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An aid to the identification of the common commercial fishes of India and Pakistan.

By
K. S. MISRA



सत्यमेव जयते

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Note.—*(An asterisk) preceding a name denotes a new variety of subspecies. † (A dagger) indicates a new species. ‡ (A double dagger) indicates a new genus or subgenus. ** (A double asterisk) indicates a new family or subfamily. Synonyms are printed in *italics*. Generic and species headings are given in thick type.

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AN AID TO THE IDENTIFICATION OF THE COMMON COMMERCIAL FISHES OF INDIA AND PAKISTAN

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(With 198 Text-figures)

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PREFACE

Considerable advances have been made in the systematics of the fishes of India and the neighbouring countries since the publication of F. Day's *Fishes of India* (1878) and his two volumes on *Fishes* in the *Fauna of British India* series (1889). With the introduction of the International Rules of Zoological Nomenclature, several of the generic and specific names as found in Day's works have become invalid. Furthermore, due to classificatory changes many of the families as given in Day are now split up. For example, the Siluridae of Day now consists of the families Ariidae, Plotosidae, Siluridae, Bagridae, Amblycepididae, Akysidae, Sisoridae, Chacidae, Schilbeidae, Saccobranchidae, Clariidae and Olyridae. The same may be said with regard to many of the composite genera and species found in Day. Thus, Day's books, while remaining important landmarks in Indian ichthyology, especially with regard to the description and illustration of the majority of the species, are not to-day of much practical use to the student of ichthyology.

In order to bridge over the nomenclative and classificatory deficiencies in Day's works, Dr. K. S. Misra undertook, in 1946, the preparation of the series of the "Check Lists" and "Aids" on the Fishes of India, Burma, and Ceylon. Besides a deep knowledge of fish taxonomy, this laborious work required an intimate knowledge of the rules and procedure of taxonomy and of the taxonomic literature. Dr. Misra has published so far two parts of each of the series¹ mentioned above. As the preparation of this comprehensive type of work for the remaining fishes of India, Burma, and Ceylon would take considerable time, it was felt that if "*An aid to the Identification of the Common Commercial Fishes of India and Pakistan*" be prepared, with the scientific names of the fishes standardised and classified, it would solve, to a great extent, the urgent need keenly felt by many students of Indian fishes and by those engaged in practical fisheries work. The Indo-Pacific Fisheries Council of the Food and Agricultural Organisation of the United Nations has also suggested the preparation of such regional *Keys* and *Aids* for the Indo-Pacific area. The preparation of such an *Aid* was entrusted, in 1954, to Dr. K. S. Misra, Assistant Superintendent, Zoological Survey of India, who has now completed it. It is hoped that it will be of considerable practical use to fisheries workers and students of systematic ichthyology.

CALCUTTA,

30th December, 1957.

M. L. ROONWAL,
Director,

Zoological Survey of India.

¹Misra, K. S., 1949a, *Rec. Indian Mus.*, Delhi, 45(1) [1947], pp. 1-46.

— 1949b, *Ibid.*, 45(4) [1947], pp. 377-431.

— 1952, *Ibid.*, 49(1) [1951], pp. 89-137.

— 1953, *Ibid.*, 50(4) [1952], pp. 367-422.

I—INTRODUCTION

The fishes dealt with in this work comprise of 402 marine, brackish and freshwater species belonging to 205 genera and 100 families, which form the most common commercial fishes of India and Pakistan.

The paper is divided into four parts, the first dealing with the key to the classes, orders, and families, the second with a running field key for all the 100 families concerned, the third with the key to the genera and species and the fourth with the generic and specific synonymies and descriptions of the species. In the systematic account of the fishes the generic and specific names have been stabilized according to the rules of the International Commission of Zoological Nomenclature¹. In the specific synonymies only the original reference of the species with its type locality and Dr. F. Day's reference as in the *Fauna of British India*, Fish Series, are given. The classification adopted here is mainly after Berg.²

The preparation of the keys is based on the examination of a large series of specimens preserved in the reserve collections of the Zoological Survey of India, and in drawing them up much reliance has been placed on the external and easily recognisable characters of the species concerned. The keys are, thus, artificial and not strictly phylogenetical. Besides, they are purely regional in application and deal only with species, genera, families and other higher taxonomic categories treated here.

A new genus *Schizothorachthys* : Cyprinidae [Cypriniformes] has been proposed with *Schizothorax esocinus* Heckel as the generitype. Under this new genus the following species are included ; *Schizothorax esocinus* Heckel, *Schizothorax cavifrons* Heckel, *Schizothorax longipinnis* Heckel, *Schizothorax niger* Heckel, *Schizothorax nasus* Heckel, *Schizothorax lugalii* Heckel, *Schizothorax micropogon* Heckel, *Schizothorax planifrons* Hecke¹, *Schizothorax pelzami* Kessler, *Schizothorax intermedius* Mc Clell., *Schizothorax argentatus* Kessler, *Schizothorax pseudaksaiensis* Herzenstein and *Schizothorax progastus* Heckel.

The following are the explanations of certain terms used in this work :—

(a) For the cartilaginous fishes—

1. Trunk is measured from the tip of snout to the vent.
2. *Length of disk* (in ray-like forms) is measured from the tip of the snout to the hind edges of the expanded pectorals.
3. *Length of head* is measured from the tip of snout to the anterior edge of the first gill-opening.
4. Preoral length is measured from the tip of snout to the mouth.
5. Internarial width is measured from the inner edge of one nostril to that of the corresponding one on the opposite side.

¹ Schenk, E. T. and McMasters, J. H. *Procedure in Taxonomy*.—new ed., Stanford Univ. Press, California, pp. I-93 (1948).

² Berg, L. S. Classification of fishes both recent and fossil. ~*Trav. Inst. Zool. Acad. Sci., U.S.S.R., Leningard*, 5, pp. 87-517 (1940).

(b) For the bony fishes—

1. *Total length* is taken from the snout tip to the end of the tail fin.
2. *Standard length* is measured from the tip of the snout to the posterior edge of the hypural plate.
3. *Head length* is taken from the tip of the snout to the posterior edge of opercle.
4. *Snout length* is measured from the tip of the snout to the anterior margin of eye.
5. *Eye diameter* is measured from margin to margin of the bony orbit.
6. *Depth of body* is taken as the vertical distance through the body at its deepest part.
7. *Least height of caudal peduncle* is the measurement taken at its narrowest part.

(c) For the taxonomic terms appearing in the generic synonymies —

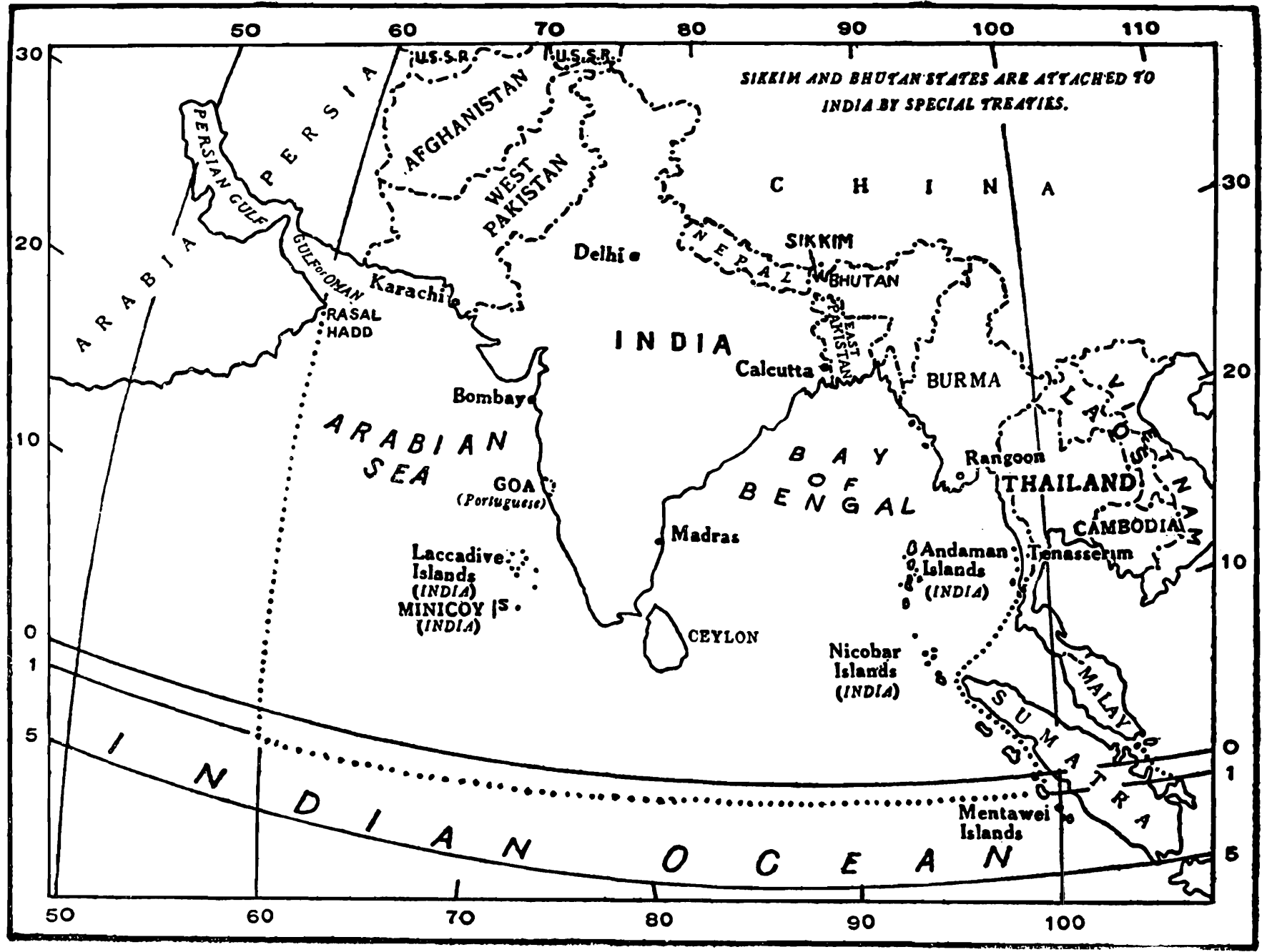
1. *Orthotype* is the type of a genus as indicated or distinctly implied by the original author.
2. *Logotype* is the type of a genus selected by the “ first reviser ”.
3. *Haplotype* or *monotype* is the sole species mentioned under a genus and so is an orthotype as well.
4. *Tautotypic* is a name of a genus identical with the specific name of the species.

The limits of the area of which the marine species are listed in this work are as that defined by Dr. B. N. Chopra in the foreward of the “ Check List ”, Part I¹, but excluding the coastal or territorial waters of Burma and Ceylon. For the freshwater species the limits of the areas are the political boundaries of India and Pakistan.

In the preparation of the paper much use has been made of the vast literature on the subject, a complete reference to which may be had from the “ Check List ” series. Regarding illustrations, those copied from other works are duly acknowledged in the legends of the figures.

I am very grateful to Mr. M. A. S. Menon, M.Sc., Scientific Assistant, Zoological Survey of India, for kindly going through the manuscript.

¹ Misra. K. S., *Rec. Indian Mus.*, Delhi, 45 (1) [1947], p. 4. (1949).



TEXT-FIG. 1.—Map showing the boundaries of the Indian region by dotted line for marine fishes. (After Misra).

II—KEY TO THE CLASSES, ORDERS AND FAMILIES

Key to the Classes of series PISCES

1. Skeleton cartilaginous : 5 pairs of lateral or ventral, non-confluent gill-openings without operculum Class ELASMOBRANCHII (Subclass *SELACHII*).
2. Skeleton bony : a pair of lateral gill-openings confluent as a single ventral slit or non-confluent as two lateral slits with operculum Class TELEOSTOMI (Subclass *ACTINOPTERYGII*).

Class ELASMOBRANCHII

Key to the superorders of subclass SELACHII

1. Gill openings lateral Superorder SELACHOIDEI (Order LAMNIFORMES).
2. Gill openings ventral Superorder BATOIDEI (Order RAJIFORMES).

Key to the suborders of order Lamniformes

1. Nictitating membrane present Suborder Scyliorhinoidei.
2. Nictitating membrane absent Suborder Lamnoidei.

Key to the families of suborder Scyliorhinoidei

1. Head with lateral (oculonarial) expansions Family SPHYRNIDAE.
2. Head without lateral (oculonarial) expansions 3.
3. Anal fin before second dorsal fin Family SCYLIORHINIDAE.
4. Anal fin opposite second dorsal fin Family CARCHARHINIDAE.

Key to the families of suborder Lamnoidei

1. Nasoral grooves present Family ORECTOLOBIDAE.
2. Nasoral grooves absent 3.
3. Teeth tricuspid : caudal peduncle not keeled on sides Family ODONTASPIDAE.
4. Teeth not tricuspid : caudal peduncle keeled on each side Family LAMNIDAE.

Key to the families of order Rajiformes

1. Disk narrow and elongate 3.
2. Disk broad and expanded 5.
3. Rostrum very much produced and saw-like Family PRISTIDAE.
4. Rostrum very short and not saw-like Family RHINOBATIDAE.

5. Head distinct from disk, with a prominent snout 7.
6. Head not distinct from disk, without a prominent snout Family TRYGONIDAE.
7. With horn-like cephalic flippers Family MOBULIDAE.
8. Without horn-like cephalic flippers 9.
9. Head bilobed or notched between rostral fins :
rostral fins separate Family RHINOPTERIDAE.
10. Head neither bilobed nor notched between
fins : rostral fins united to form one lobe Family MYLIOBATIDAE.

Class TELEOSTOMI

Key to the orders of subclass ACTINOPTERYGII

1. Body cylindrical, very much elongate and eel-shaped 3.
2. Body neither cylindrical, nor very much elongate, nor eel-shaped 7.
3. Gill-openings confluent as a single slit Order SYMBRANCHIFORMES.
(Suborder Symbranchioidei).
4. Gill-openings non-confluent as two lateral slits 5.
5. Dorsal spines present Order MASTOCEMBELIFORMES
(Family MASTOCEMBELIDAE).
6. Dorsal spines absent Order ANGUILLIFORMES
(Suborder Anguilloidei).
7. Body bilaterally symmetrical 9.
8. Body asymmetrical Order PLEURBNECTIFORMES.
9. A sucking disk (modified spinous dorsal) present
on top of head Order ECHENEIFORMES
(Family ECHENEIDAE).
10. No sucking disk on top of head 11.
11. Lower pectoral rays free and filamentous Order POLYNEMIFORMES
(Family POLYNEMIDAE).
12. Lower pectoral rays neither free nor filamentous 13.
13. Scales on anterior part of body forming corselets Order THUNNIFORMES
(Family THUNNIDAE).
14. Scales on anterior part of body not forming corselets 15.
15. Teeth united to form sharp-edged plates or chisel-like incisors Order TETRODONTIFORMES
(Family BALISTIDAE).
16. Teeth not united to form sharp-edged plates or chisel-like incisors 17.

17. Both jaws or lower jaw produced, or jaws when normal, pectorals very much elongate and wing-like Order **BELONIFORMES**.
18. Neither both jaws nor lower jaw produced, nor pectorals wing-like 19.
19. Suprabranchial organ always present: head snake-like Order **OPHIOCEPHALIFORMES**
(Family **OPHIOCEPHALIDAE**
(= **CHANNIDAE**)).
20. Suprabranchial organ absent (except in families Saccobranchidae, Chanidae, Anabantidae and Osphronemidae): head not snake-like 21.
21. Dorsal with distinct spinous and soft parts (except in families Coryphaenidae Cepolidae, Trichiuridae, Histiophoridae and Xiphiidae): mostly two-rayed dorsal fins, sometimes single 23.
22. Dorsal without distinct spinous and soft parts: rayed dorsal always single (except in genus *Plotosus* where there is procurrent caudodorsal) 27.
23. Preopercle with a prominent spine Order **BERYCIFORMES** (Family **HOLOCENTRIDAE**).
24. Preopercle without a prominent spine 25.
25. Interdorsal space wide, about 1½-2 times base of spinous dorsal Order **MUGILIFORMES**.
26. Interdorsal space narrow (or absent) less than base of spinous dorsal (except in families Cepolidae, Coryphaenidae and Trichiuridae where dorsal is single and very long) Order **PERCIFORMES**.
27. Head scaly 29.
28. Head scaleless (except in family Notopteridae) 31.
29. Adipose fin present Order **SCOPELIFORMES**
(Family **SYNODIDAE**).
30. Adipose fin absent Order **CYPRINODONTIFORMES**
(Suborder **Cyprinodontoidei**).
31. Abdomen keeled and serrated (except in genera *Albula*, *Megalops*, *Chanos* and *Dussumieria*): barbels always absent Order **CLUPEIFORMES**.
32. Abdomen non-keeled (except in genera *Oseobrama* and *Rohtee* and some species of genus *Clupisoma*), non-serrated: barbels always present (except in some species of genera *Puntius*, *Osteochilus*, *Osteobrama*, *Barilius*, *Danio* and genera *Semiplotus*, *Catla*, *Thynnichtys*, *Amblypharyngodon*, *Oxygaster* and *Chela*) Order **CYPRINIFORMES**.

Key to the suborders of order CLUPEIFORMES

1. Adipose fin present Suborder Salmonoidei
(Family SALMONIDAE).
2. Adipose fin absent 3.
3. Dorsal fin situated in caudal region of body . 5.
4. Dorsal fin situated in trunk region of body . 7.
5. Body elongate, narrow : anal fin short (less than
40 rays) : caudal bifurcate : dorsal fin always
present Suborder Chirocentroidei
(Family CHIROCENTRIDAE).
6. Body neither elongate nor narrow : anal fin
very long (more than 100 rays) : caudal not
bifurcate : dorsal fin present or absent . Suborder Notopteroidei
(Family NOTOPTERIDAE).
7. Mouth small, terminal : gill-membrane entirely
united below : accessory branchial organ
present Suborder Chanoidei (Family
CHANIDAE).
8. Mouth large, not terminal : gill-membrane
entirely free below : accessory branchial
organ absent Suborder Clupeoidei.

Key to the families of suborder Clupeoidei

1. Abdomen smooth, non-keeled 3.
2. Abdomen serrated or keeled or both (except
in genus *Dussumieria*) 7.
3. Gular plate present 5.
4. Gular plate absent Family ALBULIDAE.
5. Scales small (L. 1. above 90) : anal fin short
(less than 20 rays) Family ELOPIDAE.
6. Scales large (L. 1. below 50) : anal fin moderate
(more than 20 rays) Family MEGALOPIDAE.
7. Upper jaw prominent, maxillaries much
elongated Family ENGRAUIDAE.
8. Upper jaw not prominent : maxillaries not
elongated Family CLUPEIDAE.

Key to the suborders of order CYPRINIFORMES

1. Scales present Suborder Cyprinoidei.
2. Scales absent Suborder Siluroidei.

Key to the families of suborder Cyprinoidei

- | | |
|--|-------------------|
| 1. Six to eight barbels | Family COBITIDÆ. |
| 2. Two to four barbels or barbels absent | Family CYPRINIDÆ. |

Key to the families of suborder Siluroidei

- | | |
|---|---|
| 1. Anal fin very long | 3. |
| 2. Anal fin short | 11. |
| 3. Second rayed dorsal or procurrent caudo-dorsal present : adipose dorsal absent : caudal united with second dorsal and anal | Family PLOTOSIDÆ. |
| 4. Second rayed dorsal or procurrent caudo-dorsal absent : adipose dorsal present or absent : caudal not united with anal. | 5. |
| 5. First dorsal very long | Family CLARIIDÆ. |
| 6. First dorsal short | 7. |
| 7. Adipose dorsal absent : first dorsal spineless | 9. |
| 8. Adipose dorsal present : first dorsal with spine (except in genus <i>Ailia</i> where it is absent) | Family SCHILBEIDÆ. |
| 9. Two pairs of barbels : nasal barbels absent | Family SILURIDÆ. |
| 10. Four pairs of barbels : nasal barbels present | Family SACCOBRANCHIDÆ
(= HETEROPNEUSTIDÆ). |
| 11. Nostrils separated by a valve : 3 pairs of barbels | Family ARIIDÆ. |
| 12. Nostrils separated by a barbel : 3-4 pairs of barbels | 13. |
| 13. Head and body ventrally flattened : paired fins horizontal | Family SISORIDÆ. |
| 14. Head and body not ventrally flattened : paired fins not horizontal | Family BAGRIDÆ. |

Key to the families of suborder Auguilloidei

- | | |
|---|-----------------------|
| 1. Gill-openings wide : pectorals present or absent | 3. |
| 2. Gill-openings narrow : pectorals always present | Family MURAENIDÆ. |
| 3. Origin of dorsal fin either in advance of or opposite to pectoral origin : scaleless | 5. |
| 4. Origin of dorsal fin far behind pectoral origin : scaly | Family ANGUILLIDÆ. |
| 5. Cleft of mouth wide, about 2 times in head-length : eyes large : pectorals well developed | Family MURAENESOCIDÆ. |
| 6. Cleft of mouth moderate, about 3 times in head-length : eyes moderate : pectorals not well developed or absent | Family OPHICHTHYIDÆ. |

Key to the suborders of order BELONIFORMES

- | | |
|---|--|
| 1. Both jaws produced | Suborder Scomberesocoides
(Family BELONIDAE). |
| 2. Both jaws normal or lower jaw produced | Suborder Exocoetoidei. |

Key to the families of suborder Exocoetoidei

- | | |
|---|------------------------|
| 1. Lower jaw produced : pectorals normal | Family HEMIRHAMPHIDAE. |
| 2. Lower jaw normal : pectorals large and wing-like | Family EXOCOETIDAE. |

Key to the families of suborder Cyprinodontoidei

- | | |
|--|-------------------------|
| 1. Caudal peduncle shorter than head | Family CYPRINODONTIDAE. |
| 2. Caudal peduncle longer than head | Family POECILIIDAE. |

Key to the suborders of order MUGILIFORMES

- | | |
|--|--|
| 1. Snout pointed : pectorals low : strong socketted teeth in mouth | Suborder Sphyraenoidei
(Family SPHYRAENIDAE). |
| 2. Snout rounded : pectorals high : no socketted teeth in mouth | Suborder Mugiloidei
(Family MUGILIDAE). |

Key to the families of suborder Symbranchoidei

- | | |
|--|-----------------------|
| 1. Scales and a pair of accessory respiratory sacs present | Family AMPHIPNOIDAE. |
| 2. Scales and a pair of accessory sacs absent | Family SYMBRANCHIDAE. |

Key to the suborders of order PERCIFORMES

- | | |
|---|--|
| 1. Body cutlass-like, tail tapering | Suborder Trichiuroidei
(Family TRICHIURIDAE). |
| 2. Body neither cutlass-like nor tail tapering | 3. |
| 3. Accessory branchial organ present. | Suborder Anabantoidei |
| 4. Accessory branchial organ absent | 5. |
| 5. Pelvics always present, united to form sucking disk | Suborder Gobioides (Family GOBIIDAE). |
| 6. Pelvics present or absent, not united to form sucking disk when present | 7. |
| 7. Pelvics always present, each with 2 spines | Suborder Siganoidei (Family SIGANIDAE). |
| 8. Pelvics present or absent, each with 1 spine when present | 9. |
| 9. Pelvics always absent (in adult) | Suborder Stromatoidei
(Family STROMATEIDAE). |
| 10. Pelvics always present (except in family Xiphidae) | 11. |
| 11. Detached dorsal and anal finlets always present | Suborder Scombroidei. |
| 12. Detached dorsal and anal finlets absent (except in family Carangidae and genera <i>Trachinotus</i> and <i>Seriola</i>) | 13. |

13. Erectile spine on either side of caudal peduncle Suborder Acanthuroidei
(Family ACANTHURIDAE).
14. No erectile spine on caudal peduncle 15.
15. Head depressed, covered with spines and bony
ridges Suborder Cottoidei (Family
PLATYCEPHALIDAE).
16. Head not depressed, without spines and bony
ridges Suborder Percoidei.

Key to the families of suborder Percoidei

1. Upper jaw produced, sword-like 3.
2. Upper jaw normal, neither produced nor
sword-like 5.
3. Pelvics absent Family XIPHIIDAE.
4. Pelvics present Family HISTIOPHORIDAE.
5. Two long barbels under chin Family MULLIDAE.
6. No barbels below chin 7.
7. Two preanal spines detached from anal fin Family CARANGIDAE.
8. No preanal spines detached from anal fin 9.
9. Dorsal very long, without distinct spinous and
soft parts 11.
10. Dorsal moderate, with distinct spinous and soft
parts 13.
11. Caudal distinct from dorsal and anal: dorsal
origin on nape of head Family CORYPHAENIDAE.
12. Caudal confluent with dorsal and anal: dorsal
origin behind head Family CEPOLIDAE.
13. Anterior rays of soft dorsal and anal fins much
produced and falcate 15.
14. Anterior rays of soft dorsal and anal fins neither
produced nor falcate 17.
15. Pelvics well developed Family PLATACIDAE.
16. Pelvics rudimentary Family PSETTIDAE.
17. Body deeper than long, with a prominent sharp-
edged abdomen: anal fin spineless, with
many undeveloped rays enveloped in skin Family MENIDAE.
18. Body neither deeper than long nor abdomen
sharp-edged: anal fin with spines and well
developed rays not enveloped in skin 19.
19. Body laterally compressed, oblong or oblong-
ovate 21.
20. Body more or less subcylindrical, elongate 65.
21. Anal spines 12-16 Family CICHLIDAE.
22. Anal spines 2-4 23.
23. Origin of dorsal fin behind middle of body Family TOXOTIDAE.
24. Origin of dorsal fin before middle of body 25.
25. Anal always with 2 spines 27.
26. Anal with 3-4 spines 29.
27. Dorsals widely separated: no well developed
muciferous system on head Family APOGONIDAE.
28. Dorsals connected at base: a well developed
muciferous system on head (except in genus
Otolithes) Family SCIAENIDAE.
29. Anal with 4 spines Family SCATOPHAGIDAE.

- | | |
|---|------------------------|
| 30. Anal with 3 spines | 31. |
| 31. Spinous and soft dorsals separate or connected at base | 33. |
| 32. Spinous and soft dorsals continuous | 37. |
| 33. Dorsals separate : preoperculum smooth | Family LACTARIIDAE. |
| 34. Dorsals connected at base : preoperculum serrated | 35. |
| 35. Procumbent spine before dorsal ; caudal fin furcate : scales cycloid | Family AMBASSIDAE. |
| 36. No procumbent spine before dorsal : caudal fin rounded : scales ctenoid | Family LATIDAE. |
| 37. Gill membranes free from isthmus | 39. |
| 38. Gill membranes united with isthmus | 59. |
| 39. Dorsal spines 12-16 | 41. |
| 40. Dorsal spines 10-12 | 43. |
| 41. Maxilla extending beyond eye : operculum with 1 spine | Family NANDIDAE. |
| 42. Maxilla not extending beyond eye : operculum with 2 spines (generally bifid) | Family PRISTOLEPIDAE. |
| 43. Mouth terminal, greatly protractile | Family GERRIDAE. |
| 44. Mouth not terminal, not greatly protractile | 45. |
| 45. Operculum with scales | 47. |
| 46. Operculum without scales | Family LETHRINIDAE. |
| 47. Maxilla extending to the vertical from hind margin of eye | 49. |
| 48. Maxilla not extending to the vertical from hind margin of eye | 51. |
| 49. Gill membranes united with each other | Family LOBOTIDAE. |
| 50. Gill membranes not united with each other | Family SERRANIDAE. |
| 51. Median groove along under surface of lower jaw | Family POMADASYIDAE. |
| 52. No median groove along under surface of lower jaw | 53. |
| 53. Molar-like teeth on sides of jaws : pectorals very long, reaching 3rd anal spine | Family SPARIDAE. |
| 54. No molar-like teeth on sides of jaws : pectorals neither very long nor reaching 3rd anal spine. | 55. |
| 55. Dorsal and anal spines weak : distance between eye and angle of mouth considerable | Family NEMIPYRIDAE. |
| 56. Dorsal and anal spines strong : distance between eye and angle of mouth not considerable | 57. |
| 57. Opercular spines well developed : dorsal distinctly notched | Family THERAPONIDAE. |
| 58. Opercular spines not well developed : dorsal not distinctly notched | Family LUTIANIDAE. |
| 59. Mouth greatly protractile : top of head with long ridges and nuchal spine | Family LEIOGNATHIDAE. |
| 60. Mouth not greatly protractile : top of head without ridges and nuchal spine | 61. |
| 61. Several filiform dorsal spines | Family EPHIPPIDAE. |
| 62. No filiform dorsal spines | 63. |
| 63. Pectorals very long, reaching caudal | Family DREPANIDAE. |
| 64. Pectorals neither long nor reaching caudal | Family CHAETODONTIDAE. |

65. Head depressed, covered with spines and bony ridges Family **PLATYCEPHALIDÆ.**
 66. Head not depressed, without spines and bony ridges **67.**
 67. First dorsal reduced to disconnected spines Family **RACHYCENTRIDÆ.**
 68. First dorsal not reduced to disconnected spines Family **SILLAGINIDÆ.**

Key to the families of suborder Scombroidei

- Dorsal widely separate : adipose eye lids present Family **SCOMBRIDÆ.**
 2. Dorsals connected at base : adipose eye lids absent Family **CYBIIDÆ.**

Key to the families of suborder Anabantoidei

1. Outer rays of pelvics much produced or filiform : anal spines 5-20 Family **OSEHRONEMIDÆ.**
 Outer rays of pelvics not much produced : anal spines 9-12 Family **ANABANTIDÆ.**

Key to the suborders of order PLEURONECTIFORMES

- Origin of dorsal fin above eyes : pelvics without spine Suborder **Pleuronectoidei.**
 Origin of dorsal fin far behind eyes : pelvics with spines Suborder **Psettoidei (Family PSETTODIDÆ.)**

Key to the families of suborder Pleuronectoidei

- Margin of preoperculum free : lower jaw prominent Family **BOTHIDÆ.**
 Margin of preoperculum not free, hidden by skin and scales of head : lower jaw not prominent **3.**
 3. Eyes on left side Family **CYNOGLOSSIDÆ.**
 4. Eyes on right side Family **SOLEIDÆ.**

III—A FIELD KEY TO THE 100 FAMILIES OF THE COMMON COMMERCIAL FISHES

1. Skeleton cartilaginous : 5 pairs of lateral or ventral, non-confluent gill-openings without operculum Class **ELASMOBRANCHII, 3.**
 2. Skeleton bony : a pair of lateral gill-openings with operculum or gill-openings confluent as a single ventral slit Class **TELEOSTOMI, 25.**
 3. Gill openings lateral : body cylindrical **5.**
 4. Gill openings ventral : body flattened **15.**
 5. Eyes with nictitating membrane **7.**
 6. Eyes without nictitating membrane **11.**
 7. Head with oculonarial expansions or head hammer-shaped Family **SPHYRNIDÆ.**
 8. Head without oculonarial expansions or head normal shaped **9.**
 9. Caudal pit absent : first dorsal fin behind pelvics Family **SCYLIORHINIDÆ.**
 10. Caudal pit present : first dorsal fin before pelvics Family **CARCHARHINIDÆ.**

11. Nasoral grooves present Family ORECTOLOBIDAE
 12. Nasoral grooves absent 13.
 13. Teeth tricuspid : caudal peduncle not keeled on sides Family ODONTASPIDAE.
 14. Teeth not tricuspid : caudal peduncle keeled on each side Family LAMNIDAE.
 15. Disk narrow and elongate 17.
 16. Disk expanded and broadly circular 19.
 17. Snout very much produced and saw-like Family PRISTIDAE.
 18. Snout short or normal and not saw-like Family RHINOBATIDAE.
 19. Head distinct from disk and with a prominent snout 21.
 20. Head not distinct from disk and without a prominent snout Family TRYGONIDAE.
 21. With horn-like cephalic flippers Family MOBULIDAE.
 22. Without horn-like cephalic flippers 23.
 23. Head bilobed or notched between rostral fins : rostral fins separate Family RHINOPTERIDAE.
 24. Head neither bilobed nor notched between rostral fins : rostral fins united to form one lobe. Family MYLIOBATIDAE.
 25. Body cylindrical, greatly elongate or eel-shaped 27.
 26. Body neither cylindrical nor greatly elongate nor eel-shaped 39.
 27. Pelvics absent : body very long : dorsal spines absent 29.
 28. Pelvics present : body moderately long : dorsal spines present Family MASTOCEMBELIDAE.
 29. Gill-openings confluent, as a single ventral slit 31.
 30. Gill-openings non-confluent, as two separate slits 33.
 31. Scales and a pair of accessory respiratory sacs present Family AMPHIPNOIDAE [*A. cuchta* (Ham.)]
 32. Scales and accessory respiratory sacs absent Family SYMBRANCHIDAE [*S. bengalensis* (Mc Clell.)].
 33. Gill-openings wide : pectorals present or absent 35.
 34. Gill-openings narrow : pectorals always present Family MURAENIDAE.
 35. Origin of dorsal fin either in advance of or opposite to pectoral origin : scaleless 37.
 36. Origin of dorsal fin far behind pectoral origin : scaly Family ANGUILLIDAE [*A. bengalensis* (Gray and Hardw.)] (D. 250-305 ; P. 18 ; A. 220-250 ; C. 10-12).
 37. Cleft of mouth wide, about 2 times in head length : eyes large : pectorals well developed Family MURAENESOCIDAE
 38. Cleft of mouth moderate about 3 times in head length : pectorals not well developed or absent Family OPHICHTHYIDAE.
 39. Body totally scaleless : barbels always present 41

40. Body scaly : barbels present or absent 55.
41. Anal fin very long 43.
42. Anal fin short 51.
43. Second rayed dorsal or procurrent caudo-dorsal present : adipose dorsal absent : caudal united with second dorsal and anal Family PLOTOSIDAE.
44. Second rayed dorsal or procurrent caudo-dorsal absent : adipose dorsal present or absent : caudal not united 45.
45. First dorsal very short 47.
46. First dorsal very long Family CLARIIDAE
[*C. batrachus* (L.)]
(B. 9 ; D. 62-76 ; P. 1/8-9 ;
V. 6 : A. 45-58 ; C. 15-17).
47. Adipose dorsal absent : first dorsal spineless 49.
48. Adipose dorsal present : first dorsal with spine (except in genus *Ailia* where it is absent) Family SCHILBEIDAE.
49. Two pairs of barbels : nasal barbels absent Family SILURIDAE.
50. Four pairs of barbels : nasal barbels present Family SACCOBRANCHIDAE
(= HETEROPNEUSTIDAE)
[*H. fossilis* (Bl.)]
(B. 7 ; D. 6-7 ; P. 1/7 ; V. 6 ;
A. 60-79 ; C. 19).
51. Nostrils separated by a valve : 3 pairs of barbels Family ARIIDAE.
52. Nostrils separated by a barbel : 3-4 pairs of barbels 53.
53. Head and body ventrally flattened : paired fins horizontal Family SISORIDAE
[*B. bagarius* (Ham.)]
(B. 12 ; D. 1/6/0 ; P. 1/12 ;
V. 6 ; A. 3/10-12 ; C. 17).
54. Head and body not ventrally flattened : paired fins not horizontal Family BAGRIDAE.
55. Body bilaterally symmetrical : eyes normally placed on each side of head 63.
56. Body asymmetrical : eyes both on same side of head 57.
57. Origin of dorsal fin above eyes : pelvics without spines 59.
58. Origin of dorsal fin far behind eyes : pelvics with spines Family PSETTODIDÆ
[*P. erumie* (Schn.)]
(B. 7 ; D. 47-56 ; P. 16 ;
V. 6 ; A. 35-41 ; L. L. 70-75 ; C. 17).
59. Margin of preoperculum free : lower jaw prominent Family BOTHIDAE.
60. Margin of preoperculum not free, hidden by skin and scales of head : lower jaw not prominent 61.
61. Eyes on left side Family CYNOGLOSSIDÆ.
62. Eyes on right side Family SOLEIDAE.
63. A sucking disc absent on top of head 65.
64. A sucking disc (modified spinous dorsal) present on top of head Family ECHEINIDAE.
65. Body elongate, ribbon or cutless-like 67.

- 6 Body neither elongate nor ribbon or cutless-like 69.
67. Tail tapering to a point : dorsal very long, originating from head : pelvics and anal absent or rudimentary Family TRICHIURIDAE.
68. Tail not tapering to a point, forked : dorsal small, originating from caudal region : pelvics and anal present Family CHIROCENTRIDAE
[*C. dorab* (Forsk.)]
(B. 8 ; D. 4/12-13 ; P. 14-15 ; V. 6-7 ; A. 4/27-32 ; C. 19).
69. Adipose dorsal present 71.
70. Adipose dorsal absent 73.
71. Gape of mouth about half of head length : scales very small : gill-openings moderate Family SALMONIDAE.
72. Gape of mouth more than head length : scales moderate : gill-openings very wide Family SYNODONTIDAE.
73. With 2 widely separate dorsal fins 75.
74. With single dorsal or continuous or closely situated dorsal fins 91.
75. Pelvics present 79.
76. Pelvics absent 77.
77. Upper jaw produced, sword-like : size very large, with subcylindrical body Family XIPHIIDAE
(*X. gladius* L.)
(D. 3/40 ; A. 17).
78. Upper jaw neither produced nor sword-like : size ordinary, with compressed body Family BALISTIDAE
[*A. stellaris* (Schn.)]
(B. 6 ; D. 3/26-27 ; P. 15 ; A. 24-25 ; L. 1. 42-46 ; L. tr. 26 ; C. 13).
79. Pelvics abdominal Family SPHYRAENIDÆ.
80. Pelvics thoracic or jugular 81.
81. Pelvics jugular 83.
82. Pelvics thoracic 85.
83. Upper jaw much produced, sword-shaped : base of tail keeled Family HISTIOPHORIDAE.
84. Upper jaw not produced, normal : base of tail not keeled Family APOGONIDAE.
85. With 2 long barbels below chin Family MULLIDAE.
86. No barbels below chin 87.
87. Pectorals with detached filamentous rays Family POLYNEMIDAE.
88. Pectorals normal without detached filamentous rays 89.
89. Detached finlets behind anal and second dorsal fins Family SCOMBRIDAE.
90. No detached finlets behind anal and second dorsal fins Family MUGILIDÆ.
91. 1-3 unarticulated or unbranched rays (spines) in dorsal fin : dorsal always single or absent (as in genera *Raconda* and *Notopterus*) 93.
92. More than 3 unarticulated or unbranched rays (spines) in dorsal fin : dorsal single or when two continuous, close together or first dorsal reduced to spines 125.

93. Dorsal very long 95.
 94. Dorsal short 99.
 95. Dorsal and anal confluent with caudal . Family CEPOLIDAE
 (*C. abbreviata* V.)
 (B. 6; D. 67-74; P. 19;
 V. 1/5; A. 67-74; C. 19.)
96. Dorsal and anal not confluent with caudal 97.
 97. Dorsal origin on nape of head: accessory
 branchial organ absent Family CORYPHAENIDAE
 (*C. hippurus* L.)
 (B. 7; D. 58-63; P. 21;
 V. 1/5; A. 25-27; C. 19).
98. Dorsal origin far behind head: accessory
 branchial organ present Family OPHIOCEPHALIDAE
 (=Channidae).
99. Six to eight barbels: scales very small Family COBITIDAE.
 100. Without barbels or 2-4 barbels: scales usually
 large or moderate 101.
 101. Dorsal fin in caudal region 103.
 102. Dorsal fin not in caudal region . 109.
 103. Either both or lower jaw produced 105.
 104. Neither jaws produced 107.
 105. Lower jaw produced . Family HEMIRHAMPHIDAE.
 106. Both jaws produced . Family BELONIDAE.
 107. Pectorals much produced and wing-like Family EXOCOETIDAE.
 108. Pectorals normal Family CYPRINODONTIDAE.
 109. Gill membranes united with isthmus 111.
 110. Gill membranes free from isthmus 113.
 111. Accessory branchial organ present Family CHANIDAE
 [*C. chanos* (Fork.)]
 (D. 13-16; P. 16; A. 9-10;
 L. l. 80-90; L. tr. 12/15).
112. Accessory branchial organ absent Family CYPRINIDAE.
 113. Gular plate present in lower jaw 115.
 114. Gular plate absent in lower jaw 117.
 115. Scales small (L. 1. above 90): anal short (less
 than 20 rays) Family ELOPIDAE
 [*E. saurus* (L.)]
 (B. 29-35; D. 22-24; A. 15-
 17; L. l. 95-100; L. tr.
 12/15; C. 19).
116. Scales large (L. 1. below 50): anal moderate
 (more than 23 rays). Family MEGALOPIDAE
 [*M. cyprinoides* (Brouss.)]
 (B. 24-26; D. 19-21; A. 24-
 27; L. l. 37-42; L. tr.
 5-6/6; C. 19).
117. Head scaly . 119.
 118. Head scaleless . 121.
 119. Anal united with caudal Family NOTOPTERIDAE.
 120. Anal not united with caudal Family POECILIDAE
 [*G. affinis patruelis* (Baird
 and Girard)]
 (D. 6-9; A. 8-10; V. 6-9.
 L. l. 32; L. tr. 8).
121. Cleft of mouth very deep: maxilla extending
 considerably beyond eye Family ENGRAULIDAE.

