthr.* Panama M.

CORVINA, *Cuv.*

60. ronchus, *C. & V.* Atlant. M.
 61. *chrysoleuca, *Gthr.* Panama M.
 62. *vermicularis, *Gthr.* Panama M.
 63. *armata, *Gill.* Pacif.
 64. *ophioscion, *Gthr.* Panama M.

OTOLITHUS, *Cuv.*

65. *squamipinnis, *Gthr.* Panama M.
 66. *albus, *Gthr.* Chiapam B.
 67. *reticulatus, *Gthr.* San José, Chiapam M. & B.

Fam. ACRONURIDÆ.

ACANTHURUS, *Schn.*

68. chirurgus, *Bl.* Atlant. M.

Fam. CARANGIDÆ.

CARANX, *Gthr.*

69. crumenophthalmus, *Bl.* Atl. & Pac. M.
 70. amblyrhynchus, *C. & V.* Atlant. M.
 71. *leucurus, *Gthr.* Panama M.
 72. *speciosus, *Forsk.* From Pauama to East Africa M.

73. carangus, <i>Bl.</i>	<i>Atlant. & Ind. Occ.</i> (Chiapam & Belize)	M.
74. *hippos, <i>L.</i>	<i>Tropics generally</i>	M.
75. *caballus, <i>Gthr.</i>	Panama	M.
76. *caninus, <i>Gthr.</i>	Panama	M.
77. *dorsalis, <i>Gill</i>	San Diego (Cal.), Panama	M.
<i>ARGYRIOSUS, Lac.</i>		
78. vomer, <i>L.</i>	<i>Atl. & Pac.</i> (Belize, Chiapam, Panama)	B. & M.
79. setipinnis, <i>Mitch.</i>	<i>Atl. & Pac.</i> (Panama)	M.
<i>CHORINEMUS, C. & V.</i>		
80. occidentalis, <i>L.</i>	<i>Atlant.</i>	M.
81. saliens, <i>Bl.</i>	<i>Atlant. & Pac.</i> (Chiapam, Isabel)	B. & F.
82. *altus, <i>Gthr.</i>	Panama	M.
83. *inornatus, <i>Gill</i>	Panama	M.
<i>TRACHYNOTUS, C. & V.</i>		
84. ovatus, <i>L.</i>	<i>Atl., Pac., & Ind. Oc.</i> (Panama)	M.
85. *fasciatus, <i>Gill</i>	Panama, San José	M.

Fam. SCOMBRIDÆ.

<i>PELAMYS, C. & V.</i>		
86. *sarda, <i>Bl.</i>	<i>Atl. & Pac.</i>	M.
<i>CYBIUM, Cuv.</i>		
87. maculatum, <i>Mitch.</i>	<i>Atlant.</i> (Belize)	M.
<i>ECHENEIS, Art.</i>		
88. remora, <i>L.</i>	<i>Atl., Pac., & Ind. Oc.</i>	M.
89. naucrates, <i>L.</i>	<i>Atl., Pac., & Ind. Oc.</i>	M.

Fam. BATRACHIDÆ.

<i>BATRACHUS, Gthr.</i>		
90. *pacifici, <i>Gthr.</i>	<i>Panama, West Coast of Africa</i>	M.
91. surinamensis, <i>Bl. Schn.</i>	<i>Atl. & Pacif.</i> (Panama)	M.
* <i>THALASSOPHYRNE, Gthr.</i>		
92. *maculosa, <i>Gthr.</i>	Puerto Cabello	M.
93. *reticulata, <i>Gthr.</i>	Panama	M.
<i>PORICHTHYS, Girard.</i>		
94. porosissimus, <i>C. & V.</i>	<i>Atl. & Pac.</i>	M.

Fam. PEDICULATI.

<i>ANTENNARIUS, Commers.</i>		
95. *leopardinus, <i>Gthr.</i>	Panama	M.
96. *tenuifilis, <i>Gthr.</i>	Panama	M.

Fam. GOBIIDÆ.

<i>GOBIUS, Art.</i>		
97. soporator, <i>C. & V.</i>	<i>Atl. & Pac.</i> (Panama)	M. & B.
98. paradoxus, <i>Gthr.</i>	Panama	M.

99. <i>mexicanus</i> , <i>Gthr.</i>	Mexico, Rio Motagua	F.
100. <i>seminudus</i> , <i>Gthr.</i>	Panama	M.
<i>EUCTENOGOBIOUS</i> , <i>Gill.</i>		
101. <i>sagittula</i> , <i>Gthr.</i>	Panama	M.
<i>SICYDIUM</i> , <i>C. & V.</i>		
102. <i>plumieri</i> , <i>Bl.</i>	<i>Atl. & Pac.</i> (Panama)	M.
<i>ELEOTRIS</i> , <i>Cuv.</i>		
103. <i>*maculata</i> , <i>Bl.</i>	<i>Atl. & Pac.</i> (Huamuchal)	B.
104. <i>somnolenta</i> , <i>Girard</i>	<i>Atl. & Pac.</i> (Cardon)	M.
105. <i>dormitatrix</i> , <i>Bl.</i>	Atl. (Rio Motagua, Yzabal)	F. & B.
106. <i>*longiceps</i> , <i>Gthr.</i>	Lake of Nicaragua	F.
107. <i>*picta</i> , <i>Kner</i>	Rio Bayano	F.
108. <i>*seminuda</i> , <i>Gthr.</i>	Panama	M.
<i>AMBLIOPUS</i> , <i>C. & V.</i>		
109. <i>*brevis</i> , <i>Gthr.</i>	Panama	M.

Fam. BLENNIIDÆ.

<i>BLENNIUS</i> , <i>Artedi.</i>		
110. <i>brevipinnis</i> , <i>Gthr.</i>	Pacif.	M.
<i>SALARIAS</i> , <i>Cuv.</i>		
111. <i>atlanticus</i> , <i>C. & V.</i>	<i>Atl. & Pac.</i>	M.
<i>CLINUS</i> , <i>Gthr.</i>		
112. <i>nuchipinnis</i> , <i>Q. & G.</i>	<i>Atl. & Pac.</i>	M.
113. <i>delalandii</i> , <i>C. & V.</i>	<i>Atl. & Pac.</i>	M.
114. <i>*macrocephalus</i> , <i>Gthr.</i>	Panama	M.
<i>CREMNOBATES</i> , <i>Gthr.</i>		
115. <i>*monophthalmus</i> , <i>Gthr.</i>	Panama	M.

Fam. SPHYRÆNIDÆ.

<i>SPHYRÆNA</i> , <i>Artedi.</i>		
116. <i>picuda</i> , <i>Bl.</i>	Atl.	M.
117. <i>forsteri</i> , <i>C. & V.</i>	Ind. Oc. & Pac. (Chiapam)	M. & B.

Fam. ATHERINIDÆ.

<i>ATHERINICHTHYS</i> , <i>Gthr.</i>		
118. <i>*pachylepis</i> , <i>Gthr.</i>	Panama	M.
119. <i>*guatemalensis</i> , <i>Gthr.</i>	Huamuchal	B.

Fam. MUGILIDÆ.

<i>MUGIL</i> , <i>Artedi.</i>		
120. <i>*brasiliensis</i> , <i>Agass.</i>	<i>Atl. & Pac.</i>	M. & F.
121. <i>*incilis</i> , <i>Hancock</i>	Atl. (Chagres)	M. & F.
122. <i>proboscideus</i> , <i>Gthr.</i>	<i>Atl. & Pac.</i> (Cardon)	M. & F.
<i>AGONOSTOMA</i> , <i>Benn.</i>		
123. <i>*microps</i> , <i>Gthr.</i>	Rio Guacalate	F.

124. *nasutum, *Gthr.* { Rivers of both sides of C. America (R. San Geronimo,
R. Motagua, Panama) F.
125. *monticola, *Bancroft* W. Indies and rivers of both sides of C. America . . . F.
Myxus, *Gthr.*
126. *harengus*, *Gthr.* Panama M.

Fam. FISTULARIIDÆ.

FISTULARIA, *Lacép.*

127. *tabaccaria*, *L.* Atl. & Pac. M.

Fam. GOBIESOCIDÆ.

SICYASES, *Müll. & Trosch.*

128. *fasciatus*, *Ptrs.* Puerto Cabello M.

GOBIESOX, *Lacép.*

129. **rhodospilus*, *Gthr.* Panama M.
130. *nigripinnis*, *Ptrs.* Puerto Cabello M.
131. *nudus*, *Bl.* Atl. & Pac. (Cardon) M.

PHARYNGOGNATHII ACANTHOPTERYGII.

Fam. POMACENTRIDÆ.

POMACENTRUS, *C. & V.*

132. **rectifrænum*, *Gill* Pacif. & Atl. M.
133. *leucostictus*, *Müll. & Trosch.* . Atl. M.

GLYPHIDODON, *Cuv.*

134. *saxatilis*, *L.* Atl. M.
135. *concolor*, *Gill* Atl. & Pac. (Cardon) M.
136. *declivifrons*, *Gill* Pac. (Cardon) M.

HELIASTES, *C. & V.*

137. **marginatus*, *Casteln.* . . . Atl. & Pac. M.

Fam. LABRIDÆ.

LACHNOLEMUS, *C. & V.*

138. *falcatus*, *L.* Atl. M.

COSSYPHUS, *Günth.*

139. *rufus*, *L.* Atl. M.
140. *diplotænia*, *Gill* Panama, Lower Calif. M.
141. **pectoralis*, *Gill* Panama, Lower Calif., St. Helena (? Cuba) . . . M.

PLATYGLOSSUS, *Gthr.*

142. *bivittatus*, *Bl.* Atl. M.
143. **dispilus*, *Gthr.* Panama M.

PSEUDOJULIS, *Blkr.*

144. **notospilus*, *Gthr.* Panama M.

JULIS, *Gthr.*

145. *lucasana*, Gill Panama, Lower Calif. M.

SCARUS, *Blkr.*

146. *abildgaardii*, Bl. Atl. M.

PSEUDOSCARUS, *Blkr.*

147. *sanctæ crucis*, Bl. Atl. M.

148. *guacamaia*, C. & V. Atl. M.

Fam. GERRIDÆ.

GERRES, *Cuv.*

149. *plumieri*, C. & V. Atl. F., B., & M.

150. **axillaris*, *Gthr.* Chiapam B.

151. **brevimanus*, *Gthr.* Chiapam B.

152. *rhombeus*, C. & V. Atl. & Pac. (Chiapam) B. & M.

153. *squamipinnis*, *Gthr.* (Jamaica) Atl. & Pac. (Chiap. & Panama). B. & M.

154. *aprion*, C. & V. Atl. & Pac. (Panama) M.

155. **dovii*, Gill Pac.

Fam. CHROMIDES.

ACARA, *Gthr.*

156. **cæruleopunctata*, Kner & Steind. Chagres River F.

HEROS, *Gthr.*

157. **parma*, *Gthr.* Mexico, R. Chagres & R. Motagua F.

158. **margaritifer*, *Gthr.* Lake Peten F.

159. **melanopogon*, Steindachner . . . ? Lake Peten F.

160. **melanurus*, *Gthr.* Lake Peten F.

161. **macracanthus*, *Gthr.* Chiapam & Huamuchal F. & B.

162. **spilurus*, *Gthr.* Rio Motagua, Yzabal F.

163. **nigrofasciatus*, *Gthr.* Lakes of Amatitlan & Atitlan F.

164. **multispinosus*, *Gthr.* Lake of Managua F.

165. **longimanus*, *Gthr.* Lake of Nicaragua F.

166. **urophthalmus*, *Gthr.* Lake Peten F.

167. **aureus*, *Gthr.* Yzabal, Rio Motagua F.

168. **affinis*, *Gthr.* Lake Peten F.

169. **labiatus*, *Gthr.* Lakes of Managua & Nicaragua F.

170. **erythræus*, *Gthr.* Lake of Managua F.

171. **lobochilus*, *Gthr.* Lake of Managua F.

172. **citrinellus*, *Gthr.* Lake of Nicaragua F.

173. **altifrons*, Kner & Steind. Western Veragua F.

174. **friedrichsthalii*, Heck. Lake Peten F.

175. **salvini*, *Gthr.* Santa Isabel, Lake Peten F.

176. **trimaculatus*, *Gthr.* Chiapam, Huamuchal F. & B.

177. **dovii*, *Gthr.* Lake of Nicaragua F.

178. **motaguensis*, *Gthr.* Rio Motagua F.

179. *managuensis, <i>Gthr.</i>	Lake of Managua	F.
180. *microphthalmus, <i>Gthr.</i>	Rio Motagua	F.
181. *oblongus, <i>Gthr.</i>	Rio Motagua	F.
182. *nicaraguensis, <i>Gthr.</i>	Lake of Nicaragua	F.
183. *godmanni, <i>Gthr.</i>	River of Cahabon	F.
184. *sieboldii, Kner & Steindachner	New Granada	F.
185. *guttulatus, <i>Gthr.</i>	Lake of Amatitlan	F.
186. *irregularis, <i>Gthr.</i>	Rio Usumacinta, S. Geronimo	F.
187. *intermedius, <i>Gthr.</i>	Lake Peten	F.
188. *angulifer, <i>Gthr.</i>	Yzabal	F.
*PETENIA, <i>Gthr.</i>		
189. *splendida, <i>Gthr.</i>	Lake Peten	F.
*NEETROPLUS, <i>Gthr.</i>		
190. *nematopus, <i>Gthr.</i>	Lake of Managua	F.