122. Cleft of mouth normal : maxilla not extending beyond eye . 123.
123. Abdomen serrated or keeled or both (except in genus *Dussumieria*) . Family CLUPEIDAE.
124. Abdomen non-serrated, non-keeled . Family ALBULIDAE
[*A. vulpes* (L.)]
(B. 14-16 ; D. 17-19 ; A. 9 ; L. 1. 75-80 ; L. tr. 9-81 9-11).
125. Pelvics united to form sucking disc . Family GOBIIDAE
[*G. giuris* (Ham.)]
(B. 4 ; D. 6/1/8-9 ; P. 20 ; V. 1/5 ; A. 1/8-9 ; L. 1. 30-34 ; L. tr. 8-9 ; C. 17).
126. Pelvics not united to form sucking disc . 127.
127. Two preanal spines detached from anal fin : lateral line armed with enlarged scales (except in genera *Chorinemus*, *Trachinotus* and *Seriola* where lateral line is unarmed) . Family CARANGIDAE.
128. No spines detached from rest of anal fin : lateral line not armed with enlarged scales . 129.
129. Detached finlets behind dorsal and anal fins : caudal peduncle strongly keeled . 131.
130. No detached finlets behind dorsal and anal fins : caudal peduncle not strongly keeled . 133.
131. Scales small, those on the anterior part of body forming corselets . Family THUNNIDAE.
132. Scales rudimentary, without corselets . Family CYBIDAE.
133. Anterior rays of soft dorsal and anal fins much produced and falcate . 135.
134. Anterior rays of soft dorsal and anal fins not much produced and falcate . 139.
135. Pelvics rudimentary or absent in adult . 137.
136. Pelvics very well developed . Family PLATACIDAE.
137. Dorsal rays 38-50 : pelvics absent (in adult) . Family STROMATEIDAE.
138. Dorsal rays 28-30 : pelvics rudimentary . Family PSETTIDAE.
139. Body deeper than long, with a prominent sharp-edged abdomen ; anal fin spineless, with many undeveloped rays enveloped in skin . Family MENIDAE
[*M. maculatus* (Schn.)]
(B. 7 ; D. 3-4/40-43 ; P. 15 ; V. 1/5 ; A. 30-33 ; C. 18).
140. Body neither deeper than long nor abdomen sharp-edged : anal fin with spines and well developed rays not enveloped in skin . 141.
141. Body laterally compressed, oblong or oblong-ovate . 147.
142. Body more or less subcylindrical, elongate . 143.
143. Head depressed, covered with spines and bony ridges . Family PLATYCEPHALIDAE.
144. Head not depressed, without spines and bony ridges . 145.
145. First dorsal reduced to disconnected spines . Family RACHYCENTRIDAE
[*R. canadus* (L.)]
(B. 7 ; D. 8/28-36 ; P. 21 V. 1/5 ; A. 2/25-29 ; C. 17).
146. First dorsal not reduced to disconnected spines . Family SILLAGINIDAE

147. Anal spines 5-20 149.
148. Anal spines 2-4 155.
149. Pelvics each with 2 spines : anal spines always 7 : accessory branchial organ absent Family SIGANIDAE.
150. Pelvics each with one spine : anal spines 5-20 : accessory branchial organ present or absent 151.
151. Outer rays of pelvics much produced or fili- form : anal spines 5-20 : accessory branchial organ present Family OSPHRONEMIDAE.
152. Outer rays of pelvics not produced : anal spines 9-16 : accessory branchial organ present or absent 153.
153. Operculum strongly serrated : anal spines 9-10 : accessory branchial organ present Family ANABANTIDAE
[*A. testudineus* (Bl.)]
(B. 6 ; D. 17-18/8-10 ; P. 15 ; V. 1/5 ; A. 9-10/9-11 ; L. l. 28-32 ; L. tr. 3-4/9-10 ; C. 17).
154. Operculum smooth : anal spines 12-16 : acces- sory branchial organ absent Family CICHLIDAE.
155. Origin of dorsal fin behind middle of body Family TOXOTIDAE
[*T. chatareus* (Ham.)]
(B. 7 ; D. 4-5/12 ; P. 13 ; V. 1/5 ; A. 3/16-17 ; L. l. 31 ; L. tr. 4-5/10-11 ; C. 17).
156. Origin of dorsal fin before middle of body 157.
157. Anal with 2 spines : muciferous system on head well developed (except in genus *Oto- lithes*) Family SCIAENIDAE.
158. Anal with 3-4 spines : muciferous system on head not well developed 159.
159. Anal with 4 spines 161
160. Anal with 3 spines 163
161. Preoperculum serrated and armed Family HOLOCENTRIDAE
(= BERYCIDAE).
162. Preoperculum smooth and unarmed Family SCATOPHAGIDAE
[*S. argus* (L.)]
(B. 6 ; D. 10/1/16-17 ; P. 20 ; V. 1/5 ; A. 4/14-16 ; C. 16).
163. Spinous and soft dorsals separate or connected at base 165.
164. Spinous and soft dorsals continuous 169.
165. Dorsals separate : preoperculum smooth, non- serrated Family LACTARIIDAE
[*L. lactarius* (Schn.)]
(B. 7 ; D. 7-8/1/21-22 ; P. 17 ; V. 1/5 ; A. 3/25-28 ; L. l. 74-80 ; C. 17).
166. Dorsals connected at base : preoperculum serrated 167.
167. Procumbent spines before dorsal : caudal fur- cate ; scales cycloid Family AMBASSIDAE.
168. No procumbent spines before dorsal : caudal rounded : scales ctenoid Family LATIDAE
[*L. calcarifer* (Bl.)]
(B. 7 ; D. 7-8/1/11-12 ; P. 17 ; V. 1/5 ; A. 3/8-9 ; L. l. 52-60 ; L. tr. 6-7/13 ; C. 17).

169. Erectile spine on either side of caudal peduncle Family ACANTHURIDAE
 [*A. triostegus* (L.)]
 (B. 5 ; D. 9/23-25 ; P. 15 ;
 V. 1/5 ; A. 2/20-22 ; C. 17).
170. No erectile spine on caudal peduncle 171.
171. Gill membranes free from isthmus 173.
172. Gill membranes united with isthmus 193.
173. Dorsal spines 13-17 175.
174. Dorsal spines 9-12 177.
175. Maxilla extending beyond eye : opercle with
 one spine Family NANDIDAE
 [*N. nandus* (Ham.)]
 (B. 6 ; D. 12-14/11-13 ; P.
 16 ; V. 1/5 ; A. 3/7-9 ;
 L. 1. 46-59 ; L. tr. 5½-6/
 7-20 ; C. 15).
176. Maxilla not extending beyond eye : operculum
 with 2 spines (generally bifid) Family PRISTOLEPIDAE.
177. Mouth terminal, greatly protractile Family GERRIDAE.
178. Mouth neither terminal nor greatly pro-
 tractile 179.
179. Operculum scaly 181.
180. Operculum scaleless Family LETHRINIDAE
 [*L. nebulosa* (Forsk.)]
 (B. 6 ; D. 10/9 ; P. 13 ; V.
 1/5 ; A. 3/8 ; L. 1. 46-48
 L. tr. 6/16 ; C. 17).
181. Maxilla extending to hind margin of eye 183.
182. Maxilla not extending to hind margin of eye 185.
183. Gill membranes united with each other Family LOBOTIDAE
 [*L. surinamensis* (Bl.)]
 (B. 6 ; D. 12/15-16 ; P. 15-17 ;
 V. 1/5 ; A. 3/11-13 ; L. 1.
 42-44 ; L. tr. 9-11/22 ; C. 17).
184. Gill membranes not united with each other Family SERRANIDAE.
185. Median groove or pores under surface of lower
 jaw Family POMADASYIDAE.
186. No median groove along under surface of
 lower jaw 187.
187. Molar-like teeth on sides of jaws : pectorals
 very long, reaching third anal spine Family SPARIDAE.
188. No molar-like teeth on sides of jaws : pectorals
 neither very long nor reaching third anal
 spine 189.
189. Dorsal and anal spines weak : distance between
 eye and angle of mouth considerable Family NEMIPTERIDAE
190. Dorsal and anal spines strong : distance
 between eye and angle of mouth not consider-
 able 191.
191. Opercular spines well developed : dorsal dis-
 tinctly notched Family THERAPONIDAE
192. Opercular spines not well developed : dorsal
 not distinctly notched Family LUTIANIDAE
193. Mouth greatly protractile : top of head with
 bony ridges and nuchal spine Family LEIOGNATHIDAE.
194. Mouth not greatly protractile : top of head
 without bony ridges and nuchal spine 195.

195. Several filiform dorsal spines Family EPHIPPIDAE
(*E. orbis* Bl.)
(B. 6 ; D. 8-9/19-20 ; P. 19 ;
V. 1/5 ; A. 3/15 ; L. 1. 42 ;
L. tr. 7/15 ; C. 19).
196. No filiform dorsal spines 197.
197. Pectorals very long, reaching caudal Family DREPANIDAE
[*D. punctata* (L.)]
(B. 6 ; D. 8-9/21-22 ; P. 17 ;
V. 1/5 ; A. 3/18-19 ; L. 1.
50-55 ; L. tr. 14/33 ; C. 15).
198. Pectorals neither very long nor reaching caudal Family CHAETODONTIDAE.

IV—KEY TO THE GENERA AND SPECIES

Family ORECTOLOBIDAE

Key to the genera of family ORECTOLOBIDAE

1. Body massive : tail with lateral keels : caudal pit present Genus *Rhincodon* Smith (*R. typus* Smith).
2. Body not massive : tail without lateral keels : caudal pit absent 3.
3. First dorsal behind pelvics : 1-3 dorsal ridges on back Genus *Chiloscyllium* M. H. (*C. griseum* M. H.).
4. First dorsal opposite pelvics : no dermal ridges on back 5.
5. Caudal fin short Genus *Nebrius* Rupp. [*N. ferrugineum* (Lesson)].
6. Caudal fin long Genus *Stegostoma* M. H. [*S. varius* (Seba)].

Family LAMNIDAE

Key to the genera of family LAMNIDAE

1. Tail without lateral keel : caudal fin very long, nearly $\frac{1}{2}$ the total length Genus *Alopias* Raf. (*A. vulpinus* Bonn.).
2. Tail with lateral keel : caudal fin short, much less than $\frac{1}{2}$ the total length Genus *Isurus* Raf. (*I. glauca* M. H.).

Family CARCHARHINIDAE

Key to the genera of family CARCHARHINIDAE

1. Spiracles present Genus *Galeocerdo* M. H. [*G. arcticus* (Fabr.)].
2. Spiracles absent 3.
3. Teeth with smooth edges 5.
4. Teeth with roughened edges 7.
5. Teeth with swollen bases Genus *Physodon* M. H. (*P. mulleri* M. H.).
6. Teeth without swollen bases *Scoliodon* M. H.
7. Teeth serrated at bases and cusps (in the upper jaw) Genus *Carcharhinus* Blain.
8. Teeth serrated at bases only (in the upper jaw) Genus *Hypoprion* M. H.

Key to the species of genus Scoliodon

- | | |
|--|--------------------------------|
| 1. Labial fold extending to upper jaw : D. F.
25/21 | <i>S. walbeehmi</i> Blkr. |
| 2. Labial fold not extending to upper jaw : D. F.
23-31/22-30 | 3. |
| 3. Second dorsal fin posterior to base of anal :
D. F. 31/28-30 | <i>S. sorrahowah</i> (C.). |
| 4. Second dorsal fin over end of base of anal :
D. F. 23/22 | <i>S. palasorrahowah</i> (C.). |

Key to the species of genus Hypoprion

- | | |
|---|--------------------------|
| 1. Snout pointed : labial folds present : D. F.
27/27 | <i>H. macloti</i> M. H. |
| 2. Snout rounded : labial folds absent : D. F.
29-32/27-29 | <i>H. hemiodon</i> M. H. |

Key to the species of genus Carcharhinus

- | | |
|--|-----------------------------------|
| 1. Second dorsal larger than anal | 3. |
| 2. Second dorsal not larger than anal | 5. |
| 3. Teeth in lower jaw distinctly non-serrated :
D. F. 37-40/33-39 | <i>C. temminckii</i> (M. H.). |
| 4. Teeth in lower jaw serrated : D. F. 27-30/
27-30 | <i>C. gangeticus</i> (M. H.). |
| 5. Teeth in lower jaw serrated : D. F. 24-34/
24-31 | 7. |
| 6. Teeth in lower jaw non-serrated, D. F. 28-32/
27-28 | <i>C. menisorrahowah</i> (M. H.). |
| 7. Second dorsal distinctly smaller than anal | 9. |
| 8. Second dorsal and anal subequal | 11. |
| 9. Second dorsal and anal origins opposite :
D. F. 34/31 | <i>C. limbatus</i> (M. H.). |
| 10. Second dorsal origin behind anal origin : D. F.
25/25 | <i>C. sorrahowah</i> (M. H.). |
| 11. Preoral length distinctly less than width of
mouth | <i>C. melanopterus</i> (Q. G.). |
| 12. Preoral length more than or equal to width of
mouth | 13. |
| 13. Preoral length more than width of mouth :
D. F. 24-25/24-25 | <i>C. dussumieri</i> (M. H.). |
| 14. Preoral length equal to width of mouth : D. F.
29/26 | <i>C. bleekeri</i> (Dumeril). |

Family SPHYRNIDAE

Key to the species of genus Sphyrna

- | | |
|---|-------------------------|
| 1. Eyes and nostrils widely separated (oculonarial
expansions long) | <i>S. blochii</i> (C.) |
| 2. Eyes and nostrils not widely separated (oculo-
narial expansions short) | 3. |
| 3. Anterior edge of oculonarial expansions curved | <i>S. tudes</i> (V.). |
| 4. Anterior edges of oculonarial expansions
straight | <i>S. zygaena</i> (L.). |

Family RHINOBATIDAE

Key to the genera of family RHINOBATIDAE

1. Snout triangularly pointed : spiracles with fold on hind edge 3.
2. Snout blunt, broad and rounded : spiracles without fold on hind edge Genus **Rhina** Schn.
(*R. ancylostoma* Schn.).
3. Origin of first dorsal distinctly nearer to tip of snout than to tip of caudal Genus **Rhynchobatus** M. H.
[*R. djiddensis* (Forsk.)].
4. Origin of first dorsal distinctly nearer to tip of caudal than to tip of snout Genus **Rhinobatos** Linck.

Key to the species of genus Rhinobatos

1. Snout short, bluntly or obtusely pointed *R. obtusus* (M. H.).
2. Snout long and pointed 3.
3. Length of nostril equal to internarial space and twice the width of the mouth *R. granulatus* (C.).
4. Length of nostril greater than internarial space and less than twice the width of mouth *R. armatus* (Gray).

Family PRISTIDAE

Key to the species of genus Pristis

1. First dorsal origin distinctly behind or opposite pelvics : rostral teeth more in number, 23-35 on either side 3.
2. First dorsal origin clearly in front of pelvics : rostral teeth less in number, 17-20 on either side *P. microdon* Lath.
3. First dorsal origin behind pelvics *P. cuspidatus* Lath.
4. First dorsal origin opposite pelvics *P. pectinatus* Lath.

Family TRYGONIDAE

Key to the species of genus Dasyatis

1. Tail with cutaneous folds 3.
2. Tail without cutaneous folds 7.
3. Only a ventral cutaneous fold on tail *D. sephen* (Forsk.) .
4. Ventral and dorsal cutaneous folds on tail 5.
5. Tail short, hardly as long as length of disk *D. imbricata* (Schn.).
6. Tail long, exceeding length of disk *D. kuhlii* (M. H.).
7. With 2 buccal processes *D. bleekeri* (Blyth).
8. With 4 buccal processes *D. uarnak* (Forsk.).

Family MYLIOBATIDAE

Key to the genera of family MYLIOBATIDAE

1. Teeth in several rows of which the lateral ones narrower than the central : caudal spine absent Genus **Aetomylus** Garman.
2. Teeth in single broad series : caudal spine present Genus **Aetobatus** Blainville
[*A. flagellum* (Schn.)].

Key to the species of genus Aetomylus

1. Spiracles twice eye : about 5 blue cross bands on disk *A. nichofii* (Schn.).
2. Spiracles equal to eye : green-brown-edged ocelli on hind part of disk *A. milvus* (M. H.).

Family RHINOPTERIDAE

Key to the species of genus Rhinoptera

1. Teeth in 9 rows in upper jaw *R. aaspersa* M. H.
2. Teeth in 7 rows in upper jaw *R. javanica* M. H.

Family MOBULIDAE

Key to the genera of family MOBULIDAE

1. Cephalic horns curled : mouth inferior, well behind head Genus *Mobula* Rafin.
[*M. diabolus* (Shaw)].
2. Cephalichorns rarely curled : mouth terminal, in front of head Genus *Manta* Bancroft
[*M. ehrenbergii* (M. H.)].

Family CLUPEIDAE

Key to the genera of family CLUPEIDAE

1. Abdomen serrated 3.
2. Abdomen non-serrated Genus *Dussumeria* V.
3. Toothless 5.
4. Toothed 9.
5. Last dorsal ray prolonged into filament . . . Genus *Nematalosa* Reg.
[*N. nasus* (Bl.)]
(D. 15-17 ; V. 8 ; A. 21-24 ;
L. l. 45-50 ; L. tr. 15-19).
6. Last dorsal ray not prolonged into filament . 7.
7. Pelvic origin behind dorsal origin : L. l. scales 40-42 : L. tr. scales 12-15 Genus *Anodontostoma* Blkr.
[*A. chacunda* (Ham.)]
(D. 17-19 ; V. 8 ; A. 18-21 ;
L. l. 40-42 ; L. tr. 12-15).
8. Pelvic origin a little in front of dorsal origin : L. l. scales 45-65 : L. tr. scales 16-25 . . . Genus *Gonialosa* Reg.
[*G. manmina* (Ham.)]
(D. 14-15 ; P. 15 ; V. 8 ;
A. 22-24 ; L. l. 58-65 ;
L. tr. 21-25).
9. Anal moderate (rays 14-22) : jaws equal or subequal : plevics well developed . . . 11.
10. Anal long (rays 36-96) : lower jaw prominent : plevics small or absent 19.
11. Lateral line scales less than 50 (39-49) . . . 13.
12. Lateral line scales more than 75 (80-110) . . Genus *Gudusia* Fowler
[*G. chapra* (Ham.)]
(D. 14-16 ; P. 13 ; V. 8 ;
A. 21-24 ; L. l. 80-110 ;
L. tr. 33-35 ; C. 17).

13. Dorsal origin before pelvic origin 15.
14. Dorsal origin opposite pelvic origin Genus *Kowala* V.
[*K. coval* (C.)]
(D. 12-15 ; P. 13 ; V. 8 ;
A. 14-20 ; L. l. 38-41 ;
L. tr. 9-11).
15. Upper jaw without median notch 17.
16. Upper jaw with distinct median notch Genus *Hilsa* Reg.
17. Last 2 anal rays enlarged Genus *Sardinella* V.
18. Last 2 anal rays not enlarged Genus *Harengula* V.
[*H. punctata* (Rupp.)]
(B. 6 ; D. 17-19 ; P. 15-16 ;
V. 8 ; A. 17-18 ; L. l. 43-
45 ; L. tr. 10-12 ; C. 20)
19. Pelvics absent 21.
20. Pelvics present 23.
21. Dorsal fin present Genus *Ophistopterus* Gill
[*O. taroore* (C.)]
(B. 6 ; D. 12-17 ; A. 53-66 ;
L. l. 43-50 ; L. tr. 12-15).
22. Dorsal fin absent Genus *Raconda* Gray
(*R. russelliana* Gray)
(P. 13 ; A. 83-92 ; L. l. 60-
64 ; L. tr. 12).
23. Occipital ridges converging behind : oral edge
of upper jaw with a toothed bone between
maxillary and premaxillary Genus *Pellona* V.
(*P. ditchela* V.)
(D. 15-18 ; P. 17 ; C. 7 ;
A. 33-38 ; L. l. 40-44 ;
L. tr. 11-13).
24. Occipital ridges sub-parallel behind : oral edge
of upper jaw with a ligament between
maxillary and premaxillary Genus *Ilisha* Rich.

Key to the species of genus Dussumieria

1. Lateral line scales 40-42 : depth of body 5-5½
times in total length *D. acuta* (V.)
(B. 14-15 ; D. 19-20 ; P. 14-15 ;
V. 8 ; A. 15-17 ; L. l. 40-42 ;
L. tr. 11-12).
2. Lateral line scales 52-56 : depth of body 5¾-
6½ times in total length *D. hasselti* Blkr.
(B. 15-19 ; D. 17-20 ; P. 14-15 ;
V. 8 ; A. 15-16 ; L. l. 52-56 ;
L. tr. 12-13).

Key to the species of genus Sardinella

1. Depth of body between 3-4 times in total
length : lower gill-rakers 70-75 *S. fimbriata* (V.)
(B. 6 ; D. 18-19 ; V. 8 ; A.
18-21 ; L. l. 45 ; L. tr. 12).
2. Depth of body between 4½-5½ times in total
length : lower gill rakers 38-62 or 180-250 3.
3. Eye 4½-5 times in head : lower gill-rakers 180-
250 *S. longiceps* (V.)
(B. 6 ; D. 16-18 ; V. 9 ; A.
14-16 ; L. l. 46-48 ; L. tr.
12-13).

4. Eye $3\frac{1}{4}$ - $3\frac{3}{4}$ times in head : lower gill rakers 38-62
5. Lower gill rakers 38-44 : caudal tipped black
6. Lower gill rakers 58-62 : caudal not tipped black
- 5.
- S. melanura* (C.)
(B. 6 ; D. 18-19 ; V. 8 ; A. 16-18 ; L. l. 44-46 ; L. tr. 12-13).
- S. sindensis* (Day)
(B. 6 ; D. 17-19 ; V. 8 ; A. 18-21 ; L. l. 44-48 ; L. tr. 11-13).

Key to the species of genus *Hilsa*

1. Lateral transverse scales less than 16 : 16-18 preventral and 11-13 postventral scutes
2. Lateral transverse scales more than 16 (17-20) : 16-17 preventral and 14-15 postventral scutes
3. Parietal ridges expanded and striated : length of head $4\frac{1}{2}$ times in total length
4. Parietal ridges narrow and covered with smooth skin : length of head $5-5\frac{1}{2}$ times in total length
- 3.
- H. ilisha* (Ham.)
(B. 5 ; D. 18-20 ; P. 15 ; V. 9 ; A. 18-22 ; L. l. 45-49 ; L. tr. 17-20 ; C. 19).
- H. kelee* (C.)
(B. 5 ; D. 17-20 ; P. 16 ; V. 8 ; A. 19-22 ; L. l. 42-45 ; L. tr. 13-14).
- H. sinensis* (L.)
(B. 5 ; D. 17-19 ; P. 14 ; V. 9 ; A. 18-21 ; L. l. 39-40 ; L. tr. 13-15).

Key to the species of genus *Ilisha*

1. Anal origin clearly behind dorsal origin
2. Anal origin not behind dorsal origin
3. Lateral transverse scales 14-16 : 20-24 pre-ventral and 8-10 postventral scutes : L. l. scales 46-56
4. Lateral transverse scales 12-13 : 15-16 pre-ventral and 7-8 postventral scutes : L. l. scales 43-45
5. Height of body $3\frac{3}{4}$ in total length : lateral line scales 50
6. Height of body $3\frac{1}{4}$ - $3\frac{3}{4}$ times in total length : lateral line scales 43-44
- 3.
- 5.
- I. elongata* (Benn.)
(B. 6 ; D. 15-17 ; P. 15-17 ; V. 7 ; A. 40-50 ; L. l. 46-56 ; L. tr. 14-16 ; C. 17).
- I. motius* (Ham.)
(B. 6 ; D. 16-17 ; P. 15 ; V. 7 ; A. 40-41 ; L. l. 43-45 ; L. tr. 12-13).
- I. filigera* (V.)
(B. 6 ; D. 18-19 ; P. 17 ; V. 8 ; A. 46-50 ; L. l. 50 ; L. tr. 15-16 ; C. 19).
- I. brachysoma* Blkr.
(B. 6 ; D. 17-19 ; P. 16 ; V. 7 ; A. 46-51 ; L. l. 43-44 ; L. tr. 14-15 ; C. 17).

Family ENGRAULIDAE

Key to the genera of family ENGRAULIDAE

1. Caudal forked, not united with anal: upper pectoral ray produced or not produced 3.
2. Caudal pointed, united with anal: upper pectoral rays always produced Genus *Coilia* Gray
(*C. dussumieri* V.)
(B. 11 ; D. 1+13-15 ; P. 9+v-vi ; V. 7 ; A. 105 ; L. l. 80 ; L. tr. 9 ; C. 12).
3. Upper pectoral ray produced Genus *Setipinna* Swn.
4. Upper pectoral ray not produced 5.
5. Abdominal scutes restricted only between pectorals and pelvics: a lateral silvery band: anal short Genus *Anchoviella* Fowler.
6. Abdominal scutes not restricted between pectorals and pelvics: no lateral silvery band: anal long Genus *Thrissocles*
Jordan and Evermann.

Key to the species of genus Setipinna

1. Anal origin in front of dorsal origin: lower gill-rakers 18: anal rays 70-80 *S. phasa* (Ham.)
(B. 12-13 ; D. 15-16 ; P. 15 ; V. 7 ; A. 70-80 ; L. l. 52 ; L. tr. 14 ; C. 19).
2. Anal origin behind dorsal origin: lower gill-rakers 15-16: anal rays 57-60 *S. taty* (V.)
(B. 11-12 ; D. 14-16 ; A. 51-60 ; L. l. 42-46 ; L. tr. 12 ; C. 19).

Key to the species of genus Anchoviella

1. Abdominal scutes between pectorals and pelvics 6-8 *A. commersonii* Lac.
(B. 11-13 ; D. 15-16 ; P. 14-15 ; V. 7 ; A. 20-21 ; L. l. 38-40 ; L. tr. 8-9).
2. Abdominal scutes between pectorals and pelvics 4-5 3.
3. Maxillary reaching front border of preopercle *A. indica* (v. Hass.)
(B. 11 ; D. 16 ; P. 14-16 ; V. 7 ; A. 19-21 ; L. l. 40 ; L. tr. 8-9).
4. Maxillary reaching gill-opening *A. tri* (Blkr.)
(B. 11 ; D. 14-15 ; P. 12-13 ; V. 7 ; A. 20-23 ; L. l. 32-35 ; L. tr. 8-9).

Key to the species of genus Thrissocles

1. Maxillary extending beyond gill-opening 3.
2. Maxillary not extending beyond gill-opening 5.
3. Lower gill-rakers 13: anal more than 3 times in standard length *T. mystax* (Schn.)
(B. 12-14 ; D. 14-16 ; P. 12 ; V. 7 ; A. 35-38 ; L. l. 45 ; L. tr. 12 ; C. 19).

4. Lower gill-rakers 11 : anal $2\frac{3}{4}$ times in standard length *T. purava* (Ham.)
(B. 12 ; D. 14 ; P. 15 ; V. 6 ; A. 45-47 ; L. l. 46 ; L. tr. 12).
5. Lower gill-rakers 13 : abdominal scutes 26 : L. l. scales 44 *T. hamiltoni* (Gray)
(B. 12 ; D. 14 ; P. 12 ; V. 7 ; A. 40-41 ; L. l. 44 ; L. tr. 11-12 ; C. 19).
6. Lower gill-rakers 16-25 : abdominal scutes 22-27 : L. l. scales 39-42 7.
7. Lower gill-rakers 21-25 : abdominal scutes 27 : L. l. scales 39-40 *T. malabaricus* (Bl.)
(B. 12 ; D. 15-16. P. 14 ; V. 7 ; A. 40-43 ; L. l. 39-40 ; L. tr. 11-12 ; C. 20).
8. Lower gill-rakers 16-20 : abdominal scutes 22-24 : L. l. scales 40-42 *T. dussumieri* (V.)
(B. 12 ; D. 14-16 ; P. 12 ; V. 7 ; A. 34-36 ; L. l. 40-42 ; L. tr. 9-10).

Family SALMONIDAE

Key to the species of genus Salmo

1. Lateral line scales 115-145 : spotted below lateral line, colour greenish or brownish 3.
2. Lateral line scales 127-160 : not spotted below lateral line, colour steel blue *S. gairdnerii gairdnerii* Rich.
(B. 11-12 ; D. 11/0 ; A. 12 ; L. l. 127-160).
3. Colour brownish : lateral line scales 115-130 *S. trutta fario* L.
(B. 10-12 ; D. 12-14/0 ; P. 13-14 ; V. 9 ; A. 11-13 ; C. 18-19 ; L. l. 115-130 ; L. tr. 24-27/32-38).
4. Colour greenish : lateral line scales 120-130 *S. levenensis* Walker
(B. 10-12 ; D. 12-14/0 ; P. 12-14 ; V. 9 ; A. 10-12 ; C. 19 ; L. l. 120-130 ; L. tr. 24-28/26-30).

Family SYNODIDAE

Key to the genera of family SYNODIDAE

1. Caudal fin trilobed : pelvic origin almost opposite to dorsal origin Genus *Harpodon* Lesueur
[*H. nehereus* (Ham.)]
(D. 12-13/0 ; P. 11-12 ; A. 13-15 ; C. 19).
2. Caudal fin bilobed : pelvic origin clearly in front of dorsal origin 3.
3. Inner rays of pelvics much longer than outer ones : a single band of teeth on each side of palate Genus *Trachinocephalus* Gil
[*T. myops* (Schn.)]
(B. 16 ; D. 12-13/0 ; P. 12-13 ; A. 15-16 ; L. l. 54-58 ; L. tr. 3/7).

4. Inner rays of pelvics not much longer than outer ones : a double band of teeth on each side of palate

Genus *Saurida* V.
[*S. tumbil* (Bl.)]
(B. 14-16 ; D. 11/0 ; P. 14-15 ; V. 9 ; A. 10-11 ; L. l. 54-63 ; E. tr. 14½/7)

Family CYPRINIDAE

Key to the genera of family CYPRINIDAE

- | | | |
|--|-----|---|
| 1. Abdomen or part of abdomen sharp-edged : dorsal in the posterior half of body | 3. | |
| 2. Abdomen not sharp-edged, rounded or flat : dorsal not in the posterior half of body | 5. | |
| 3. Pelvic origin nearer to pectoral base than to : anal base : outer pelvic rays produced | | Genus <i>Chela</i> Ham. |
| 4. Pelvic origin nearer to anal base than to pectoral base : outer pelvic rays not produced | | Genus <i>Oxygaster</i> v Hass. |
| 5. An anal sheath of enlarged tile-like scales : L. l. scales more than 98 (98-190) | 7. | |
| 6. No anal sheath of enlarged tile-like scales : L. l. scales less than 98 (20-94) | 9. | |
| 7. Lower lip suctorial | | Genus <i>Schizothorax</i> Heck. |
| 8. Lower lip non-suctorial | | Genus <i>Schizothoraichthys</i> Misra nov. ¹ |
| 9. Upper lip separated from skin of the snout by a deep groove : lower lip without suctorial disc | 13. | |
| 10. Upper lip continuous with skin of snout and not separated by a groove : lower lip with or without suctorial disc | 11. | |
| 11. Upper and lower lips continuous : lower lip with suctorial disc | | Genus <i>Garra</i> Ham. |

¹ Bleeker in *Ned. Tijds. Dierk.*, 1, pp. 179-186 : 1863, has already designated *Schizothorax plagiostomus* Heckel as the type of the genus *Schizothorax* Heckel. Jordan also, in the *Gen. Fish.*, pt. 2, p. 192: 1919, fixes *S. plagiostomus* as the genotype of *Schizothorax*. Therefore, Gunther's designation, in 1886, of *S. cavifrons* as the type of the genus *Schizothorax* is not valid according to Article 30, II.g, p. 41, of the International Commission of Zoological Nomenclature. Also, Mc Clelland's (1839) genus *Oreinus* with its genotype *O. guttatus* Mc Clelland becomes synonymous with *Schizothorax* Heckel. Thus to accommodate all the species without suctorial disc which were put under the genus *Schizothorax* by Heckel and which are now left without any generic name, a new genus *Schizothoraichthys* is proposed here with *Schizothorax esocinus* Heckel as the genotype (see Text-fig. 88). *Schizothoraichthys*, gen. nov., which very closely resembles *Schizothorax* Heckel but can be easily separated from the latter by means of its non-suctorial lip, is redefined as follows:—

Scales very small, 95-190 in the longitudinal series. Single dorsal with a strong or moderate, bony, serrated ray. Mouth arched, inferior or sub-inferior ; lower lip non-suctorial ; lower labial fold interrupted or uninterrupted in the middle. Two pairs of barbels. Anal sheath of large, tile-like scales.

Under this new genus the following species are included : *Schizothorax esocinus* Heckel, *Schizothorax cavifrons* Heckel, *Schizothorax longipinnis* Heckel, *Schizothorax niger* Heckel, *Schizothorax nasus* Heckel, *Schizothorax hugalii* Heckel, *Schizothorax micropogon* Heckel, *Schizothorax planifrons* Heckel, *Schizothorax pelzami* Kessler, *Schizothorax intermedius* Mc Clell., *Schizothorax argentatus* Kessler, *Schizothorax pseudaksaiensis* Herzenstein and *Schizothorax progastus* Mc Clelland.

12. Upper and lower lips not continuous : lower lip without suctorial disc
13. A symphyseal knob in lower jaw fitting into a notch in upper jaw (except in genus *Esomus*) : dorsal origin always behind pelvic origin
14. No symphyseal knob in lower jaw (except in genera *Cirrhina* and *Semiplotus*) : dorsal origin before, above or behind pelvic origin
15. Maxillary barbels very long, reaching beyond pelvic base : no symphyseal knob in lower jaw
16. Maxillary barbels short or absent : symphyseal knob present in lower jaw
17. Suborbital ring of bones distinctly broad and prominent : cleft of mouth often extending beyond anterior margin of eye
18. Suborbital ring of bones not broad and prominent : cleft of mouth not extending beyond anterior margin of eye
19. Dorsal with 12-19 rays : anal with 13-20 rays
20. Dorsal with 9 rays : anal with 7-8 rays
21. A procumbent spine before dorsal
22. No procumbent spine before dorsal
23. Anal spine serrated
24. Anal spine non-serrated
25. Lower lip with a continuous transverse fold
26. Lower lip without a continuous transverse fold
27. Anal long with more than 13 rays (14-36) : body very much laterally compressed
28. Anal short with less than 11 rays (7-11) : body not very much laterally compressed
29. A procumbent dorsal spine
30. No procumbent dorsal spine
31. Lower lip absent
32. Lower lip present
- Genus *Crossocheilus* v. Hass.
[*C. latius* (Ham.)]
(D. 3/8 ; P. 1/13 ; V. 1/8 ;
A. 2/5 ; L. 1. 37-42 ;
L. tr. 5½/4½).
- 15.
- 21.
- Genus *Esomus* Swn.
[*E. danrica* (Ham.)]
(D. 2/6 ; P. 15 ; V. 9 ; A. 3/5 ;
L. 1. 30-34 ; L. tr. 5-6/3).
- 17.
- Genus *Barilius* Ham.
- 19.
- Danio Ham.
- Genus *Rasbora* Blkr.
- Genus *Mystacoleucus* Gthr.
[*M. ogilbii* (Sykes)]
(D. 3/8 ; P. 15 ; V. 10 ; A.
3/13 ; L. 1. 55 ; L. tr.
13/11 ; C. 20).
- 23.
- Genus *Carassius* Nilsson }
[*C. carassius*. (L.)]
(D. 2-2/17-18 ; P. 14-16 ;
A. 2/5 ; L. 1. 25-30 ; L. tr.
6½/10.
- 25.
- Genus *Tor* Gray
- 27.
- 29.
- 31.
- Genus *Rohtee* Sykes
(*R. ogilbii* Sykes)
(D. 3/8 ; P. 15 ; V. 10 ; A.
3/13 ; L. 1. 55 ; L. tr.
13/11 ; C. 20).
- Genus *Osteobrama* Heck.
- Genus *Aspidoparia* Heck.
[*A. morar* (Ham.)]
(D. 2-3/7-8 ; P. 15 ; V. 8 ;
A. 2/8-10 ; L. 1. 38-42 ;
L. tr. 5½/5).
- 33

33. Upper lip absent 35.
34. Upper lip present 39.
35. Lateral line complete : dorsal origin opposite pelvic origin 37.
36. Lateral line incomplete : dorsal origin behind pelvic origin
37. Dorsal 3/9 : scales very minute : lateral transverse scales 25-30/25
38. Dorsal 3-4/14-16 : scales large : lateral transverse scales $7\frac{1}{2}/9$
39. Symphyseal knob in lower jaw . 41.
40. No symphyseal knob in lower jaw . 43.
41. Dorsal long, with 20-25 rays
42. Dorsal short, with 8-15 rays
43. Lips not continuous at corners of mouth : upper lip forming a broad fold square vestibulum of mouth .
44. Lips continuous at corners of mouth : upper lip not forming a broad fold square vestibulum of mouth
45. Lower lip broadly confluent with isthmus, no distinct postlabial groove
46. Lower lip partly or entirely separated from isthmus by a distinct postlabial groove 47.
47. Lower lip without an inner transverse fold : mouth terminal or subterminal 49.
48. Lower lip with an inner transverse fold : mouth inferior 53.
49. Lower lip conspicuously separated from jaw which has a horny covering : dorsal spine osseous, smooth : 4 barbels
50. Lower lip not separated or only by a superficial furrow from jaw which is devoid of a horny covering ; dorsal spine, osseous or weak and smooth or serrated : 4, 2 or no barbels
- Genus *Amblypharyngoodon* Blkr.
[*A. mola* (Ham.)]
(D. 2/7 ; P. 15 ; V. 9 ; A. 2/5 ; L. l. 65-75 ; L. tr. 12/12 ; C. 19).
- Genus *Thynnichthys* Blkr.
[*T. sandkhol* (Sykes)]
(D. 3/9 ; P. 19 ; V. 9 ; A. 3/5 ; L. r. 120 ; L. tr. 25-30/25 ; C. 19).
- Genus *Catla* V.
[*C. catla* (Ham.)]
(D. 3-4/14-16 ; P. 21 ; V. 9 ; A. 3/5 ; L. l. 40-43 ; L. tr. $7\frac{1}{2}/9$).
- Genus *Semiplotus* Blkr.
[*S. semiplotus* Mc Clell.)]
(D. 3/24-25 ; P. 16 ; V. 10 ; A. 2/7 ; L. l. 27-33 ; L. tr. 6/6 ; C. 19).
- Genus *Cirrhinus* C.
- Genus *Crossocheilus* v. Hass.
- Genus *Osteochilus* Gthr.
- Genus *Acrossocheilus* Oshima
[*A. hexagonolepis* (Mc Clell.)]
(B. 3 ; D. 3/9 ; P. 17 ; V. 9 ; A. 2/5 ; L. l. 28-31 ; L. tr. $4\frac{1}{4}/4\frac{1}{2}$; C. 19).