ANACANTHINI.

Fam. LYCODIDÆ.

*MICRODESMUS, *Gthr.*

191. *dipus, <i>Gthr.</i>	Panama	M.
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Fam. OPHIDIIDÆ.

BROTULA, *Cuv.*

192. *?multibarbata, <i>Schleg.</i>	Pac. coast	M.
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DINEMATICHTHYS, *Blkr.*

193. marginatus, <i>Ayres</i>	Panama	M.
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OPHIDIUM, *Cuv.*

194. brevibarbe, <i>Cuv.</i>	Atl. & Pac.	M.
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Fam. PLEURONECTIDÆ.

CITHARICHTHYS, *Blkr.*

195. *spilopterus, <i>Gthr.</i>	Atl. & Pac. (Chiapam)	M. & B.
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196. *guatemalensis, <i>Blkr.</i>	Guatemala	
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HEMIRHOMBUS, *Blkr.*

197. *ovalis, <i>Gthr.</i>	Pac.	M.
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PSEUDORHOMBUS, *Blkr.*

198. *brasiliensis, <i>Ranzani</i>	Atl.	M.
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SOLEA, *Gthr.*

199. scutum, <i>Gthr.</i>	Panama	M.
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APHORISTIA, *Kaup.*

200. *ornata, <i>Lacép.</i>	Atl. & Pac.	M.
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PHYSOSTOMI.

Fam. SILURIDÆ.

AMIURUS, *Rafin.*

201. *meridionalis, *Gthr.* Rio Usumacinta F

PIMELODUS, *Gthr.*

202.	<i>modestus, Gthr.</i>	Rio Chagres, Esmeraldas	F.
203.	<i>guatemalensis, Gthr.</i>	Huamuchal	F.
204.	<i>godmanni, Gthr.</i>	Lower Vera Paz, Rio Motagua, Mexico	F.
205.	<i>*wagneri, Gthr.</i>	<i>Pacific & Atlantic rivers of Panama</i>	F.
206.	<i>*managuensis, Gthr.</i>	Lake of Managua	F.
207.	<i>micropterus, Gthr.</i>	Rio San Geronimo	F.
208.	<i>nicaraguensis, Gthr.</i>	Lake of Nicaragua	F.
209.	<i>petenensis, Gthr.</i>	Lake Peten	F.
210.	<i>motaguensis, Gthr.</i>	Rio Motagua	F.
211.	<i>salvini, Gthr.</i>	Rio San Geronimo	F.
212.	<i>polycaulus, Gthr.</i>	Rio San Geronimo	F.

ARIUS, *Gthr.*

213.	<i>guatemalensis</i> , <i>Gthr.</i>	Chiapam, Panama	B.
214.	<i>*assimilis</i> , <i>Gthr.</i>	Lake of Yzabal	F.
215.	<i>platypogon</i> , <i>Gthr.</i>	San José	F.
216.	<i>seemanni</i> , <i>Gthr.</i>	—?	
217.	<i>cærulescens</i> , <i>Gthr.</i>	Huamuchal	F.
218.	<i>troscheli</i> , Gill	Pac.	
219.	<i>*dovii</i> , Gill	Pac.	
220.	<i>melanopus</i> , <i>Gthr.</i>	Rio Motagua	F.
221.	<i>multiradiatus</i> , <i>Gthr.</i>	Rio Bayano	F.

ÆLURICHTHYS, Baird & Gir.

222. * <i>nuchalis</i> , <i>Gthr.</i>	Panama
223. * <i>panamensis</i> , Gill	Panama

PLECOSTOMUS, *Gthr.*

224. *?*sp.*, Kner & Steindachner . . . Rio Chagres F

CHÆTOSTOMUS, *Heck.*

225. * <i>aspidolepis</i> , <i>Gthr.</i>	Veragua	F.
226. *? <i>cirrhosus</i> , Val.	Rio Chagres	F.

LORICARIA, *Lacép.*

227. **uracantha*, Kner & Steindachner. *Atlantic & Pacific rivers of Panama* F.
228. *lima*, Kner *Atlantic & Pacific rivers of Panama* F.

Fam. CHARACINIDÆ.

MACRODON, Müll. & Trosch.

229. *microlepis, *Gthr.* *W. Ecuador, Rio Chagres* F

TETRAGONOPTERUS, *Cuv.*

230. *fasciatus*, *Cuv.* { From Brazil to Mexico (Huamuchal, Rio Guacalate,
Rio Motagua, Rio Chisoy) F

231. <i>microphthalmus</i> , <i>Gthr.</i>	Lake of Amatitlan, Pacif. Coast of Guatemala, Peru.	F.
232. <i>panamensis</i> , <i>Gthr.</i>	<i>Panama, Yzabal</i>	F.
233. <i>brevimanus</i> , <i>Gthr.</i>	Rio S. Geronimo, Yzabal	F.
234. <i>petenensis</i> , <i>Gthr.</i>	<i>Lake Peten, W. Ecuador</i>	F.
235. <i>humilis</i> , <i>Gthr.</i>	Lake of Amatitlan	F.
236. <i>*æneus</i> , <i>Gthr.</i>	Mexico, <i>Pacific & Atlantic rivers of Panama</i>	F.
<i>CHALCINOPSIS</i> , <i>Kner.</i>		
237. <i>*dentex</i> , <i>Gthr.</i>	<i>Rio Motagua and Usumacinta, Yzabal; Ecuador</i>	F.
238. <i>striatulus</i> , <i>Kner</i>	<i>Pacific & Atlantic rivers of Panama</i>	F.
239. <i>chagrensis</i> , <i>Kner</i>	Rio Chagres	F.
<i>ANACYRTUS</i> , <i>Gthr.</i>		
240. <i>*guatemalensis</i> , <i>Gthr.</i>	<i>Rio Chagres, Huamuchal</i>	F.

Fam. SCOPELIDÆ.

SAURUS, *C. & V.*

241. <i>foetens</i> , <i>L.</i>	<i>Atl. & Pac.</i>	M.
242. <i>myops</i> , <i>Bl.</i>	<i>Atl. & Pac.</i>	M.

Fam. SCOMBRESOCIDÆ.

HEMIRHAMPHUS, *Cuv.*

243. <i>unifasciatus</i> , <i>Ranzani</i>	<i>Atlantic, Pacific, & Indian Oceans</i>	M.
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EXOCÆTUS, *Artemi.*

244. <i>*callopterus</i> , <i>Gthr.</i>	<i>Pac.</i>	M.
245. <i>albidactylus</i> , Gill (? = <i>bahiensis</i> , <i>Ranz.</i>)	<i>Pac.</i>	M.
246. <i>dovii</i> , Gill	<i>Pac.</i>	M.

Fam. CYPRINODONTIDÆ.

**CHARACODON*, *Gthr.*

247. <i>*lateralis</i> , <i>Gthr.</i>	—?
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HAPLOCHILUS, *M'Clell.*

248. <i>*dovii</i> , <i>Gthr.</i>	<i>Punta Arenas (Costa Rica)</i>	F.
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FUNDULUS, *C. & V.*

249. <i>*labialis</i> , <i>Gthr.</i>	Rio S. Geronimo, Yzabal	F.
250. <i>*punctatus</i> , <i>Gthr.</i>	Chiapam	B.
251. <i>*guatemalensis</i> , <i>Gthr.</i>	{ Lakes of Dueñas & Amatitlan, Rio Guacalate, W. Ecuador	F.
252. <i>*pachycephalus</i> , <i>Gthr.</i>	Lake of Atitlan	F.

BELONESOX, *Kner.*

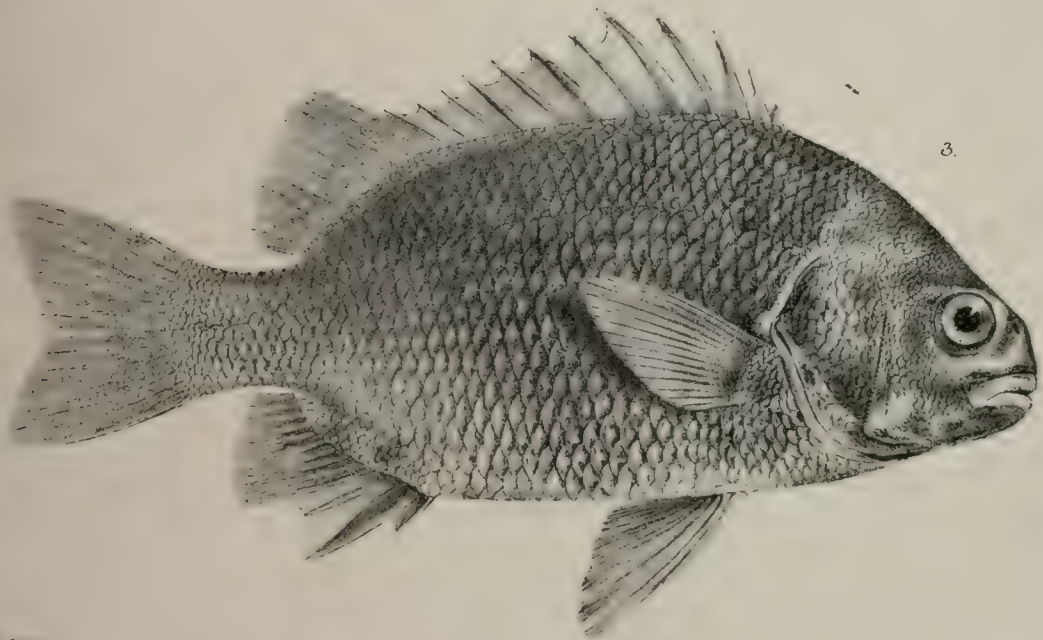
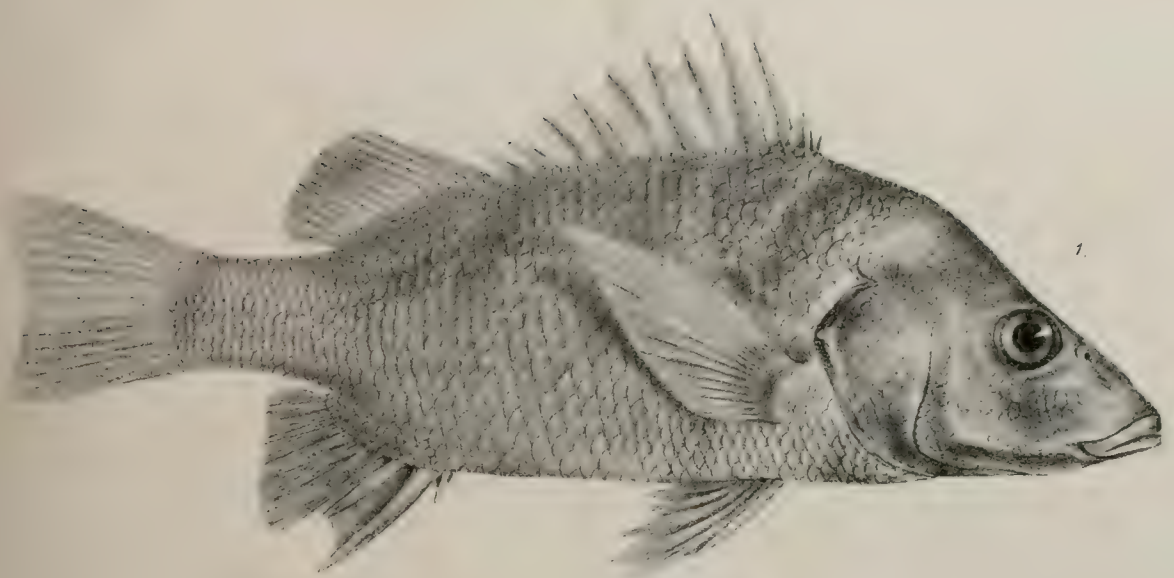
253. <i>belizanus</i> , <i>Kner</i>	Lake Peten, Honduras, Mexico	F.
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GAMBUSIA, *Poey.*

254. <i>*nicaraguensis</i> , <i>Gthr.</i>	Lake of Nicaragua	F.
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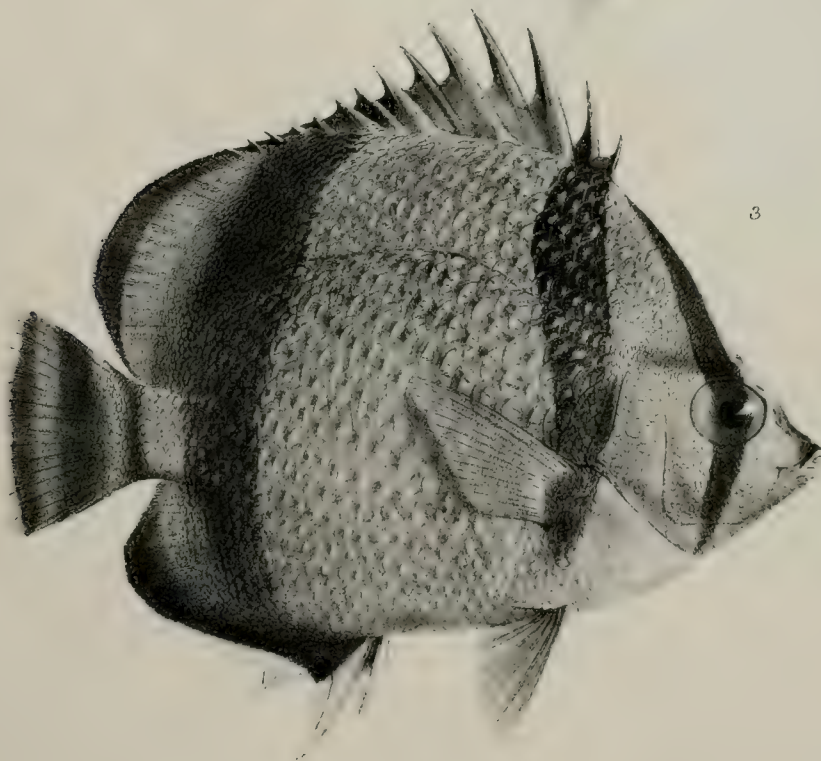
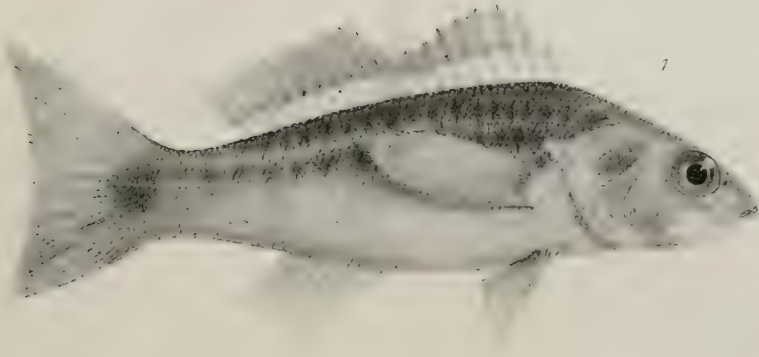
ANABLEPS, *Artemi.*

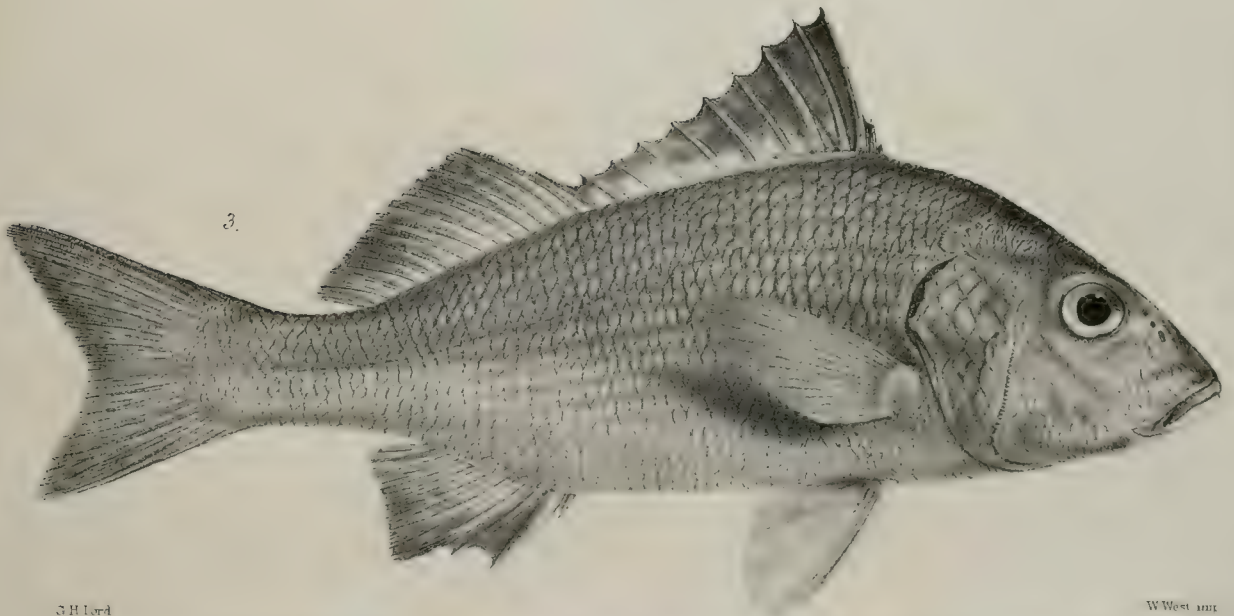
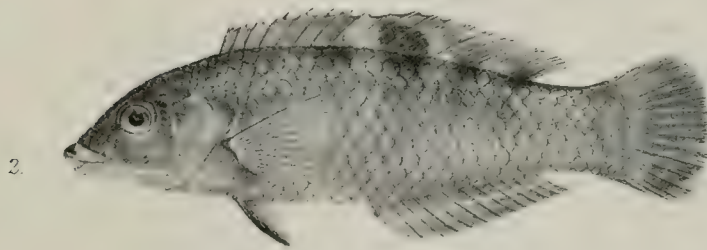
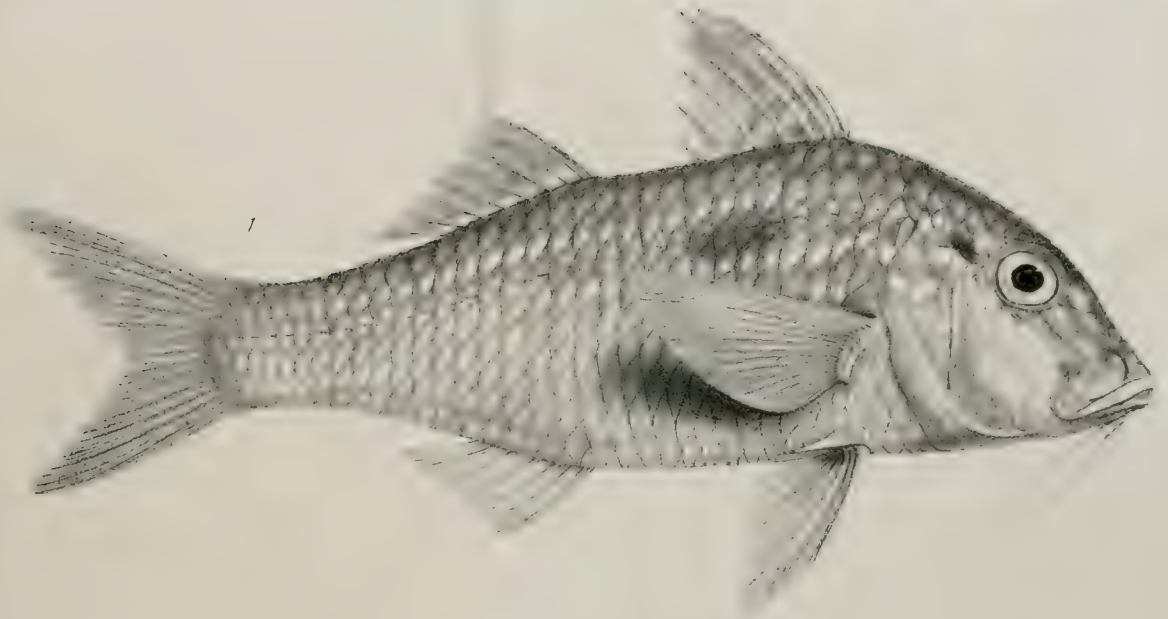
255. <i>dovii</i> , Gill	Chiapam	B.
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G. Weale

W. Weale imp.

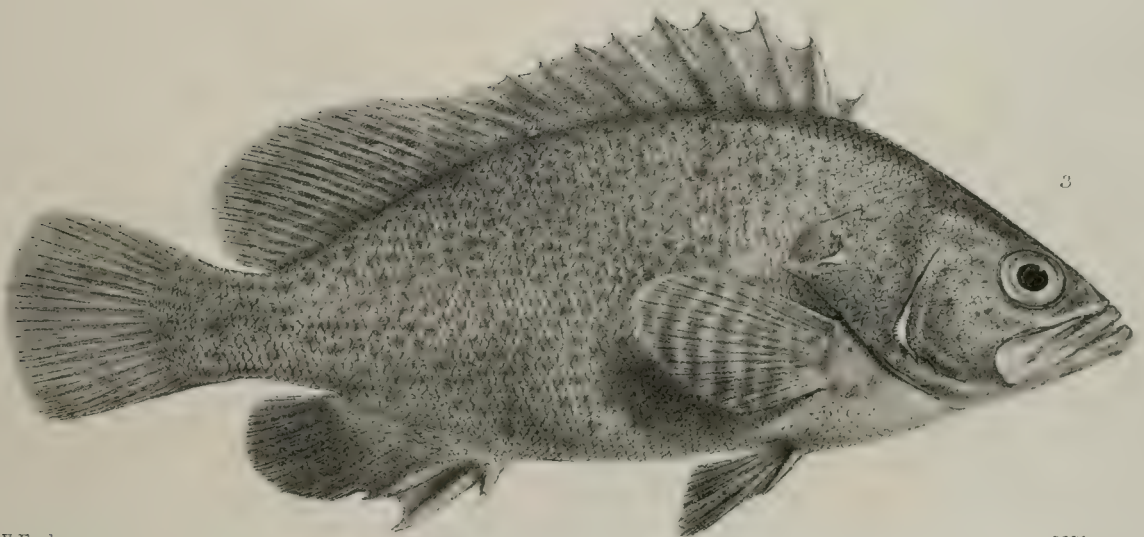
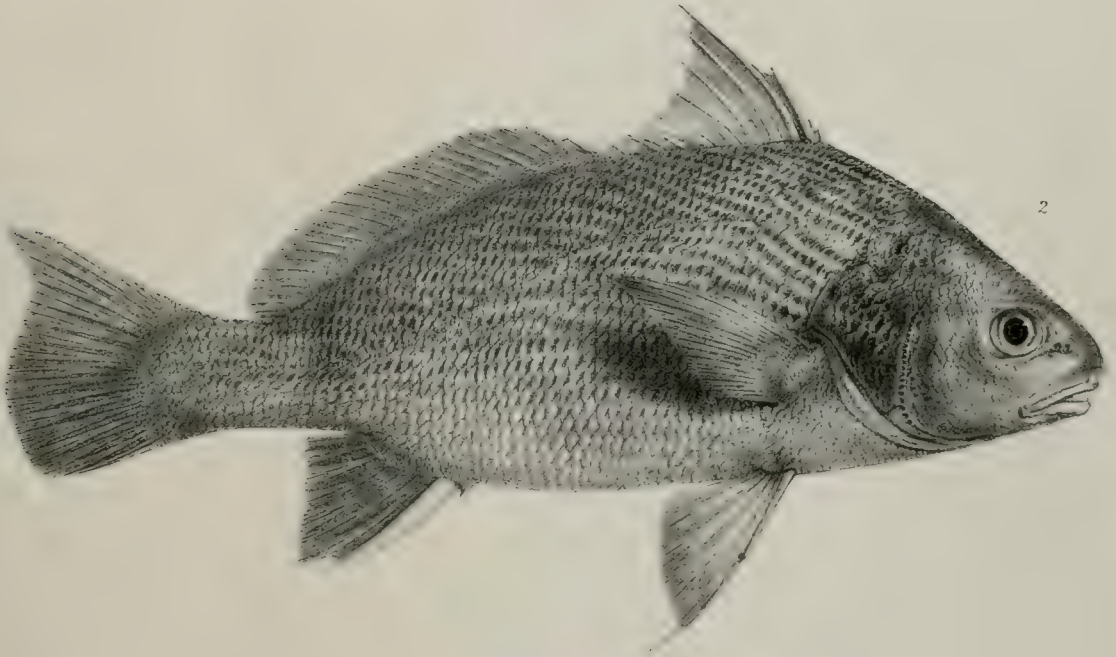
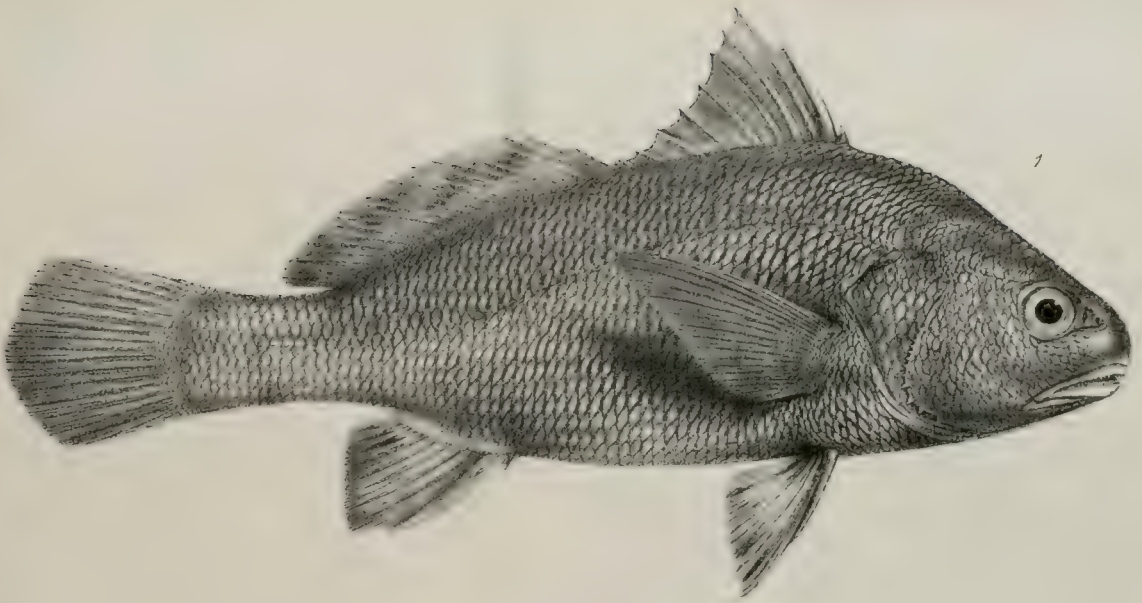




J. H. Ford

W. West and

1. *UPENEUC TETRASPILUS* 2. *PSEUDOJULIS NOTOSPILUS* 3. *PRISTIPOMA LEUCISCUS*.