51. Last anal rays elongated in males, normal in females : snout and cheeks profusely tubercled in males and females
Genus *Chagunius* H. M. Smith
[*C. chagunio* (Ham.)]
(B. 3 ; D. 3/9 ; P. 15 ; V. 9 ;
A. 3/5 ; L. l. 44-47 ;
L. tr. 11/9 ; C. 19).
52. Last anal rays normal in males and females : snout alone tuberculated in some and more often not tuberculated
Genus *Puntius* Ham.
53. Snout horizontally divided by deep groove
Genus *Schismatorhynchus* Blkr
[*S. (Nukta) nukta* (Sykes)]
(B. 3 ; D. 2/9 ; P. 15 ; V. 9 ;
A. 2/5 ; L. l. 37-38 ;
L. tr. 6/9 ; C. 19).
54. Snout not horizontally divided by a deep groove
Genus *Labeo* C.

Key to the species of genus *Chela*

1. Lateral line scales 55-65
C. atpar (Ham.)
(D. 9 ; A. 22-24 ; L. l. 55-65).
2. Lateral line scales 34-37
C. laubuca (Ham.)
(D. 10-11 ; A. 19-23 ; L. l. 34-37).

Key to the species of genus *Oxygaster*

1. Lateral line scales above 111 (140-160)
O. gora (Ham.)
(B. 3 ; D. 9-10 ; A. 15-16 ;
L. l. 140-160 ; L. tr. 18-20/
18).
2. Lateral line scales below 111 (80-110)
3.
3. L. tr. scales 12-15/6
O. clupeioides (Bl.)
(B. 3 ; D. 9 ; A. 13-15 ; L. l. 80-93 ; L. tr. 12-15/6)
4. L. tr. scales 17-19/6
O. bacaila (Ham.)
(B. 3 ; D. 9 ; A. 13-15 ; L. l. 80-110 ; L. tr. 17-19/6).

Key to the species of genus *Barilius*

1. Mouth very deeply cleft, maxillary extending beyond postorbital margin
B. bola (Ham.)
(B. 3 ; D. 3/7-8 ; P. 13 ; V. 9 ;
A. 3/10 ; L. l. 11-94 ; L. tr. 12-15/9-11 ; C. 19).
2. Mouth not deeply cleft, maxillary not extending beyond postorbital margin
3.
3. Anal short, 9-11 rays
B. bendelisis (Ham.)
(B. 3 ; D. 2/7 ; P. 15 ; V. 9 ;
A. 2-3/7-8 ; L. l. 40-43 ;
L. tr. 7-8/5 ; C. 18).
4. Anal long, 13-17 5.
5. Four barbels : vertical bars on body 10
B. vagra (Ham.)
(B. 3 ; D. 2/7 ; P. 16 ; V. 9 ;
A. 2-3/11-12 ; L. l. 42-44 ;
L. tr. 7-8/4 ; C. 19).
6. Two or no barbels : vertical bars on body 14-15 7.

7. Anal rays 13-14 : L. l. scales 39-40

B. gatensis (V.)

(B. 3 ; D. 2-3/8-9 ; P. 15 ; V. 9 ;
A. 3/12-14 ; L. l. 39-40 ;
L. tr. 8/5 ; C. 18).

8. Anal rays 15-17 ; L. l. scales 43-46

B. barila (Ham.)

(B. 3 ; D. 2/7 ; P. 13 ; V. 9 ;
A. 3/10-11 ; L. l. 43-46 ;
L. tr. 7/5 ; C. 19).

Key to the species of genus **Danio**

1. Anal rays 18-19 : L. l. scales 41-48 : no barbels

D. devario (Ham.)

(B. 3 ; D. 18-19 ; A. 18-19 ;
L. l. 41-48 ; L. tr. 11/5 ;
C. 19).

2. Anal rays 14-16 ; L.l scales 32-34 : 4 barbels

D. aequipinnatus (Mc Clell.)

(B. 3 ; D. 12-14 ; A. 14-16 ;
L. l. 32-34 ; L. tr. 6-7/3½ ;
C. 19).

Key to the species of genus **Rasbora**

1. L.l. scales 31-34 : a black lateral stripe

R. daniconius (Ham.)

(B. 3 ; D. 2/7 ; P. 15 ; V. 9 ;
A. 2/5 ; L. l. 31-34 ; L. tr.
4½/5 ; C. 19).

2. L. l. scales 26-29 : no black lateral stripe

R. rasbora (Ham.)

(B. 3 ; D. 2/7 ; P. 15 ; V. 9 ;
A. 2/5-6 ; L. l. 26-29 ;
L. tr. 4½/3 ; C. 19).

Key to the species of genus **Tor**

1. Length of head equal to or greater than depth of body

3.

2. Length of head less than depth of body

5.

3. Snout tuberculated : length of head equal to depth of body

T. khudree (Sykes)

(D. 4/9 ; P. 15 ; V. 9 ; A. 2/7 ;
L. l. 25-27 ; L. tr. 4½/2½ ;
C. 19).

4. Snout not tuberculated : length of head greater than depth of body

T. putitora (Ham.)

(D. 4/8 ; P. 17-18 ; V. 9 ;
A. 2/5 ; L. l. 25-28 ; L. tr.
4½/2½ ; C. 19).

5. Snout tuberculated

T. mussullah (Sykes)

(D. 2/10 ; P. 16 ; V. 9 ; A. 2/5 ;
L. l. 25-26 ; L. tr. 4/3 ; C. 19).

6. Snout not tuberculated

T. tor (Ham.)

(D. 4/8 ; P. 15-18 ; V. 9
A. 3/5 ; L. l. 22-27 ; L. tr.
4½/2½ ; C. 19).

Key to the species of genus **Puntius**

1. Last unbranched dorsal ray serrated and osseous

3.

2. Last unbranched dorsal ray non-serrated and weak or non-serrated and osseous

7.

3. Four barbels : lateral line complete, 28-34 scales : height of body $3\frac{1}{2}$ - $3\frac{3}{8}$ in total length *P. sarana* (Ham.)
(B. 3 ; D. $\frac{4}{8}$; P. 15-17 ; V. 8-9 ; A. $2\frac{3}{5}$; L. l. 28-34 ; L. tr. $5\frac{1}{2}$ - $\frac{6}{6}$; C. 19).
4. No barbels : lateral line complete or incomplete, 23-26 scales : height of body $2\frac{3}{8}$ - $3\frac{1}{2}$ in total length 5.
5. Lateral line incomplete, 24-28 scales : height of body $2\frac{3}{8}$ in total length *P. conchoni* (Ham.)
(B. 3 ; D. $\frac{3}{8}$; P. 11 ; V. 9 ; A. $\frac{2}{5}$; L. l. 24-28 ; L. tr. $5\frac{1}{2}$ / $\frac{6}{2}$; C. 19).
6. Lateral line complete or incomplete, 22-26 scales : height of body 3 - $3\frac{1}{2}$ in total length *P. ticto* Ham.
(B. 3 ; D. $\frac{3}{8}$; P. 15 ; V. 9 ; A. $\frac{2}{7}$; L. l. 22-26 ; L. tr. $5\frac{1}{2}$ / $\frac{6}{2}$; C. 19).
7. Last unbranched ray osseous : 2-4 barbels or without barbels 9.
8. Last unbranched ray weak : 4 barbels 17.
9. Four barbels *P. carnaticus* (Jerdon)
(B. 3 ; D. $\frac{4}{8}$; P. 15 ; V. 9 ; A. $\frac{2}{5}$; L. l. 32 ; L. tr. $\frac{5}{6}$; C. 19).
10. Two barbels or without barbels 11.
11. Two barbels 13.
12. Without barbels *P. sophore* Ham.
(B. 3 ; D. $\frac{3}{8}$ -9 ; P. 17 ; V. 9 ; A. $\frac{3}{5}$; L. l. 23-26 ; L. tr. $4\frac{1}{2}$ - $\frac{5}{5}$; C. 19).
13. L. l. scales 40-43 *P. kolus* (Sykes).
(B. 3 ; D. $3\frac{4}{9}$; P. 15 ; V. 9 ; A. $\frac{3}{5}$; L. l. 40-43 ; L. tr. $\frac{10}{8}$; C. 19).
14. L. l. scales 21-24 15.
15. Height of body 3 - $3\frac{1}{2}$ in total length : L. l. scales 21 : a deep oval black mark on lateral line above anal *P. filamentosus* (V.)
(B. 3 ; D. $\frac{3}{8}$; P. 15 ; V. 9 ; A. $\frac{2}{5}$; L. l. 21 ; L. tr. $\frac{4}{5}$; C. 19).
16. Height of body $4\frac{1}{2}$ -5 in total length : L. l. scales 23-24 ; no deep oval black mark on lateral line above anal *P. amphibius* (V.)
(B. 3 ; D. $2\frac{3}{8}$; P. 15 ; V. 9 ; A. $\frac{2}{5}$; L. l. 23-24 ; L. tr. $\frac{5}{4}$; C. 19).
17. Lateral line scales 41 *P. curmuca* (Ham.)
(B. 3 ; D. $\frac{3}{9}$; P. 16 ; V. 9 ; A. $\frac{3}{5}$; L. l. 41 ; L. tr. $\frac{8}{z}$; C. 18).
18. Lateral line scales 27-34 19.
19. Each scale without red lunule : L. l. scales 27-32 *P. jerdoni* (Day)
(B. 3 ; D. $3\frac{4}{9}$; P. 14-17 ; V. 9 ; A. $2\frac{3}{5}$; L. l. 27 ; L. tr. $5\frac{6}{4}$ - $5\frac{1}{2}$; C. 19).

20. Each scale with a red lunule : L. 1. scales
31-34

P. thomassi (Day)
(B. 3 ; D. 3-4/9 ; P. 17 ; V.
10 ; A. 3/5 ; L. 1. 31-34 ;
L. tr. 6/6 ; C. 19).

Key to the species of genus *Cirrhinus*

1. Four barbels : dorsal rays 17-19
2. Two barbels : dorsal rays 10-16
3. Lateral line scales 44-52 : dorsal rays 10
4. Lateral line scales 35-45 : dorsal rays 10-16
5. Lateral line scales 35-38 : dorsal rays 10-12
6. Lateral line scales 40-45 : dorsal rays 15-16

C. cirrhosa (Bl.)
(B. 3 ; D. 3-4/14-15 ; P. 19 ;
V. 9 ; A. 3/5 ; L. 1. 42-44 ;
L. tr. 8/9 ; C. 19).

3.
C. fulungee (Sykes)
(B. 3 ; D. 2/8 ; P. 15 ; V. 9 ;
A. 2/5 ; L. 1. 44-52 ; L. tr.
8/9 ; C. 19).

5.
C. reba (Ham.)
(B. 3 ; D. 2-3/8-9 ; P. 16 ; V.
9 ; A. 3/5 ; L. 1. 35-38 ;
L. tr. 7/9 ; C. 19).

C. mrigala (Ham.)
(B. 3 ; D. 3/12-13 ; P. 15 ;
V. 9 ; A. 3/5 ; L. 1. 40-45 ;
L. tr. 6½-7/8½ ; C. 19).

Key to the species of genus *Garra*

1. Pupil of eye in the posterior half of head : proboscis on snout well developed
2. Pupil of eye not wholly in the posterior half of head : proboscis on snout not well developed

G. gotyla (Gray)
(B. 3 ; D. 2/9 ; P. 16 ; V. 9 ;
A. 2/5 ; L. 1. 34 ; L. tr.
4/5).

G. mullya (Sykes)
(B. 3 ; D. 2-3/8-9 ; P. 15 ;
V. 9 ; A. 2/5 ; L. 1. 32-36 ;
L. tr. 4-4½/5 ; C. 17).

Key to the species of genus *Labeo*

1. Lower lip separated from isthmus by a post-labial groove : branched dorsal rays 12-18
2. Lower lip not separated from isthmus by a post-labial groove : branched dorsal rays 8-10
3. Lateral line scales 71-84
4. Lateral line scales 40-47
5. Branched dorsal rays 15-18 : a thin cartilaginous layer on the inner side of both jaws : lateral line scales 44-47
6. Branched dorsal rayer 12-15 : no cartilaginous layer on the inner side of both jaws : lateral line scales 40-44

3.
9.
L. gonius (Ham.)
(B. 3 ; D. 2-3/13-14 ; P. 17 ;
V. 9 ; A. 2/5 ; L. 1. 71-84 ;
L. tr. 16/17 ; C. 19).

5.
L. fimbriata (Bl.)
(B. 3 ; D. 3-4/15-18 ; P. 17 ;
V. 9 ; A. 2/5 ; L. 1. 44-47 ;
L. tr. 6½/9 ; C. 19).

7.

7. Branched dorsal rays 12-13 : lateral line scales 40 to 42 : bluish or brownish above and silvery below
L. rohita (Ham.)
(B. 3 ; D. 3/12-13 ; P. 17 ; V. 9 ; A. 2/5 ; L. l. 40-42 ; L. tr. 6½-9 ; C. 19).
8. Branched dorsal rays 13-15 : lateral line scales 40-44 : blackish becoming lighter below
L. calbasu (Ham.)
(B. 3 ; D. 3/13-15 ; P. 19 ; V. 9 ; A. 2/5 ; L. l. 40-44 ; L. tr. 7½-8 ; C. 19).
9. Lateral line scales 60-65 : lateral transverse scales 11-12/14
L. boggut (Sykes)
(B. 3 ; D. 3/8-9 ; P. 17 ; V. 9 ; A. 2/5 ; L. l. 60-65 ; L. tr. 11-12/14 ; C. 19).
10. Lateral line scales 37-44 : lateral transverse scales 6½-8/6-9
11. A tubercle inside lower jaw above symphysis : no horny covering inside lower jaw
L. bata (Ham.)
(B. 3 ; D. 2-3/9-10 ; P. 18 ; V. 9 ; A. 2/5 ; L. l. 37-40 ; L. tr. 7/6-7 ; C. 19).
12. No tubercle inside lower jaw above symphysis : a thin, horny covering inside lower jaw
13. A thin horny covering inside upper jaw : lateral line scales 41-44 : snout grooved
L. dero (Ham.)
(B. 3 ; D. 2-3/9-10 ; P. 17 ; V. 9 ; A. 2/5 ; L. l. 41-44 ; L. tr. 8/9 ; C. 19).
14. No thin horny covering inside upper jaw : lateral line scales 37-39 : snout not grooved
L. boga (Ham.)
(B. 3 ; D. 2-3/9-10 ; P. 16 ; V. 9 ; A. 2/5 ; L. l. 37-39 ; L. tr. 6½-7/7 ; C. 19).

Key to the species of genus Osteobrama

1. Lateral line scales 73-85 : anal rays 3/21-27
O. vigorsii (Sykes)
(B. 3 ; D. 3-4/8 ; P. 19 ; V. 10 ; A. 3/21-27 ; L. l. 73-85 ; L. tr. 16-18/21 ; C. 19).
2. Lateral line scales 59-70 : anal rays 3/28-38
O. cotio (Ham.)
(B. 3 ; D. 3-4/8 ; P. 13 ; V. 10 ; A. 3/28-38 ; L. l. 59-70 ; L. tr. 9-15/14-21 ; C. 19).

Key to the species of genus Schizothorax

1. Lateral line scales 113
S. molesworthi (Chaudhuri)
(B. 3 ; D. 3/8 ; P. 17 ; V. 10 ; A. 2/5 ; L. l. 113 ; C. 19).
2. Lateral line scales 108-110
S. plagiostomus (Heckel)
(B. 3 ; D. 2-3/8 ; P. 17 ; V. 11 ; A. 2/5 ; L. l. 108-110 ; C. 19).

Key to the species of genus Schizothoraichthys

1. Lateral line scales 150-156 : depth of body 5-5½ times in total length
S. progastus (Mc Clell.)
(B. 3 ; D. 3/8-9 ; P. 19 ; V. 11 ; A. 2/5 ; L. l. 150-156 ; C. 19).

2. Lateral line scales 95 : depth of body $4\frac{1}{4}$ - $4\frac{1}{2}$ times in total length

S. esocinus (Heckel)
(B. 3 ; D. 4/8 ; P. 20 ; V. 10 ;
A. 2/5 ; L. l. 95 ; C. 19).

Key to the species of genus Osteochilus

1. Lateral line scales 39

O. thomassi (Day)
(B. 3 ; D. 3/11-12 ; P. 16 ;
V. 9 ; A. 2/6 ; L. l. 39 ;
L. tr. 7/7 ; C. 19).

2. Lateral line scales 40-43

O. nashi (Day)
(B. 3 ; D. 2-3/11-12 ; P. 15 ;
V. 9 ; A. 2/5 ; L. l. 40-43 ;
L. tr. 7/7 ; C. 20).

Family COBITIDAE

Key to the genera of family COBITIDAE

1. An erectile preorbital spine : body much laterally compressed

Genus *Botia* Gray

2. No erectile preorbital spine : body subcylindrical

Genus *Noemacheilus* v. Hass.

Key to the species of genus Botia

1. Least height of caudal peduncle about twice in its length

B. dario (Ham.)
(B. 3 ; D. 3/9-10 ; P. 14 ;
V. 8 ; A. 2/5-6 ; C. 19).

2. Least height of caudal peduncle $1\frac{1}{2}$ times in its length

B. dayi (Hora)
(B. 3 ; D. 3/9 ; P. 14 ; V. 8 ;
A. 2/5 ; C. 19).

Key to the species of genus Noemacheilus

1. Lateral line complete : dorsal rays 12-14

N. botia (Ham.)
(B. 3 ; D. 2/10-12 ; P. 11 ;
V. 8 ; A. 2/5 ; C. 17).

2. Lateral line incomplete (stopping opposite the posterior end of dorsal fin) : dorsal rays 11-12

N. botia aureus Day
(B. 3 ; D. 2/9-10 ; P. 11 ;
V. 8 ; A. 2/5 ; C. 17).

Family ARIIDAE

Key to the genera of family ARIIDAE

1. A pair of osseous barbels

Genus *Osteogeniosus* Blkr.
[*O. militaris* (L.)].
(B. 5 ; D. 1/7/0 ; P. 1/10-11 ;
V. 6 ; A. 4-5/15-17 ; C. 17).

2. Three pairs of non-osseous barbels

3.

3. Teeth on palate

• Genus *Tachysurus* Lac.

4. No teeth on palate

Genus *Hemipimelodus* Blkr.
[*H. jatius* (Ham.)].
(B. 6 ; D. 1/7/0 ; P. 1/10 ;
V. 6 ; A. 5/13 ; C. 17).

Key to the species of genus Tachysurus

1. Palatine teeth in 3 groups on each side 3.
T. thalassinus (Rupp.)
(B. 6; D. 1/7/0; P. 1/11;
V. 6; A. 3-5/12-13; C.17).
2. Palatine teeth in one or two groups on each side 5.
3. Palatine teeth in two groups on each side 9.
4. Palatine teeth in one group on each side
5. Teeth globular : outer and inner palatine teeth widely separated 7.
T. dussumieri (V.)
(B. 6; D. 1/7/0; P. 1/12;
V. 6; A. 4-5/10-11; C. 11).
6. Teeth villiform : outer and inner palatine teeth not widely separated
7. Outer palatine groups oval or rounded, larger and continuous with inner groups 11.
T. sagor (Ham.)
B. 6; D. 1/7/0; P. 1/10; V. 6;
A. 3-4/14-15; C. 15.)
8. Outer palatine groups triangular, smaller and separated from the inner groups
T. sona (Ham.)
(B. 6; D. 1/7/0; P. 1/12;
V. 6; A. 6/11; C. 17).
9. Palatine teeth villiform, in triangular patches : pectoral spine shorter than dorsal spine
T. caelatus (V.)
(B. 6; D. 1/7/0; P. 1/9;
V. 6; A. 5-6/13-14; C. 15).
10. Palatine teeth globular, in ovoid or elliptical patches : pectoral spine longer than or equal to the dorsal spine
11. Pectoral spine longer than dorsal spine : palatine patches placed far back
T. maculatus (Thunberg)
(B. 6; D. 1/7/0; P. 1/10;
V. 6; A. 5-6/13-14; C. 17).
12. Pectoral spine equal to dorsal spine : palatine patches placed well forward
T. gogora (Ham.)
(B. 6; D. 1/7/0; P. 1/10;
V. 6; A. 5-6/12-13; C. 17).

Family PLOTOSIDAE

Key to the species of genus Plotosus

1. Procurrent caudo-dorsal rays 242-271 : uniform brownish
P. canius (Ham.)
(B. 11-13; D. 1/5; 2 D+C
A. 242-271; P. 1/10-11;
V. 12).
2. Procurrent caudo-dorsal rays 169-190 : brownish with 2 longitudinal bands
P. auguillaris Bl.
(B. 11; D. 1/4-5; 2 D+C
A. 169-190; P. 1/11;
V. 12).

Family SILURIDAE

Key to the genera of family SILURIDAE

1. Cleft of mouth very deep extending beyond eye posteriorly ; barbels always 4
Genus *Wallago* Blkr.
[*W. attu* (Gchn.) Schn.].
(B. 19-21; D. 5; P. 1/13-15;
V. 8-10; A. 4/82-89; C. 17).

2. Cleft of mouth not deep and not extending beyond eye : barbels 2-6 . 3.
3. Caudal rounded : barbels 4-6 . Genus *Silurus* L.
(*S. cochinchinensis* V.)
(B. 12-15 ; D. 4-5 ; P. 1/10-11 ;
V. 8-10 ; A. 2/58-62 ; C. 17-19).
4. Caudal bilobed : 2-4 barbels . Genus *Ompok* Lac.

Key to the species of genus Ompok

1. Maxillary barbel long, extending upto pelvics *O. bimaculatus* (Bl.)
(B. 12-15 ; D. 2-5 ; P. 1/11-15 ;
V. 8-10 ; A. 2-3/47-72 ; C. 13-19).
2. Maxillary barbel shorter than the head *O. pabo* (Ham.)
(B. 12 ; D. 5 ; P. 1/14 ;
V. 9-10 ; A. 3/63-66 ; C. 17).

Family SCHILBEIDAE

Key to the genera of family SCHILBEIDAE

1. Dorsal absent : anal long (59-75 rays) Genus *Ailia* Gray
[*A. coila* (Ham.)]
(B. 8 ; P. 1/14 ; V. 6 ; A. 59-75 ; C. 19).
2. Dorsal present : anal moderate (29-51 rays) 3.
3. Barbels 8 5.
4. Barbels 2-4 7.
5. Cleft of mouth oblique, extending below middle of eye Genus *Eutropiichthys* Blkr.
[*E. vacha* (Ham.)]
(B. 9 ; D. 1/7/0 ; P. 1/13-16 ;
V. 6 ; A. 3-4/41-47 ; C. 17).
6. Cleft of mouth not oblique, extending only to front edge of eye Genus *Clupisoma* Swn.
[*C. garua* (Ham.)]
(B. 6 ; D. 1/7 ; P. 1/11 ; V. 6 ;
A. 3/26-33 ; C. 17).
7. Barbels 2, short : anal rays 40-48 Genus *Silonia* Swn.
[*S. silundia* (Ham.)]
(B. 11-12 ; D. 1/7/0 ; P. 1/11—
13 ; V. 6 ; A. 4/36-44 ;
C. 17).
8. Barbels 4, long : anal rays 31-34 Genus *Pangasius* (Ham.)
(B. 9-10 ; D. 1/7/0 ; P. 1/12 ;
V. 6 ; A. 4-5/27-29 ; C. 19).

Family BAGRIDAE

Key to the genera of family BAGRIDAE

1. Barbels 6 : dorsal and pectoral spines stout, firm and hollow Genus *Rita* Blkr.
2. Barbels 8 : dorsal and pectoral spines neither stout, firm nor hollow Genus *Mystus* Scopoli.

Key to the species of genus Rita

1. Villiform or cardiform teeth in lower jaw *R. kuturnee* (Sykes)
(B. 8; D. 1/6/0; P. 1/10;
V. 7-8; A. 5/8-9; C. 17).
2. No villiform or cardiform teeth in lower jaw 3.
3. Eye 8-10 times in head length : patches of palatine teeth wide apart *R. rita* (Ham.)
(B. 8; D. 1/6/0; P. 1/10;
V. 8; A. 4-5/10; C. 19).
4. Eye 4 times in head length : patches of palatine teeth close together *R. chrysea* Day
(B. 8; D. 1/6/0; P. 1/9;
V. 8; A. 2/10; C. 18).

Key to the species of genus Mystus

1. A separate neural shield between occipital process and basal bone of dorsal 3. (Subgenus *Aorichthys*)
2. No separate neural shield between occipital process and basal bone of dorsal 5. (Subgenus *Mystus*)
3. Maxillary barbel reaching beyond caudal end *M. aor* (Ham.)
(B. 12; D. 1/7/0; P. 1/9-12;
V. 6; A. 3-4/9; C. 17).
4. Maxillary barbel reaching anal *M. seenghala* (Sykes)
(B. 12; D. 1/7/0; P. 1/9;
V. 6; A. 3/8-9; C. 21-19).
5. Origin of adipose dorsal opposite to pelvic origin 7.
6. Origin of adipose dorsal opposite to anal origin 9.
7. Maxillary barbels reaching caudal *M. cavasius* (Ham.)
(B. 6; D. 1/7/0; P. 1/8;
V. 6; A. 4/7-9; C. 16).
8. Maxillary barbels reaching anal *M. bleekeri* (Day)
(B. 10; D. 1/7/0; P. 1/9-10;
V. 6; A. 3/6-7; C. 17).
9. Occipital process reaching basal bone of dorsal *M. vittatus* (Bl.)
(B. 10; D. 1/7/0; P. 1/9;
V. 6; A. 2-3/7-9; C. 17).
10. Occipital process not reaching basal bone of dorsal *M. gulio* (Ham.)
(B. 9; D. 1/7/0; P. 1/8-9;
V. 6; A. 3-4/9-11; C. 17).

Family MURAENIDAE

Key to the species of genus Muraena

1. Maxillary teeth biserial : tail shorter than trunk or about the same length *M. tile* (Ham.).
2. Maxillary teeth uniserial : tail longer than trunk *M. thyrsoidea* (Rich.).

Family MURAENESOCIDAE

Key to the species of genus Muraenesox

1. Outer row of mandibular teeth directed outwards: vomerine teeth slender *M. talabonoides* (Blkr.)
(B. 18-19; P. 15; D. 245-250; A. 200-205; C. 10).

2. Outer row of mandibular teeth not directed outwards : vomerine teeth large

M. cenereus (Forsk.)
B. 20-22 ; P. 14-16 ; D. 230-270 ; A. 190-220 ; C. 10).

Family OPHICHTHYIDAE

Key to the genera of family OPHICHTHYIDAE

1. Teeth obtuse or granular, in bands Genus *Pisodonophis* Kaup
[*P. boro* (Ham.)]
(B. 29-31 ; D. 320-400 ; P. 13 ;
A. 250-270).
2. Teeth conical, acute, subequal, in single row Genus *Lamnostoma* Kaup
[*L. orientalis* (Mc Clell.)].

Family BELONIDAE

Key to the genera of family BELONIDAE

1. Dorsal origin behind anal origin Genus *Strongylura* v. Hass.
2. Dorsal origin opposite anal origin Genus *Xenentodon* Regan
[*X. cancila* (Ham.)]
(B. 10 ; D. 16-18 ; P. 11 ;
V. 6 ; A. 16-18 ; C. 15).

Key to the species of genus Strongylura

1. Caudal rounded : a round bluish-black spot at root of caudal *S. strongylura* (v. Hass.)
(B. 12 ; D. 13-15 ; P. 17 ;
V. 6 ; A. 16-18 ; C. 15).
2. Caudal forked : no round bluish-black spot at root of caudal *S. choram* (Forsk.)
(B. 10 ; D. 22-23 ; P. 14 ;
V. 6 ; A. 19-20 ; C. 18).

Family HEMIRAMPHIDAE

Key to the genera of family HEMIRAMPHIDAE

1. Caudal forked Genus *Hemiramphus* C.
2. Caudal rounded or truncate Genus *Zenarchopterus* Gill.

Key to the species of genus Hemiramphus

1. Triangular part of upper jaw longer than broad *H. georgii* (V.)
(B. 12 ; D. 14-17 ; A. 13-14 ;
L. tr. 54-58 ; C. 16).
2. Triangular part of upper jaw broader than long 3.
3. Distance between anal and pelvic origins 3 times in length of caudal peduncle : no lateral blotches *H. gaimardi* (V.)
(B. 10 ; D. 13-14 ; P. 10 ;
V. 6 ; A. 13-15 ; L. l. 50-52 ; C. 14).

4. Distance between anal and pelvic origins 2 times in length of caudal peduncle : 4 lateral blotches

H. far (Forsk.)
(B. 12-14 ; D. 13-14 ; A. 10-12 ; L. l. 50-54 ; C. 15).

Key to the species of genus Zenarchopterus

1. Triangular part of upper jaw broader than long. 3.
2. Triangular part of upper jaw longer than broad

Z. ectuntio (Ham.)
(B. 10 ; D. 13-14 ; P. 9 ; V. 6 ; A. 10-12 ; L. l. 46-48 ; C. 15).

3. Dorsal rays 11-12

Z. dispar (V.)
(B. 10-11 ; D. 11-12 ; P. 10 ; V. 6 ; A. 11-12 ; L. l. 40 ; C. 15).

4. Dorsal rays 14

Z. buffonis (V.)
(B. 11 ; D. 14 ; P. 10 ; V. 6 ; A. 10-12 ; L. l. 42 ; C. 13).

Family EXOCOETIDAE

Key to the genera of family EXOCOETIDAE

1. A large patch of teeth on vomer : teeth on tongue : lateral line 38-40

Genus *Parexocoetus* Blkr.
[*P. brachypterus* (Rich.)]
(B. 11 ; D. 10-11 ; P. 13 ; V. 6 ; A. 10-11 ; L. l. 38-40 ; L. tr. 6/2 ; C. 17).

2. No teeth on vomer or tongue : lateral line more than 40

3.

3. Pelvic origin nearer to snout end than to caudal base : pelvics shorter than head

Genus *Exocoetus* L.
(*E. volitans* L.)
(D. 12-14 ; P. 14 ; V. 6 ; A. 13-15 ; L. l. 40-42 ; C. 17).

4. Pelvic origin nearer to caudal base than to snout end : pelvics longer or as long as head

Genus *Cypsilurus* Swn.
[(*C. altipinnis* (V.))]
(B. 11 ; D. 13 ; P. 14-15 ; V. 6 ; A. 10 ; L. l. 52 ; L. tr. 7-8/2 ; C. 14).

Family CYPRINODONTIDAE

Key to the genera of family CYPRINODONTIDAE

1. Dorsal origin in front of anal origin

Genus *Aphanius* Nardo
[*A. dispar* (Rupp.)]
(B. 3 ; D. 9 ; P. 17 ; V. 7 ; A. 10 ; L. l. 25-27 ; L. tr. 8 ; C. 15).

2. Dorsal origin far behind anal origin

3.

3. Cleft of mouth wide : upper jaw protractile : deep transverse fold across snout : gill-membranes free : anal rays 14-18

Genus *Aplocheilus* Mc Clell.

4. Cleft of mouth narrow : upper jaw not protractile : no fold across snout : gill-membranes united : anal rays 20-24

Genus *Oryzias* J. S.

[*O. melastigmus* (Mc Cell.)]
(B. 4 ; D. 6-7 ; A. 20-24 ;
L. l. 27 ; L. tr. 9-11 ;
C. 15).

Key to the species of genus Aplocheilus

1. A prolonged pelvic ray *A. lineatum* (V.)
(B. 5-6 ; D. 8-9 ; P. 15 ; V. 6 ;
A. 15-18 ; L. l. 32-34 ;
L. tr. 9 ; C. 15-19).
2. No prolonged pelvic ray 3.
3. L. l. scales 31-34 : dorsal rays 7-11 *A. panchax* (Ham.)
(B. 5-6 ; D. 7-11 ; A. 15-17 ;
L. l. 31-34 ; L. tr. 9-10 ;
C. 13).
4. L. l. scales 26-27 : dorsal rays 3-6 *A. blanchii* (Arnold)
(D. 3-6 ; A. 14-15 ; L. l. 26-
27 ; L. tr. 7).

Family HOLOCENTRIDAE

Key to the species of genus Holocentrus

1. A bifid rostral spine on each side : snout equal to eye diameter *H. spinifer* (Forsk.)
(D. 11/15 ; P. 17 ; V. 1/7 ;
A. 4/9 ; L. l. 42 ; L. tr. 3½/7½ ; C. 22).
2. Two simple rostral spines on each side : snout less than eye diameter *H. ruber* (Forsk.)
(D. 11/12-13 ; A. 4/9 ; L. l. 35-39 ; L. tr. 3/6½).

Family SPHYRAENIDAE

Key to the species of genus Sphyraena

1. Opercle with two points : L. tr. scales 18/22 *S. jello* C.
(B. 7 ; D. 5/1/9 ; P. 14 ;
V. 1/5 ; A. 8-9 ; L. l. 120 ;
L. tr. 18/22 ; C. 17).
2. Opercle with single point : L. tr. scales 9-14/17-18 3.
3. L. tr. scales 14/18 *S. acutipinnis* Day
(B. 7 ; D. 5/1/9 ; P. 15 ;
V. 1/5 ; A. 1/8 ; L. l. 120 ;
L. tr. 14/18 ; C. 17).
4. L. tr. scales 9/17 *S. obtusata* C.
(B. 7 ; D. 5/1/9 ; P. 14 ; V. 1/5 ;
A. 1/9 ; L. l. 90 ; L. tr. 9/17 ; C. 17).

Family MUGILIDAE

Key to the genera of family MUGILIDAE

1. Mouth inferior, snout projecting beyond mouth : eyes projecting above level of interorbital *Rhinomugil* Gill
[*R. corsula* (Ham.)]
(D. 4/1/7-8 ; A. 3/9 ; L. l. 48-52 ; L. tr. 15 ; C. 15).

2. Mouth neither inferior nor snout projecting beyond mouth : eyes not projecting above level of interorbital

3. Opercle with spine

4. Opercle without spine

5. Eyes with adipose lids .

6. Eyes without adipose lids

3.

Sicamugil Fowler

[*S. cascasia* (Ham.)]

(B. 6 ; D. 4/1/8 ; P. 15 ; V. 1/5 ; A. 3/8-9 ; L. l. 36-39 ; L. tr. 16-18 ; C. 14).

5.

Mugil L.

Chelon Rose

Key to the species of genus Mugil

1. L. tr. scales 14 : maxillary not visible

M. cephalus (L.)

(B. 6 ; D. 4/1/8 ; P. 15 ; V. 1/5 ; A. 3/8 ; L. l. 42-44 ; L. tr. 14 ; C. 15).

2. L. tr. scales 11-12 : maxillary visible

3.

3. L. l. scales 33-35

5.

4. L. l. scales 40-43

M. strongylocephalus (Rich.)

(B. 6 ; D. 4/1/8 ; P. 16 ; V. 1/5 ; A. 3/9 ; L. l. 40-43 ; L. tr. 11-12 ; C. 14).

5. Height of body 4½-4¾ in total length : a notch below symphysial knob .

M. parsia (Ham.)

(B. 6 ; D. 4/1/8 ; P. 14 ; V. 1/5 ; A. 3/8-9 ; L. l. 34-35 ; L. tr. 11-12 ; C. 14).

6. Height of body 5½-6 in total length : no notch below symphysial knob

M. tade (Ham.)

(B. 6 ; D. 4/1/8 ; P. 17 ; V. 1/5 ; A. 3/9 ; L. l. 33-35 ; L. tr. 11 ; C. 17).

Key to the species of genus Chelon

1. Maxillary visible : L. tr. scales 10-11 : L. l. scales 26-33

3.

2. Maxillary not visible : L. tr. scales 9 : L. l. scales 26-27 :

C. vaigiensis (Q. G.)

(D. 4/1/7-8 ; A. 3/8 ; L. l. 26-27 ; L. tr. 9).

3. L. tr. scales 11 : L. l. scales 31-34

C. macrolepis (Smith)

(B. 6 ; D. 4/1/8 ; P. 15 ; V. 1/5 ; A. 3/9 ; L. l. 31-34 ; L. tr. 11 ; C. 15-17).

4. L. tr. scales 10 : L. l. scales 26-28 .

C. oligolepis (Blkr.)

(B. 6 ; D. 4/1/8 ; P. 15 ; V. 1/5 ; A. 3/9 ; L. l. 26-28 ; L. tr. 10 ; C. 16).

Family POLYNEMIDAE

Key to the genera of family POLYNEMIDAE

1. With 7 free pectoral filaments

Genus **Polynemus** L.

(*P. paradiseus* L.)

(B. 7 ; D. 7/1/15-16 ; P. 15+ viii ; V. 1/5 ; A. 2/12 ; L. l. 70 ; L. tr. 5/14 ; C. 19).

2. With 4-6 free pectoral filaments
3. With 5-6 free pectoral filaments
4. With 4 free pectoral filaments

3.

Genus *Polydactylus* Lac.Genus *Eleutheronema* Blkr.[*E. tetradactylum* (Shaw)](B. 7 ; D. 8/1/13-15 ; P. 17+
vi ; V. 1/5 ; A. 2-3/15-17 ;
L. 1. 75-85 ; L. tr. 8/14 ;
C. 19).*Key to the species of genus Polydactylus*

1. With 5 free pectoral filaments .

P. indicus (Shaw)(B. 7 ; D. 8/1/13-14 ; P. 15+
v ; V. 1/5 ; A. 2-3/11-12 ;
L. 1. 70-75 ; L. tr. 7/13 ;
C. 17).

2. With 6 free pectoral filaments .

P. sextarius (Schn.)(B. 7 ; D. 8/1/12-13 ; P. 14+
vi ; V. 1/5 ; A. 3/12-13 ;
L. 1. 48-50 ; L. tr. 5/10 ;
C. 17).

Family OPHIOCEPHALIDAE

Key of the species of genus Channa

1. 9-10 scales between orbit and angle of preopercle :
predorsal scales 15-20 : cephalic pits multiple :
prenasals present 3.
2. 4-5 scales between orbit and angle of preopercle :
predorsal scales 12-13 : cephalic pits simple :
prenasals absent 5.
3. Dorsal rays 45-55 : a large black ocellus on
caudal

C. marulius (Ham.)(B. 5 ; D. 45-55 ; P. 18 ; V. 6 ;
A. 28-36 ; L. 1. 60-70 ;
L. tr. 4½-8½/11-13 ; C.
14).

4. Dorsal rays 37-45 : no black ocellus on caudal

C. striatus (Bl.)(B. 5 ; D. 37-45 ; P. 17 ; V. 6 ;
A. 23-26 ; L. 1. 50-57 ;
L. tr. 4½-8/7-10 ; C. 13).

5. Pelvic 2/5 length of pectoral

C. gachua (Ham.)(B. 5 ; D. 32-37 ; P. 15 ;
V. 6 ; A. 21-23 ; L. 1. 40-
45 ; L. tr. 3-4/6-7 ; C. 12).

6. Pelvic 4/5 length of pectoral .

C. punctatus (Bl.)(B. 5 ; D. 29-32 ; P. 17 ;
V. 6 ; A. 21-23 ; L. 1. 37-
40 ; L. tr. 4-5/9 ; C. 12).

Family AMBASSIDAE

Key to the species of genus Ambassis

1. Interopercle serrated : anal short, 3/9-10 ; L. 1.
-
- scales 31-41

A. thomassi Day(B. 6 ; D. 7/1/10-12 ; P. 15 ;
V. 1/5 ; A. 3/9-10 ; L. 1.
35-41 ; L. tr. 7/17 ; C. 15).

2. Interopercle entire : anal long, $3/13-17$; L. 1. scales 60-80 or indistinct 3.
3. Height of body $2\frac{1}{3}-2\frac{1}{2}$ times in total length : L. 1. scales 60-70
A. ranga (Ham.)
(B. 6 ; D. $7/1/13-15$; P. 11 ; V. $1/5$; A. $3/14-16$; L. 1. 60-70 ; C. 17).
4. Height of body $2\frac{1}{4}-3$ times in total length : L. 1. scales 70-80 or indistinct 5.
5. Height of body 3 times in total length : L. 1. scales 70-80
A. baculis (Ham.)
(B. 6 ; D. $7/1/13$; P. 12 ; V. $1/5$; A. $3/13$; L. 1. 70-80 ; L. tr. 18 ; C. 17).
6. Height of body $2\frac{1}{4}-3$ times in total length : L. 1. indistinct or interrupted
A. nama (Ham.)
(B. 6 ; D. $7/1/13-17$; P. 13 ; V. $1/6$; A. $3/14-17$; C. 17).