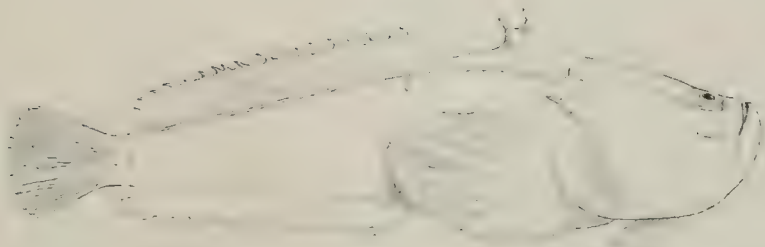
G.H. Ford

W. West imp

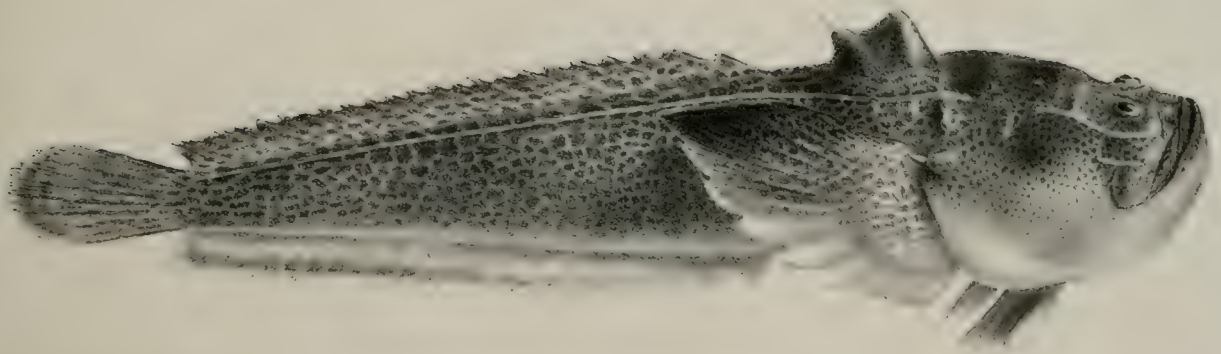
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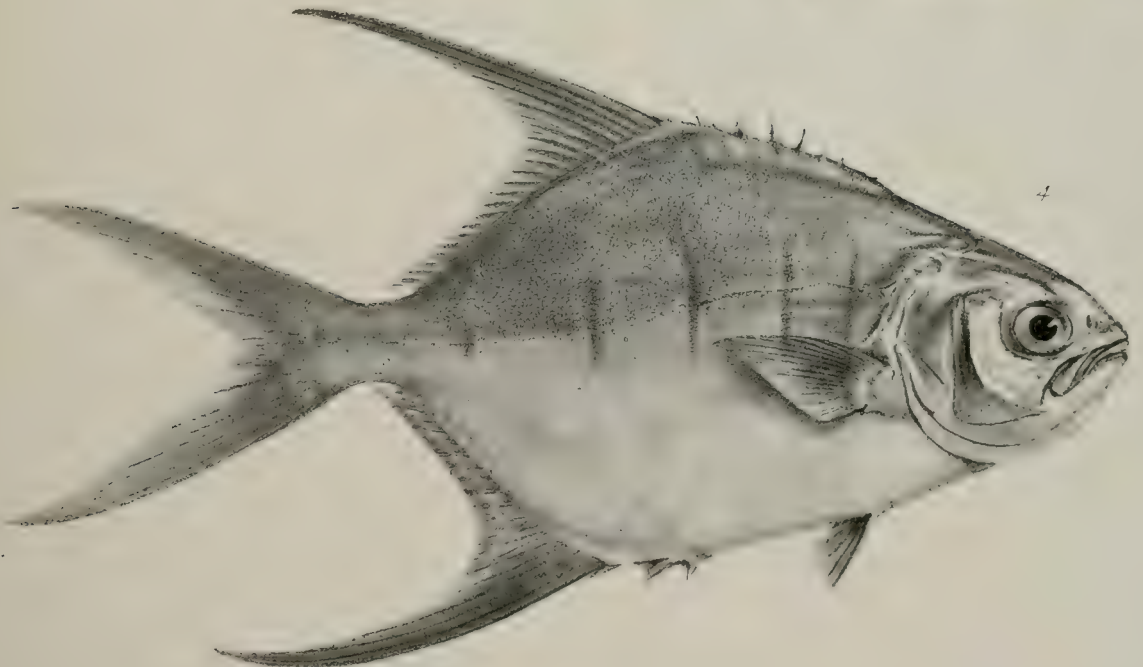
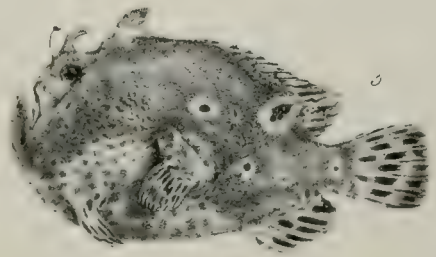
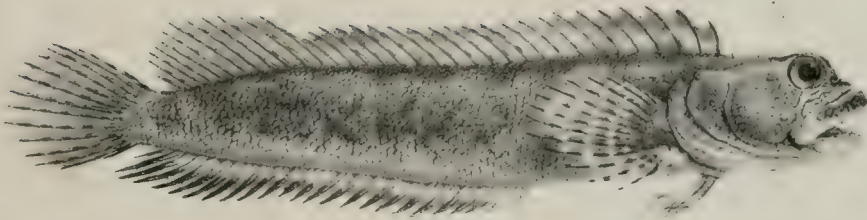


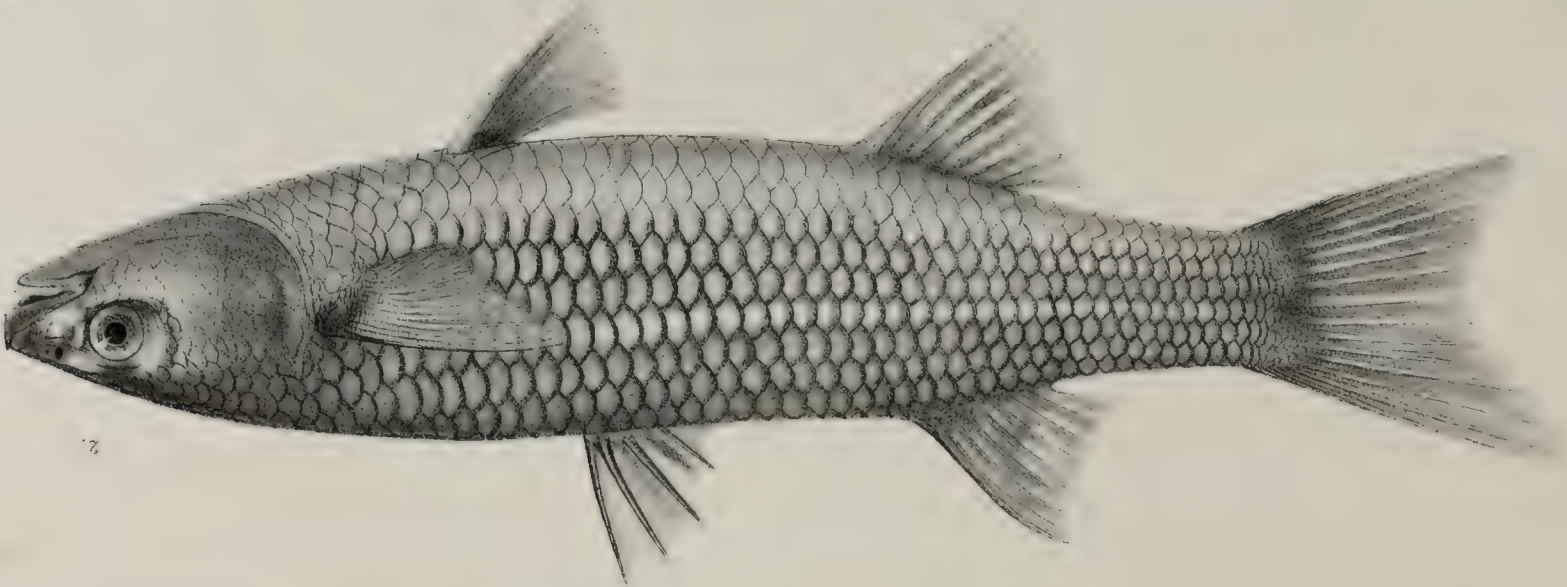
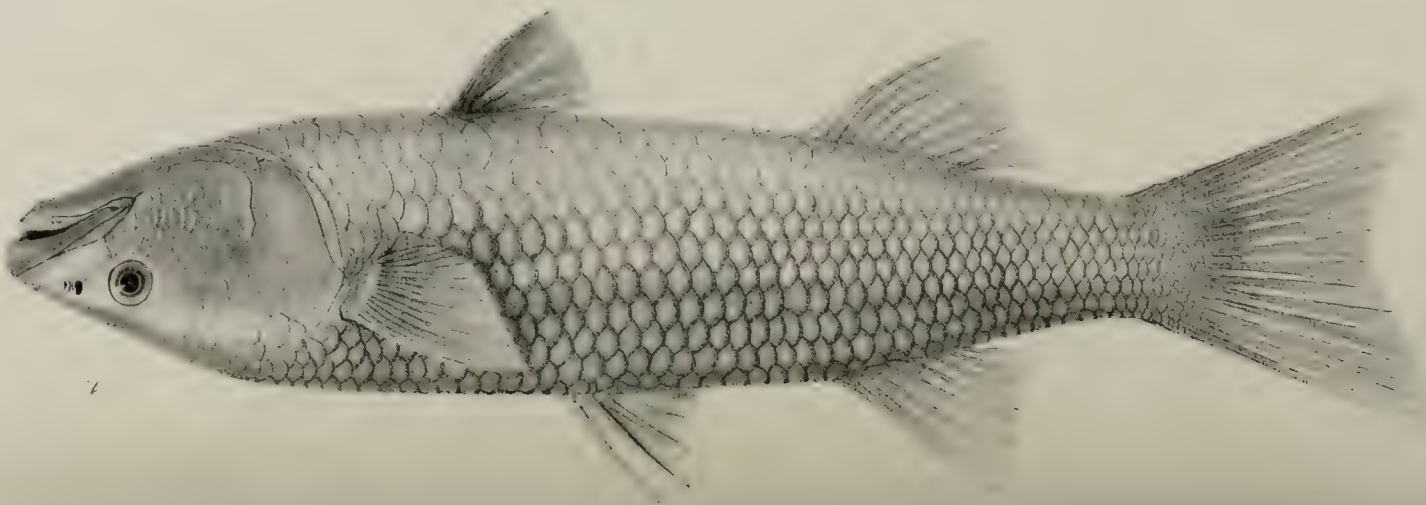
1