Family APOGONIDAE

Key to the species of genus Apogon

1. First dorsal with 6 spines
A. laterale (V.)
(B. 7 ; D. $6/1/9$; P. 14 ; V. $1/5$; A. $2/9$; L. 1. 23-25 ; L. tr. $2/7$; C. 17).
2. First dorsal with 7 spines 3.
3. Height of body $3-3\frac{1}{2}$ times in total length : no vertical bands on sides below dorsals
A. aureus (Lac.)
(B. 7 ; D. $7/19$; P. 14 ; V. $1/5$; A. $2/8$; L. 1. 25-26 ; L. tr. $2\frac{1}{2}-6$; C. 17).
4. Height of body $2\frac{3}{4}$ in total length : 2 vertical bands on sides each below dorsals
A. bifasciatus (Rupp.)
(B. 7 ; D. $7/1/9$; P. 15 ; V. $1/5$; A. $2/8$; L. 1. 25-26 ; L. tr. $2-7\frac{1}{2}$; C. 17).

Family SERRANIDAE

Key to the species of genus Epinephelus

1. Dorsal with 9 spines
E. sonnerati (C.)
(B. 7 ; D. $9/14-15$; P. 18-19 ; V. $1/5$; A. $3/8-9$; L. 1. 100-112 ; L. tr. $11-14/1/48-50$; C. 17).
2. Dorsal with 11 spines 3.
3. Lateral line scale tubules with 4-6 radiating ridges : dorsal spines low
E. lanceolatus (Bl.)
(D. $11/14-16$; P. 17 ; V. $1/5$; A. $3/8$; L. 1. 95 ; L. tr. $14/1/38$).
4. Lateral line scale tubules simple, without radiating ridges : dorsal spines moderately high 5.
5. Mandibular teeth in 2 series . . . 7.
6. Mandibular teeth in 3 series . . . 11.

7. L. tr. scales 18/56 : L. l. scales 127 : gill rakers 14+20 *E. undulosus* (Q. G.)
(D. 11/7-19 ; V. 1/5 ; A. 3/8-9 ; L.l. 127 ; L. tr. 17/1/56).
8. L. tr. scales 13/41-45 : L. l. scales 94-112 : gill rakers 8+16 9.
9. Cheek scales 30-31 : L. l. scales 104-112 : body with hexagonal spots *E. aureolatus* (Forsk.)
(D. 11/15-17 ; P. 17 ; V. 1/5 ; A. 3/8 ; L. l. 104-112 ; L. tr. 12/1/41-45 ; C. 17).
10. Cheek scales 21-25 : L. l. scales 94 : body with vertical bars *E. diacanthus* (V.)
(D. 11/14-15 ; P. 16 ; V. 1/5 ; A. 3/8 ; L. l. 94 ; L. tr. 11-15/1/34 ; C. 17).
11. Predorsal scales 56-62 : cheek scales 25-27 : maxilla extending only upto postorbit *E. merra* (Bl.)
(D. 11/15-17 ; P. 16 ; V. 1/5 ; A. 3/8 ; L. l. 95-102 ; L. tr. 10-12/1/33-35).
12. Predorsal scales 66-70 : cheek scales 36-38 : maxilla extending an eye diameter beyond orbit . *E. tauvina* (Forsk.)
(D. 11/15-16 ; P. 18 ; V. 1/5 ; A. 3/8 ; L. l. 97-107 ; L. tr. 12-13/1/35-39 ; C. 17).

Family THEROPONIDAE

Key to the species of genus *Therapon* C.

1. Lateral bands curved *T. jarbua* (Forsk.)
(D. 10-12/9-10 ; A. 3/8-9 ; L. l. 80/90 ; L. tr. 15/13).
2. Lateral bands straight 3.
3. Lateral line scales 90-100 *T. puta* C.
(D. 11-12/10 ; P. 15 ; A. 3/8-9 ; L. l. 90-100 ; L. tr. 13-14/24).
4. Lateral line scales 50-55 *T. therops* C.
(D. 12/10 ; P. 15 ; A. 3/8 ; L. l. 50-55 ; L. tr. 11/16).

Family SILLAGINIDAE

Key to the genera of family SILLAGINIDAE

1. Second dorsal spine very much elongated, reaching beyond caudal **Genus *Sillaginopsis* Gill**
[*S. panijus* (Ham.)]
(B. 6 ; D. 9/1/25-27 ; P. 24 ; V. 1/5 ; A. 1/26-27 ; L. l. 90 ; L. tr. 5-6/14 ; C. 19).
2. Second dorsal spine neither elongated nor exceeding height of body **Genus *Sillago* C.**
[*S. sihama* (Forsk.)]
(B. 6 ; D. 10-11/1/20-23 ; P. 20 ; V. 1/5 ; A. 1/22-23 ; L. l. 70-74 ; L. tr. 5-6/12 ; C. 19).

Family CARANGIDAE

Key to the genera of family CARANGIDAE

1. Lateral line armed with scutes : supplemental bone always present 3.
2. Lateral line not armed with scutes : supplemental bone present or absent 15.
3. One or more finlets behind second dorsal and anal 5.
4. No finlets behind second dorsal and anal 7.
5. One finlet behind second dorsal and anal Genus **Decapterus** Blkr.
[*D. russellii* (Rupp.)]
(B. 7 ; D. 8/1/29-30+1 ;
P. 22 ; C. 1/5 ; A. 2/1/25-
27+1 ; L. 1. sc. 40 ;
C. 17).
6. Several finlets behind second dorsal and anal Genus **Megalaspis** Blkr.
[*M. cordyla* (L.)]
(B. 7 ; D. 6-8/1/9-11+vii-x ;
P. 21 ; V. 1/5 ; A. 2/1/8-9+
vii-viii ; L. 1. sc. 55 ;
C. 18).
7. First dorsal well developed, spines connected by membrane 9.
8. First dorsal rudimentary, spines not connected by membrane Genus **Alectis** Rafin.
9. A deep median groove on the abdomen (containing vent and 2 detached anal spines and pelvics) Genus **Atropus** C.
[*A. atropus* (Schn.)]
(B. 7 ; D. 8/1/22 ; P. 22 ;
V. 1/5 ; A. 2/1/18 ; L. 1.
sc. 32-35 ; C. 16).
10. No deep median abdominal groove
11. Teeth in lower jaw uniserial : adipose eyelid well developed 13.
12. Teeth in lower jaw pluriserial : adipose eyelid rudimentary Genus **Citula** C.
13. Outer series of teeth in upper jaw strong and prominent : no groove in shoulder girdle under operculum Genus **Caranx** Blkr.
14. Outer series of teeth in upper jaw weak and not prominent : a groove in shoulder girdle under operculum Genus **Selar** Blkr.
15. Anal and second dorsal equal : no supplemental bone 17.
16. Anal shorter than second dorsal : supplemental bone present 19.
17. With several finlets behind dorsal and anal : anterior rays of second dorsal and anal normal Genus **Scomberoides** Lac.
18. Without finlets behind dorsal and anal : anterior rays of second dorsal and anal falciform Genus **Trachinotus** Lac.
19. A finlet behind dorsal and anal : gill openings extending forward till upper edge of eye Genus **Elagatis** Benn.
[*E. bipinnulata* (Q. G.)]
(B. 7 ; D. 5/1/22-25+i ; P.
V. 1/5 ; A. 0-2/16-17+i ;
L. 1. 95 ; L. tr. 16/28 ;
C. 18)

20. No finlet behind dorsal and anal: gill opening not extending forward till upper edge of eye

Genus *Seriola* C.[*S. nigrofasciata* (Rupp.)](B. 7; D. 5-6/1/29-33; P. 19;
V. 1/5; A. 1/15-17; C. 19).*Key to the species of genus Alectis*

1. Eye $1\frac{1}{2}$ - $1\frac{3}{4}$ times in snout: preorbital about twice eye diameter
A. indica (Rupp.)
(B. 7; D. 0-6/1/19;
P. 17; V. 1/5; A. 0-2/1/16;
L. l. sc. 8-10; C. 19).
2. Eye $\frac{3}{4}$ -1 times in snout: preorbital not higher than diameter
A. ciliaris (Bl.)
(B. 7; D. 6/1/10; P. 18;
V. 1/5; A. 2/1/16; L. l. sc. 15; C. 19).

Key to the species of genus Selar

1. Height of body 3- $3\frac{1}{2}$ times in total length
2. Height of body $3\frac{1}{4}$ - $4\frac{3}{8}$ times in total length
3. Dorsal and ventral profiles equally convex: lateral line scutes 46-53
4. Ventral profile more convex than the dorsal: lateral line scutes 40-44
5. Maxillary reaching middle of orbit: eye diameter 3 times in head length
6. Maxillary reaching anterior margin of orbit: eye diameter $3\frac{1}{2}$ -4 times in head length
7. Lateral line scutes 27-32: lateral line not arched
8. Lateral line scutes 46: lateral line arched
3.
5.
S. djedaba (Forsk.)
(B. 7; D. 8/1/22-25; P. 21;
V. 1/5; A. 2/1/19-20;
L. l. sc. 46-53; C. 17).
- S. kalla* (C.)
(B. 7; D. 8/1/23-24; P. 20;
V. 1/5; A. 2/1/19-20;
L. l. sc. 40-44; C. 17).
7.
S. mate (C.)
(B. 7; D. 7/8/1/24; P. 24;
V. 1/5; A. 2/1/19-20;
L. l. sc. 40-44; C. 17).
- S. crumenophthalmus* (Bl.)
(B. 7; D. 8/1/24-26; P. 21;
V. 1/5; A. 2/1/21-22;
L. l. sc. 27-32; C. 21).
- S. boops* (C.)
(B. 7; D. 8/1/24-25; P. 19;
V. 1/5; A. 2/1/20-21;
L. l. sc. 46; C. 17).

Key to the species of genus Citula

1. Anterior rays of dorsal and anal falciform
2. Anterior rays of dorsal and anal normal
3. Height of body $2\frac{1}{2}$ times in total length: anterior dorsal rays as high as body
3.
C. malabaricus (Schn.)
(B. 7; D. 7-8/1/12-22; P. 21;
V. 1/5; A. 2/1/17-18; L. l. sc. 28; C. 21).
- C. armatus* (Forsk.)
(B. 7; D. 6-8/1/20-21; P. 21;
V. 1/5; A. 2/1/16-17; L. l. sc. 20; C. 19).

4. Height of body $3\frac{1}{2}$ times in total length : anterior dorsal rays $\frac{2}{3}$ height of body *C. oblongus* (C.)
(B. 7 ; D. 8/1/21-22 ; P. 21 ;
V. 1/5 ; A. 2/1/18-19 ;
L. l. sc. 34-40 ; C. 18).

Key to the species of genus Caranx

1. Maxillary extending to vertical from postorbital : chest wholly scaly *C. sexfasciatus* (Q. G.)
(B. 7 ; D. 7-8/1/19-22 ; P. 22 ;
V. 1/5 ; A. 2/1/14-17 ;
L. l. sc. 30-36 ; C. 21).
2. Maxillary extending to the vertical from midorbital : chest mostly naked or sparsely scaly 3.
3. Chest entirely scaleless : ventral and dorsal profiles equally convex anteriorly *C. carangus* (Bl.)
(B. 7 ; D. 8/1/20-22 ; P. 21 ;
V. 1/5 ; A. 2/1/15-18 ;
L. l. sc. 33-37 ; C. 19).
4. Chest sparsely scaly : ventral profile less convex than dorsal profile *C. sansun* (Forsk.)
(B. 7 ; D. 8/1/19-21 ; P. 20 ;
V. 1/5 ; A. 2/1/16-17 ; L. l. sc. 30-36 ; C. 19).

Key to the species of genus Scomberoides

1. Maxillary extending behind the vertical from postorbital 3.
2. Maxillary extending only upto the vertical from postorbital *S. sanctipetri* (C.)
(B. 8 ; D. 7/1/19-21 ; P. 17 ;
V. 1/5 ; A. 2/1/18-19 ;
C. 15).
3. Height of body $3\frac{2}{3}$ times in total length *S. tala* (C.)
(B. 8 ; D. 7/1/19-20 ; P. 19-20 ;
V. 1/5 ; A. 2/1/17-18 ;
C. 17-19).
4. Height of body 4 times in total length *S. lysan* (Forsk.)
(B. 8 ; D. 7/1/19-20 ; P. 19 ;
V. 1/5 ; A. 2/1/17-18 ;
C. 19).

Key to the species of genus Trachinotus

1. Height of body twice or less in total length : body without lateral spots *T. blochii* (Lac.)
(B. 7 ; D. 6-7/1/18-21 ; P. 17 ;
V. 1/5 ; A. 2/1/16-19 ;
C. 17).
2. Height of body more than twice in total length : body with lateral spots 3.
3. Snout blunt : pelvics small : 2-5 small lateral blotches *T. bailloni* (Lac.)
(B. 7 ; D. 6-7/1/22-24 ; P. 17 ;
V. 1/5 ; A. 2/1/22-24 ;
C. 19).
4. Snout pointed : pelvics large : 3-6 large lateral blotches *T. russellii* C.
(B. 7 ; D. 6/1/22-23 ; P. 17 ;
V. 1/5 ; A. 2/1/20-21 ;
C. 17).

Family LUTIANIDAE

Key to the species of genus Lutianus

1. Scales above lateral line in oblique series 3.
2. Scales above lateral line in series parallel to its course *L. johnii* (Bl.)
(B. 7 ; D. 10/13-14 ; P. 16 ;
V. 1/5 ; A. 3/8-9 ; L. l. 84 ;
L. tr. 7/13 ; C. 17).
3. Scales below lateral line in oblique series *L. sanguineus* (C.)
(B. 7 ; D. 11/13-14 ; P. 17 ;
V. 1/5 ; A. 3/8-9 ; L. l. 52-55 ; L. tr. 11-12/25 ;
C. 17).
4. Scales below lateral line in horizontal series 5.
5. Predorsal scales extending over interorbital 7.
6. Predorsal scales not extending over interorbital 11.
7. Preopercle deeply notched *L. kashmira* (Forsk.)
(B. 7 ; D. 10-11/13-14 ; P. 16 ;
V. 1/5 ; A. 3/8-9 ; L. l. 48-51 ; L. tr. 7-8/18-21).
8. Preopercle feebly notched 9.
9. Preorbital and infraorbital very narrow : gill rakers 16-18 *L. lineolatus* (Rupp.)
(B. 7 ; D. 11/12-13 ; P. 16 ;
V. 1/5 ; A. 3/8-9 ; L. l. 50 ;
L. tr. 6-7/14 ; C. 17).
10. Preorbital and infraorbital much wider than maxillary : gill rakers 6+15 *L. lutjanus* (Bl.)
(B. 7 ; D. 10/13-14 ; P. 16 ;
V. 1/5 ; A. 3/8-9 ; L. l. 50 ;
L. tr. 6/16 ; C. 17).
11. Scales above lateral line in oblique rows throughout 13.
12. Scales above lateral line in oblique rows posteriorly *L. argentimaculatus* (Forsk.)
(B. 7 ; D. 10/13-15 ; P. 16 ;
V. 1/5 ; A. 3/8 ; L. l. 45-50 ; L. tr. 7-8/16 ; C. 17).
13. Preopercle deeply notched : no light coloured blotch below spinous and soft dorsal 15.
14. Preopercle feebly notched : light coloured blotch below spinous and another below soft dorsal *L. bohar* (Forsk.)
(B. 7 ; D. 10/14 ; P. 17 ;
V. 1/5 ; A. 3/8 ; L. l. 50 ;
L. tr. 7/18 ; C. 17).
15. L. tr. 8/19 : numerous wavy white or blue bands on cheeks : no horizontal stripes on body *L. rivulatus* (C.)
(B. 7 ; D. 10/15 ; P. 17 ;
V. 1/5 ; A. 3/8-9 ; L. l. 45-50 ; L. tr. 8/19 ; C. 17).
16. L. tr. 6-9/15 ; no wavy white or blue bands on cheeks : 7 horizontal stripes on body *L. vaigiensis* (Q.)
(B. 7 ; D. 10/13-14 ; P. 16 ;
V. 1/5 ; A. 3/8 ; L. l. 50 ;
L. tr. 6-9/15 ; C. 17).

Family NEMIPTERIDAE

Key to the species of genus Nemipterus

1. Upper caudal ray elongated . . . *N. japonicus* (Bl.)
(B. 6 ; L. 1. 48 ; L. tr. 3½/10).
2. Upper caudal ray normal . . . 3.
3. Dorsal spines longer than rays . . . *N. tolu* (V.)
(B. 6 ; L. 1. 48 ; L. tr. 3/10).
4. Dorsal spines shorter than rays . . . *N. bleekerii* (Day)
(B. 6 ; L. 1. 48 ; L. tr. 3½/11).

Family LOBOTIDAE

Key to the genera of family LOBOTIDAE

1. Eye in anterior third of head : soft dorsal higher than spinous dorsal . . . Genus *Lobotes* C.
(*L. surinamensis* Bl.)
(D. 12/15-16 ; A. 3/11-13 ; L. tr. 9-11/22).
2. Eye in anterior half of head : soft dorsal lower than spinous dorsal . . . Genus *Datnioides* Bl.
[*D. quadrifasciatus* (Sevastian)]
(D. 12/13-14 ; A. 2/8-9 ; L. 1. 48 ; L. tr. 12/25).

Family LEIOGNATHIDAE

Key to the genera of family LEIOGNATHIDAE

1. Teeth minute : no canines . . . Genus *Leiognathus* Lac.
2. Teeth large : with canines . . . Genus *Gazza* Rupp.
[*G. minutus* (Bl.)]
(B. 5 ; D. 8/16 ; P. 17 ; V. 1/5 ; A. 3/14 ; C. 17).

Key to the species of genus Leiognathus

1. Longest dorsal spine exceeding half height of body . . . *L. fasciata* (Lac.)
(B. 5 ; D. 8/16 ; P. 19 ; V. 1/5 ; A. 3/14 ; C. 17).
2. Longest dorsal spine not exceeding half height of body . . . 3.
3. Mouth very oblique . . . *L. ruconius* (Ham.)
(B. 5 ; D. 8/16 ; P. 18 ; V. 1/5 ; A. 3/14 ; C. 17).
4. Mouth horizontal . . . 5.
5. Height of body 2-2½ times in total length . . . 7.
6. Height of body 2¼-3¼ times in total length . . . 9.
7. Chest scaly : height of body 2¼-2½ times in total length . . . *L. splendens* (C.)
(B. 5 ; D. 8/16 ; P. 17 ; V. 1/5 ; A. 3/14 ; L. 1. 55-66 ; C. 17).

8. Chest scaleless : height of body $2-2\frac{1}{4}$ times in total length

L. equula (Forsk.)
(B. 5 ; D. 8/15-16 ; P. 20 ;
V. 1/5 ; A. 3/14 ; L. l. 60 ;
C. 17).

9. Chest scaly : height of body $2\frac{1}{4}-3\frac{1}{4}$ times in total length

L. blochii (V.)
(B. 5 ; D. 8/16 ; P. 18 ;
V. 1/5 ; A. 3/14 ; C. 17).

10. Chest scaleless : height of body $2\frac{3}{4}$ times in total length

L. lineolata (V.)
(B. 5 ; D. 8/16 ; P. 19 ;
V. 1/5 ; A. 3/14 ; C. 17).

Family GERRIDAE

Key to the species of genus *Gerres*

- | | |
|---|---|
| 1. Dorsal with 10 spines | <i>G. setifer</i> (Ham.)
(D. 10/10 ; P. 17 ; A. 3/7 ;
L. l. 38 ; L. tr. 5/10 ;
C. 19). |
| 2. Dorsal with 9 spines | 3. |
| 3. Height of body 4 times in total length | <i>G. oblongus</i> C.
(D. 9/10 ; P. 17 ; A. 3/7 ;
L. l. 48-50 ; C. 17). |
| 4. Height of body $2\frac{1}{4}-3\frac{1}{2}$ times in total length . | 5. |
| 5. Second dorsal spine prolonged, extending to caudal base | <i>G. filamentosus</i> C.
(D. 9/10 ; P. 15 ; A. 3/7 ;
L. l. 45-48 ; L. tr. 6/14) |
| 6. Second dorsal spine normal | 7. |
| 7. Longest dorsal spine much longer than longest anal spine | 9. |
| 8. Longest dorsal spine not longer than longest anal spine | <i>G. limbatus</i> C.
(D. 9/10 ; P. 15 ; L. tr. 4/10 ;
C. 17). |
| 9. L. tr. scales 5/10 | <i>G. oyena</i> (Forsk.)
(D. 9/10 ; P. 15 ; A. 3/7 ;
L. l. 38-40 ; L. tr. 5/10 ;
C. 19). |
| 10. L. tr. scales 6/11 | <i>G. poeti</i> C.
(D. 9/10 ; P. 15 ; A. 3/7 ;
L. l. 40 ; L. tr. 6/11 ;
C. 17). |

Family POMADASYIDAE

Key to the genera of family POMADASYIDAE

- | | |
|--|----------------------------------|
| 1. A medium groove along under surface of lower jaw | Genus <i>Pomadasys</i> Lac. |
| 2. No median groove along under surface of lower jaw | Genus <i>Plectorhynchus</i> Lac. |

Key to the species of genus Pomadasys

- | | |
|---|--|
| 1. Second anal spine much longer than third | 3. |
| 2. Second anal spine not longer than third | <i>P. maculatus</i> (Bl.)
(D. 12/11-14 ; P. 17 ; A. 3/7 ;
L. 1. 52-56 ; L. tr. 8/12 ;
C. 17). |
| 3. Scales below lateral line 18 | <i>P. furcatus</i> Schn.)
(D. 12-13/15 ; P. 17 ; A.
3/8-9 ; L. 1. 55-60 ; L. tr.
7/18 ; C. 17). |
| 4. Scales below lateral line 10-13 | 5. |
| 5. Dorsal spotted : 4-5 interrupted grey lines on sides | <i>P. hasta</i> (Bl.)
(D. 12/13-14 ; P. 15-17 ;
A. 3/7-8 ; L. 1. 46-50 ;
L. tr. 5-7/10-13 ; C. 17). |
| 6. Dorsal not spotted : sides uniform silvery | <i>P. argyreus</i> (C.)
(D. 12-13/12-14 ; P. 16 ;
A. 3/7-8 ; L. 1. 45-47 ;
L. tr. 6/12). |

Key to the species of genus Plectorhynchus

- | | |
|--|--|
| 1. Dorsal with 14 spines | <i>P. niger</i> (C.)
(B. 7 ; D. 14/15-16 ; P. 17 ;
A. 3/7 ; L. 1. 50-60 ; L. tr.
10/17). |
| 2. Dorsal with 9-12 spines | 3. |
| 3. Uniform on sides | <i>P. schotaf</i> (Fork.)
(B. 7 ; D. 11-12/18-21 ; P. 17 ;
A. 3/7-9 ; L. 1. 63 ; L. tr.
13/26). |
| 4. Longitudinally banded or spotted on sides | <i>P. picta</i> (Thunberg)
(B. 6-7 ; D. 9-10/22-25 ; P. 17 ;
A. 3/7 ; L. 1. 88-100 ;
L. tr. 17-20/30-31). |

Family SCIAENIDAE

Key to the genera of family SCIAENIDAE

- | | |
|---|---|
| 1. Mouth terminal, snout more or less pointed : cleft of mouth oblique : canine teeth well developed | 3. |
| 2. Mouth inferior, snout bluntly rounded or inflated : cleft of mouth more or less horizontal : no true canines | 9. |
| 3. Five pores below mandibular symphysis | Genus <i>Pseudosciaena</i> Blkr. |
| 4. Two to four or no pores below mandibular symphysis | 5. |
| 5. Jaws unequal, lower more prominent : no pores below mandibular symphysis | Genus <i>Otolithes</i> Oken. |
| 6. Jaws subequal or upper jaw less prominent : 2-4 pores below mandibular symphysis | 7. |
| 7. Dorsal spines 10, rays 40-43 : 2 pores below mandibular symphysis | Genus <i>Pama</i> Fowler
(<i>P. pama</i> Ham.)
(B. 7 ; D. 10/1/40-43 ; P. 17 ;
V. 1/5 ; A. 2/7 ; L. 1. 48-
50 ; L. tr. 9½/24½ ; C.
17.) |

8. Dorsal spines 10-12, rays 27-34 : 4 pores below
mandibular symphysis Genus *Otolithoides* Fowler
[*O. biauratus* (Cantor)]
(D. 9/1/27-33 ; P. 19 ; A. 2/7 ;
L. 1. 115/95 ; L. tr. 12/25).
9. A barbel at mandibular symphysis Genus *Sciaena* L.
10. No barbel at mandibular symphysis Genus *Johnius* Bl.

Key to the species of genus Sciaena

1. Anal base twice in soft dorsal base : scales below
lateral line 15 *S. indica* (van Hass.)
(B. 7 ; D. 10/1/24-27 ; P. 17 ;
V. 1/5 ; A. 2/5 ; L. 1. 50 ;
L. tr. 6/15 ; C. 17).
2. Anal base 4 times in soft dorsal base : scales
below lateral line 17 *S. dussumieri* (V.)
(B. 7 ; D. 10/1/24-27 ; P. 17 ;
V. 1/5 ; A. 2/7-8 ; L. 1. 52 ;
L. tr. 6/17 ; C. 17).

Key to the species of genus Pseudosciaena

1. Second anal spine strong, 3/4 length of first ray
or more 3.
2. Second anal spine weak, 2/3 length of first ray or
less 7.
3. Scales below lateral line 14 5.
4. Scales below lateral line 16-18 7.
5. Fourth and fifth dorsal spines longest *P. axillaris* (C.)
(B. 7 ; D. 10/1/26-29 ; P. 17 ;
V. 1/5 ; A. 2/7 ; L. 1. 48-
50 ; L. tr. 6-7/14 ; C. 17).
6. Third and fourth dorsal spines longest *P. sina* (C.)
(B. 7 ; D. 10/1/27-29 ; P. 17 ;
V. 1/5 ; A. 2/7-8 ; L. 1. 48-
50 ; L. tr. 8/14 ; C. 17).
7. Scales below lateral line 16 *P. soldado* (Lac.)
(B. 7 ; D. 9-10/1/28-30 ; P.
17 ; V. 1/5 ; A. 2/7 ; L. 1.
50-52 ; L. tr. 8-16 ; C. 17).
8. Scales below lateral line 18 9.
9. Scales along lateral line 53-55 *P. coibor* (Ham.)
(B. 7 ; D. 9-10/1/24-25 ;
P. 18 ; V. 1/5 ; A. 2/7 ; L. 1.
53-55 ; L. tr. 7/18 ; C. 17).
10. Scales along lateral line 50 *P. diacanthus* (Lac.)
(B. 7 ; D. 10/1/23-24 ; P. 18-
19 ; V. 1/5 ; A. 2/7 ; L. 1.
50 ; L. tr. 7-18 ; C. 17).

Key to the species of genus Johnius

1. Outer pelvic ray prolonged 3.
2. Outer pelvic ray not prolonged *J. osseus* (Day)
(B. 7 ; D. 10/1/25 ; P. 18 ;
V. 1/5 ; A. 2/7 ; L. 1. 50 ;
L. tr. 6/15 ; C. 17).

3. Scales below lateral line 25
J. semiluctuosus (C.)
(B. 7 ; D. 10/1/28-31 ; P. 19 ;
V. 1/5 ; A. 2/7 ; L. 1. 52 ;
L. tr. 8-9/25 ; C. 17).
4. Scales below lateral line 14-18
5. Scales below lateral line 14
J. belengeri (C.)
(B. 7 ; D. 9/1/27-32 ; P. 17 ;
V. 1/5 ; A. 2/7 ; L. 1. 50 ;
L. tr. 6/14 ; C. 17).
6. Scales below lateral line 18
7. Second anal spine weak
J. carutta Bl.
(B. 7 ; D. 10/1/25-28 ; P. 17 ;
V. 1/5 ; A. 2/7 ; L. 1. 50 ;
L. tr. 5-6/18 ; C. 17).
8. Second anal spine strong
J. dussumieri (C.)
(B. 7 ; D. 10/1/28-30 ; P. 16 ;
V. 1/5 ; A. 2/8 ; L. 1. 50 ;
L. tr. 5-6/18 ; C. 17).

Key to the species of genus Otolithes

1. Anal with 7-8 rays : L. 1. scales 50
O. argenteus (C.)
(B. 7 ; D. 10/1/28-30 ; P. 16 ;
V. 1/5 ; A. 2/7-8 ; L. 1. 50 ;
L. tr. 7-8/21 ; C. 17).
2. Anal with 10-12 rays : L. 1. scales 85
O. maculatus (C.)
(B. 7 ; D. 9-10/1/30 ; P. 18 ;
V. 1/5 ; A. 2/10-12 ;
L. 1. 85 ; L. tr. 14/16 ; C. 17).

Family MULLIDAE

Key to the species of genus Upeneus

1. Lobes of caudal barred
U. vittatus (Forsk.)
(B. 4 ; D. 8/1/8 ; P. 15-17 ;
V. 1/5 ; A. 1/7 ; L. 1. 38-
39 ; L. tr. 2½/7 ; C. 15).
2. Lobes of caudal not barred
O. sulphureus (C.)
(B. 4 ; D. 8/1/8 ; P. 15 ;
V. 1/5 ; A. 1/7 ; L. 1. 35-
38 ; L. tr. 2½/7 ; C. 15).

Family PSETTIDAE

Key to the species of genus Monodactylus

1. Height of body 6/13 to 1/2 in total length : no
bands on body
M. falciformis Lac.
(B. 6 ; D. 8/28-30 ; P. 16 ;
V. 1/3-5 ; A. 3/29 ; L. 1.
100 ; C. 17).
2. Height of body 2/3 in total length : 2 vertical
bands on body
M. argenteus (L.)
(B. 6 ; D. 8/28-30 ; P. 17 ;
V. 1/2-3 ; A. 3/28-30 ;
L. 1. 105/75 ; C. 17).

Family SPARIDAE

Key to the genera of family SPARIDAE

1. Two or 3 rows of molars in upper jaw ; inter-orbital scaly

Genus **Argyrops** Swn.[*A. spinifer* (Forsk.)](B. 6 ; D. 11-12/9-11 ; P. 15 ;
V. 1/5 ; A. 3/8-9 ; L. 1. 53 ;
L. tr. 6-7/18 ; C. 17).

2. Four or 5 rows of molars in upper jaw : inter-orbital scaleless

Genus **Sparus** L.*Key to the species of genus Sparus*

1. L. tr. scales 4-5/11 : 4 rows of molars in lower jaw

S. datnia (Ham.)(B. 6 ; D. 10-13/10-11 ; P. 15 ;
V. 1/5 ; A. 3/8-9 ; L. 1.
46-48 ; L. tr. 4-5/11 ; C. 17).

2. L. tr. scales 6/13 : 3 rows of molars in lower jaw

S. berda Forsk.(B. 6 ; D. 11-12/11-12 ; P. 15 ;
V. 1/5 ; A. 3/8-10 ; L. 1.
44-46 ; L. tr. 6/13 ; C. 17).

Family CHAETODONTIDAE

Key to the genera of family CHAETODONTIDAE

1. A strong preopercular spine

Genus **Holacanthus** Lac.[*H. imperator* (Bl.)](B. 6 ; D. 14/21-22 ; P. 21 ;
V. 1/5 ; A. 3/20-21 ; C. 17).

2. No preopercular spine

3.

3. Fourth dorsal spine normal

Genus **Chaetodon** L.(*C. vagabundus* L.)(B. 6 ; D. 12-13/23-25 ; P. 15 ;
V. 1/5 ; A. 3/20-22 ; L. tr.
4/15 ; C. 17).

4. Fourth dorsal spine prolonged and filiform

Genus **Heniochus** C.[*H. acuminatus* (L.)](B. 5 ; D. 11-12/24-25 ; P. 17 ;
V. 1/5 ; A. 3/17-18 ; L. 1.
52 ; L. tr. 9/22 ; C. 17).

Family PRISTOLEPIDAE

Key to the species of genus Pristolepis

1. Vomerine teeth villiform

P. malabarica (Gthr.)(B. 6 ; D. 14/12-14 ; P. 14-15 ;
V. 1/5 ; A. 3/8 ; L. 1. 25-
27 ; L. tr. 3½/11 ; C. 16).

2. Vomerine teeth globular

P. fasciata (Blkr.)(B. 6 ; D. 12-13/14-16 ; P. 15 ;
V. 1/5 ; A. 3/8 ; L. 1. 26-
28 ; L. tr. 4½/12 ; C. 14).

Family CICHLIDAE

Key to the species of genus Etroplus

1. Anal spines 14-16 : dorsal spines 21-22
E. canarensis Day
(B. 6 ; D. 21-22/8 ; P. 15 ;
V. 1/5 ; A. 14-16/6-7 ; L. 1.
30-31 ; L. tr. 5½/15 ; C.
16).
2. Anal spines 12-15 : dorsal spines 17-20
3. Anal rays 8-9 : sides blotched
E. maculatus (Bl.)
(B. 6 ; D. 17-20/8-10 ; P. 14 ;
V. 1/5 ; A. 12-15/8-9 ;
L. 1. 25 ; L. tr. 6/19 ;
C. 16).
4. Anal rays 11-12 : sides transversely banded
E. suratensis (Bl.)
(B. 6 ; D. 18-19/14-15 ; P. 17 ;
V. 1/5 ; A. 12-13/11-12 ;
L. 1. 35-40 ; L. tr. 5½/16 ; C.
16).

Family SIGANIDAE

Key to the species of genus Siganus

1. Profuse spots on sides becoming bands on abdomen
S. java L.
(B. 5 ; D. 13/10 ; P. 18 ;
V. 2/3 ; A. 7/9 ; C. 19).
2. A few scattered spots on sides
S. oramin (Schn.)
(B. 5 ; D. 13/10 ; P. 16 ;
V. 2/3 ; A. 7/9 ; C. 17).

Family TRICHIURIDAE

Key to the species of genus Trichiurus

1. Distance between lateral line and anus much less than twice in its distance from base of dorsal : pelvics vestigial, scale-like
T. muticus Gray
(B. 7 ; D. 140-150 ; P. 11).
2. Distance between lateral line and anus much more than twice in its distance from base of dorsal : pelvics absent
3. First anal spine longer than following ones
T. savala (C.)
(B. 7 ; D. 112-120 ; P. 11).
4. First anal spine very small, not longer than following ones
T. haumela (Forsk.)
(B. 7 ; D. 127-133 ; P. 11).

Family SCOMBRIDAE

Key to the species of genus Rastrelliger

1. Depth of body more than 3½ times in total length : lower gill-rakers 36-41
R. canagurta (C.)
(B. 6 ; D. 8-10/1/11+v-vi ;
P. 21 ; V. 1/5 ; A. 1/11+v-vi ; L. 1. 130-150 ; L. tr. 10/28 ; C. 24).

2. Depth of body less than $3\frac{1}{2}$ times in total length : lower gill-rakers 43-45

R. brachysoma (Blkr.)
(B. 7 ; D. 10/1/11+v ; P. 22 ;
V. 1/5 ; A. 1/11+v ; L. 1.
135 ; C. 21).

Family CYBIIDAE

Key to the species of genus *Scomberomorus*

1. Maxilla extending beyond vertical from postorbital margin : sides with vertical bands : lower limb of first gill arch with 3 rudimentary rakers

S. commersoni Lac.
(B. 7 ; D. 16-17/3-4/13-14+
ix-x ; P. 20-23 ; V. 1/5 ;
A. 2-3/12-13+ix-xii ; C. 21).

2. Maxilla not extending beyond vertical from postorbital margin : sides with 3 horizontal rows of spots : lower limb of first gill arch with more than 3 well developed rakers

S. guttatus (Schn.)
(B. 7 ; D. 16-17/4-5/14-15+
viii-x ; P. 21 ; V. 1/5 ;
A. 3/17-19+vii-x ; C. 26).

Family HISTIOPHORIDAE

Key to the genera of family HISTIOPHORIDAE

1. Dorsal much higher than depth of body

Genus *Istiophorus* Lac.
[*I. gladius* (Bl.)]
(B. 7 ; D. 40-50/7 ; P. 15 ;
V. 1-2 ; A. 10/7 ; C. 17).

2. Dorsal much less than depth of body

Genus *Tetrapturus* Rafin.
[*T. brevirostris* (Playfair)]
(B. 7 ; D. 35/7 ; P. 19 ; V. 2 ;
A. 11/7 ; C. 17).

Family STROMATEIDAE

Key to the genera of family STROMATEIDAE

1. Lateral line keeled at caudal peduncle

Genus *Parastromateus*
[*P. niger* (Bl.)]
(B. 7 ; D. 5/42-44 ; P. 22 ;
A. 3/32-39 ; C. 19).

2. Lateral line not keeled throughout

Genus *Pampus* Bonaparte.

Key to the species of genus *Pampus*

1. Depth of body much more than half total length : no spines before dorsal and anal

P. chinensis (Euphr.)
(B. 6 ; D. 43/50 ; P. 25 ;
A. 39-42 ; C. 19).

2. Depth of body less than half total length : spines before dorsal and anal

P. argenteus (Ephr.)
(B. 7 ; D. 5-9/1/38-43 ; P. 27 ;
A. 5-6/1/32-41 ; C. 19).

Family OSPHRONEMIDAE

Key to the genera of family OSPHRONEMIDAE

1. Lateral line complete : caudal roundly truncate . Genus **Osphronemus** Lac.
(*O. goramy* Lac.)
(B. 6 ; D. 11-14/11-12 ; P. 15 ;
V. 1/5 ; A. 9-12/19-21 ; L. 1.
30-38 ; L. tr. 5-8/13 ; C.
16).
2. Lateral line incomplete : caudal lanceolate . Genus **Macropodus** Lac.
[*M. cupanus* (Lac.)]
(B. 6 ; D. 14-17/5-7 ; P. 21 ;
V. 1/5 ; A. 16-19/9-11 ;
L. 1. 29-32 ; L. tr. 4/7-8 ;
C. 13).

Family PLATYCEPHALIDAE

Key to the species of genus Platycephalus

1. Lateral line with spines throughout *P. tuberculatus* C.
(B. 6 ; D. 1/7-8/11-12 ; P. 21 ;
V. 1/5 ; A. 11-12 ; L. 1.
53-55 ; C. 15).
2. Lateral line without spines *P. indicus* (L.)
(B. 7 ; D. 1/7/13 ; P. 17 ;
V. 1/5 ; A. 13 ; C. 15).

* Family THUNNIDAE

Key to the genera of family THUNNIDAE

1. Body completely scaled, those of corselet and lateral line usually longer . Genus **Thunnus** Smith
[*T. neothunnus albacore* (Lowe)]
(B. 7 ; D. 14/3/12+x ; P. 31 ;
V. 1/5 ; A. 12+ x ; C. 28).
2. Body naked except for corselet and lateral line . Genus **Euthynnus** Jordan and Gilbert.

Key to the species of genus Euthynnus

1. Depth of body $4\frac{1}{2}$ times in length from snout end to middle of tail fin : no dark stripes along lower side of body : lower gill rakers 25-30 . *E. alleteratus affinis* Cantor
(B. 7 ; D. 15/3/10-11+viii ;
P. 26 ; V. 1/5 ; A. 3/11+viii ; C. 17).
2. Depth of body $3\frac{1}{2}$ - $3\frac{3}{4}$ times in length from snout end to middle of tail fin : dark stripes along lower side of body : lower gill rakers 36-40 . *E. pelamis* (L.)
(B. 7 ; D. 15/1-2/12+viii,
P. 27 ; V. 1/5 ; A. 2/12+viii).

Family BOTHIDAE

Key to the species of genus Pseudorhombus

1. Anterior dorsal rays longer than those following :
lower gill-rakers 20-25 : 3 ocelli on body *P. triocellatus* (Schn.)
(B. 6 ; D. 66-69 ; V. 5 ;
A. 49-51 ; L. 1. 65-70).
2. Anterior dorsal rays not longer than those following :
lower gill-rakers 8-15 : no ocelli on
body 3.
3. Maxillary extending to vertical from postorbital
margin *P. arsius* (Ham.)
(B. 7 ; D. 71-79 ; P. 11-12 ;
V. 6 ; A. 54-61 ; L. 1. 75-
85 ; C. 17).
4. Maxillary extending to vertical from midorbit *P. javanicus* (Blkr.)
(B. 6 ; D. 69 ; P. 10 ; V. 6 ;
A. 52-53 ; L. 1. 70-75 ;
C. 18).