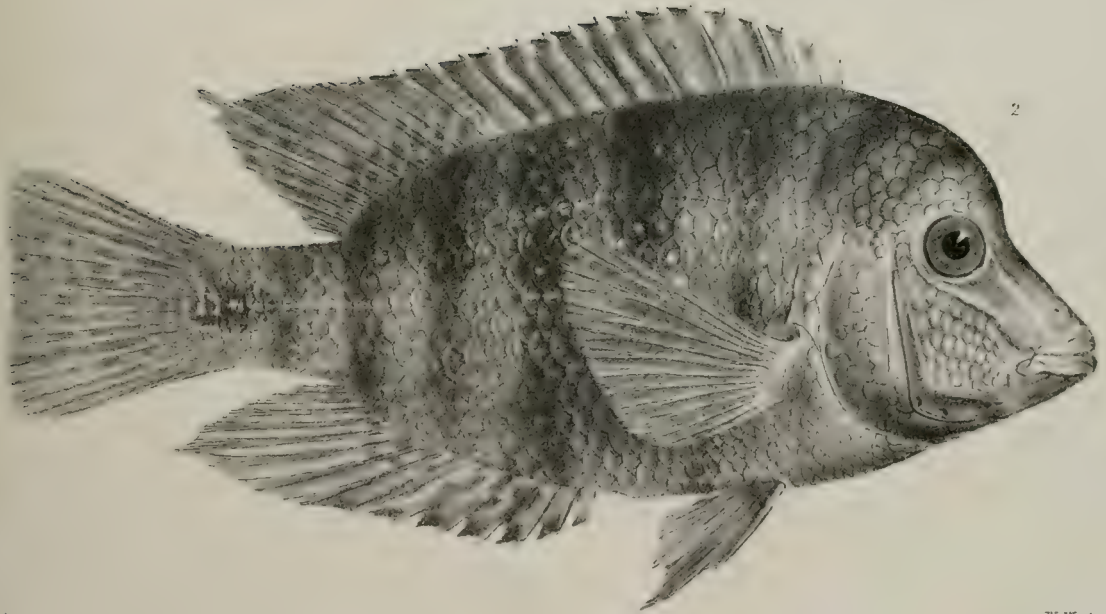
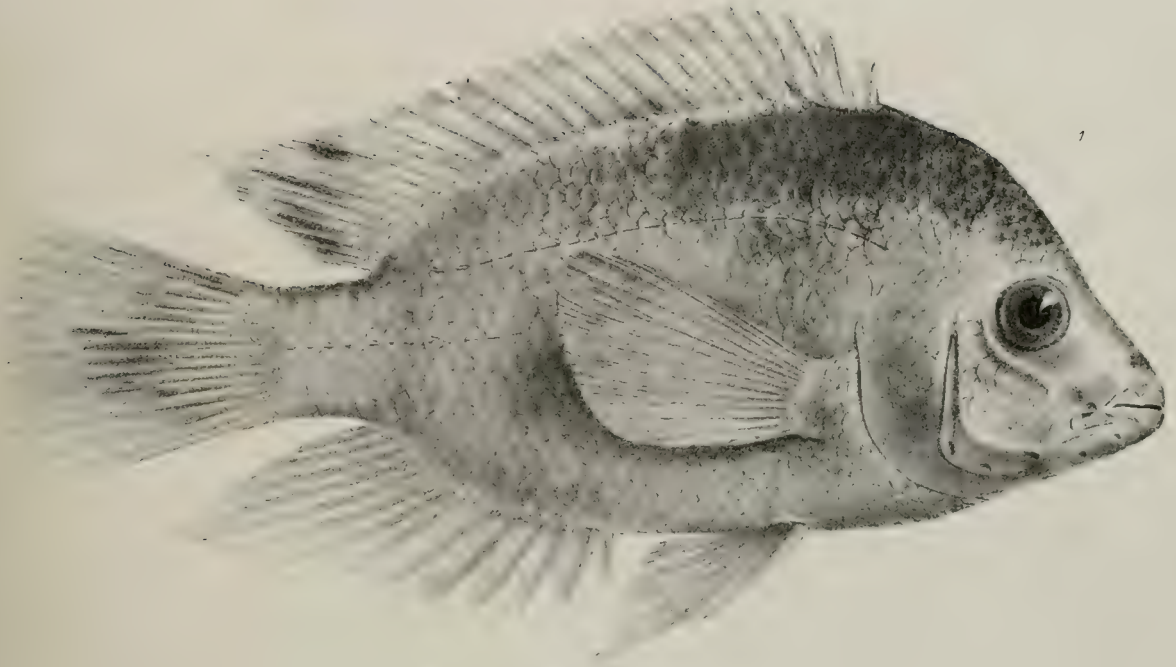
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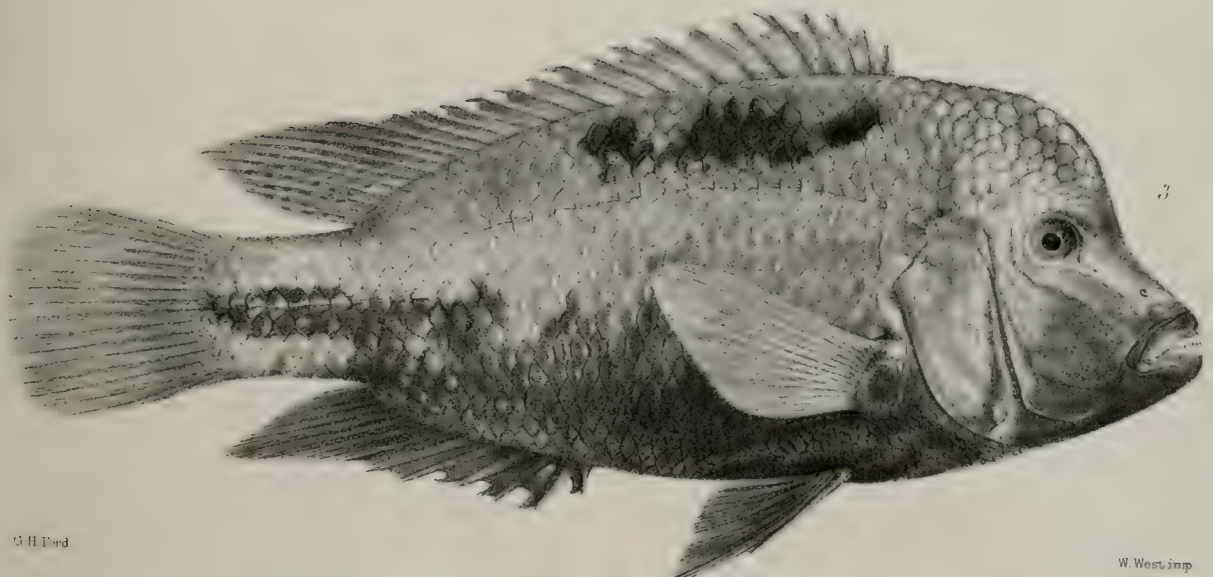
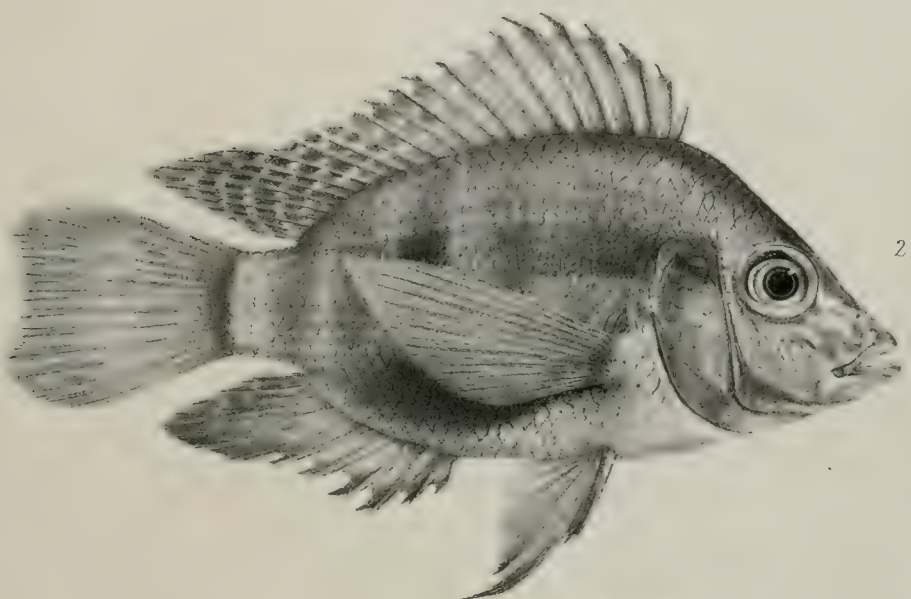
1 AGONOSTOMA MICROPS. 2. A. NASUTUM.



G. West.

W. West imp

1. HEROS CITRINELLUS. 2. HEROS MARGARITIFER.



G.H. Ford

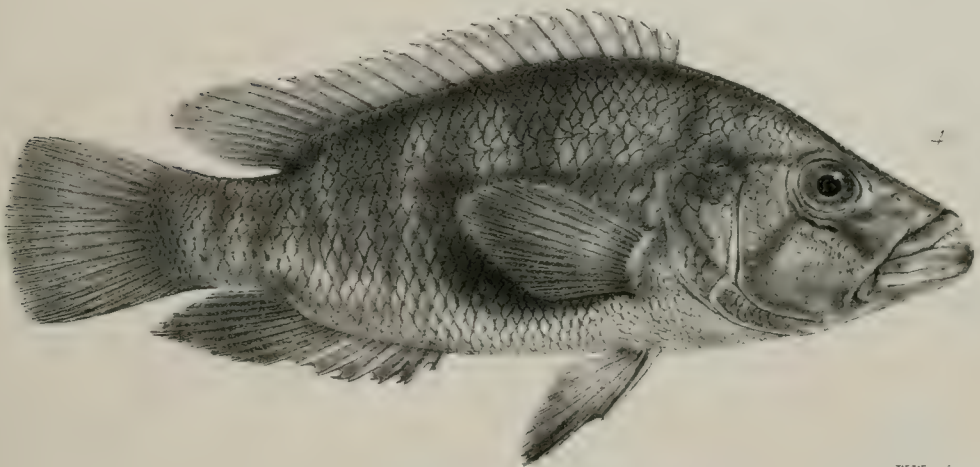
W. West, imp.

1. HEROS UROPHTHALMUS. 2. H. LONGIMANUS 3. H. MELANURUS.



1.

Heros spilurus (L.)

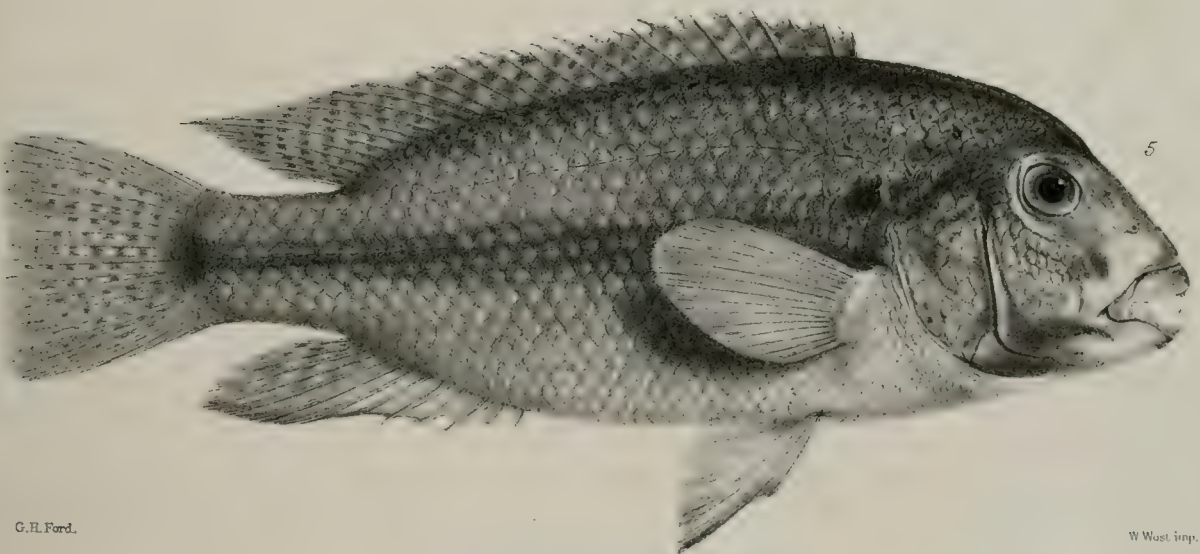
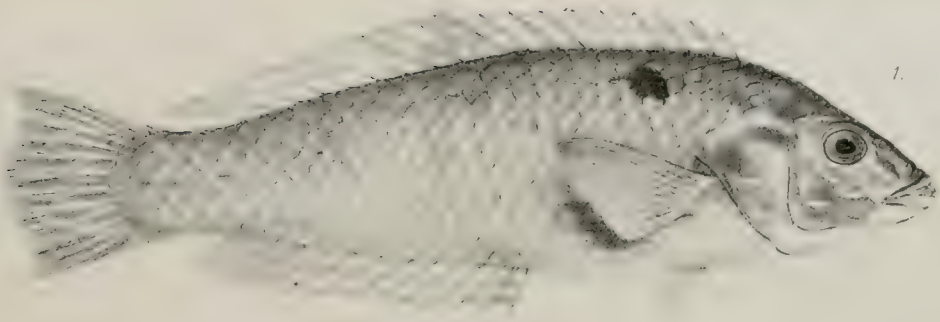


4.

G.H. Ford

W West imp.

1. HEROS SPILURUS. 2. H. AUREUS. 3. H. SALVINI. 4. H. DOVII.



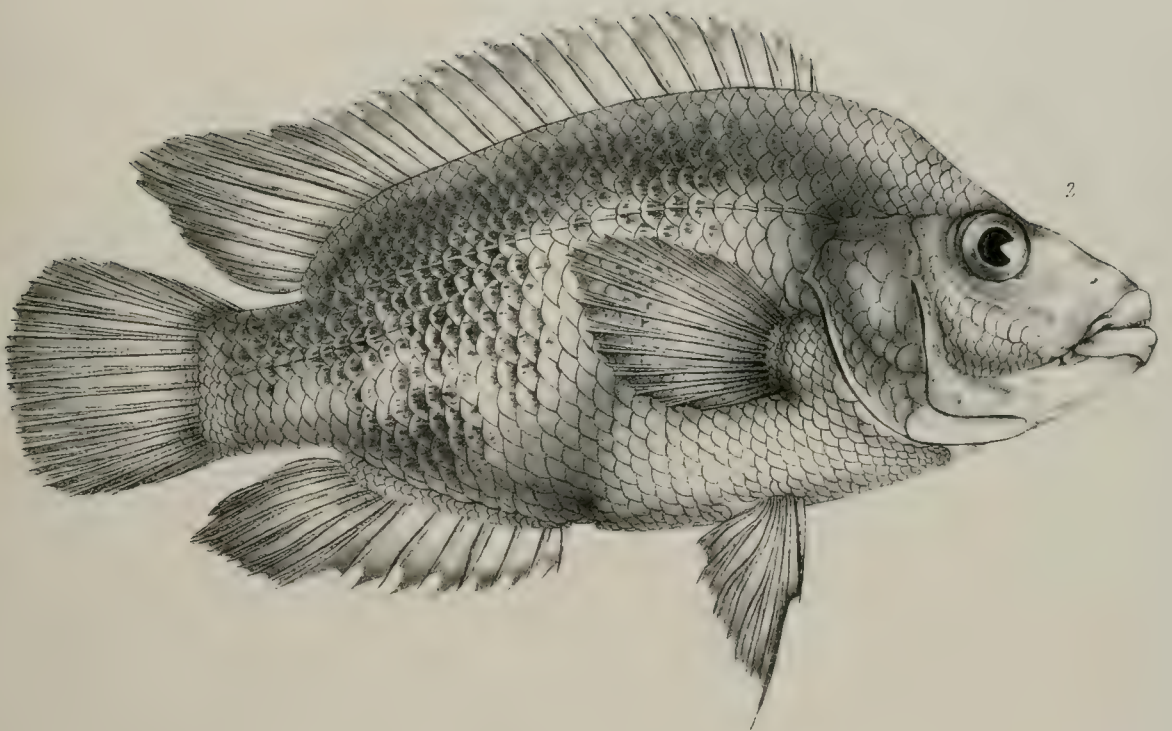
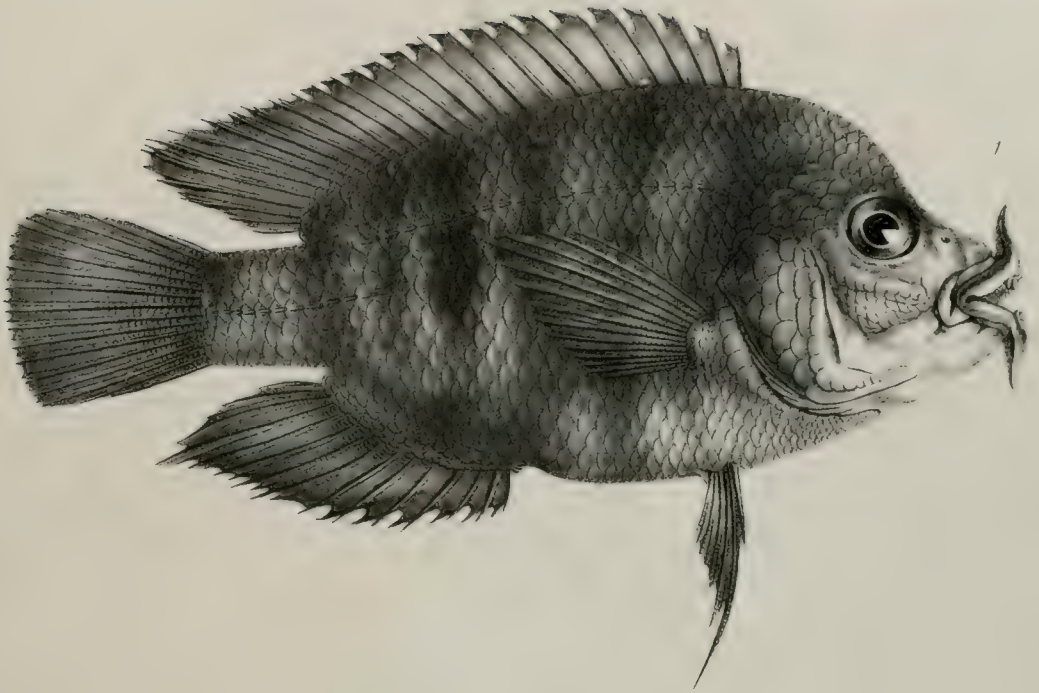
G.H. Ford.

W. West imp.

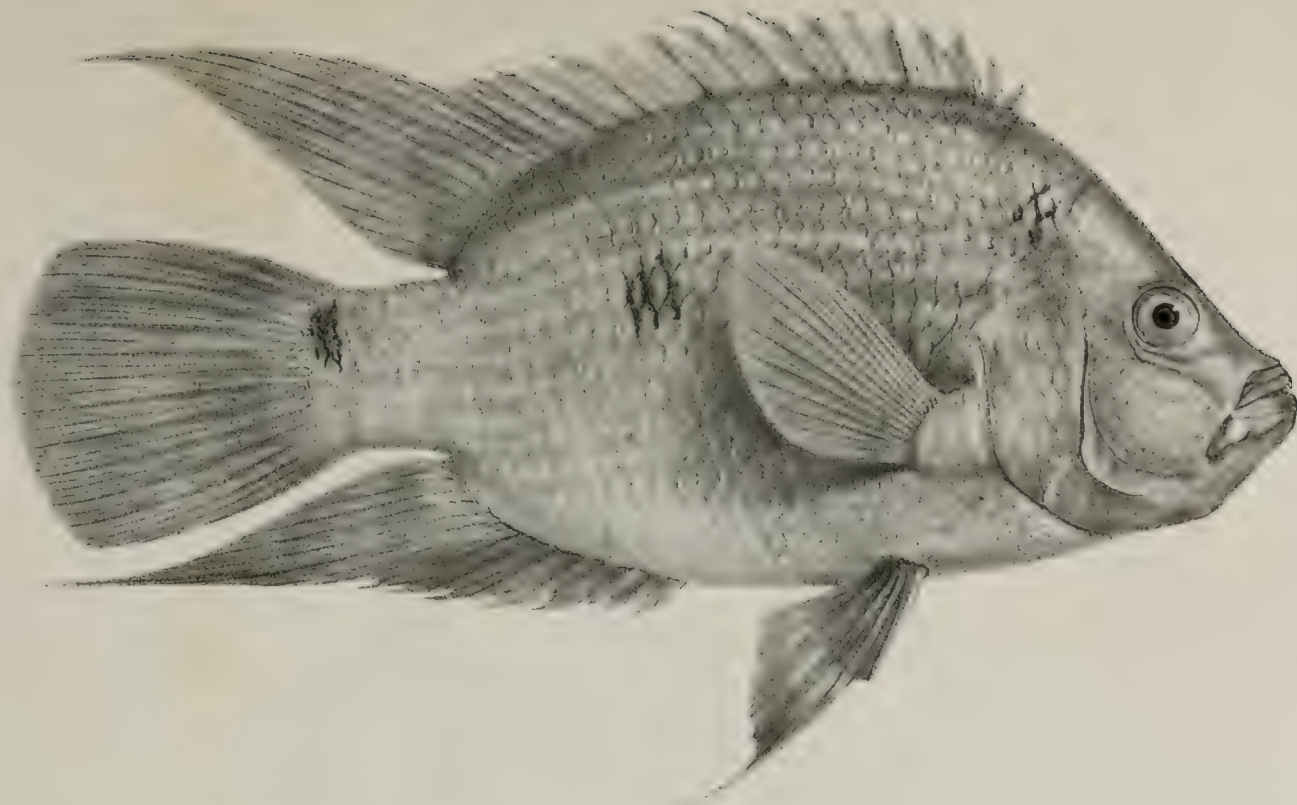
1. PLATYGLOSSUS DISPILUS.

2. HEROS MULTISPINOSUS. 3. H. NIGROFASCIATUS. 4. NEETROPLUS NEMATOPUS.

5. HEROS GODMANNI.



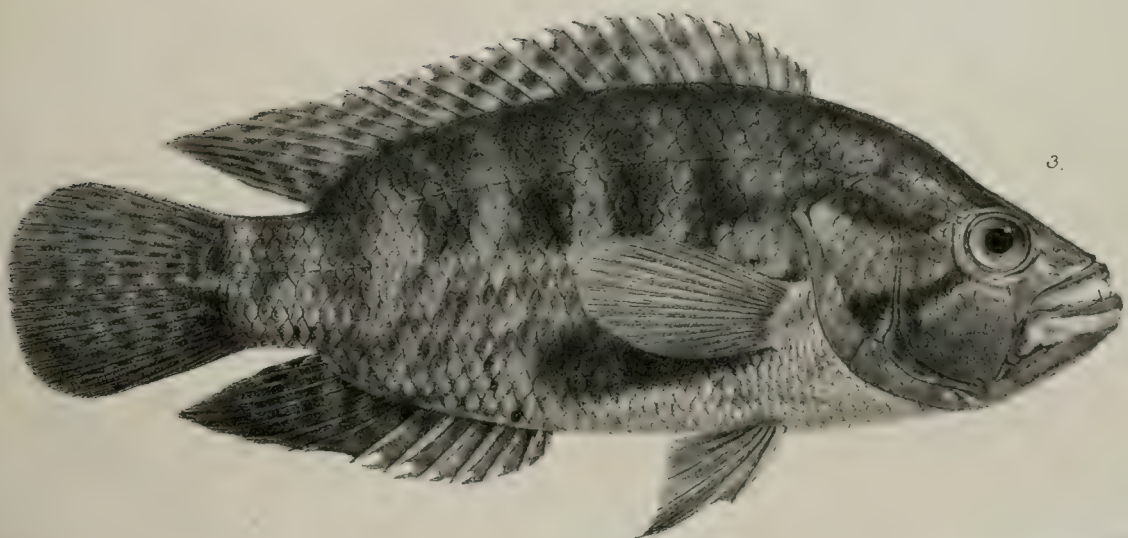
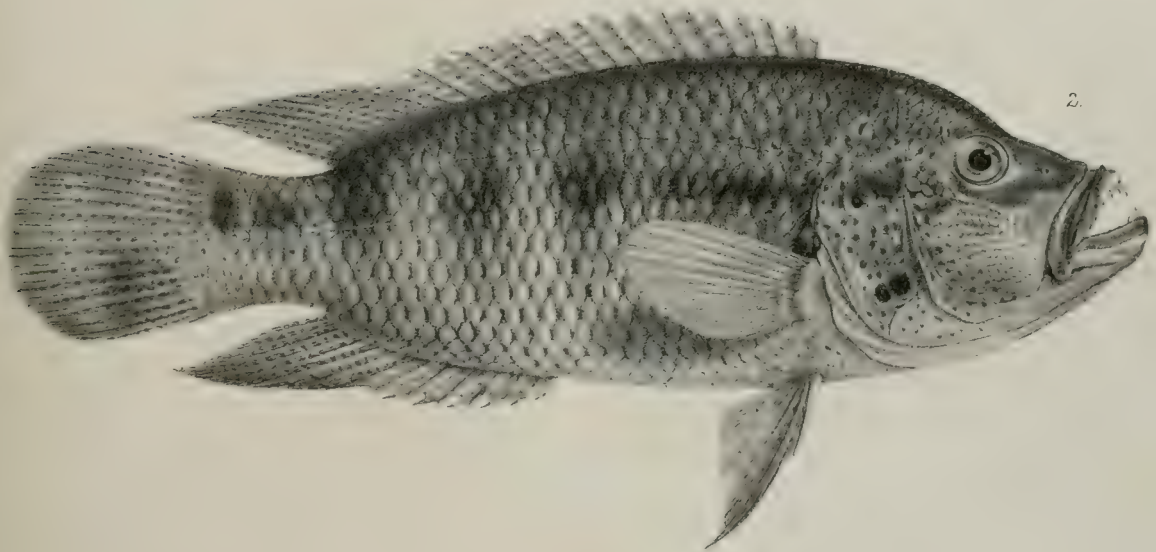
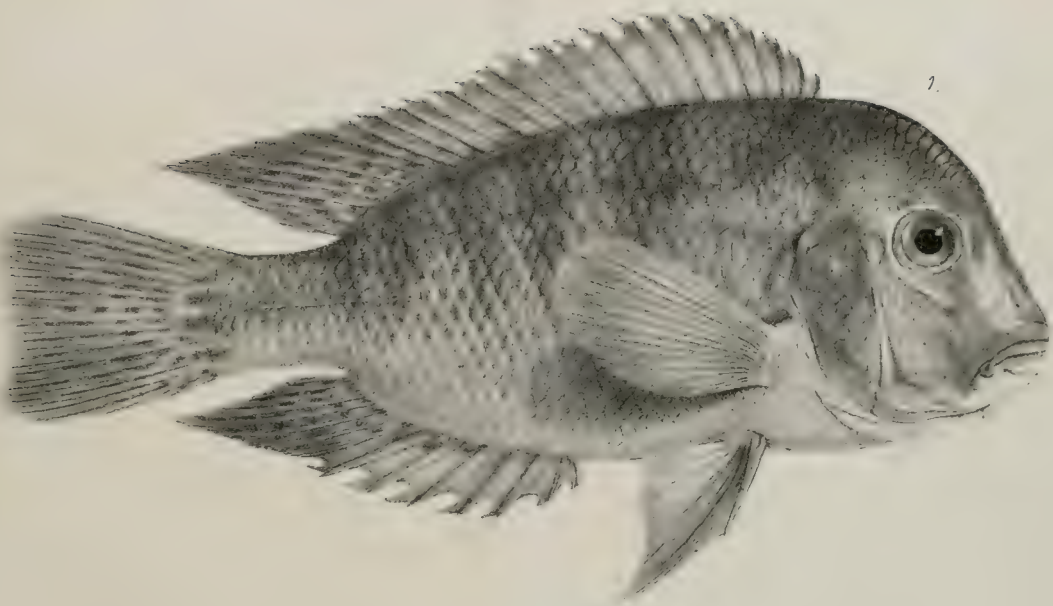
T. SUGIM LITH.