Family SOLEIDAE

Key to the genera of family SOLEIDAE

1. Posterior rays of dorsal and anal fins elongate and
confluent with rays of caudal fin Genus *Brachirus* Swns.
2. Posterior rays of dorsal and anal fins normal and
non-confluent with rays of caudal fin Genus *Solea* Quensel
(*S. ovata* Richardson)
(B. 6 ; D. 60-66 ; P. 9 ; V. 5 ;
A. 42-49 ; L. 1. 110 ; C. 12).

Key to the species of genus Brachirus

1. Lateral line scales 155 : depth of body $3\frac{1}{3}$ - $3\frac{1}{2}$
in total length *B. albomaculatus* (Kaup)
(B. 6 ; D. 72-74 ; P. 7-8 ;
V. 4 ; A. 56-59 ; L. 1. 110-
120 ; C. 16).
2. Lateral line scales 63-74 ; depth body $2-2\frac{1}{4}$ in
total length 3.
3. Dorsal rays 62-72 : anal rays 47-57 : none of the
scales enlarged *B. orientalis* (Schn.)
(B. 6 ; D. 62-72 ; P. 7 ; V. 5 ;
A. 47-57 ; L. 1. 70-85 ;
C. 16).
4. Dorsal rays 57-61 : anal rays 43-46 : scales of
nape and upper part of head enlarged *B. pan* (Ham.)
(B. 6 ; D. 57-61 ; P. 7 ; V. 6 ;
A. 43-46 ; L. 1. 80 ; C. 14).

Family CYNOGLOSSIDAE

Key to the species of genus Cynoglossus

1. Two lateral lines on blind side *C. bilineatus* (Lac.)
(B. 6 ; D. 106-116 ; V. 4 ;
A. 83 ; L. 1. 108 ; C. 12).

2. One lateral line on blind side 3.
3. Twelve to fourteen scales between lateral lines on ocular side : depth $5\frac{2}{5}$ — $6\frac{1}{2}$ times in total length
C. lingua (Ham.)
 (B. 6 ; D. 142—150 ; V. 4 ; A. 105-110 ; L. 1. 100-115 ; C. 8.).
4. Seven to nine scales between lateral line on ocular side : depth $3\frac{1}{2}$ — $4\frac{2}{3}$ times in total length
C. macrolepidotus (Blkr.)
 (B. 6 ; D. 116-118 ; V. 4 ; A. 86-90 ; L. 1. 50-55 ; C. 11).

Family MASTOCSEMBELIDAE

Key to the genera of family MASTOCSEMBELIDAE

1. A preorbital spine : snout not transversely striated ventrally
 Genus *Mastocembelus* Scopoli.
2. No preorbital spine : snout transversely striated ventrally
 Genus *Macrognaathus* Lac.
 [*M. aculeatum* (Bl.)]
 (B. 6 ; D. 16-20/44-54 ; P. 23 ; A. 2-3/44-52 ; C. 15).

Key to the species of genus Mastocembelus

1. Caudal confluent with vertical fins
M. armatus (Lac.)
 (B. 6 ; D. 32-39/74-90 ; P. 23 ; A. 3/75-88).
2. Caudal non-confluent with vertical fins
M. pancalus (Ham.)
 (B. 6 ; D. 24-26/32-42 ; P. 19 ; A. 3/31-46 ; C. 12).

V—SYSTEMATIC ACCOUNT OF THE SPECIES

Class ELASMOBRANCHII

Subclass SELACHII

Order LAMNIFORMES

Suborder Lamnoidei

I. Family ORECTOLOBIDAE

1. Genus *Chiloscyllium* M. H.

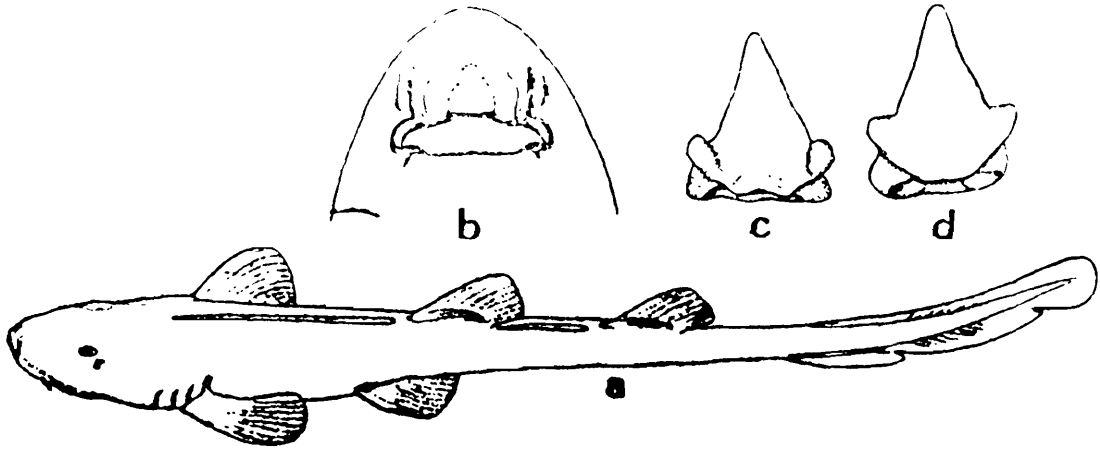
1837. *Chiloscyllium* Müller & Henle, *Arch. Naturgesch.*, 3, p. 395. (Type, *Scyllium plagiosum* Bennett, designated by Gill, *Ann. Lyc. nat. Hist. New York*, 7, p. 42, 1861.)
1838. *Hemisicyllium* Andrew Smith, *Proc. zool. Soc. Lond.*, p. 86. (Type, *Squalus ocellatus* Bonnaterre.)
1862. *Synchismus* Gill, *Ann. Lyc. nat. Hist. New York*, 7, pp. 407, 408 (Type, *Squalus tuberculatus* Schn., orthotypic.)

1. *Chiloscyllium griseum* M. H.

(Text fig. 2)

1841. *Chiloscyllium griseum* Müller & Henle, *Syst. Besch. Plagiostomen*, p. 19 (type-locality : India, Japan).
1889. *Chiloscyllium indicum* (nec Gmelin) Day, *Fauna Brit. India, Fish.*, 1, p. 34, fig. 14. 9

Head 5·2, depth 8·7 to subcaudal origin. Eye about the same size as the spiracle, 1·5 in head. Angle of mouth nearer eye than snout end. Teeth triangular, with smooth edges. First dorsal origin just behind base of pelvics. Pale brown with about 13 transverse dark brown cross bands enclosing paler interspace.



TEXT-FIG. 2.—(a) Lateral view of *Chiloscylidium griseum* M.H. (b) Ventral view of head of same. (c) Upper teeth of same. (d) Lower teeth of same. (After Misra).

Distribution.—INDIA : Port Canning, West Bengal, Orissa coast, Vizagapatam, Madras, Travancore-Cochin coast, Malabar coast, Bombay ; PAKISTAN : coasts of Sind, East Pakistan.—Red Sea, South Africa, Malay Peninsula, Malay Archipelago, China, Japan, Philippines.

Remarks.—A common shallow water shark growing to about 609 mm. (2½ feet) in length.

2. Genus *Nebrius* Rupp.

1837. *Nebrius* Ruppell, *Neue. Wirbelth. Fische*, p. 62. (Type, *N. concolor* Rupp., monotypic ; name regarded as preoccupied by *Nebria* Latrelle and *Nebrius* Cuvier, but the root is different and thus not involved.)
1838. *Ginglymostoma* Müller & Henle, *S. B. preuss. Akad. Wiss.*, p. 113. (Type, *Squalus cirratus* Gmelin ; designated by Hay, *Bull. U. S. geol. Surv.*, 179, p. 310, 1902.)
1913. *Nebrodes* Garman, *Mem. Harv. comp. Zool.*, 36, p. 56, (Type, *Nebrius concolor* Rupp.)

2. *Nebrius ferrugineum* (Lesson)

1830. *Scyllium ferrugineum* Lesson, *Voy. "Coquille", Zool.*, 2, pt. 1, fig. 95 (type-locality : Port Parslin ; Offack Bay, Waigiu).
1889. *Ginglymostoma mülleri* Day, *Fauna Brit. India, Fish.*, 1, p. 33.

Head 5·3, depth 7·5 to subcaudal origin. Eye minute, 11 in head. Snout short, not equalling width of mouth. Teeth mostly tricuspid. Last 2 gill openings close together, others equidistant. First dorsal origin opposite pelvic origin. Angles of paired fins pointed. Uniform rusty brown.

Distribution.—INDIA : Malabar coast, Bombay ; PAKISTAN ; Sind.—Ceylon, Red Sea, Madagascar, Malay Peninsula, Indo-China, Malay Archipelago, Melanesia, Polynesia.

Remarks.—It attains 2,895 mm. (9½ feet) in length.

3. Genus *Rhincodon* Smith

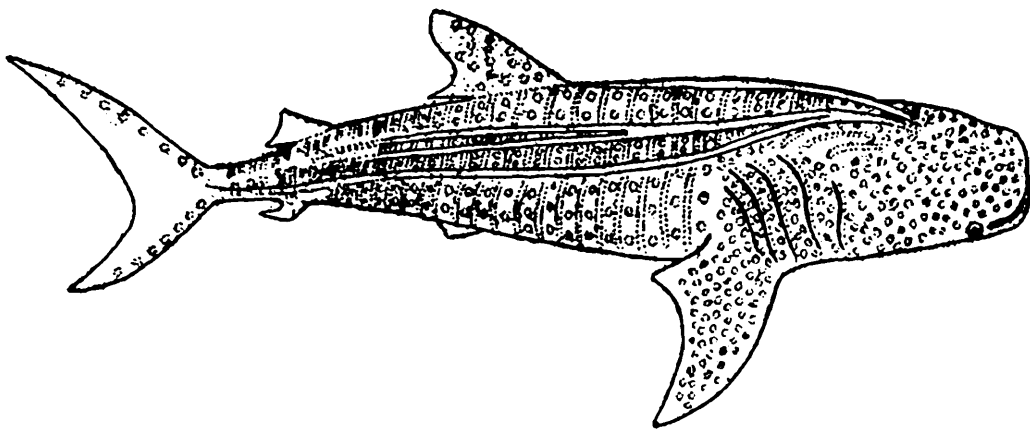
1829. *Rhincodon* A. Smith, *Zool. J.*, 4, p. 443. (Type, *R. typus* A. Smith, monotypic.)
 1838. *Rhineodon* Müller & Henle, *Mag. nat. Hist. Charlesworth*, 2, p. 37. (Type, *Rhincodon typus* A. Smith.)
 1839. *Rhiniodon* Swainson, *Nat. Hist. Fish. Animal.*, 2, p. 317. (Type, *Rhincodon typus* A. Smith.)

3. *Rhincodon typus* Smith

(Text-fig. 3)

1829. *Rhincodon typus* Smith, *Zool. J.*, 4, p. 443. (type-locality : Table Bay, South Africa).
 1889. *Rhinodon typicus* Day, *Fauna Brit. India*, Fish., 1, p. 29.

Head 5·5, depth 5·5 to subcaudal origin. Eye small, 13·5 in head. Snout short, broad, flat. Teeth small, conical, 12-15 transverse rows. Body massive ; tail laterally keeled. Mouth wide, transverse. First dorsal origin slightly in front of pelvic origin. Brownish to purplish with spots and transverse streaks of white.



TEXT-FIG. 3.—Lateral view of *Rhinocodon typus* Smith. (After Smith).

Distribution.—INDIA : Bay of Bengal, Travancore-Cochin coast ; PAKISTAN : Bay of Bengal.—Ceylon, Seychelles, South Africa, Siam, Japan, Java, Philippines, California, Panama, Chile and the tropical Atlantic.

Remarks.—It attains about 21,336 mm. (70 feet) in length and is esteemed for the large quantity of oil it yields.

4. Genus *Stegostoma* M. H.

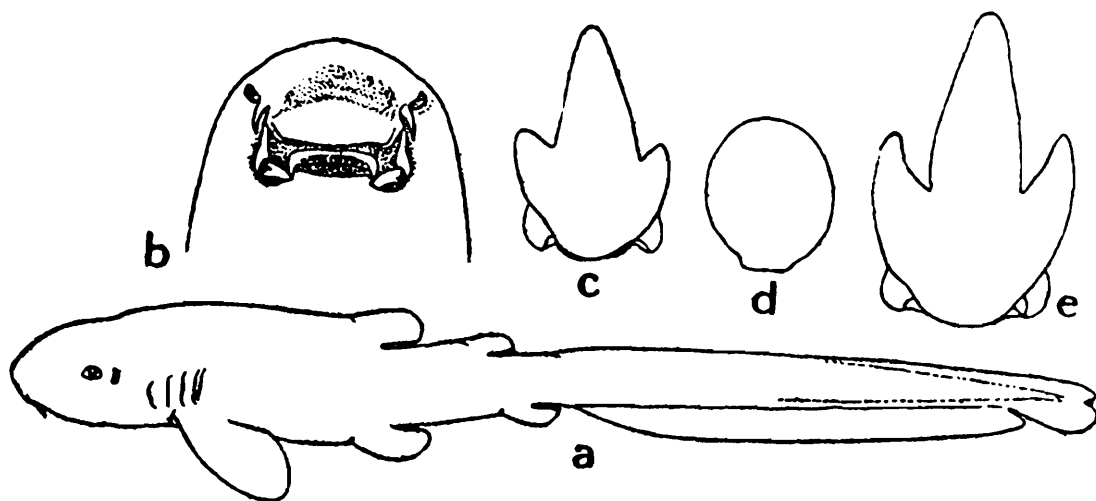
1837. *Stegostoma* Müller & Henle, *S. B. preuss. Akad. Wiss.*, p. 112. (Type, *Squalus fasciatus* Hermann, orthotypic.)

4. *Stegostoma varius* (Seba)

(Text-fig. 4)

1758. *Squalus varius* Seba, *Thesauri*, 3, pl. 34, fig. 1, p. 105 (type-locality : not given).
 1889. *Stegostoma tigrinum* Day, *Fauna Brit. India*, Fish., 1, p. 33.

Head as broad as long, 3·6 to 4, depth 4·3 to 4·5 to subcaudal origin. Eye 10 to 10·5 in head. Snout obtuse. Upper lip with a barbel on either side. Teeth small, trilobed. Fourth and fifth gill openings close together. Caudal very long, about $\frac{1}{2}$ the total length, notched near its lower extremity. Brownish or tawny becoming whitish below; with many cross bands of deeper brown, each bordered broadly by blackish; lower side of body and tail with dark spots.



TEXT-FIG. 4.—(a) Lateral view of *Stegostoma varius* (Seba). (b) Ventral view of head of same. (c) Upper teeth of same. (d) Scale of same. (After Misra).

Distribution.—INDIA : Bay of Bengal, Orissa coast, Madras, Travancore-Cochin coast, Bombay; PAKISTAN : Sind coast, Bay of Bengal.—Ceylon, Red Sea, Zanzibar, East Africa, Madagascar, Malay Peninsula, Sima, Indo-China, China, Formosa, Japan, Malay Archipelago, Australia.

Remarks.—It attains more than 609 mm. (2 ft.) in length.

II. Family ODONTASPIDAE

5. Genus *Carcharias* Rafinesque

1810. *Carcharias* Rafinesque, *Caratt. Animal. Piante Sicilia*, p. 10. (Type, *C. taurus* Raf., monotypic.)
 1825. *Odontaspis* Agassiz, *Poiss. Foss.*, 3, p. 55. (Type, *Squalus ferox* Risso, monotypic.)

5. *Carcharias tricuspidatus* Day

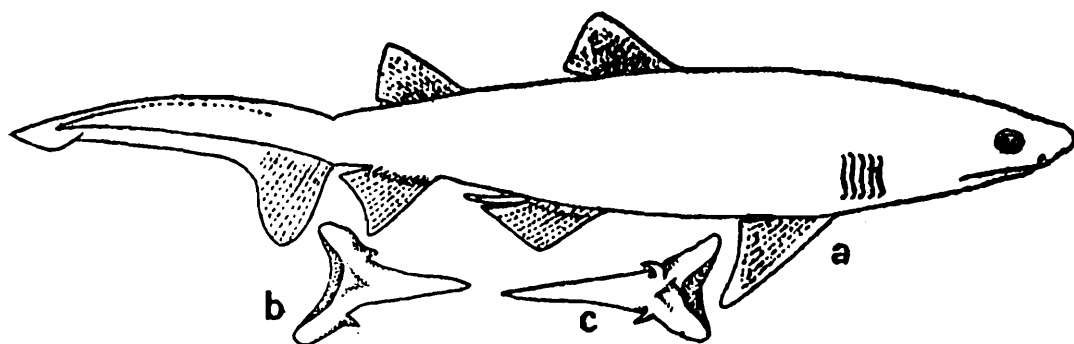
(Text-fig. 5)

1878. *Carcharias tricuspidatus* Day, *Fish. India*, p. 713, pl. 186, fig. 1 (type-locality : Karachi, Baluchistan).
 1889. *Odontaspis tricuspidatus* Day, *Fauna Brit. India*, Fish., 1, p. 27, fig. 8.

Head 3·7, depth 5 to subcaudal origin. Eye 9·5 in head. Mouth crescentic, teeth large, awl-shaped, with one or two cusps at the base. First dorsal partly over pelvics. Upper caudal pit distinct. Subcaudal produced. Brown above, dull white below.

Distribution.—INDIA : Bombay coast ; PAKISTAN : Sind coast.—South Africa, Indo-China, Philippines.

Remarks.—It grows to about 6,096 mm. (20 feet) in length.



TEXT-FIG. 5.—(a) Lateral view of *Carcharias tricuspidatus* Day. (b) Upper teeth of same. (c) Lower teeth of same. (After Day).

III. Family LAMNIDAE

6. Genus *Alopias* Rafinesque

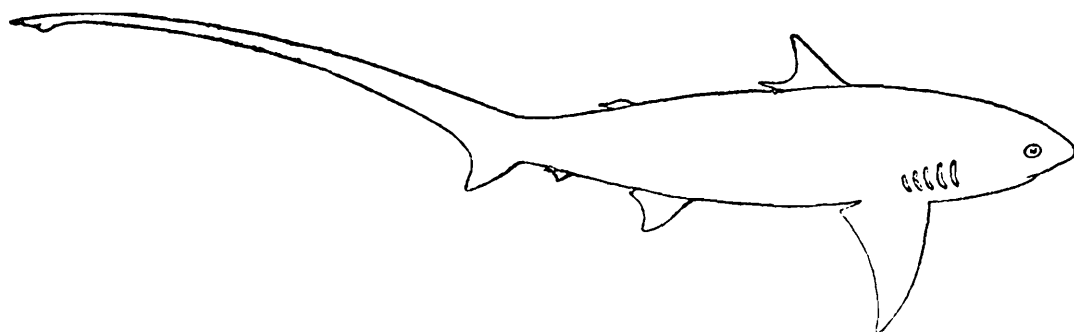
1810. *Alopias* Rafinesque, *Caratt. Animal. Piante Sicilia*, p. 12. (Type, *A. macrourus* Rafinesque, monotypic.)

6. *Alopias vulpinus* (Bonnaterre)

(Text-fig. 6)

1788. *Squalus vulpinus* Bonnaterre, *Tabl. Ichth.*, p. 1. 85, fig. 349 (type, locality : Mediterranean).
1889. *Alopias vulpes* Day, *Fauna. Brit. India, Fish.*, 1, p. 28, fig. 9.

Head 4·2, depth 4 to subcaudal origin. Eye 7·7 in head. Mouth crescentic ; teeth small, flattened, triangular, smooth-edged. First dorsal larger than second dorsal and anal ; pectorals large, falcate. Body fusiform, with the caudal about half the total length. Slaty, greyish brown becoming whitish below.



TEXT-FIG. 6.—Lateral view of *Alopias vulpinus* (Bonn.). (After Day).

Distribution.—INDIA : Travancore-Cochin coast.—Ceylon, Arabia, Natal, South Africa, China, Japan, Korea, Philippines, California, Chile.

Remarks.—It attains 4,472 mm. (15 feet) in length.

7. Genus *Isurus* Raf.

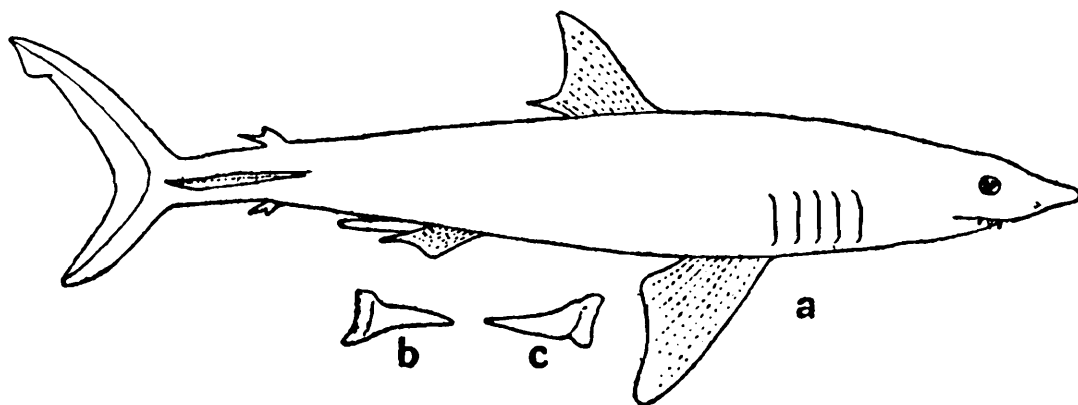
1810. *Isurus* Rafinesque, *Caratt. Animal. Piante Sicilia*, p. 11. (Type, *I. oxyrinchus* Raf., monotypic.)

7. *Isurus glauca* M. H.

(Text-fig. 7)

1841. *Oxyrhina glauca*, Müller & Henle, *Syst. Besch. Plagiostomen*, p. 60, pl. 29 (type-locality : Java).
1889. *Lamna spallanzanii* Day, *Fauna Brit. India*, Fish., 1, p. 26, fig. 7.

Head 4·2, depth 6·3 to subcaudal origin. Eye 12·5 in head. Snout pointed. Mouth as long as wide ; teeth large, awl-shaped with sharp but entire lateral edges, without basal cusps. Spiracles minute or absent. First dorsal origin opposite inner pectoral angle ; anal base wholly behind second dorsal ; pectoral large ; lower caudal lobe longer. A keel along side of tail. A pit at caudal base. Greyish blue, becoming lighter beneath.



TEXT-FIG. 7.—(a) Lateral view of *Isurus glauca* M.H. (b) Upper teeth of same. (c) Lower teeth of same. (After Day).

Distribution.—INDIA : Madras.—Ceylon, Arabia, Red Sea, Cape of Good Hope, Indo-China, Japan, Chile, St. Helena.

Remarks.—It grows to about 2,133 mm. (7 feet) in length.

Suborder Scyliorhinoidei (Carcharinidae)

IV. Family SCYLIORHINIDAE

8. Genus *Atelomycterus* Garman

1913. *Atelomycterus* Garman, *Mem. Harv. Mus. Comp. Zool.*, 36, p. 100. (Type, *Scyllium marmoratum* Bennett, monotypic.)

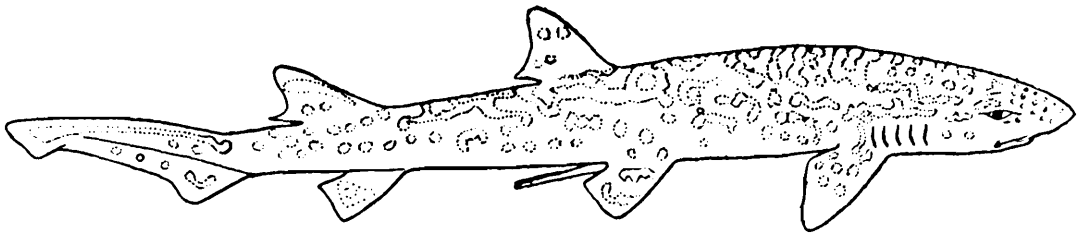
8. *Atelomycterus marmoratum* (Benn.)

(Text-fig. 8)

1830. *Scyllium marmoratum* Bennett, *Life of Raffles*, p. 693 (type-locality : Sumatra).
1889 *Scyllium marmoratum* Day, *Fauna Brit. India*, Fish., 1, p. 31, fig. 11.

Head 5·6, depth 7·6 to subcaudal origin. Eye 5·4 in head. Snout equals width of month. Nasal valves confluent, with a single transverse, uninterrupted flap and a well developed labial fold. Teeth small,

tricuspid. First dorsal origin just behind pelvic base ; second dorsal larger than first dorsal and anal ; anal origin in front of second dorsal origin. Tawny brown with about 12 transverse bands separated by light blotches or spots ; lower surface pale white.



TEXT-FIG. 8.—Lateral view of *Atelomycterus marmoratum* (Benn.) (After Day).

Distribution.—Seas of INDIA and PAKISTAN.—Singapore, Siam, Malay Peninsula, Indo-China, China, Java, Sumatra, Philippines, Amboyna.

Remarks.—It attains about 457 mm. ($1\frac{1}{2}$ feet) in length.

V Family CARCHARHINIDAE

9. Genus *Physodon* M. H.

1841. *Physodon* Müller & Henle, *Syst. Besch. Plagiostomen*, p. 30. (Type, *Carcharias (Physodon) mulleri* M. H., monotypic.)

9. *Physodon mülleri* (M. H.)

1841. *Carcharias (Physodon) mulleri* Muller & Henle, *Syst. Besch. Plagiostomen*, p. 30, pl. 19, fig. 1 (type-locality : Bengal).
1889. *Carcharias mulleri* Day, *Fauna Brit. India*, Fish., 1, p. 11.

Head broader than deep. Snout elongated, pointed, 3 in head to first gill opening. Eye small, above middle of mouth. Teeth smooth, central ones smaller than those at sides which bear swollen bases with oblique, narrow cusps. End of base of first dorsal opposite pelvic origin ; second dorsal small ; origin above last third of anal base. Dark brownish becoming lighter beneath, with fins a little darker.

Distribution.—INDIA : Bay of Bengal, Vizagapatam, Madras, Bombay ; PAKISTAN : Bay of Bengal.—China, Philippines.

Remarks.—It attains about 457 mm. ($1\frac{1}{2}$ feet) in length.

10. Genus *Scoliodon* M. H.

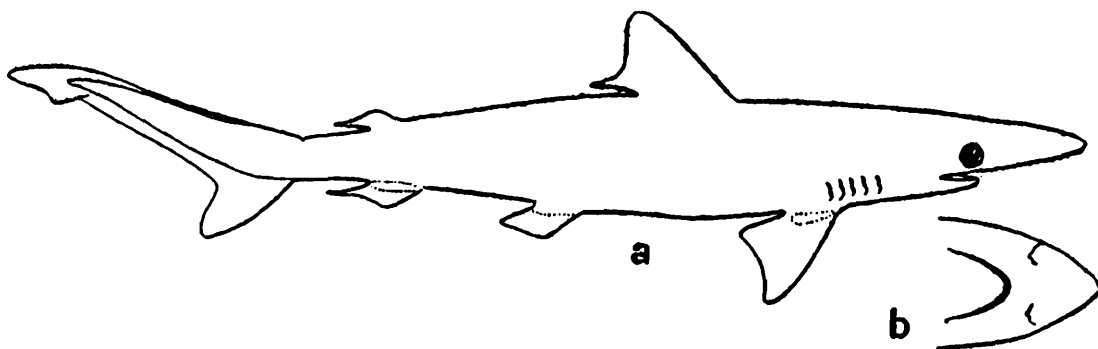
1837. *Scoliodon* Müller & Henle, *M. g. nat. Hist. Charlesworth*, 2, p. 114. [Type, *Carcharias (Scoliodon) laticaudus* M. H., designated by Gill, *Ann. Lyc. nat. Hist. New York*, 8, p. 35, 1861.]
1915. *Rhizoprion* (nec Jourdain, 1861) Ogilby, *Mem. Qd. Mus.*, 3, p. 132. [Type, *Carcharias (Scoliodon) crenidens* Klunzinger, orthotypic : inadmissible.]
1929. *Rhizoprionodon* Whitley, *Aust. Zool.* 5, p. 345. (Type, *Carcharias (Scoliodon) crenidens* Klunzinger, orthotypic.)

10. *Scoliodon palasorrah* (C.)

(Text-fig. 9)

1829. *Carcharias palasorrah* Cuvier, *Regne Animal.*, 2, ed. 2, p. 388 (on *Palasorrah* Russel, *Fish. Coromandel*, 1, p. 9, pl. 14, 1803 ; type-locality : Vizagapatam).
1889. *Carcharias acutus* Day, *Fauna Brit. India*, Fish., 1, p. 10.

Head 3.6 to 4.3, depth 5 to 7 to subcaudal origin. Eye 8.7 to 9 in head. Mouth 3 to 3.5 in head, with short groove at each angle along upper jaw; labial fold not extending to upper jaw. Teeth in jaws oblique, nonserrated, without swollen bases. First dorsal origin much nearer pectoral base than pelvic origin; second dorsal origin over end of base of anal. Grey or bronze above, white below, with paired fins pale below.



TEXT-FIG. 9.—(a) Lateral view of *Scoliodon palasorrah* (C.). (b) Ventral view of head of same. (After Day).

Distribution.—INDIA : Bay of Bengal, Vizagapatam, Madras, Bombay; PAKISTAN : Bay of Bengal.—Ceylon, Arabia, Red Sea, South Africa, Malay Peninsula, Siam, Indo-China, China, Japan, Java, Philippines.

Remarks.—It attains nearly 533 mm. ($1\frac{2}{3}$ feet) in length.

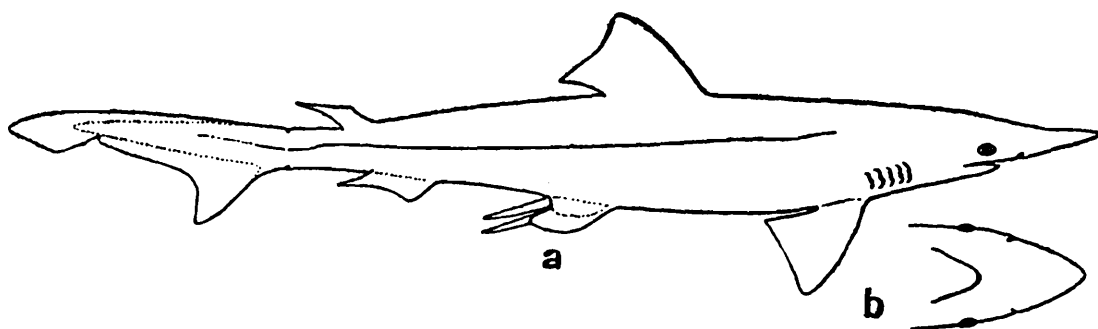
11. *Scoliodon sorrakowah* (C.)

(Text-fig.10)

1829. *Carcharias sorrakowah* Cuvier, *Regne Animal.*, 2, ed. 2, p. 388 (type-locality : Vizagapatam).

1889. *Carcharias laticaudus* Day, *Fauna Brit., India, Fish.*, 1, p. 9.

Head 3.5, depth 7 to subcaudal origin. Eye 8 in head. Mouth not exceeding preoral length; upper jaw without labial fold. Teeth in jaws oblique, entire, without swollen bases. First dorsal origin midway between pectoral and pelvic bases; second dorsal origin over commencement of anal. Greyish yellow superiorly becoming dull white below; fins dull brown, deeper medially.



TEXT-FIG. 10.—(a) Lateral view of *Scoliodon sorrakowah* (C.). (b) Ventral view of head of same. (After Day).

Distribution.—INDIA : West Bengal coast, Orissa coast, Vizagapatam, Tuticorin, Ennur, Travancore-Cochin coast, Malabar coast, Bombay; PAKISTAN : Coasts of Sind, East Pakistan.—Burma, Ceylon, Malay, Peninsula, Siam, Indo-China, Japan, Java, Philippines.

Remarks.—It attains about 457 mm. ($1\frac{1}{2}$ feet) in length.

12. *Scoliodon walbeehmi* Blkr.

1856. *Carcharias (Scoliodon) walbeehmi* Bleeker, *Nat. Tijdschr. Ned.-Indie*, 10, p. 353 (type-locality : Rio, Bintang Is.).

1889. *Carcharias walbeehmi* Day, *Fauna Brit. India, Fish.*, 1, p. 10.

Head 4 to 4.2, depth 7 to 7.2 to subcaudal origin. Eye 3 to 4.7 in snout. Mouth not exceeding preoral length, with a well defined groove at the angle and on jaws ; labial fold extending to upper jaw. Teeth in jaws oblique, entire, flat. First dorsal origin nearer to pectoral base than to pelvic origin ; second dorsal origin behind anal origin. Light brown superiorly, dull white beneath ; fins gray with light outer edges.

Distribution.—INDIA : West Bengal coast, Orissa coast, Madras, Tuticorin, Ennur, Travancore-Cochin coast, Bombay, Andamans ; PAKISTAN : Coasts of Sind, East Pakistan.—Ceylon, Natal, Malay Peninsula, Indo-China, China, Formosa, Japan, Java, Philippines.

Remarks.—It grows to at least 457 mm. ($1\frac{1}{2}$ feet) in length.

11. Genus *Hypoprion* M. H.

1841. *Hypoprion* Müller & Henle, *Syst. Besch. Plagiostomen*, p. 34 (Type, *Carcharias (Hypoprion) macloti* M. H., logotypic.)

13. *Hypoprion hemiodon* M. H.

1841. *Carcharias (Hypoprion) hemiodon* Müller & Henle, *Syst. Besch. Plagiostomen*, p. 35, pl. 19, fig. 2 (type-locality : Pondicherry).

1889. *Carcharias hemiodon* Day, *Fauna Brit. India, Fish.*, 1, p. 12.

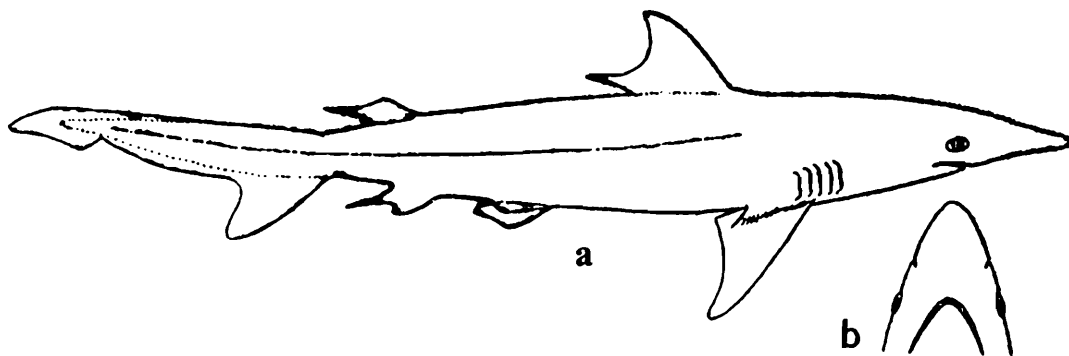
Snout blunt. No labial folds. Teeth in upper jaw oblique, with only the outer side of their bases serrated ; 29 to 32 rows above, 27 to 29 below. First dorsal origin close behind pectoral base ; second dorsal origin a little behind anal origin. Black grey, lighter below.

Distribution.—INDIA : Hoogly at Calcutta, Pondicherry.—Arabia, Indo-China, Philippines.

Remarks.—It attains about 609 mm. (2 feet) in length.

14. *Hypoprion macloti* M. H.

(Text-fig. 11)



TEXT-FIG. 11.—(a) Lateral view of *Hypoprion macloti* M.H. (b) Ventral view of head of same. (After Day).

1841. *Carcharias (Hypoprion) macloti* Müller & Henle, *Syst. Besch. Plagiostomen*, p. 34, pl. 10 (type-locality : New Guinea).

1889. *Carcharias macloti* Day, *Fauna Brit. India, Fish.*, 1, p. 12.

Head 3·8, depth 6·7 to subcaudal origin. Snout pointed, 2·3 in head. Eye 3·2 in snout. Labial fold present. Teeth in upper jaw inclined, with both sides of their bases serrated ; 27 rows in each jaw. First dorsal origin just behind pectoral base ; second dorsal smaller than anal, origin above last third of anal base. Grey or brown, pale white below, with the fins grey, the caudal being nearly black in its posterior half.

Distribution.—INDIA : Malabar coast, Bombay coast ; PAKISTAN : Sind coast, Makran.—Ceylon, Malay Peninsula, Chile.

Remarks.—Specimens measuring about 609 mm. (2 feet) in length have been obtained.

12. Genus *Carcharhinus* Blainville

1816. *Carcharhinus* Blainville, *Bull. Soc. philom. Paris*, p. 121. (Type, *Squalus commersonii* Blainville, logotypic).
 1861. *Eulamia* Gill, *Ann. Lyc. nat. Hist. New York*, 7, p. 401. (Type, *Carcharias lamia* Blainville).

15. *Carcharhinus bleekeri* (Dumeril)

- 1865 *Carcharias (Prionodon) bleekeri* Dumeril, *Hist. nat. Poiss.*, 1, p. 367 (type-locality : Pondicherry).
 1889. *Carcharias bleekeri* Day, *Fauna Brit. India*, Fish., 1, p. 15.

Head much depressed. Preoral length equal to width of mouth. Teeth in 29 rows above and 26 below, finely serrated ; upper oblique, triangular with a notched outer border ; lower nearly erect, on broad bases. First dorsal origin at a short distance behind pectoral base ; second dorsal opposite, as long as but lower than anal. Grey with a deep black spot at lower edge of end of pectoral fin ; another at end of inferior lobe of caudal.

Distribution.—INDIA : West Bengal coast, Orissa coast, Pondicherry ; PAKISTAN : East Pakistan coast.—Seychelles, Red Sea.

Remarks.—Specimens measuring upto 762 mm. (2½ feet) in length have been obtained.

16. *Carcharhinus dussumieri* (M. H.)

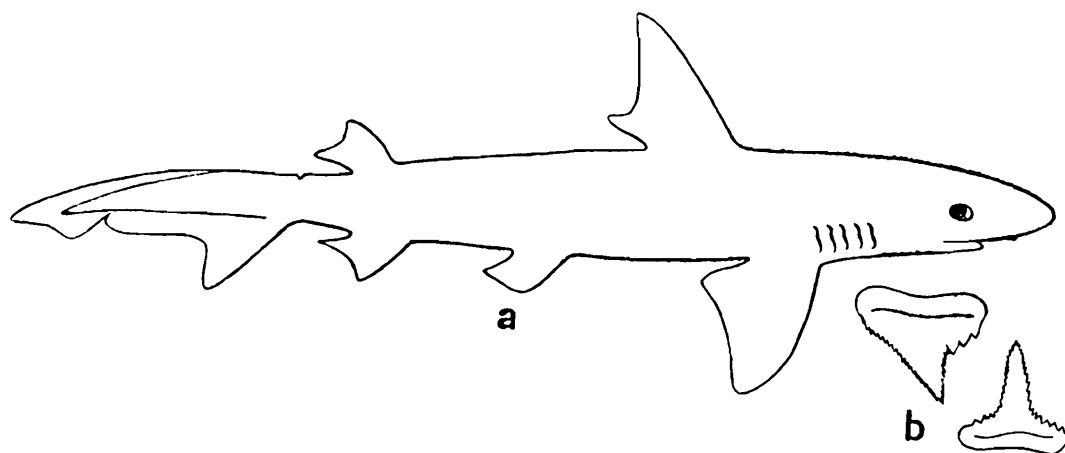
(Text-fig. 12)

1841. *Carcharias (Prionodon) dussumieri* Müller & Henle, *Syst. Besch. Plagiostomen*, p. 47, pl. 19, fig. 8 (type-locality : China, Bombay, Pondicherry).
 1889. *Carcharias dussumieri* Day, *Fauna Brit. India*, Fish., 1, p. 13.

Head 3·7 to 4·4, depth 4·7 to 6·2 to subcaudal origin. Snout 2·2 to 2·3 in head ; preoral length greater than width of mouth. Teeth in 24-25 rows, serrated. First dorsal origin close behind pectoral base ; second dorsal often slightly smaller than anal. Grey or dull brown, becoming white beneath ; fins with outer edges dark ; upper two-thirds of second dorsal black.

Distribution.—INDIA : Madras, Pondicherry, Malabar coast, Bombay ; PAKISTAN : Sind coast.—Ceylon, East Africa, Malay Peninsula, Indo-China, Java, Philippines.

Remarks.—Specimens measuring about 609 mm. (2 feet) have been obtained.