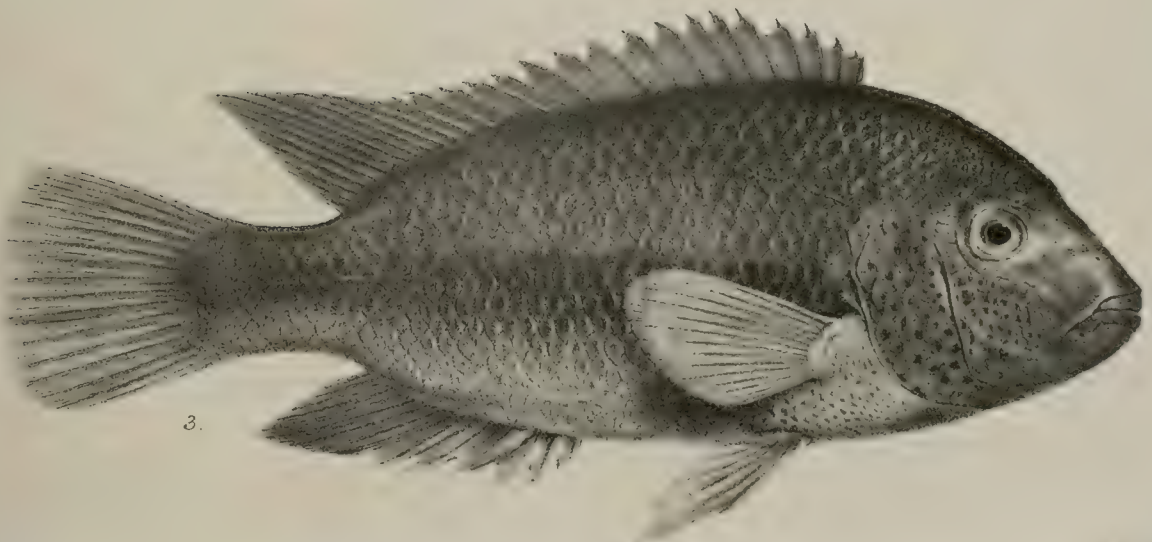
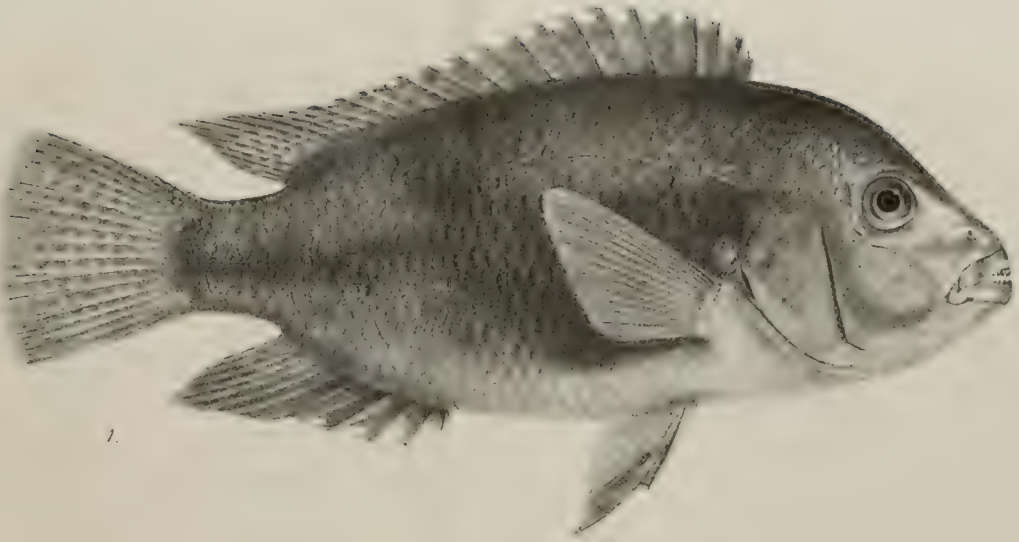


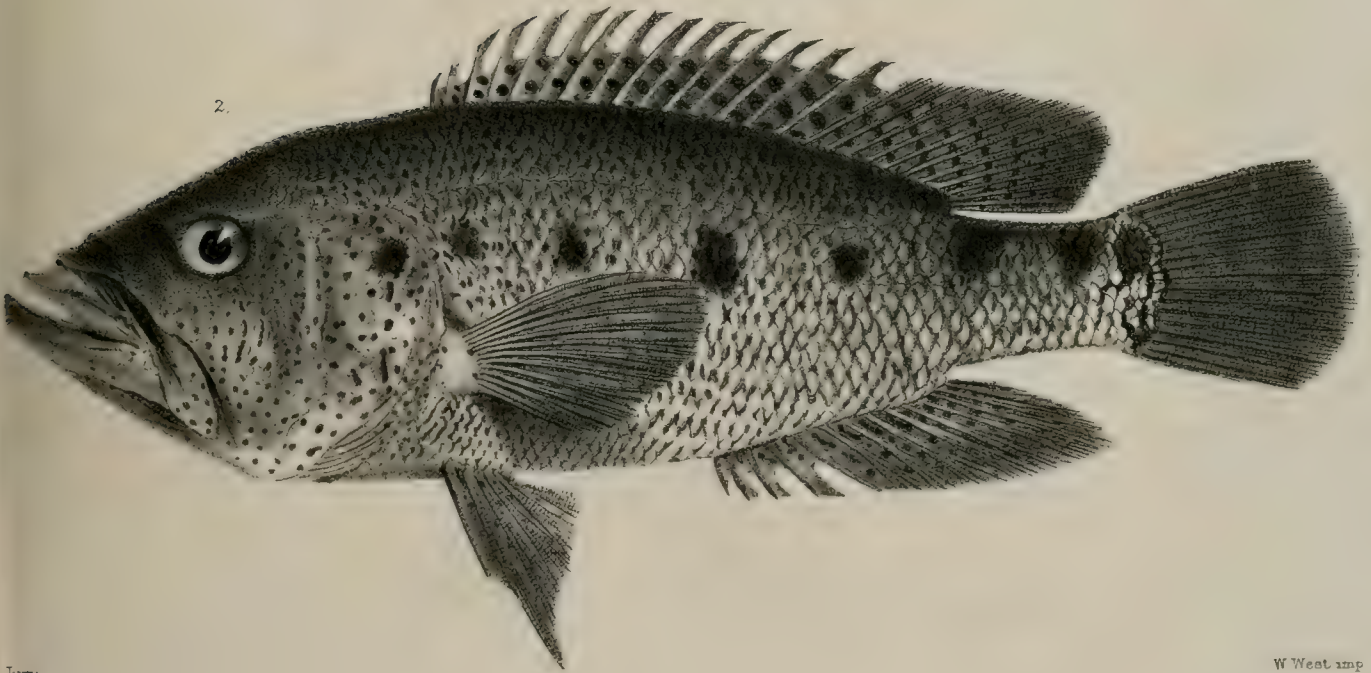
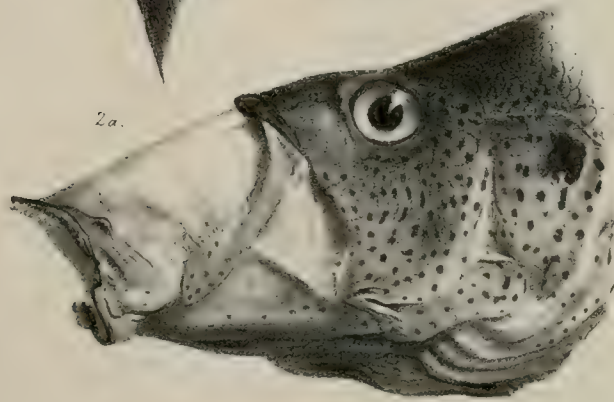
G.H. Ford.

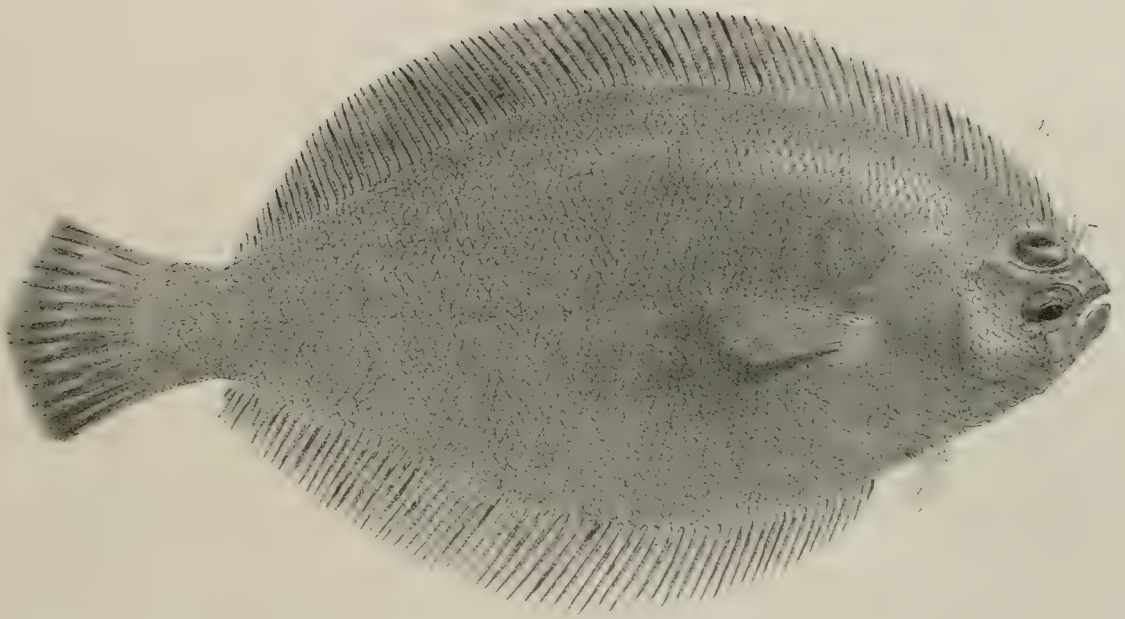
W. Westrup

HEROS TRIMACULATUS.