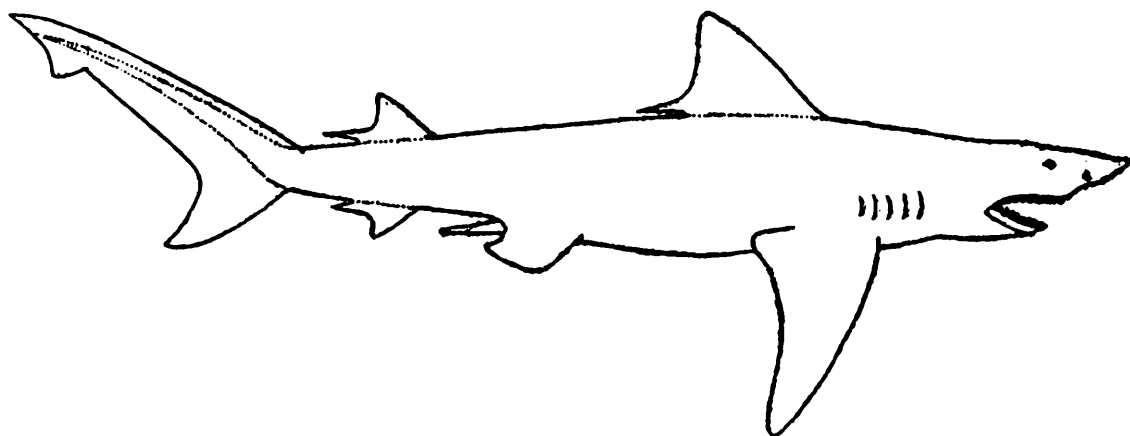


TEXT-FIG. 12.—(a) Lateral view of *Carcharhinus dussumieri* (M.H.). (b) Upper and lower teeth of same. (After Day).

17. *Carcharhinus gangeticus* (M. H.)
(Text-fig. 13)

1841. *Carcharias* (*Prionodon*) *gangeticus* Müller & Henle, *Syst. Besch. Plagiostomen*, p. 39, pl. 13 (type-locality : Hoogly river, Bengal).
1889. *Carcharias gangeticus* Day, *Fauna Brit. India*, Fish., 1, p. 23.

Head 4, depth 6 to subcaudal origin. Snout short, 2·9 in head. Preoral length 0·6 width of mouth. Eye 8 in head. Teeth in 27 to 30 rows in either jaws, serrated, lower narrower. First dorsal origin a little posterior to hind edge of pectoral base ; second dorsal origin ahead of anal origin which is nearer to caudal than to pelvics. Grey superiorly becoming dull white below ; fins with light edges, hind portion of caudal being rather dark.



TEXT-FIG. 13.—Lateral view of *Carcharhinus gangeticus* M. H. (After Müller & Henle).

Distribution.—INDIA : Hoogly at Calcutta, West Bengal coast, Chilka Lake, Bombay ; PAKISTAN : coasts of Sind, East Pakistan.—Burma, Ceylon, Arabia, Indo-China, China, Japan, Java, Philippines, Fiji.

Remarks.—It attains at least 2,743 mm. (9 feet) in length. It ascends tidal rivers.

18. *Carcharhinus limbatus* (M.H.)

1841. *Carcharias (Prionodon) limbatus* Müller & Henle, *Syst. Besch. Plagiostomen*, p. 49, pl. 19, fig. 9 (type-locality : Martinique).
 1889. *Carcharias limbatus* Day, *Fauna Brit. India, Fish.*, 1, p. 17.

Head 3·7, depth 5·5 to subcaudal origin. Eye small, 8·3 in head. Preoral length equal to width of mouth. Teeth in 34 rows above, 31 below, serrated. First dorsal origin over inner angle of base of pectoral ; second dorsal origin just behind anal origin. Grey above, dull white below.

Distribution.—INDIA : West Bengal coast, Orissa coast, Malabar coast, Bombay ; PAKISTAN : coasts of Sind, Makran, Karachi, East Pakistan.—Arabia, Red Sea, Natal, Seychelles, Cochin-China, Polynesia and also in tropical Atlantic.

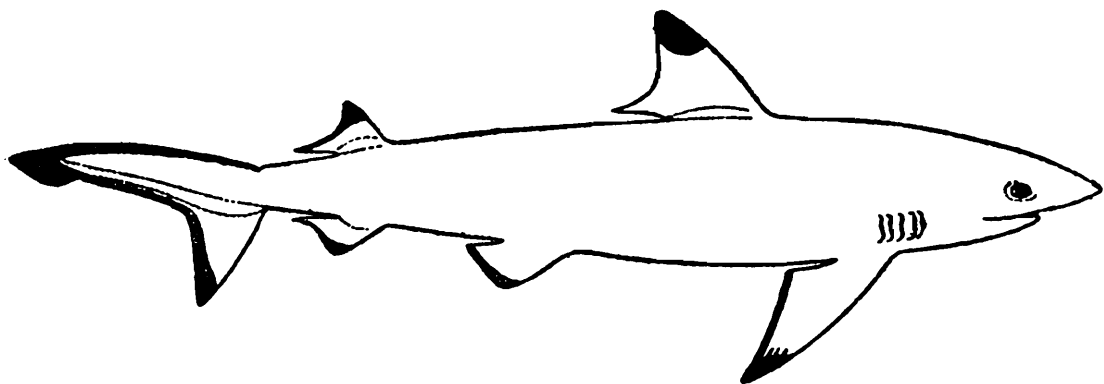
Remarks.—It attains at least 1,828 mm. (6 feet) in length. It yields plenty of liver oil.

19. *Carcharhinus melanopterus* (Q. G.)

(Text-fig. 14)

1824. *Carcharias melanopterus* Quoy & Gaimard, *Voy. "Uranie", Zool.*, pts. 5, 6, p. 194, pl. 42, figs. 1-2 (type-locality : Waigiou : Marianas).
 1889. *Carcharias melanopterus* Day, *Fauna Brit. India, Fish.*, 1, p. 14.

Head 3·6 to 3·8, depth 5 to 5·6 to subcaudal origin. Preoral length 0·6 width of mouth. Teeth 25 rows in each jaw, serrated. First dorsal origin nearer to pectoral base than to pelvic base ; second dorsal opposite and similar to anal. Brown or bluish grey superiorly becoming dull white beneath ; ends of all fins tipped black.



TEXT-FIG. 14.—Lateral view of *Carcharhinus melanopterus* (Q.G.). (After Day).

Distribution.—INDIA : Hoogly at Calcutta, Chilka Lake, Travancore-Cochin coast, Malabar coast, Bombay, Andamans ; PAKISTAN : Karachi, coasts of Sind and Makran.—Burma, Ceylon, Arabia, Red Sea, South Africa, Malay Peninsula, Siam, Indo-China, China, Japan, Java, Amboyna, Philippines, Melanesia, Micronesia, Polynesia, Hawaii.

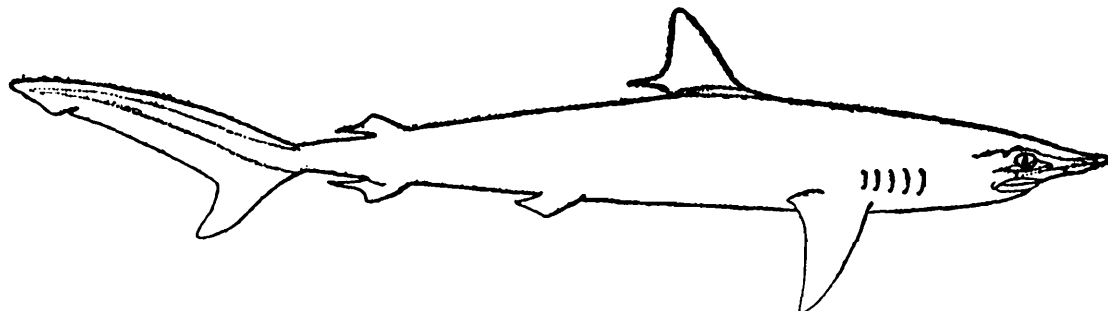
Remarks.—It attains about 3,048 mm. (10 feet) in length and its liver is found to be exceedingly rich in vitamin contents. It ascends tidal rivers.

20. *Carcharhinus menisorrh* (M. H.)

(Text-fig. 15)

1841. *Carcharias (Prionodon) menisorrh*, Müller & Henle, *Syst. Besch. Plagiostomen*, p. 46, pls. 17, 19, fig. 7 (type-locality : Java, Australia, Red Sea).
 1889. *Carcharias menisorrh* Day, *Fauna Brit. India, Fish.*, 1, p. 16.

Head 3.4 to 3.6, depth 5.2 to 6.7 to subcaudal origin. Snout 2.2 to 2.3 in head ; preoral length nearly equals width of mouth. Teeth 28 to 32 rows above, 27 to 28 below which are not serrated. First dorsal origin close behind pectoral base ; second dorsal origin opposite anal origin. Grey above, white below ; upper half of second dorsal of deep black.



TEXT-FIG. 15.—Lateral view of *Carcharhinus menisorrah* (M.H.). (After Müller & Henle).

Distribution.—INDIA : Calicut in Malabar coast, Bombay ; PAKISTAN : coasts of Sind and Makran, Karachi.—Burma, Arabia, Red Sea, Malay Peninsula, Indo-China, Java, Philippines, Panama.

Remarks.—It attains 3,657 mm. (12 feet) or more in length.

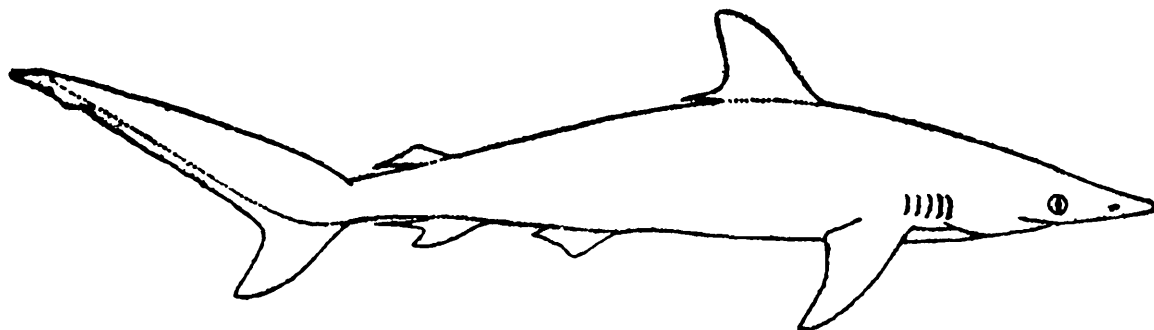
21. *Carcharhinus sorrah* (M. H.)

(Text-fig. 16)

1841. *Carcharias (Prionodon) sorrah* Müller & Henle, *Syst. Besch. Plagios-tomen*, p. 45, pl. 16 (type-locality : India ; Java ; Madagascar).

1889. *Carcharias sorrah* Day, *Fauna Brit. India*, Fish., 1, p. 12.

Head 4 to 4.2, depth 4.2 to 5.2 to subcaudal origin. Snout 2 to 2.3 in head ; preoral length about width of mouth. Teeth in 25 rows on either jaw, serrated. First dorsal origin slightly posterior to pectoral base ; second dorsal smaller than anal and posterior to anal origin. Dull brown superiorly becoming white below ; fins grey, lower caudal lobe and pectoral, black tipped.



TEXT-FIG. 16.—Lateral view of *Carcharhinus sorrah* (M.H.). (After Müller & Henle).

Distribution.—INDIA : Coromadal coast, Bombay ; PAKISTAN coast of Sind.—Red Sea, Madagascar, Malay Peninsula, Malay Archipelago, Indo-China, China, Melanesia, Hawaii.

Remarks.—Specimens measuring about 762 mm. (2½ feet) in length have been obtained.

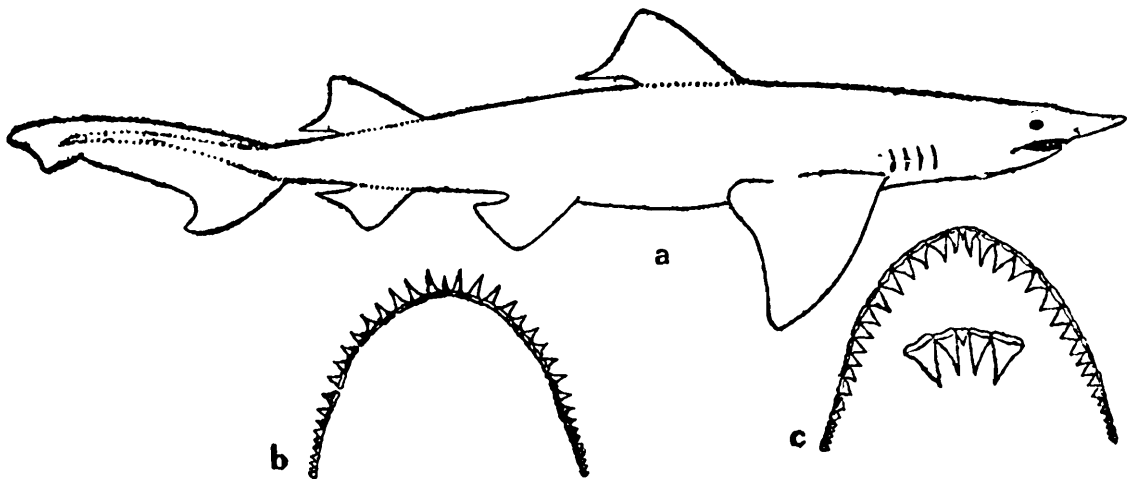
22. *Carcharhinus temminckii* (M. H.)

(Text-fig. 17)

1841. *Carcharias (Prionodon) temminckii* Müller & Henle, *Syst. Besch. Plagiostomen*, p. 48, pl. 18 (type-locality : Pondicherry).

1889. *Carcharias temminckii* Day, *Fauna. Brit. India*, Fish., 1, p. 17.

Head 3·5, depth 4·8 to subcaudal origin. Snout 2·3 in head ; preoral length equals about 0·8 width of mouth. Teeth 37 to 40 rows above, 33 to 39 below ; upper broad, serrated, lower awl-shaped, entire. First dorsal origin midway between roots of pectorals and pelvics ; second dorsal origin opposite anal origin. Fawn above and white below.



TEXT-FIG. 17.—(a) Lateral view of *Carcharhinus temminckii* M.H. (b) Lower jaw of same. (c) Upper jaw of same. (After Müller & Henle).

Distribution.—INDIA : Hoogly at Calcutta, Bombay.—Burma, Malay Archipelago.

Remarks.—Specimens upto 609 mm. (2 feet) in length have been obtained.

13. Genus *Galeocerdo* M. H.

1837. *Galeocerdo* Müller & Henle, *S. B. preuss. Akad. Wiss.*, p. 115. (Type, *Squalus arcticus* Faber, monotypic.)

23. *Galeocerdo arcticus* (Fabr.)

(Text-fig. 18)

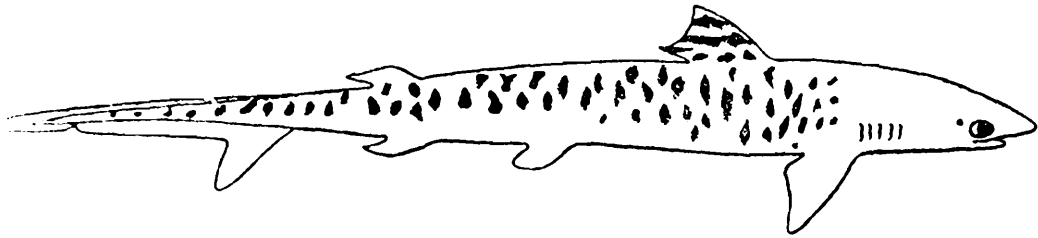
1829. *Squalus arcticus* Faber, *Nat. Fisch. Islands*, p. 17 (type-locality : Iceland).

1889. *Galeocerdo tigrinus* Day, *Fauna Brit. India*, Fish., 1, p. 21, fig. 3.

1889. *Galeocerdo rayneri* (nec McDonald & Barrow) Day, *Fauna Brit. India*, Fish., 1, p. 20.

Head 4, depth 7 to subcaudal origin. Snout 3 in head ; preoral length 0·5 or a little less than half width of mouth. Teeth in 23 rows on either jaws, compressed, serrated. First dorsal origin close behind pectoral base ; second dorsal origin opposite anal origin ; caudal with a double

notch. Slaty grey becoming paler below ; with numerous dark or brown variegated spots or vertical bars on body, pectorals, dorsal and caudal.



TEXT-FIG. 18.—Lateral view of *Galeocerdo articus* (Faber). (After Day).

Distribution.—INDIA : Travancore-Cochin coast, Bombay.—Ceylon, Arabia, Red Sea, Natal, Indo-China, China, Japan, Java, Philippines, Melanesia, Hawaii, the Galapagos, California and the Atlantic.

Remarks.—It attains 3,962 mm. (13 feet) in length.

VI. Family SPHYRNIDAE

14. Genus *Sphyrna* Rafinesque

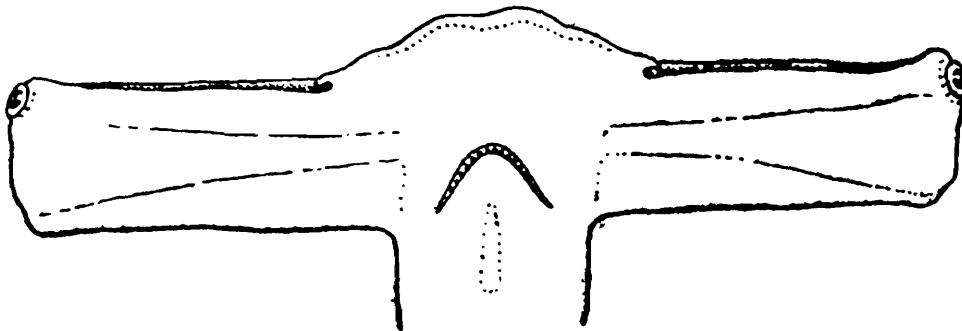
1792. *Cestracion* (Klein) Walbaum, *Artedi Pisc.*, 3, p. 580. (Type, *Squalus zygaena* L., inadmissible.)
 1810. *Sphyrna* Rafinesque, *Indice. Itt. Siciliana*, pp. 46, 60. (Type, *Squalus zygaena* L., designated by Jordan & Gilbert, *Bull. U. S. nat. Mus.*, 16, p. 26, 1883.)

24. *Sphyrna blochii* (C.)

(Text-fig. 19)

1817. *Zygaena blochii* Cuvier, *Regne Animal.*, 2, ed. 1, p. 127 (type-locality : Mediterranean ; America).
 1889. *Zygaena blochii* Day, *Fauna Brit. India*, Fish., 1, p. 22.

Head 3.5 to 4.2, depth 5.6 to 5.7 to subcaudal origin ; eyes and nostrils widely separated (oculonarial expansions long) ; each lateral expansion twice to thrice as long as broad and with a deep groove along the front edge. Teeth oblique, notched ; entire. First dorsal origin just behind pectoral base ; second dorsal smaller than anal, origin behind anal origin. Dusky brown above, lighter beneath.



TEXT-FIG. 19.—Ventral view of head of *Sphyrna blochii* (C.). (After Day).

Distribution.—INDIA : Hoogly at Calcutta, West Bengal coast, Malabar coast, Travancore-Cochin coast, Bombay ; PAKISTAN : coasts of Sind, Makran, Karachi, East Pakistan.—Burma, Ceylon, Malay Peninsula, Malay Archipelago, Siam, Indo-China.

Remarks.—It grows upto 1,524 mm. (5 feet) in length. Its liver yields considerable amount of oil.

25. *Sphyrna tudes* (V.)

1822. *Zygaena tudes* Valenciennes, *Mem. Mus. Hist. nat., Paris*, 9, p. 225, pl. 12, figs. 1a-b (type-locality : Mediterranean ; Cayenne ; Coromandel).
1889. *Zygaena tudes* Day, *Fauna Brit. India*, Fish., 1, p. 23.

Head 3·4, depth 4·8 to subcaudal origin ; eyes and nostrils not widely separated (oculonarial expansions short) ; lateral expansion shorter than its width, and with a groove along its curved front edge. Teeth in about 30 rows above, 26 below, oblique, notched. First dorsal origin above hind margin of inner edge of pectoral ; second dorsal origin behind anal origin. Grey becoming lighter below ; first dorsal, upper part of second dorsal and lower caudal lobe deep black.

Distribution.—INDIA : Madras, Coromandal coast, Travancore-Cochin coast, Bombay ; PAKISTAN : coasts of Sind, Karachi, Makran.—East Africa, Indo-China, Philippines, Melanesia, Hawaii, Panama, Mediterranean, Atlantic.

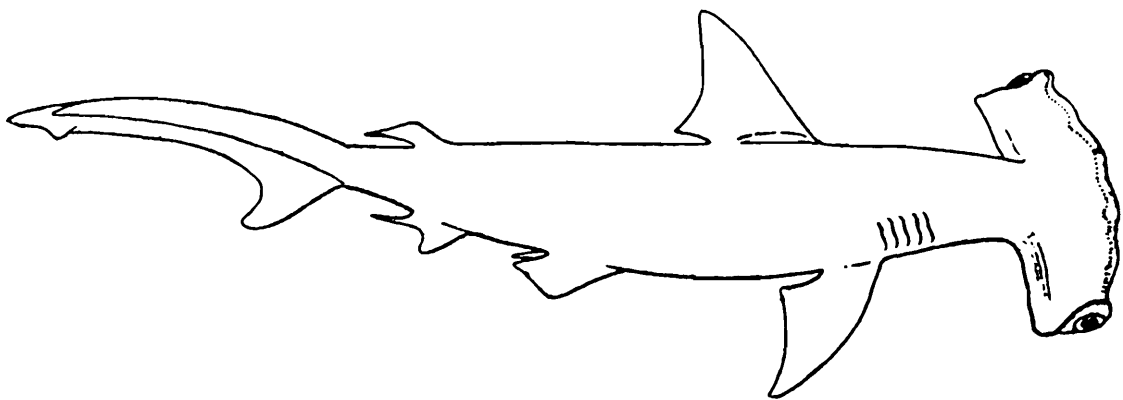
Remarks.—It attains at least 1,828 mm. (6 feet) in length.

26. *Sphyrna zygaena* (L.)

(Text-fig. 20)

1758. *Squalus zygaena* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 234 (type-locality : Europe ; America).
1889. *Zygaena malleus* Day, *Fauna Brit. India*, Fish., 1, p. 22.

Head 3·8 to 4·8, depth 4·6 to 7·8 to subcaudal origin ; eyes and nostrils not widely separated (oculonarial expansions short) ; lateral expansion nearly equals its width near eye and with a groove along its straight front edge. Teeth in about 35 rows above and 32 below, compressed, notched, entire in adults. First dorsal origin close behind pectoral base ; second dorsal origin opposite anal origin. Slaty grey above, white below.



TEXT-FIG. 20.—Lateral view of *Sphyrna zygaena* (L.). (After Day).

Distribution.—INDIA : Travancore-Cochin coast, Bombay ; PAKISTAN : coasts of Sind, Makran, Karachi.—Ceylon, Arabia, Red Sea, North Africa, Seychelles, Madagascar, Malay Peninsula, Indo-China, China, Japan, Philippines, Polynesia, Hawaii, Eastern Pacific and tropical Atlantic.

Remarks.—It grows to 1,828 mm. (6 feet) in length and its liver yields considerable amount of oil.

Order RAJIFORMES

VII. Family RHINOBATIDAE

15. Genus *Rhinobatos* Linck

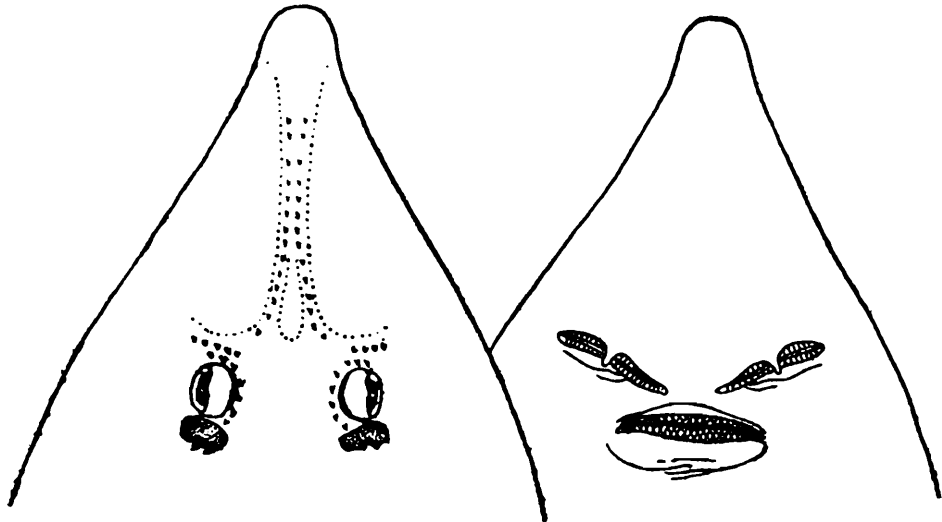
1790. *Rhinobatos* Linck, *Mag. Phys. Naturg. Gotha*, (3), 6, p. 32. (Type, *Raja rhinobatos* L., tautotypic.)
 1792. *Rhinobatus* (Klein) Walbaum, *Artedi Pisc.*, 3, p. 581. (Type, *Raja rhinobatos* L., tautotypic : inadmissible.)

27. *Rhinobatos armatus* (Gray)

(Text-fig. 21)

- 1933-34. *Rhinobatus armatus* Gray, *Ill. Ind. Zool. Hardwicke*, 2, pl. 99 (type-locality : India).
 1889. *Rhinobatus granulatus* (part) Day, *Fauna Brit. India*, Fish., 1, p. 42.

Snout moderate, pointed ; preorbital length 3 to 3·2 times the distance between the spiracles. Length of nostril greater than internarial space and less than twice the width of mouth. First dorsal origin behind pelvic base. Tubercles enlarged on back, scapular region and head.



TEXT-FIG. 21.—(a) Dorsal view of head of *Rhinobatos armatus* (Gray). (b) Ventral view of head of same. (After Norman).

Distribution.—INDIA : West Bengal, Orissa coast, Bombay ; PAKISTAN : coasts of Sind, Makran, Karachi, East Pakistan.—Malay Peninsula and Malay Archipelago.

Remarks.—Specimens measuring about 609 mm. (2 feet) in length have been obtained.

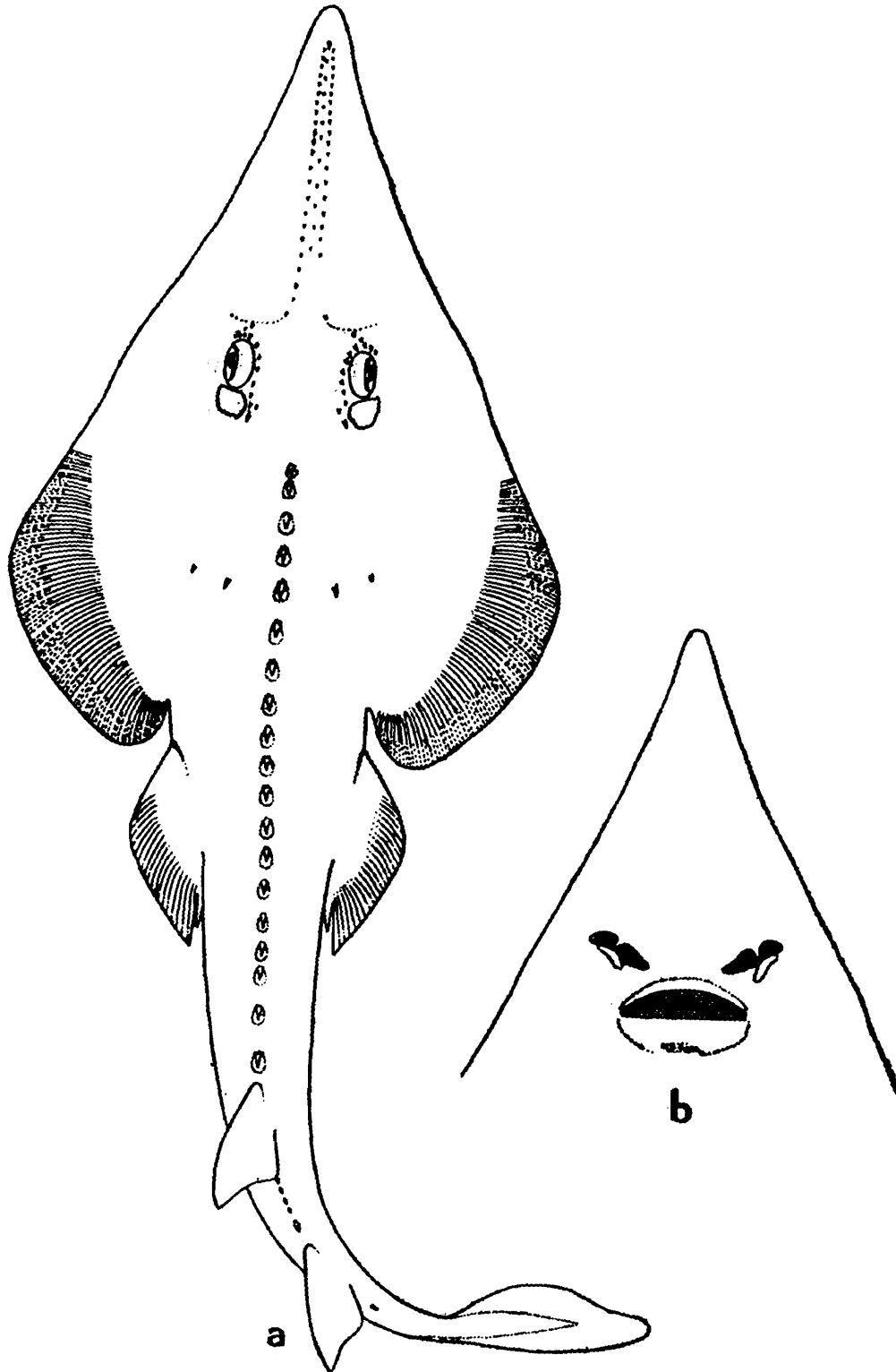
28. *Rhinobatos granulatus* (C.)

(Text-fig. 22)

1829. *Rhinobatus granulatus* Cuvier, *Regne Animal.*, 2, ed. 2, p. 396 (type-locality : Pondicherry).
 1889. *Rhinobatus granulatus* (part) Day, *Fauna Brit. India*, Fish., p. 42, fig. 17.

Head 3 to 3·6, depth 14·5 to 17·6 to subcaudal origin. Snout long pointed ; preorbital length 3·5 to 3·6 times the distance between spiracles. Teeth in 52 to 62 rows, smooth, rhomboid ; dental plate with a central

and lateral elevation in lower jaw, with corresponding depressions in upper. First dorsal far behind pelvics and larger than second dorsal. Tubercles on back and a row of compressed spines along its middle, which become obsolete with age. Reddish grey superiorly becoming white below.



TEXT-FIG. 22.—(a) Dorsal view of *Rhinobatos granulatus* (C.). (b) Ventral view of head of same. (After Misra).

Distribution.—INDIA : Hoogly at Calcutta, West Bengal coast, Orissa coast, Madras, Coromandel coast, Travancore-Cochin coast, Malabar coast, Bombay, Andamans ; PAKISTAN : coasts of Sind, Makran, Karrachi, East Pakistan.—Burma, Ceylon, Malay Peninsula, Malay Archipelago, Siam, Cochin-China and China.

Remarks.—It attains at least 2,133 mm. (7 feet) in length.

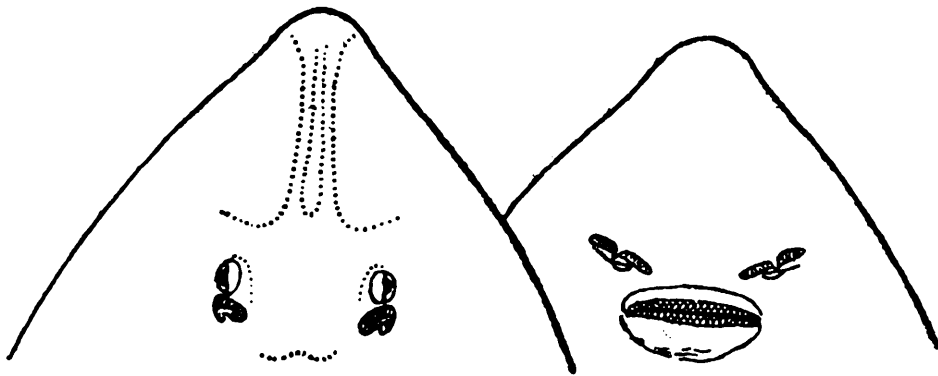
29. *Rhinobatos obtusus* (M. H.)

(Text-fig. 23)

1841. *Rhinobatos obtusus* Müller & Henle, *Syst. Besch. Plagiostomen*, p. 122, pl. 37, fig. 2 (type-locality : India ; Pondicherry, Malabar).

1889. *Rhinobatos halavi* (*nec* Forskal) Day, *Fauna Brit. India*, Fish., 1, p. 43.

Snout short, blunt ; preorbital length 2·2 times the distance between spiracles. Interorbital length equals 2·2 to 2·3 in length of snout. Rostral ridges divergent posteriorly becoming confluent at about their anterior half. Teeth in 66 to 70 rows ; dental plate almost straight. The two dorsals far behind pelvics and of about the same size. Denticles enlarged on back, scapular region and top of head. Reddish grey above and dull white below ; large ones often with black blotches over them.



TEXT-FIG. 23.—(a) Dorsal view of head of *Rhinobatos obtusus* (M.H.). (b) Ventral view of same. (After Norman).

Distribution.—INDIA : Hoogly at Calcutta, West Bengal coast, Pondicherry, Coromandel coast, Mangalore, Malabar coast, Bombay ; PAKISTAN : coasts of Sind, East Pakistan.—South Africa, Malay Archipelago.

Remarks.—It attains at least 1,828 mm. (6 feet) in length.

16. Genus *Rhina* Schn.

1792. *Rhina* (Klein) Walbaum, *Artedi Ichth.*, ed. 2, p. 580. (Type, *Squalus squatina* L., inadmissible.)

1801. *Rhina* Schneider, *Syst. Ichth. Bloch*, p. 352. (Type, *R. ancylostoma* Schn.)

30. *Rhina ancylostomus* Schn.

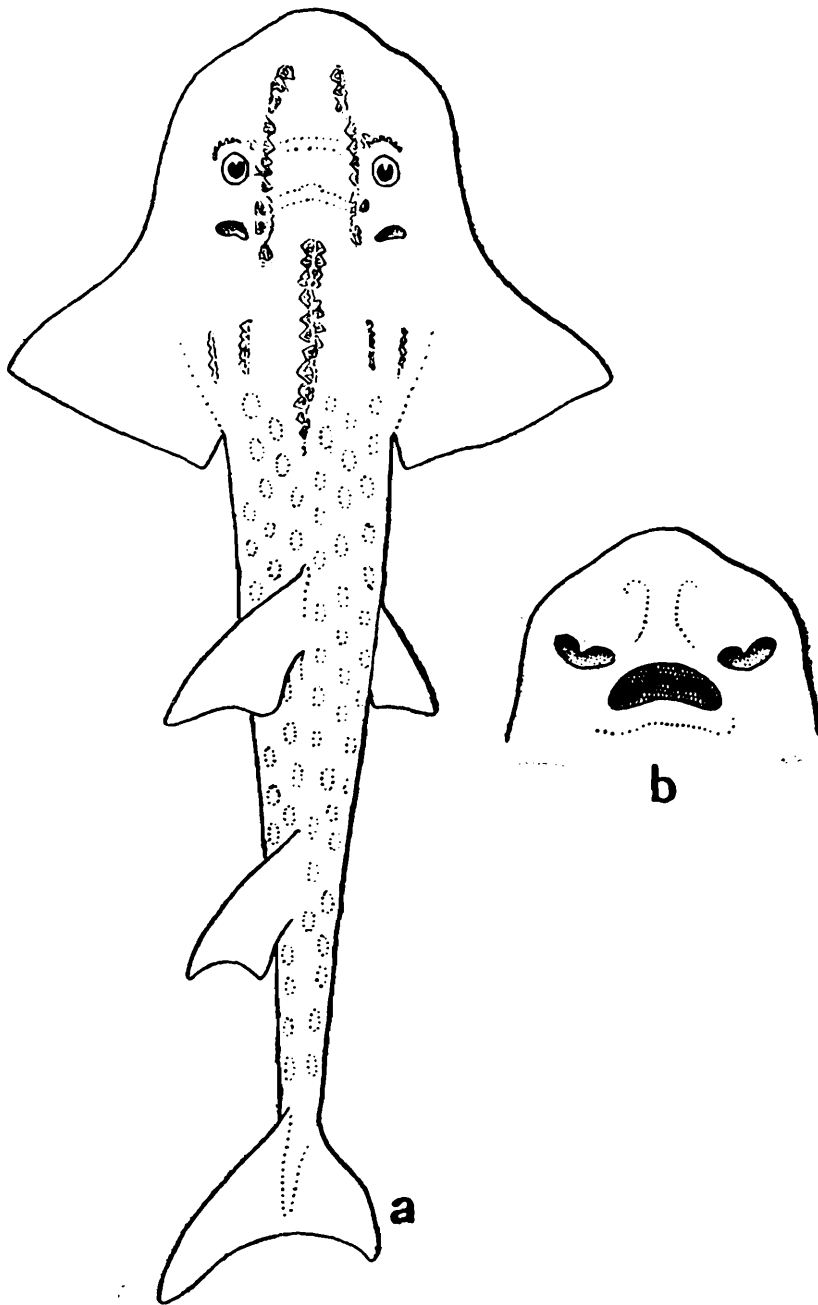
(Text-fig. 24)

1801. *Rhina ancylostomus* Schneider, *Syst. Ichth. Bloch*, p. 352, pl. 72 (type-locality : Indian Seas ; Coromandel).

1889. *Rhynchobatus ancylostomus* Day, *Fauna Brit. India*, Fish., 1, p. 41.

Head measured to spiracle 4·8 to subcaudal origin. Disk length 1·3 in its width. Snout 1·3 in head to spiracle, broad, with a semicircular outline. Teeth in 70 to 75 rows ; dental plate with a median and lateral elevation. First dorsal opposite pelvics and nearer to snout end than

to caudal end. Irregular rows of tubercles on disc. Dull brown, lighter below, often with some tortuous black lines.



TEXT-FIG. 24.—(a) Dorsal view of *Rhina ancylostomus* Schn. (b) Ventral view of head of same. (After Day).

Distribution.—INDIA: W. Bengal coast, Orissa coast, Madras, Coromandel coast, Travancore-Cochin coast, Bombay; PAKISTAN: coasts of Sind, E. Pakistan.—Ceylon, Red Sea, Seychelles, East Africa, Malay Peninsula, Cochin-China, Japan, Philippines.

Remarks.—It attains about 2,133 mm. (7 feet) in length.

17. Genus *Rhynchobatus* M. H.

1837. *Rhynchobatus* Müller & Henle, *S. B. preuss. Akad. Wiss.*, p. 116. (Type, *Rhinobatus laevis* Schn., monotypic.)