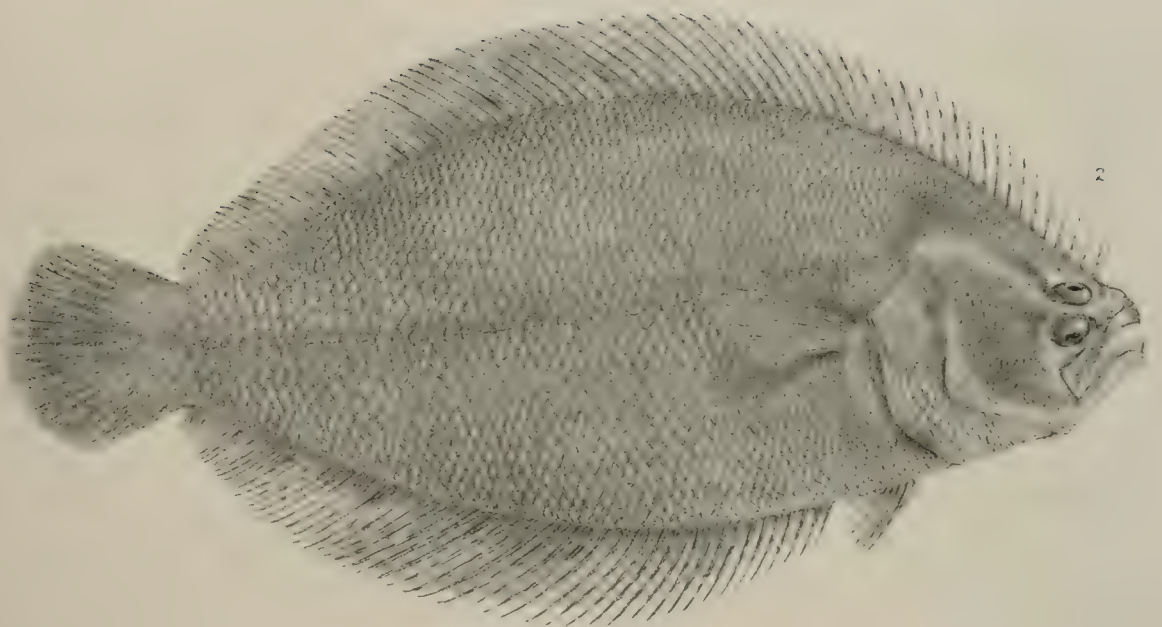








2

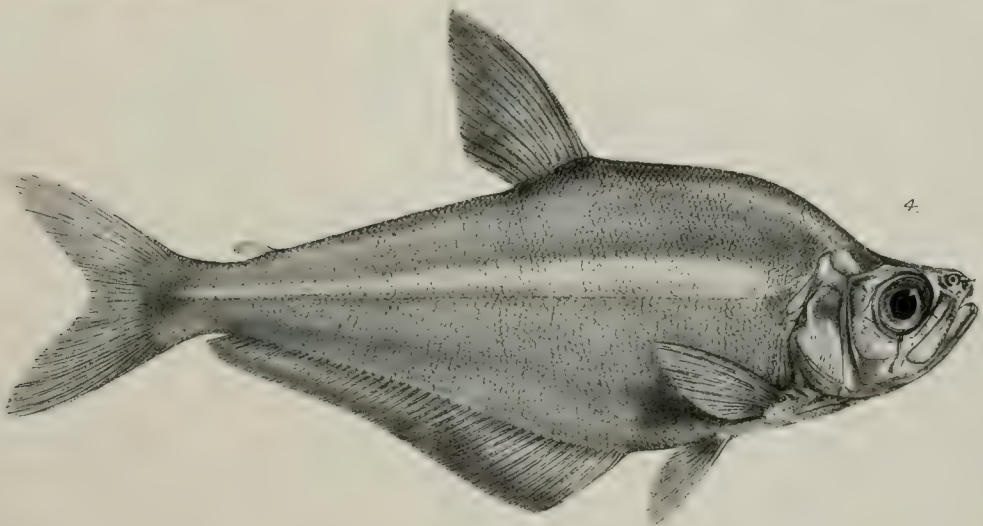


J. Jury

W. West imp.



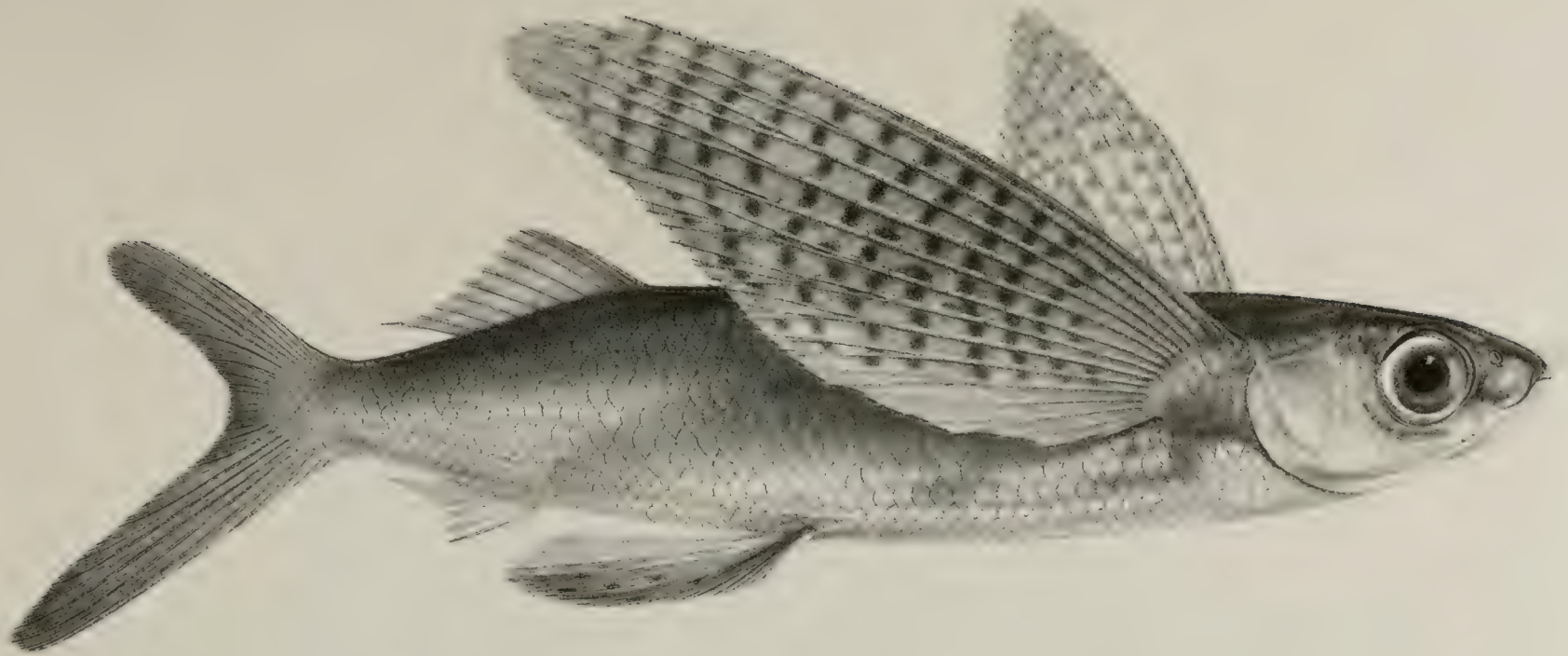
1. AMIURUS MERIDIONALIS. 2. AELURICHTHYS NUCHALIS.



G.H. Ford

W. West imp.

1. CHALCINOPSIS DENTEX. 2. CHARACODON LATERALIS. 3. GAMBUSIA NICARAGUENSIS.
4. ANACYRTUS GUATEMALENSIS. 5. HAPLOCHILUS DOVII.



G. H. Ford.

W. West imp.

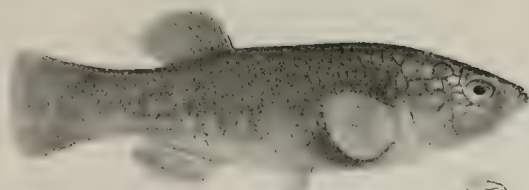
EXOCOETUS CALLOPTERUS.



5.



6.



3.



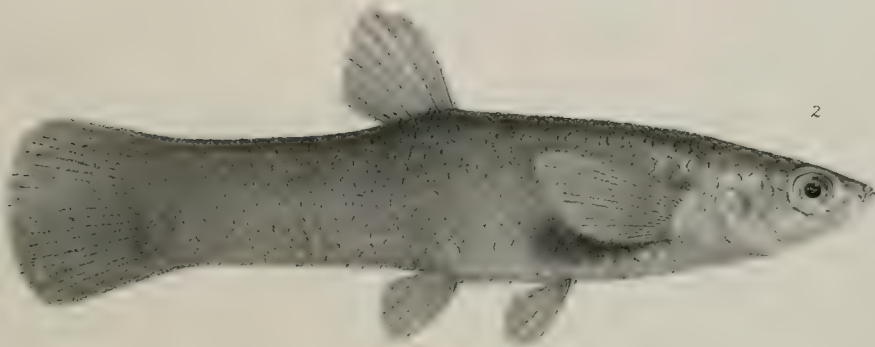
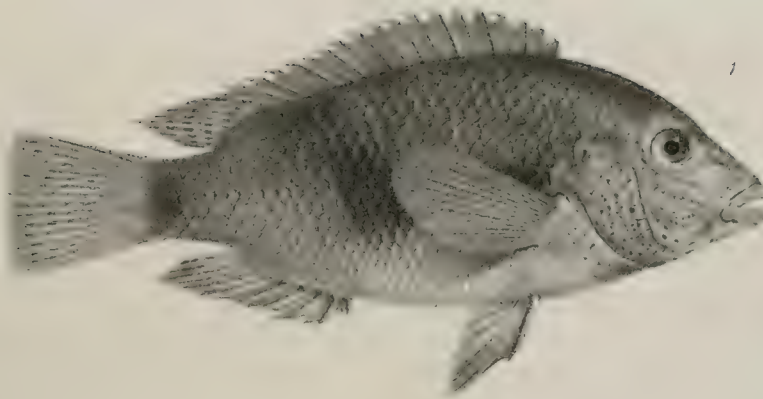
4.

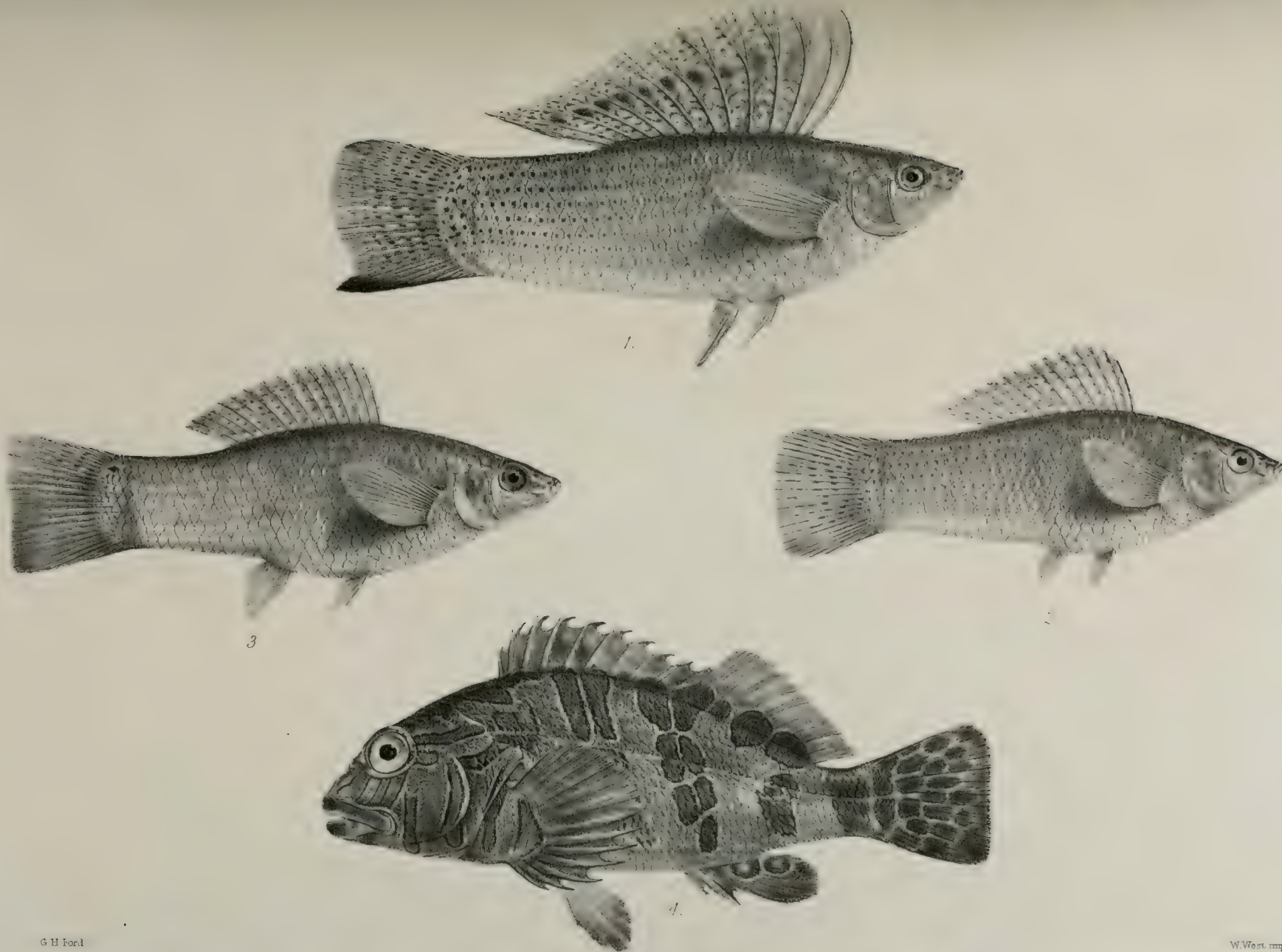


1.



2.





G. H. Ford

W. Westrup

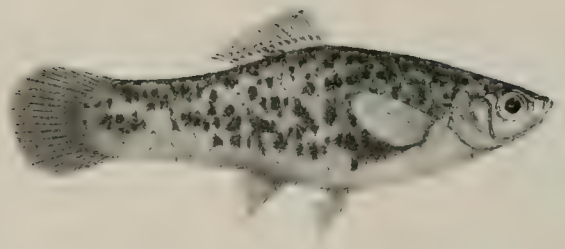
1. *MOLLIENESIA PETENENSIS*, adult male 2. immature male 3. adult female 4. *CIRRHITICHTHYS* 5. *PLATUS*.



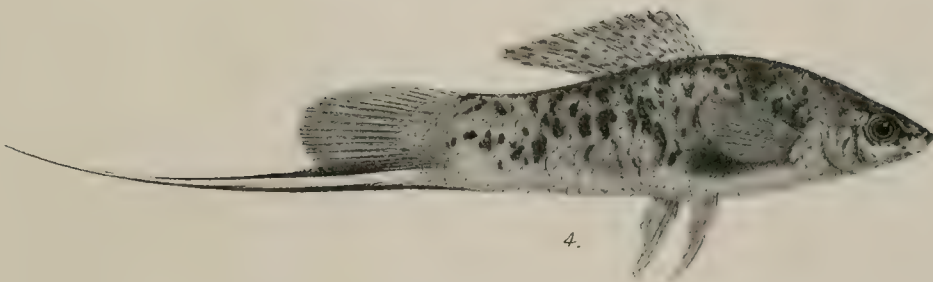
1.



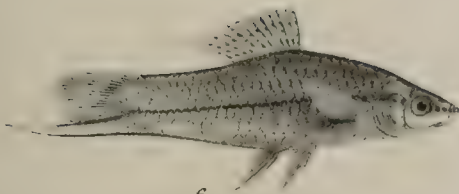
2



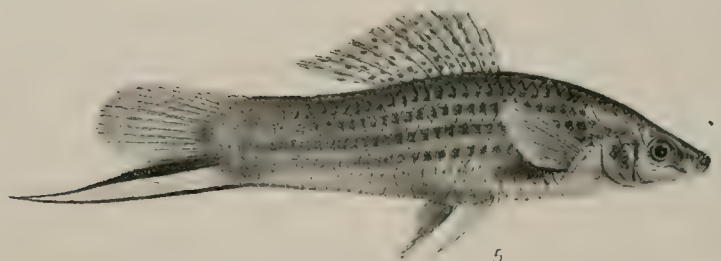
3



4.



6.



5.

G.H.Ford

W.Westamp

1. GIRARDINUS PLEUROSPILUS. 2 & 3. XIPHOPHORUS HELLERI. *female*.
4, 5 & 6. XIPHOPHORUS HELLERI, *young & adult males*