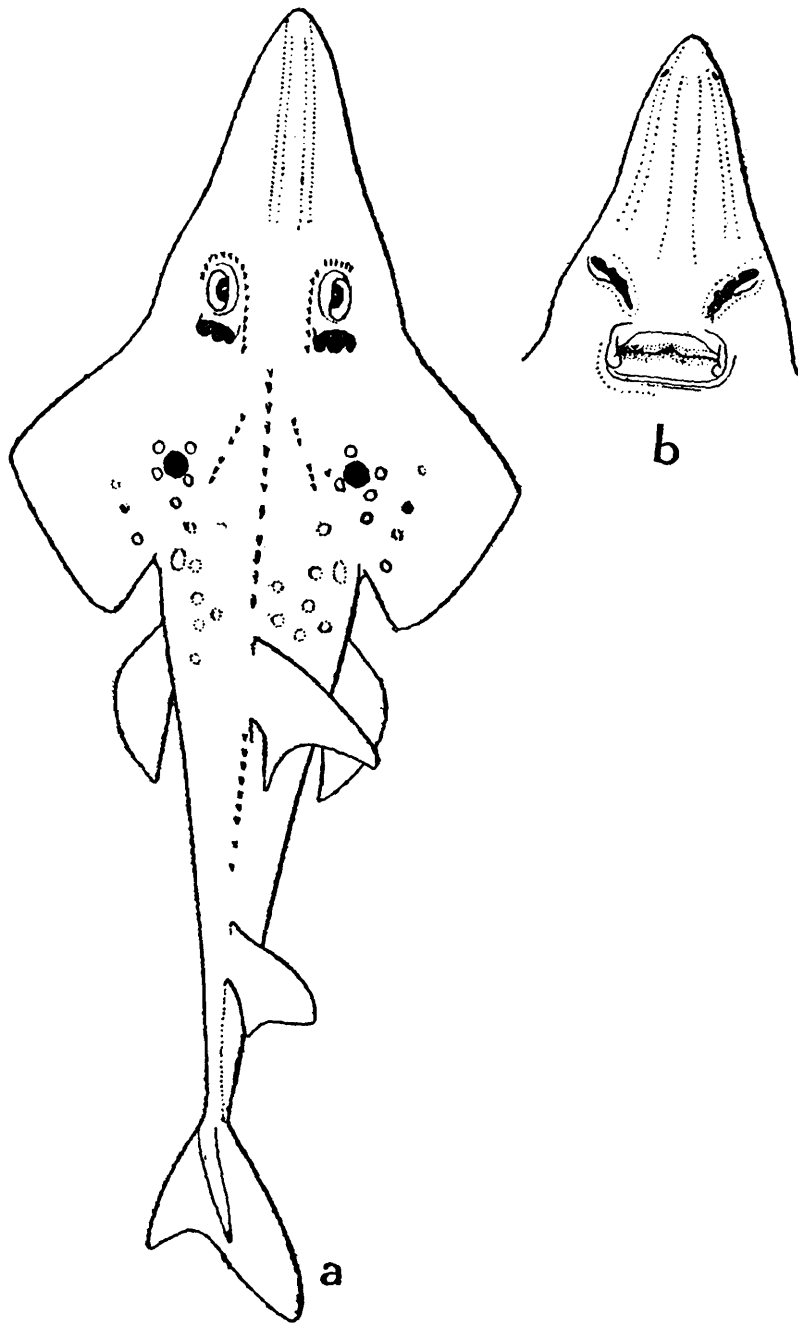
31. *Rhynchobatus djiddensis* (Forsk.)

(Text-fig. 25)

1775. *Raja djiddensis* Forskal, *Descript. Animal.*, pp. viii, 18 (type-locality: Djidda & Lohaja, Red Sea).

1889. *Rhynchobatus djeddensis* Day, *Fauna Brit. India, Fish.*, 1, p. 40, fig. 16.

Head 2.2 to 2.8, depth 10 to 11.4 to subcaudal origin. Snout 1.6 in head, elongated, triangularly pointed. Teeth in 40-42 rows in each jaw, smooth, rhomboid; dental plate with a central and lateral elevation. First dorsal nearly opposite pelvics; second dorsal nearer to caudal base than to base of first dorsal. Median row of small vertebral tubercles and short series on shoulder and supraorbital edge. Gray above with small, obscure, white spots scattered about, surrounding round blackish spots; under surface whitish gray.



TEXT-FIG. 25.—(a) Dorsal view of *Rhynchobatus djiddensis* (Forsk.). (b) Ventral view of head of same (After Day).

Distribution.—INDIA : Bay of Bengal, W. Bengal coast, Coromandel coast, Travancore-Cochin coast, Malabar coast, Bombay, Andamans; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Arabia, Red Sea, Zanzibar, Seychelles, East Africa, Madagascar, Malay Peninsula, Malay Archipelago, Cochin-China, Japan, Melanesia.

Remarks.—It attains about 2,743 mm. (9 feet) in length.

VIII. Family PRISTIDAE

18. Genus *Pristis* Linck

1779. *Pristis* Klein, *Neue. Schauplatz*, 7, p. 403. (Type, *Squalus pristis* L., inadmissible.)
 1790. *Pristis* Linck, *Mag. Phys. Naturg. Gotha*, (3) 6, p. 31. (Type, *Squalus pristis* L., tautotypic.)

32. *Pristis cuspidatus* Latham

1794. *Pristis cuspidatus* Latham, *Trans. Linn. Soc. Lond. Zool.*, 2, p. 279, pl. 26, fig. 3 (type-locality : not given).
 1889. *Pristis cuspidatus* Day, *Fauna Brit. India*, Fish., 1, p. 37, fig. 15.

Head 2.4, depth 11.7 to subcaudal origin. Rostrum with about 23-25 pairs of broad teeth. Width of mouth slightly greater than interorbital. Teeth in 62 rows, small, longer than broad. First dorsal origin behind pelvic origin ; second dorsal origin nearer to caudal base than to first dorsal base. Caudal fin with distinct lower lobe. A lateral keel on tail. Grayish yellow above, whitish below.

Distribution.—INDIA : W. Bengal coast, Orissa coast, Madras, Coromandel coast, Travancore-Cochin coast, Calicut, Malabar coast, Bombay, Andamans ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Red Sea, Malay Peninsula, Cochin-China, Philippines.

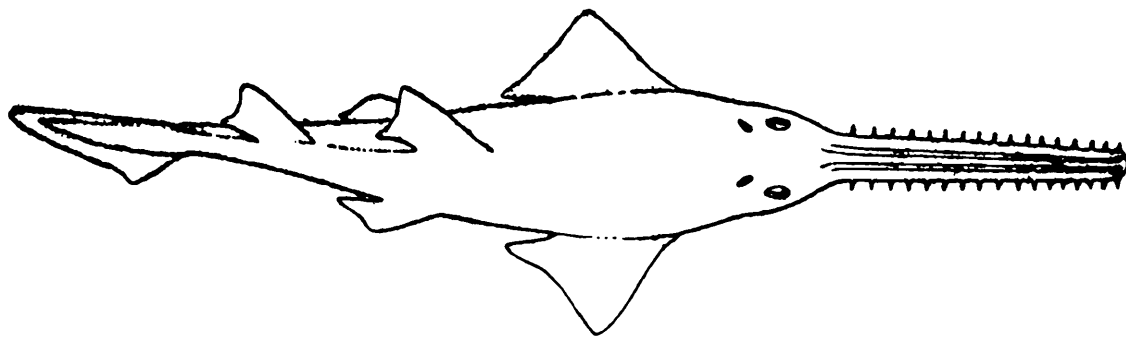
Remarks.—It attains 6,096 mm. (20 feet) and more (including the saw) in length.

33. *Pristis microdon* Latham

(Text-fig. 26)

1794. *Pristis microdon* Latham, *Trans. Linn. Soc. Lond. Zool.*, 2, p. 280, pl. 26, fig. 4 (type-locality : not given).
 1889. *Pristis perrotteti* Day, *Fauna Brit. India*, Fish., 1, p. 38.

Head to spiracles 2.6, depth at pectoral origin 2.7 to subcaudal origin. Rostrum with about 17-20 pairs of teeth. Jaw teeth in 70 rows above and 72 below, in pavement, oval, longer than broad. First dorsal in front of pelvic origin ; second dorsal origin nearer to first dorsal base than to caudal base. Caudal fin without a distinct lower lobe. Reddish brown above, becoming dull white inferiorly.



TEXT-FIG. 26.—Dorsal view of *Pristis microdon* Lath. (After Day).

Distribution.—INDIA : Mahanadi river, Orissa, Travancore coast, Bombay ; PAKISTAN : coast of Sind.—Zanzibar, Madagascar, Ceylon, Siam, Malay Archipelago, tropical Atlantic.

Remarks.—It attains about 5,486 mm. (18 feet) (including the saw) in length.

34. *Pristis pectinatus* Latham

1794. *Pristis pectinatus* Latham, *Trans. zool. Soc. Lond. Zool.*, 2, p. 278, pl. 26, fig. 2 (type-locality : in the Ocean).

1889. *Pristis pectinatus* Day, *Fauna Brit. India, Fish.*, 1, p. 39.

Rostral width basally 7 in its length ; rostral teeth 29-31 pairs. Width of mouth 6.5 in head, slightly less than interorbital. Teeth 68 rows in upper jaw and 70 in lower, in pavement. First dorsal origin opposite pelvic origin ; second dorsal origin nearer caudal base than to first dorsal base. A low, postventral keel. Caudal fin without a distinct lower lobe. Superiorly olive-buff, with disc edges, pectoral and pelvic edges, caudal lobe and hind body keels white like lower surface of body.

Distribution.—INDIA : Hoogly at Calcutta, Bay of Bengal, Chilka Lake ; PAKISTAN : coast of E. Pakistan.—Burma, Red Sea, South Africa, Philippines, tropical Atlantic.

Remarks.—It attains at least 4,472 mm. (15 feet) (including the saw) in length.

IX. Family TRYGONIDAE

19. Genus *Dasyatis* Rafinesque

1792. *Dasybatus* (Klein) Walbaum, *Artedi Pisc.*, 3, p. 581. (Type, *Raja pastinaca* L., designated by Jordan, *Proc. U. S. nat. Mus.*, 4, p. 35, 1881 ; inadmissible.)

1810. *Dasyatis* Rafinesque, *Caratt. Animal. Piante Sicilia*, p. 16. (Type, *D. ujo* Raf., monotypic.)

1817. *Trygon* Cuvier, *Regne Animal.*, 2, ed. 1, p. 316. (Type, *Raja pastinaca* L., designated by Jordan and Evermann, *Gen. Fish.*, p. 98, 1917.)

35. *Dasyatis* (*Himantura*) *bleekeri* (Blyth)

1860. *Trygon bleekeri* Blyth, *J. Asiat. Soc. Beng.*, 23, p. 41 (type-locality : Bengal).

1889. *Trygon bleekeri* Day, *Fauna Brit. India, Fish.*, 1, p. 54.

Head to hind spiracle edge 8.6 in total length ; snout 1.2 in head to hind spiracle edge. Jaws distinctly undulated ; teeth dark reddish brown, with single transverse ridge ; on mouth floor 2 finger-like processes. Tail long whip-like, more than thrice the length of disc, with or without cutaneous folds. Large round tubercle in middle of back, and some along upper tail surface to caudal spine. Uniform dark brown above and below.

Distribution.—INDIA : W. Bengal coast, Orissa coast, Bombay ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Siam, Cochin-China, Philippines.

Remarks.—It grows to about 2,438 mm. (8 feet) in length.

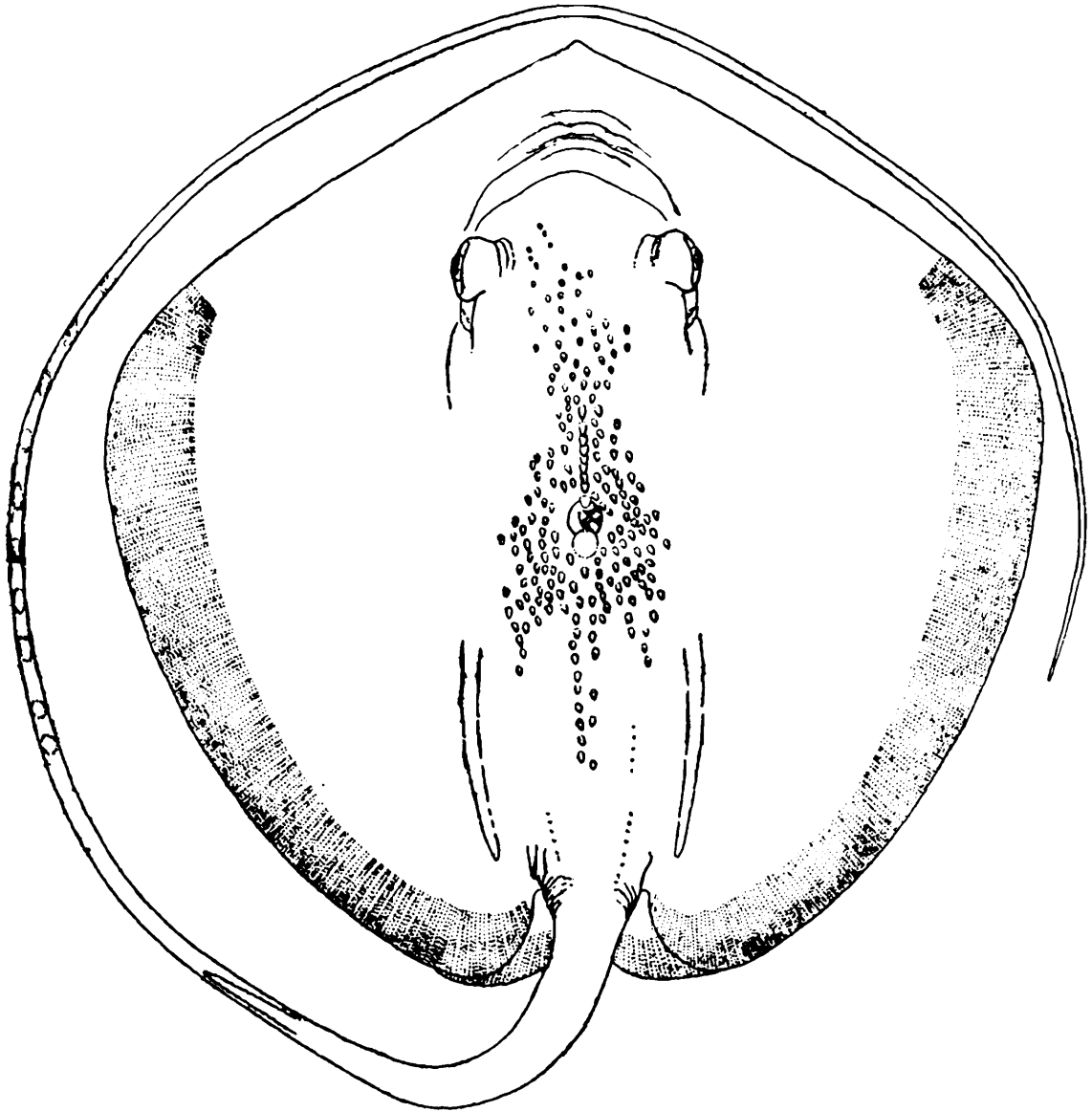
36. *Dasyatis* (*Himantura*) *uarnak* (Forsk.)

(Text-fig. 27)

1775. *Raja uarnak* Forskal, *Descript. Animal.*, pp. viii, 18 (type-locality : Arabia).

1889. *Trygon uarnak* Day, *Fauna Brit. India, Fish.*, 4, p. 53.

Head 6 to 10·2 to caudal end. Disc about as long as broad, its length 1·6 to 2·6 in tail ; snout 1·3 to 1·6 in head. Jaws undulated ; teeth in 25 to 38 rows ; on mouth floor 4 finger-like processes. Tail long, whip-like, about twice as long as disc, without cutaneous folds. Two or three rows of widely separated tubercles on either side of head and on the occiput, from where to the scapular region and the median line in a single row. Colour varying with age, the adult being uniformly brownish or greenish olive ; tail banded.



TEXT-FIG. 27.—Dorsal view of *Dasyatis (Himantura) uarnak* (Forsk.) (After Misra).

Distribution.—INDIA : Salt Lake near Calcutta, Bengal coast, Chilka Lake, Vizagapatam, Madras, Coromandel coast, Malabar coast, Bombay, Andamans ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Arabia, Red Sea, Zanzibar, Malay Peninsula, Malay Archipelago, Siam, Cochin-China, Melanesia, Polynesia.

Remarks.—It grows to at least 1,524 mm. (5 feet) across the disk.

37. *Dasyatis (Pastinachus) sephen* (Forsk.)

1775. *Raja sephen* Forskal, *Descript. Animal.*, pp. viii, 17 (type-locality : Djedda, Lohaja, Red Sea).

1889. *Trygon sephen* Day, *Fauna Brit. India*. Fish. 1, p. 50 fig. 21.

Head 6.6 to 10.5 to end of caudal. Disc length 1.1 to 1.2 in its width and 1 to 1.5 in tail ; snout 1.3 to 1.7 in head. Upper dental plate bent forward and lower more flattened and pointed ; teeth in 20 rows ; on mouth floor 4 finger-like processes. Tail $\frac{1}{2}$ longer than disc, with broad, ventral cutaneous fold. Disc covered with minute spines and 3 or 4 round, flattened tubercles in the median line of scapular region ; sides of disc smooth or granular. Dark brown or lead-coloured, becoming black in the posterior part of tail and paler at sides.

Distribution.—INDIA : The Ganges river at Kanpur, Allahabad and Benares, Calcutta, Chilka Lake, Travancore-Cochin coast, Bombay ; PAKISTAN : coasts of Sind, Karachi, Makran.—Burma, Ceylon, Arabia, Red Sea, Seychelles, Singapore, Malay Archipelago, Siam, Indo-China, Micronesia.

Remarks.—It attains 1,778 mm. (5 feet 10 inches) across the disk.

38. *Dasyatis (Amphotistius) imbricata* (Schn.)

1801. *Raja imbricata* Schneider, *Syst. Ichth. Bloch*, p. 366 (type-locality : Coromandel).

1889. *Trygon imbricata* Day, *Fauna Brit. India, Fish.*, 1, p. 52.

Snout produced, pointed, longer than preoral. Disc about as broad as long. Mouth width 3 in preoral ; oral papillae 2 on mouth floor. Teeth in 32 rows in each jaw ; dental plate undulated. Tail short, hardly as long as disc and with dorsal and ventral cutaneous folds. Interorbital space, and middle of back broadly covered with minute, rough tubercles ; a median row of 7-9 small spines between base of tail and the caudal spines. Uniform brown superiorly becoming whitish below.

Distribution.—INDIA : W. Bengal coast, Orissa coast, Chilka Lake, Madras, Coromandel coast, Travancore-Cochin coast, Bombay ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Red Sea, Mauritius, Seychelles, Malay Peninsula, Siam, Indo-China, China, Java, Philippines.

Remarks.—Specimens measuring about 304 mm. (a foot) across the disk have been obtained.

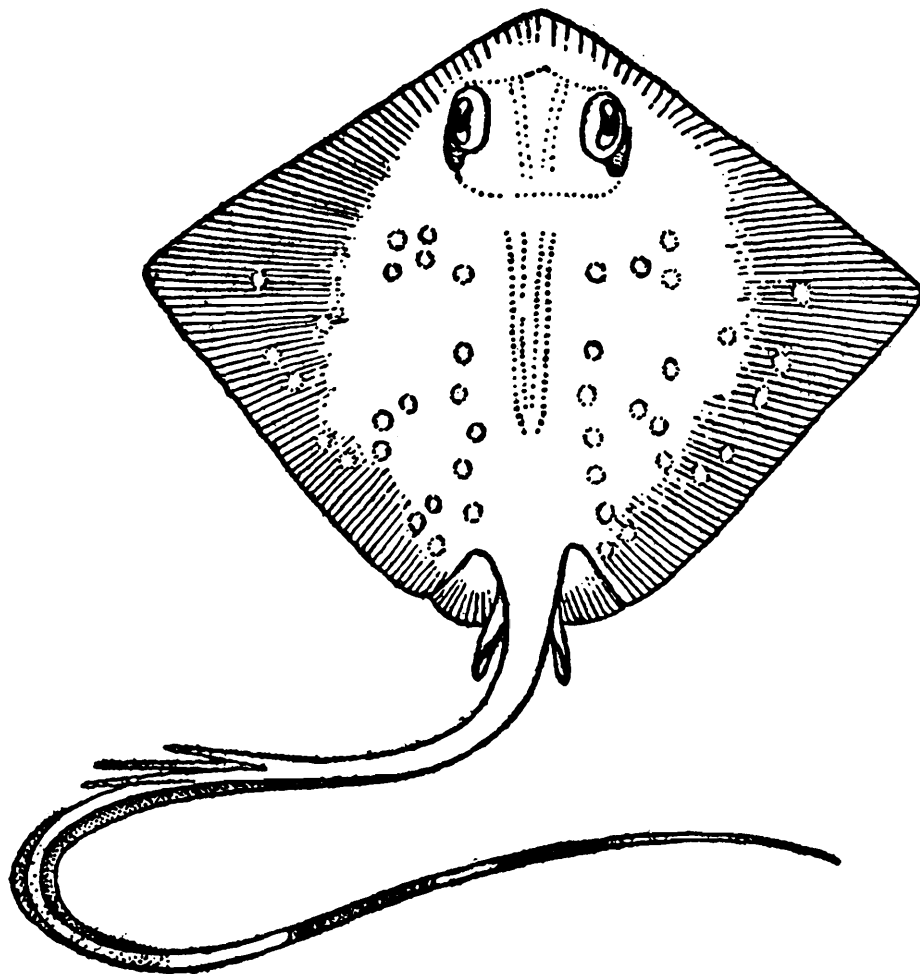
39. *Dasyatis (Amphotistius) kuhlii* (M.H.)

(Text-fig. 28)

1841. *Trygon kuhlii* Müller & Henle, *Syst. Besch. Plagiostomen*, p. 164, pl. 51, fig. 2 (type-locality : India, Vanicore, New Guinea).

1889. *Trygon kuhlii* Day, *Fauna Brit. India, Fish.*, 1, p. 52.

Head 6.5 to 8 to end of tail ; snout somewhat obtuse, 1.4 to 1.5 in head. Disc broader than long, 1.2 to 1.3 in its width. Oral papillae 2 on mouth floor ; teeth in 25-30 rows ; dental plate more undulated in the upper than in the lower jaw. Tail about $\frac{1}{2}$ longer than disc, with dorsal and ventral cutaneous folds. Skin smooth, superiorly dull brown, covered with numerous small black spots and larger rounded blue ocelli, each having a rather dark outer edge.



TEXT-FIG. 28.—Dorsal view of *Dasyatis (Amphotistius) kuhlii* (M.H.). (After Day).

Distribution.—INDIA : Orissa coast, Madras, Coromandel coast, Bombay ; PAKISTAN : coasts of Sind, Karachi, Makran.—Ceylon, Zanzibar, Singapore, Java, Celebes, Siam, Cochin-China, China, Japan, Philippines, Melanesia, Polynesia, Australia.

Remarks.—Specimens measuring nearly 457 mm. ($1\frac{1}{2}$ feet) across the disk have been obtained.

X. Family MYLIOBATIDAE

20. Genus *Aetomylus* Garman

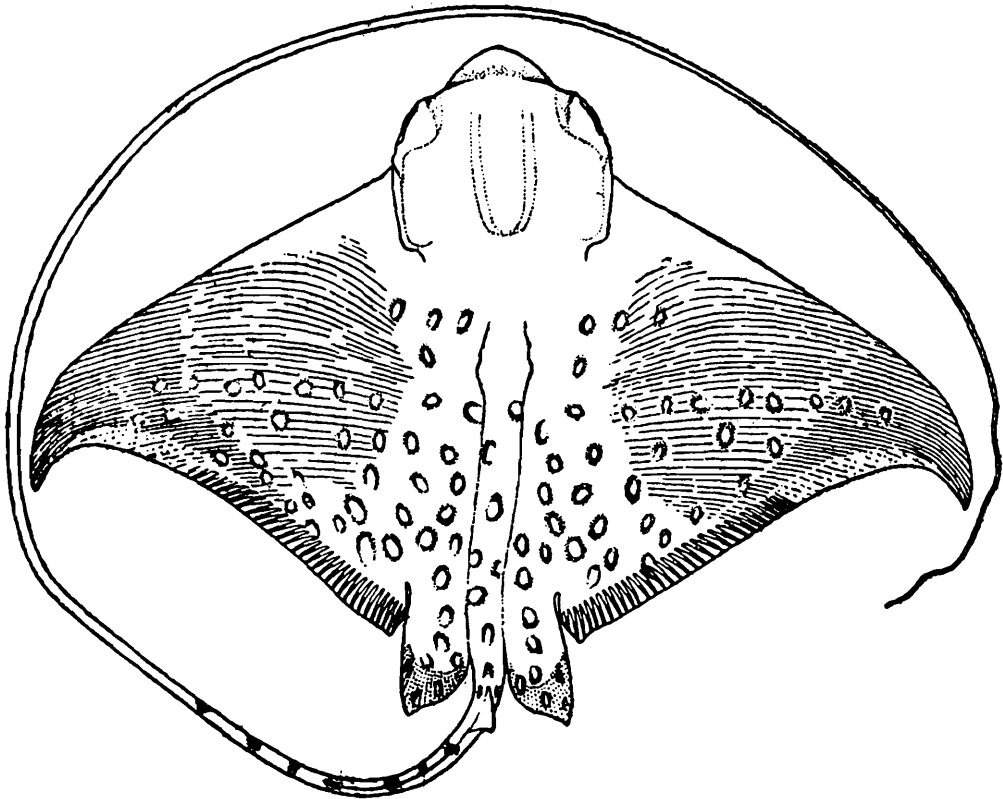
1908. *Aetomylus* Garman, *Bull. Harv. Mus. Comp. Zool.*, 31, p. 252.
(Type, *Myliobatis maculatus* Gray, orthotypic.)

40. *Aetomylus milvus* (M.H.)

(Text-fig. 29)

1841. *Myliobatis milvus* Müller & Henle, *Syst. Besch. Plagiostomen*, p. 178
(type-locality : Red Sea).

Head conspicuous, rostral fins forming a unilobed blunt, snout. Mouth width 2.5 in interorbital ; median teeth 7 or 8 times as wide as long ; 3 series of small laterals on each side. Spiracle as large as eye. Dorsal origin above ends of pelvic bases. Length of disc 1.4 in its width. Tail spineless, long, more than twice disc length. Skin smooth, dark uniform brown with green brown-edged ocelli on hind part of disc.



TEXT-FIG. 29.—Dorsal view of *Aetomylus milvus* (M.H.). (After Misra).

Distribution.—INDIA : Bombay ; PAKISTAN : coast of Sind.—Red Sea, Penang, East Indies, China.

Remarks.—Specimens measuring nearly 457 mm. ($1\frac{1}{2}$ feet) across the disk have been obtained.

41. *Aetomylus nichofii* (Schn.)

1801. *Raja nichofii* Schneider, *Syst. Ichth. Bloch*, p. 364 (type-locality : East Indies).

1889. *Myliobatis nieuhoftii* Day, *Fauna Brit. India*, Fish., 1, p. 58.

Head 3.3 to 3.5 in disc length with a short, unilobed snout ; snout 1.7 to 2 in head. Teeth with broad median row and 3 narrow lateral rows each side. Spiracle twice eye. Disc 1.6 to 1.8 in its width. Dorsal at the commencement of the base of tail. Tail about thrice as long as disc, spineless. Skin smooth in young. Dark brown with 3 to 5 transverse or horizontal gray bands ; posteriorly, variable, rounded grayish blotches ; under surface whitish.

Distribution.—INDIA : Ganges mouth, Orissa coast, Chilka Lake, Madras, Coromandel coast, Travancore-Cochin coast ; PAKISTAN : Ganges mouth, Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Malay Peninsula, Malay Archipelago, Cochin-China, China, Japan.

Remarks.—Specimens measuring 457 mm. ($1\frac{1}{2}$ feet) across the disk are commonly found.

21. Genus *Aetobatus* Blainville

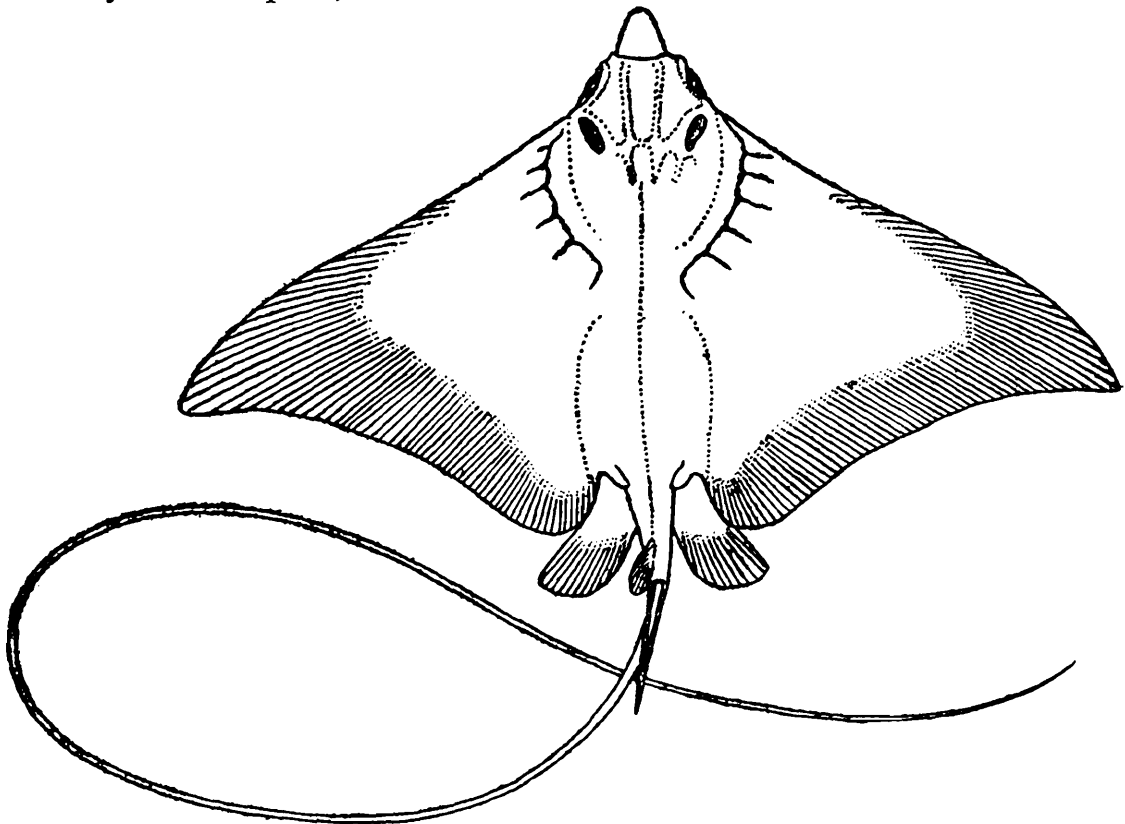
1816. *Aetobatus* Blainville, *Bull. Soc. philom. Paris*, 8, p. 122. (Type, *Raja narinari* Euphrasen, designated by Gill, *Proc. U. S. nat. Mus.*, 17, p. 122, 1894.)

1825. *Aetobatis* Blainville, *Faun. Francaise Poiss.*, p. 38. (Type, *Raja narinari* Eupharasen.)

42. *Aetobatus flagellum* (Schn.)
(Text-fig. 30)

1801. *Raja flagellum* Schneider, *Syst. Ichth. Bloch*, p. 361, pl. 73 (type-locality : Indian Ocean).
1889. *Aetobatis narinari* (nec Euphrasen) Day, *Fauna Brit. India*, Fish., 1, p. 59.

Head 2·8 to 3 in disc length ; snout 1·8 to 2 in head, with a prolongation. Spiracle about twice eye. Teeth broad, flat, uniserial, lower dental plate projecting beyond upper one. Disc length 1·5 to 1·8 in its width. Dorsal origin opposite the base of centre of the pelvics. Tail very long, whip-like, about 3 or 4 times the length of disc with a single or rarely two, serrated spines. Skin smooth. Grayish-olive or leaden gray above, with numerous dirty white or bluish spots edged with black, from beyond occiput ; under surface whitish.



TEXT-FIG. 30.—Dorsal view of *Aetobatus flagellum* (Schn.). (After Day).

Distribution.—INDIA : West Bengal coast, Orissa coast, Chilka Lake, Madras coast, Coromandel coast, Travancore-Cochin coast, Bombay ; PAKISTAN : coasts of Sind, Karachi, Makran, East Pakistan.—Burma, Ceylon, Malay Peninsula, Java, Borneo, Celebes, Siam, Cochin-China, China, Philippines, Melanesia, Micronesia, Polynesia, Hawaii.

Remarks.—It attains about 1,828 mm. (6 feet) or more across the disk.

XI. Family RHINOPTERIDAE

22. Genus *Rhinoptera* C.

1829. *Rhinoptera* Cuvier, *Regne Animal.*, 3, ed. 2, p. 401. (Type, *Myliobatis marginata* Saint Hilaire, designated by Fowler, *Bull. geol. Surv. N. J.*, 4, p. 101, 1911.)

43. *Rhinoptera adpersa* M. H.

1841. *Rhinoptera adpersa* Müller & Henle, *Syst. Besch. Plagiostomen*, p. 183 (type-locality : India).

1889. *Rhinoptera adpersa* Day, *Fauna Brit. India*, Fish., 1, p. 61.

Head with a bilobed, short, broad snout. Teeth in upper jaw in 9 rows ; median row and second on each side about equal, each row of teeth less than 3 times as broad as long, narrower than separating rows ; lower teeth in 7 rows, medium row wider, other rows narrowing to outer. Disc twice as wide as long. Dorsal origin a little behind pelvic origin. Tail about thrice disc length, with a strong serrated spine at the base. Back rough with small stellate-based spines ; greenish brown superiorly becoming lighter at the edges of disc and below.

Distribution.—INDIA : Madras, Coromandel coast.—Ceylon, East Indies.

Remarks.—Specimens measuring about 914 mm. (3 feet) across the disk have been obtained.

44. *Rhinoptera javanica* M. H.

1841. *Rhinoptera javanica* Müller & Henle, *Syst. Besch. Plagiostomen*, p. 132, pl. 58 (type-locality : Java).

1889. *Rhinoptera javanica* Day, *Fauna Brit. India*, Fish., 1, p. 61, fig. 25.

Head 2.7 to 4 in disc length, with a bilobed, short, blunt snout. Mouth width 1.6 to 1.7 in head ; teeth in 7 rows in jaws, median row 3.1 to 7 times as wide as those in lateral rows ; outermost row of teeth smallest, as wide as long. Disc length 1.6 to 8.7 in its width. Dorsal at the base of tail. Tail long with a serrated spine at the base. Skin smooth. Uniform brown above, below white.

Distribution.—INDIA : Travancore-Cochin coast, Malabar coast, Bombay ; PAKISTAN : coast of Sind.—Ceylon, Arabia, Red Sea, Natal, Madagascar, Seychelles, Malay Peninsula, Malay Archipelago.

Remarks.—It grows to 1,219 mm. (4 feet) across the disk.

XII. Family MOBULIDAE

23. Genus *Mobula* Rafinesque

1810. *Mobula* Rafinesque, *Indice d' Ittiol. Sicil.*, pp. 48, 61. (Type, *Mobula auriculata* Raf., monotypic.)

1810. *Apterurus* Rafinesque, *Indice d' Ittiol. Sicil.*, pp. 48, 62. (Type, *Raja fabroniana* Lac., monotypic.)

1810. *Cephaloptera* (*nec* Geoffroy St. Hilaire, 1809) Risso, *Ichth. Nice*, p. 14. (Type, *Raja giorna* Lac. = *Raja cephaloptera* Schn., tautotypic ; inadmissible.)

1816. *Dicerobatus* Blainville, *Bull. Soc. philom. Paris*, 8, p. 121. (Type, *Raja mobular* Bonnaterre, designated by Jordan & Evermann, *Gen. Fish.*, p. 95, 1917.)

45. *Mobula diabolus* (Shaw)

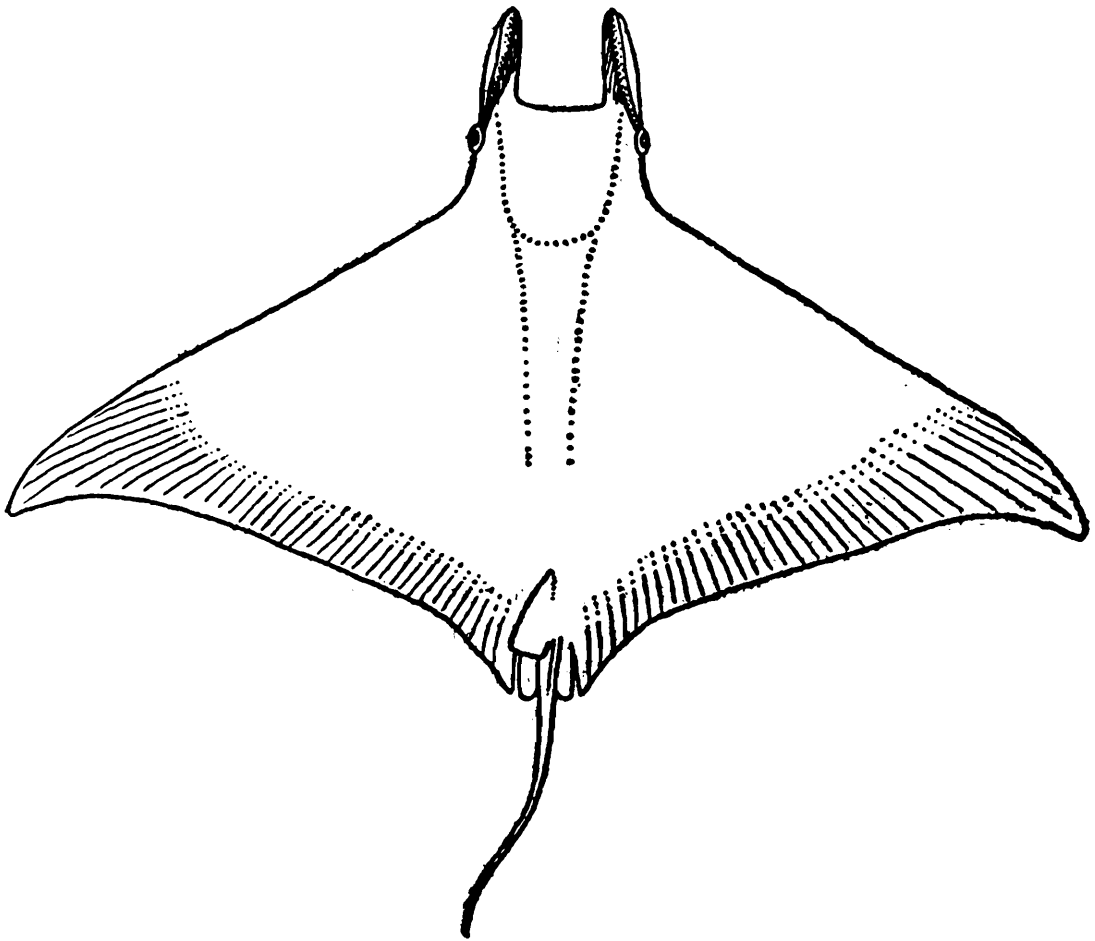
(Text-fig. 31)

1804. *Raja diabolus* Shaw, *General Zool.*, 5, p. 291 (type-locality : Vizagapatam).

1889. *Dicerobatis eregoodoo* Day, *Fauna Brit. India*, 1, p. 62, fig. 26.

1889. *Dicerobatis kuhlii* Day, *Fauna Brit. India*, Fish., 1, p. 63.

Head 4 in disc length, broad, flat ; with two cephalic horns. Mouth inferior, well behind head ; width 1.2 in head ; in each jaw 30-80 oblique rows of about 10 teeth, according to age. Disc broader than long 1.7 in its width. Dorsal fin small, at the base of tail. Tail whip-like, shorter than disc length, spineless. Skin smooth. Brown to purplish above, white below.



TEXT-FIG. 31.—Dorsal view of *Mobula diabolus* (Shaw). (After Day).

Distribution.—INDIA : Madras, Coromandel coast, Travancore-Cochin coast, Bombay ; PAKISTAN : coasts of Sind, Karachi, Makran.— Ceylon, Arabia, Red Sea, Penang, Malay Archipelago, Queensland.

Remarks.—It attains 5,486 mm. (18 feet) or more across the disk.

24. Genus *Manta* Bancroft

1829. *Manta* Bancroft, *Zool. J.*, 4, p. 441. (Type, *Cephaloptera manta* Bancroft, tautotypic.)

1837. *Ceratoptera* Müller & Henle, *S. B. preuss. Akad. Wiss.*, p. 118. [Type, *Cephaloptera giorna* (nec Lac.) Lesueur.]

46. *Manta ehrenbergii* (M.H.)

1841. *Ceratoptera ehrenbergii* Müller & Henle, *Syst. Besch. Plagiostomen*, p. 187 (type-locality : Red Sea).

Head width 3.6 in total length, truncated anteriorly, free from pectoral fins ; with two cephalic horns. Mouth wide, anterior ; width 2.7 in disk length, or 6.6 in greatest disk width. Teeth small often only in lower jaw, 143, in transverse series. Disc about twice as broad as long.

Dorsal triangular, above pelvics. Tail slightly longer or as long as disk length, without spine. Skin rough with asperities. Blackish or dark olive superiorly, whitish below.

Distribution.—INDIA : Puri, Orissa coast.—South Africa, Red Sea, Malay Peninsula, Malay Archipelago, Melanesia.

Remarks.—Specimens measuring 1,828 mm. (6 feet) across the disk have been obtained.

Class TELEOSTOMI
Subclass ACTINOPTERYGII
Order CLUPEIFORMES
Suborder Clupeoidei
XIII. Family ELOPIDAE
25. Genus *Elops* L.

1766. *Elops* Linnaeus, *Syst. Nat.*, 1, ed. 12, p. 518. (Type, *E. saurus* L., monotypic.)

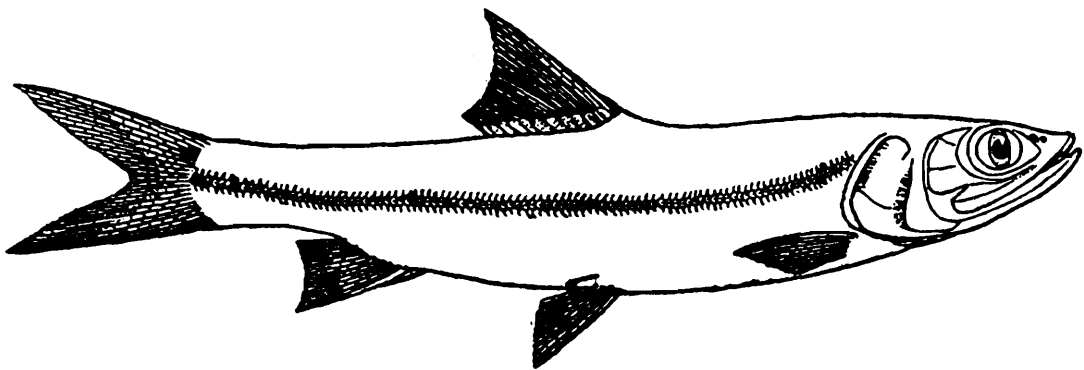
47. *Elops saurus* (L.)

(Text-fig. 32)

1766. *Elops saurus* Linnaeus, *Syst. Nat.*, 1, ed. 12, p. 518 (type-locality : Carolina).

1889. *Elops saurus* Day, *Fauna Birt. India*, Fish., 1, p. 401, fig. 125.

Head 4.5 to 5, depth 5 in total length. Cleft of mouth oblique, maxilla extending beyond eye. Eyes with well developed adipose lids. Gular plate at the symphysis of lower jaw. Dorsal origin nearer to caudal base than to snout end. Anal short, with 15-17 rays. Scales small, 94-100 in the lateral line. Silvery, fins yellowish with greenish tinge.



TEXT-FIG. 32.—Lateral view of *Elops saurus* L. (After Day).

Distribution.—INDIA : Chilka Lake, Vizagapatam, Madras, Coromandel coast, Tuticorin, Travancore-Cochin coast, Andamans ; PAKISTAN : coasts of Sind, Karachi and Makran.—Ceylon, Arabia, Red Sea, East coast of Africa, Mauritius, Madagascar, Malay Peninsula, Malay Archipelago, Philippines, China, Japan, Queensland, Hawaii.

Remarks.—It grows to about 457 mm. (1½ feet) in length and ascends fresh water rivers.

XIV Family MEGALOPIDAE

26. Genus *Megalops* Lac.

1803. *Megalops* Lacepede, *Hist. nat. Poiss.*, 5, p. 289. (Type, *M. filamentosus* Lac.)

48. *Megalops cyprinoides* (Brouss.)

1782. *Clupea cyprinoides* Broussonet, *Ichth.*, pl. 9 (type-locality : Ocean between the Tropics).
1889. *Megalops cyprinoides* Day, *Fauna Brit. India*, Fish., 1, p. 402, fig. 126.

Head 4.5 to 5, depth 4.5 to 5 in total length. Cleft of mouth moderately oblique, maxilla extending to eye. Eyes with narrow adipose lids. A narrow symphyseal gular plate in lower jaw. Dorsal origin opposite pelvic origin and about midway between caudal base and snout end ; last ray prolonged. Anal moderate, with 23-28 rays. Scales large, 37-42 in lateral line. Summit of head dark olive in adults, lighter in young ; abdomen silvery with bluish markings.

Distribution.—INDIA : mouth of Ganges, West Bengal coast, Chilka Lake, Coromandel coast, Madras, Travancore-Cochin coast, Malabar coast, Andamans ; PAKISTAN : mouth of Ganges, East Pakistan.—Burma, Ceylon, East Africa, Zanzibar, Natal, Madagascar, Malay Peninsula, Malay Archipelago, Siam, China, Formosa, Japan, Australia, Melanesia, Micronesia, Polynesia.

Remarks.—It grows to about 457 mm. (1½ feet) in length, ascends rivers and is often found in tanks.

XV Family ALBULIDAE

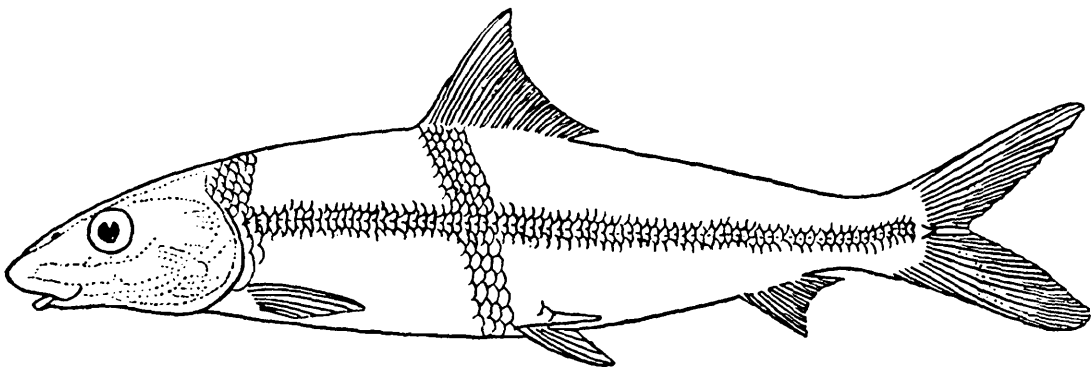
27. Genus *Albula* Scopoli

1777. *Albula* Scopoli, *Introd. nat. Hist.*, p. 454. (Type, *Esox vulpes* L.)

49. *Albula vulpes* (L.)

(Text-fig. 33)

1758. *Esox vulpes* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 313 (type-locality : Bahama Islands).
1889. *Albula conorhynchus* Day, *Fauna Brit. India*, Fish., 1, p. 401.



TEXT-FIG. 33.—Lateral view of *Albula vulpes* (L.). (After Boulenger).

Head 4.5 to 5, depth 5.5 to 6.5 in total length. Cleft of mouth horizontal, short, maxilla nearly reaching to front edge of eye. Eyes with well developed adipose lids. Dorsal origin before pelvic origin and nearer to snout and than to caudal base. Scales rather small, 70-80 in the lateral line. Silvery.

Distribution.—Seas of INDIA and PAKISTAN, sometimes ascending estuaries.—Ceylon, Red Sea, Zanzibar, Natal, Mauritius, Malay Peninsula, Malay Archipelago, Japan, Korea, Queensland, New South Wales, Melanesia, Micronesia, Polynesia, Hawaii.

Remarks.—It grows to about 914 mm. (3 feet) in length.

XVI. Family CLUPEIDAE

28. Genus *Dussumieria* V

1847. *Dussumieria* Valenciennes, *Hist. nat. Poiss.*, 20, p. 467 (Type, *D. ccuta* V., monotypic).

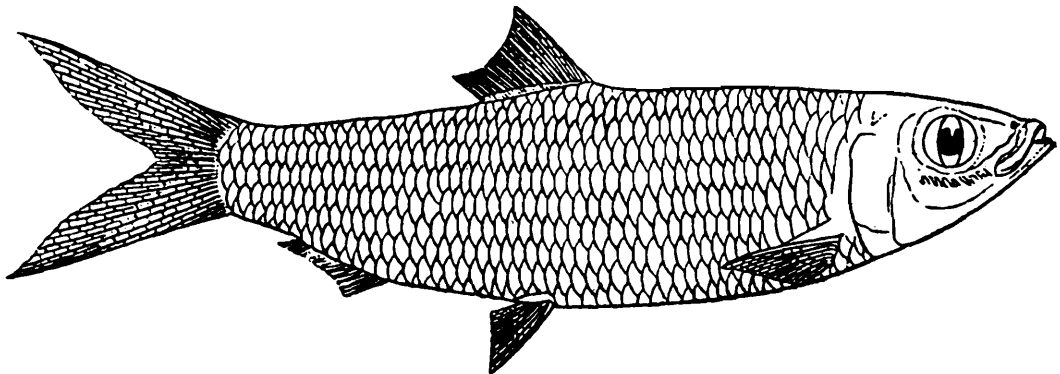
50. *Dussumieria acuta* V

(Text-fig. 34)

1847. *Dussumieria acuta* Valenciennes, *Hist. nat. Poiss.*, 20, p. 407, pl. 606 (type-locality : Bombay : Coromandel).

1889. *Dussumieria acuta* Day, *Fauna Brit. India*, Fish., 1, p. 399, fig. 123.

Head 5 to 5.5, depth 5 to 5.2 in total length. Eyes with broad adipose eye lids. Snout pointed, lower jaw longer than upper when mouth is closed. Abdominal profile more convex than that of back. Dorsal origin in front of pelvic origin. Lateral line scales 40-42. Deep greenish blue above, becoming lighter and silvery at side and abdomen ; a bronzed line on side with a pinkish silvery one below it.



TEXT-FIG. 34.—Lateral view of *Dussumieria acuta* V. (After Day).

Distribution.—INDIA : Chilka Lake, Coromandel coast, Tuticorin, Travancore-Cochin coast, Malabar coast, Bombay, Andamans ; PAKISTAN : coasts of Sind, Karachi, Makran.—Ceylon, South Arabia, Malay Peninsula, Malay Archipelago, China, Philippines, Queensland.

Remarks.—It attains at least 177 mm. (7 inches) in length.

51. *Dussumieria hasselti* Blkr.

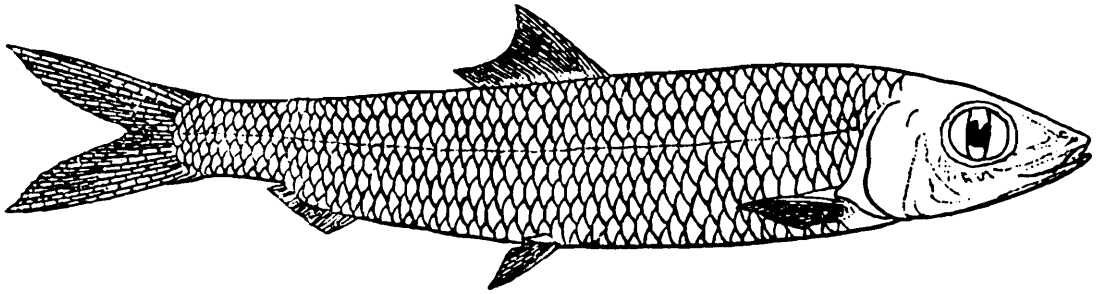
(Text-fig. 35)

1851 *Dussumieria hasselti* Bleeker, *Nat. Tijdschr. Ned.-Ind.*, 1, p. 422 (type-locality : Batavia).

1889. *Dussumieria hasselti* Day, *Fauna Brit. India*, Fish., 1, p. 399.

Head 4.5 to 5, depth 5.6 to 6.3 in total length. Eyes with well developed adipose lids, 4 to 4.2 in head. Snout pointed, both jaws of

same length anteriorly. Dorsal and ventral profiles uniform. Dorsal origin midway between hind edge of eye and base of caudal. Lateral line scales 52-56. Back greenish shot with blue ; sides lighter and silvery with a bronzed line and below it a silvery, pinkish one ; caudal shot with blue, green and gold ; pectorals, pelvics and anal almost white.



TEXT-FIG. 35.—Lateral view of *Dussumieria hasselti* Blkr. (After Day).

Distribution.—INDIA : W Bengal coast, Orissa coast, Coromandel coast, Tuticorin, Travancore-Cochin coast, Calicut, Malabar coast, Andamans ; PAKISTAN : coast of E. Pakistan.—Burma, Malay Peninsula, Malay Archipelago, Formosa, Queensland.

Remarks.—It attains at least 203 mm. (8 inches) in length.

29. Genus *Harengula* V

1847. *Harengula* Valenciennes, *Hist. nat. Poiss.*, 20, p. 20, (Type, *H. latulus* V.=*Clupea macrophthalmus* Ranzani, designated by Gill, *Proc. Acad. nat. Sci. Philad.*, p. 36, 1861).

52. *Harengala punctata* (Rupp.)

1835-40. *Clupea punctata* Ruppell, *Neue Wirbelth. Fische*, p. 78, pl. 21, fig. 2 (type-locality : Red Sea).

1880. *Clupea kunzei* Day, *Fauna Birt. India*, Fish., 1, p. 372.

Head 4.5 to 4.6, depth 4.5 to 4.7 in total length. Eyes with broad adipose lids, 3 to 3.2 in head. Dorsal origin opposite pelvic origin. Dorsal and ventral profiles almost equal. Lateral line scales 43-45. Postventral scutes 13. Bluish along back, becoming silvery white shot with purple on sides and below.

Distribution.—INDIA : Puri, Orissa coast, Andamans and Nicobar islands, Calicut, Malabar coast, Bombay coast ; PAKISTAN : coast of Sind.—Ceylon, Arabia, Red Sea, Zanzibar, Madagascar, Seychelles, Singapore, Malay Archipelago, Japan, Queensland, Melanesia, Micronesia, Polynesia.

Remarks.—It attains 152 mm. (6 inches) in length.

30. Genus *Sardinella* V.

1847. *Sardinella* Valenciennes, *Hist. nat. Poiss.*, 20, p. 281. (Type, *S. aurita* V., designated by Gill, *Proc. Acad. nat. Sci. Philad.*, p. 35, 1861.)

1849. *Amblygaster* Bleeker, *J. Ind. Archipel.*, 3, p. 73. (Type, *A. clupeoides* Blkr., monotypic.)

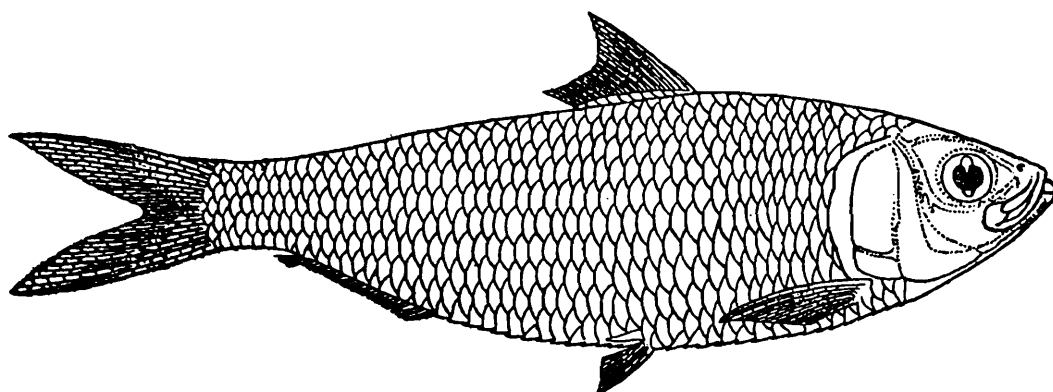
53. *Sardinella fimbriata* (V.)

(Text-fig. 36)

1847. *Spratella fimbriata* Valenciennes, *Hist. nat. Poiss.*, 20, p. 359, pl. 600 (type-locality : Malabar).

1889. *Clupea fimbriata* (part) Day, *Fauna Brit. India*, Fish., 1, p. 373.

Head 5 to 5.2, depth 4 to 5 in total length. Eye 3.2 in head, about a diameter from snout end. Lower jaw prominent, maxilla reaching to below third of eye. Ventral profile more convex than dorsal. Dorsal origin midway between snout end and posterior extremity of base of anal. Lateral line scales 45 ; lateral transverse scales 12. Lower gill rakers 70-75. Postventral scutes 14-15. Bluish green with the sides silvery; dorsal with numerous black dots, and a black mark at base of its anterior rays ; caudal with bluish reflections and tipped dark.



TEXT-FIG. 36.—Lateral view of *Sardinella fimbriata* (V.). (After Day).

Distribution.—INDIA : Orissa coast, Vizagapatam, Madras, Coromandel coast, Travancore-Cochin coast, Malabar coast, Bombay ; PAKISTAN : coast of Sind.—Burma, Ceylon, Singapore, Malay Archipelago, Siam, Indo-China, China.

Remarks.—It attains more than 152 mm. (6 inches) in length.

54. *Sardinella longiceps* V.

1847. *Sardinella longiceps* Valenciennes, *Hist. nat. Poiss.*, 20, p. 273 (type-locality : Pondicherry).

1889. *Clupea longiceps* Day, *Fauna Brit. India*, Fish., 1, p. 373.

Head 3.7 to 4, depth 5 to 5.2 in total length. Eyes with broad adipose eyelids, 5 to 6 in head. Lower jaw prominent, maxilla reaching the first 1/3 or 1/2 of eye. Dorsal and ventral profiles more or less equal. Dorsal origin nearer snout end than base of caudal. Lateral line scales 46-48 ; lateral transverse scales 12-13. Lower gill rakers 180-250. Postventral sutures 13-14. Steel blue along back with a golden sheen, becoming silvery shot with purple at sides ; a golden line dividing the back from sides ; dorsal greenish, caudal with green, other fins transparent.

Distribution.—INDIA : Coromandel coast, Madras, Pondicherry, Tuticorin, Travancore-Cochin coast, Malabar coast, Bombay, Andamans ; PAKISTAN : coasts of Sind, Karachi, Makran.—Ceylon, Arabia, Seychelles, Malay Archipelago, Philippines.

Remarks.—It attains at least 203 mm. (8 inches) in length and is more common on the west coast of India than on the Coromandel coast.

55. *Sardinella melanura* (C.)

1829. *Clupea melanura* Cuvier, *Regne, Animal.*, 2, ed. 2, p. 318 (type-locality : Bombay).

1889. *Clupea atricauda* Day, *Fauna Brit. India, Fish.*, 1, p. 372.

Head 4·7, depth 4·7 in total length. Eyes with broad adipose lids, 3·2 to 3·7 in head. Lower jaw projecting beyond upper, maxilla extending to first third of eye. Dorsal and ventral profiles equal and convex. Dorsal origin midway between snout end and posterior extremity of anal. Lateral line scales 44-46 ; lateral transverse scales 12-13. Lower gill-rakers 38-44. Postventral scutes 13. Dark steel blue above, purplish-silvery at sides and abdomen with an yellowish line dividing the back from sides ; caudal tipped black.

Distribution.—INDIA : Coromandel coast, Tuticorin, Travancore-Cochin coast, Bombay, Andamans ; PAKISTAN : coasts of Sind, Karachi, Makran.—Ceylon, East coast of Africa, Madagascar, Malay Archipelago, Hainan, China, Micronesia, Polynesia.

Remarks.—It grows to about 152 mm. (6 inches) in length.

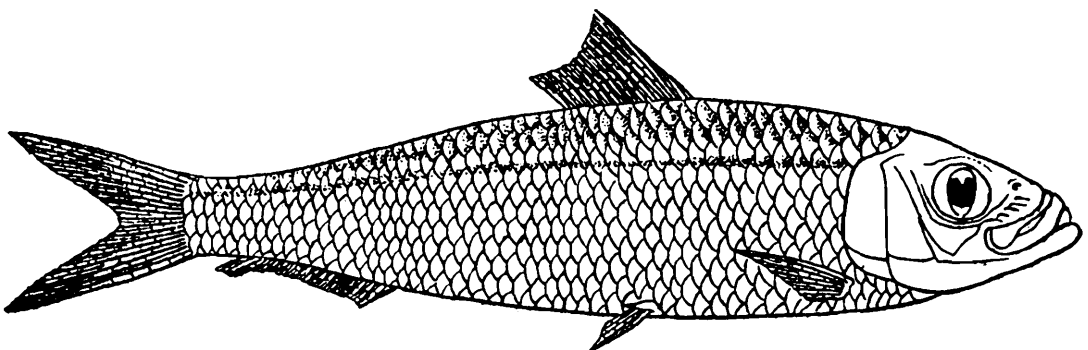
56. *Sardinella sindensis* (Day)

(Text-fig. 37)

1878. *Clupea sindensis* Day, *Fish. India*, p. 638, pl. 163, fig. 2 (type-locality : Karachi).

1889. *Clupea sindensis* Day, *Fauna Brit. India, Fish.*, 1, p. 374.

Head 4·8 to 5, depth 4·5 to 4·8 in total length. Eyes with well developed adipose eyelids, 4·2 in head. Lower jaw prominent, maxilla reaching to first 1/4 of eye. Dorsal and ventral profiles more or less equally convex. Dorsal origin nearer to snout end than to caudal base. Lateral line scales 44-48 ; lateral transverse scales 11-13. Lower gill-rakers 58-62. Postventral scutes not well developed, 13-14. Deep blue above, becoming purplish golden below ; fins yellowish, dorsal shot with black ; yellowish lines along rows of scales in the upper part of body.



TEXT-FIG. 37.—Lateral view of *Sardinella sindensis* (Day). (After Day).

Distribution.—INDIA : Coromandel coast, Bombay, Tuticorin, Travancore-Cochin coast ; PAKISTAN : coasts of Sind, Karachi, Makran.—Seychelles, Singapore, Amboina, Philippines. Formosa.

Remarks.—It attains 203 mm. (8 inches) in length.

31. Genus *Hilsa* Regan

1916. *Paralosa* (nec Bleeker) Regan, *Ann. Durban Mus.*, 1, p. 167. (Type, *P. durbanensis* Reg., monotypic ; inadmissible.)

1917. *Hilsa* Regan, *Ann. Mag. nat. Hist.*, (8) 19, p. 303. (Type, *Paralosa durbanensis* Reg., orthotypic.)

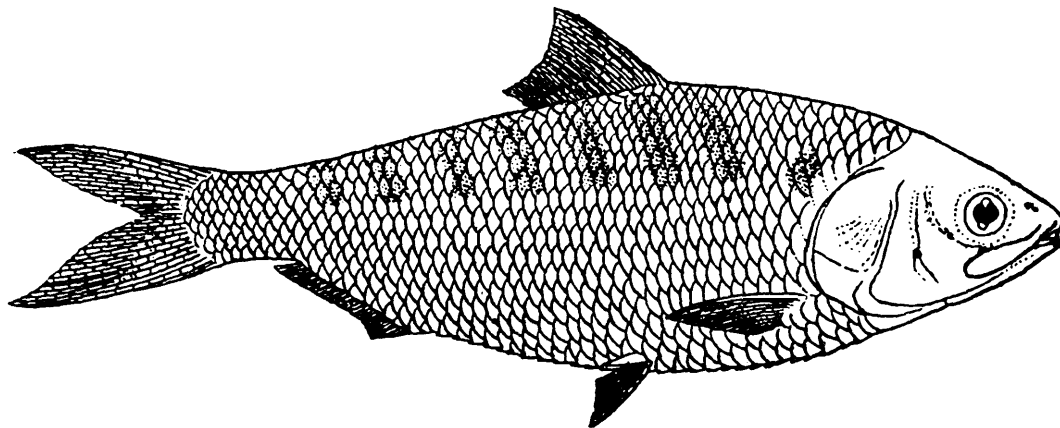
57. *Hilsa ilisha* (Ham.)

(Text-fig. 38)

1822. *Clupanodon ilisha* Hamilton, *Fish. Ganges*, p. 243, pl. 19, fig. 75 (type-locality : Ganges estuaries).

1889. *Clupea ilisha* Day, *Fauna Brit. India*, Fish., 2, p. 376, fig. 115.

Head 4.2 to 4.5, depth 3.5 to 3.7 in total length. Eyes with broad adipose eyelids, 4.5 to 6 in head. Lower jaw not prominent, maxilla reaching to or a little beyond posterior border of eye. Dorsal and ventral profiles equally convex. Dorsal origin nearer to snout end than to caudal base. Lateral line scales 45-49 ; lateral transverse scales 17-20. Lower gill rakers 120 (young) to 220. Postventral scutes 14-15. Silvery shot with gold and purple ; young of bronze colour along back with a row of spots in the upper half of body.



TEXT-FIG. 38.—Lateral view of *Hilsa ilisha* (Ham.). (After Day).

Distribution.—INDIA : the Jamuna at Delhi and Agra, the Ganges at Kanpur, Allahabad, Benares, Buxar, Patna, Monghyr, Calcutta, mouth of the Ganges, W. Bengal coast, Orissa coast, Vizagapatam, Coromandel coast, Cochin, Cauvery River, Tanjore, Malabar coast, Bombay ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Iraq, Persiæ Culf.

Remarks.—It grows to 457 mm. (1½ feet) in length It forms an important fishery in Bengal.

58. *Hilsa kelee* (C.)

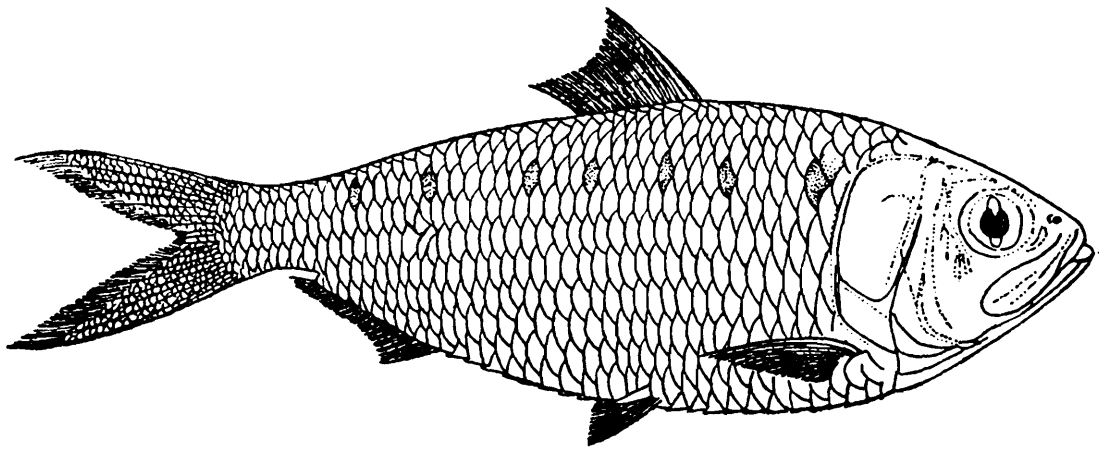
(Text-fig. 39)

1829. *Clupea kelee* Cuvier, *Regne Animal.*, 2, ed. 2, p. 320 (on *Kelee* Russell, *Fish. Coromandel*, 2, p. 75, pl. 195, upper fig., 180? ; type-locality : Vizagapatam).

1889. *Clupea kanagurta* Day, *Fauna Brit. India*, Fish., 1, p. 377

Head 4.2, depth 3.2 to 3.5 in total length. Eyes with broad adipose lids, 4 in head. Lower jaw not prominent, maxilla almost reaching to hind border of eye. Ventral profile more convex than dorsal profile

Parietal ridges broad and striated. Dorsal origin midway between snout end and end of base of anal. Lateral line scales 42-45; lateral transverse scales 13-14. Lower gill rakers 95-130. Postventral scutes 11. Bluish green above, purplish golden on sides and beneath; usually a row of about 6 or 8 oval spots along side of body.



TEXT-FIG. 39.—Lateral view of *Hilsa kelee* (C.). (After Day).

Distribution.—INDIA: Travancore-Cochin coast, Bombay; PAKISTAN: coasts of Sind, Karachi, Makran.—Ceylon, Aden, Zanzibar, Malaya, Siam, Malay Archipelago.

Remarks.—It grows to about 304 mm. (a foot) in length. It does not appear to ascend rivers to breed.

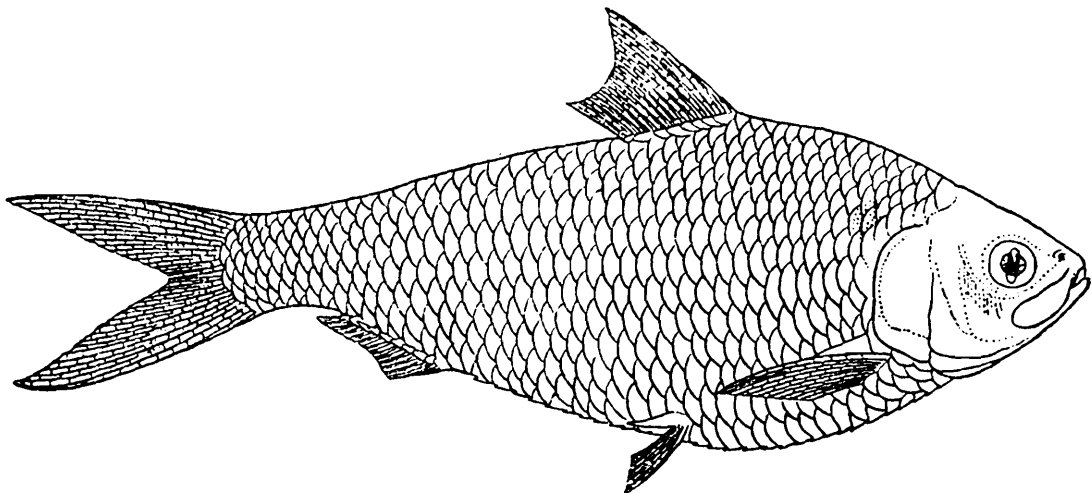
59. *Hilsa sinensis* (L.)

(Text-fig. 40)

1758. *Clupea sinensis* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 319 (type-locality: China).

1889. *Clupea toli* Day, *Fauna Brit. India*, Fish., 1, p. 377.

Head 5 to 5.2, depth 3.5 to 4 in total length. Eyes with broad adipose lids, 4.2 in head. Lower jaw slightly more prominent, maxilla not



TEXT-FIG. 40.—Lateral view of *Hilsa sinensis* (L.). (After Day).

reaching hind border of eye. Parietal ridges narrow and smooth. Ventral profile more convex than dorsal profile. Dorsal origin nearer to snout end than to caudal base. Lateral line scales 39-40; lateral transverse scales 13-15. Lower gill rakers 70-95. Postventral scute 12-13. Silvery shot with yellow and purple at sides and dark gray above

Distribution.—INDIA : W. Bengal coast, Orissa coast, Pondicherry, Coromandel coast, Travancore-Cochin coast, Bombay ; PAKISTAN : coasts of Sind, Karachi, Makran, W. Pakistan.—Ceylon, Malay Peninsula, Malay Archipelago, Siam, Formosa, China, Japan.

Remarks.—It attains at least 914 mm. (3 feet) in length. It does not appear to ascend rivers to breed, but is sometimes found at their mouths.

32. Genus *Gudusia* Fowler

1911. *Gudusia* Fowler, *Proc. Acad. nat. Sci. Philad.*, 63, p. 207. (Type, *Clupanodon chapra* Ham., orthotypic.)

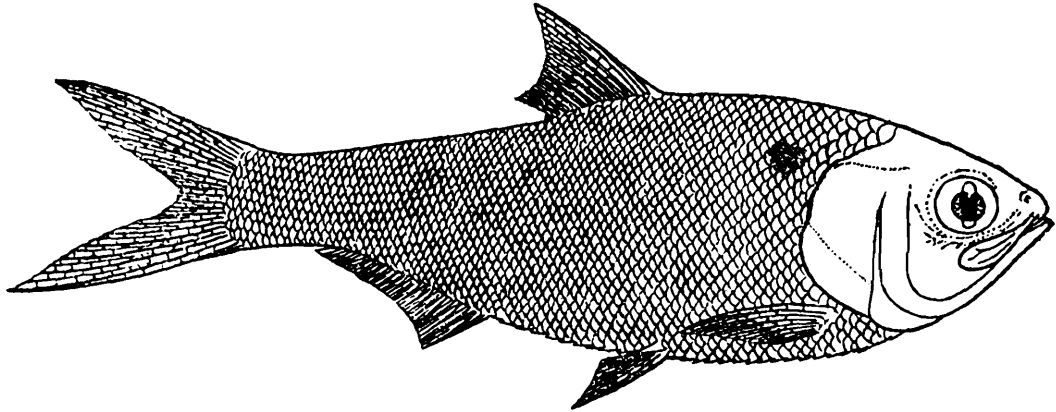
60. *Gudusia chapra* (Ham.)

(Text-fig. 41)

1822. *Clupanodon chapra* Hamilton, *Fish. Ganges*, pp. 248, 383 (type-locality : Upper parts of the Ganges).

1889. *Clupea chapra* Day, *Fauna Brit. India*, Fish., 1, p. 375.

Head 4.3 to 4.5, depth 3.5 to 4 in total. Eyes with broad adipose lids, 3.5 to 4 in head. Lower jaw slightly prominent, maxilla reaching middle of eye. Ventral profile more convex than dorsal profile. Dorsal origin nearer hind base of anal than to snout end. Lateral line scales 80-110 ; lateral transverse scales 33-35. Preventral scutes 18-19 ; post-ventral scutes 9-10. Silvery shot with gold at sides, back dark.



TEXT-FIG. 41.—Lateral view of *Gudusia chapra* (Ham.). (After Day).

Distribution.—INDIA : Sylhet, Assam, Siliguri, Monghyr, W. Bengal, Upper parts of the Ganges, Calcutta, Pulta, Orissa, Bombay : (freshwaters throughout India as far south as the Kistna river, but absent from Malabar and Madras) ; PAKISTAN : freshwaters of Sind, E. Pakistan.—Penang.

Remarks.—It attains at least 203 mm. (8 inches) in length.

33. Genus *Kowala* V

1847. *Kowala* Valenciennes, *Hist. nat. Poiss.*, 20, p. 362. (Type, *Clupea kowal* Rupp., tautotypic.)

1850. *Clupeoides* Bleeker, *Nat. Tijdscher. Ned.-Ind.*, 1, p. 274. (Type, *C borneensis* Blkr., monotypic.)

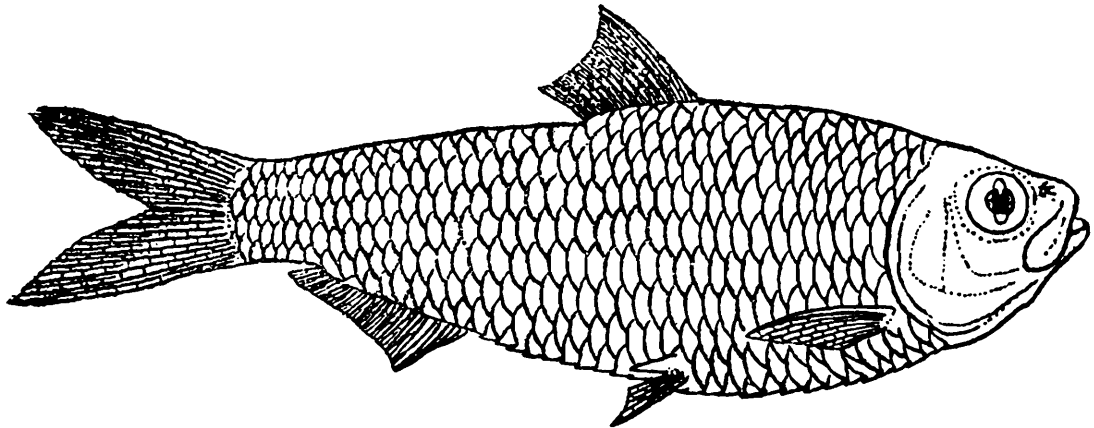
61. *Kowala coval* (C.)

(Text-fig. 42)

1829. *Clupea coval* Cuvier, *Regne Animal.*, 2, ed. 2, p. 318 (type-locality : Vizagapatam).

1889. *Clupea lile* Day, *Fauna Brit. India*, Fish., 1, p. 374.

Head 5 to 5.3, depth 3.5 to 3.6 in total length. Eyes with broad adipose lids, 3 to 3.2 in head. Snout obtuse, lower jaw slightly longer, maxilla reaching to middle of eye. Dorsal profile nearly horizontal, ventral convex. Dorsal origin nearer to snout end than to base of caudal. Lateral line scales 38-41; lateral transverse scales 9-11. Preventral scutes 16-18; postventral scutes 11-12.



TEXT-FIG. 42.—Lateral view of *Kowala coval* (C.). (After Day).

Distribution.—India: Orissa, Vizagapatam, Coromandel coast, Pondicherry, Travancore-Cochin coast, Malabar coast, Bombay; PAKISTAN: coast of Sind.—Burma, Ceylon, Malaya, Malay Archipelago, China.

Remarks.—It attains 102 mm. (4 inches) in length. It is found in vast numbers along the western coast of India.

34. Genus *Ilisha* Richardson

1846. *Ilisha* Richardson, *Ichth. China, Japan*, p. 306. [Type, *I. abnormis* (Gray) Richardson, monotypic.]

62. *Ilisha brachysoma* (Blkr.)

1852. *Pellona brachysoma* Bleeker, *Verh. Bat. Gen.*, 24, p. 22 (type-locality : Batavia).

1889. *Pellona brachysoma* Day, *Fauna Brit. India*, Fish., 1, p. 382.

Head 4.4 to 4.5, depth 3.2 to 3.5 in total length. Eyes 3.2 to 4 in head. Maxilla reaches to middle of eye. Ventral profile more convex than dorsal profile. Dorsal not over anal; origin midway between snout end and base of caudal. Anal rays 40-50. Lateral line scales 46-56; lateral transverse scales 14-16. Preventral scutes 20-24; postventral scutes 8-10.

Distribution.—INDIA: W. Bengal coast, Orissa coast, Coromandel coast, Tuticorin, Travancore-Cochin coast, Bombay; PAKISTAN: coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Malaya, Malay Archipelago, Siam, Cochin China, Formosa, China, Japan.

Remarks.—It grows to 304 mm. (a foot) in length.

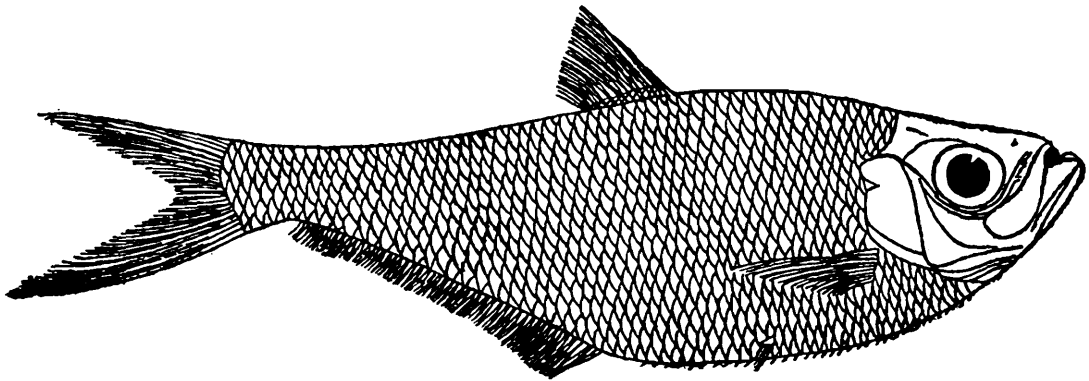
63. *Ilisha filigera* (V.)

(Text-fig. 43)

1847. *Pellona filigera* Valenciennes, *Hist. nat. Poiss.*, 20, p. 322 (type-locality : Coromandel).

1889. *Pellona filigera* Day, *Fauna Brit. India*, Fish., 1, p. 380.

Head 5.2, depth 3.6 to 4 in total length. Eyes 3 in head. Maxilla extends to middle of eye. Ventral profile more convex than dorsal profile. Dorsal almost in front of anal origin; origin midway between snout end and caudal base. Anal rays 46-50. Lateral line scales 50; lateral transverse scales 15-16. Preventral scutes 22-23; postventral scutes 10-12.



TEXT-FIG. 43.—Lateral view of *Ilisha filigera* (V.). (After Day).

Distribution.—INDIA : W. Bengal coast, Orissa coast, Coromandel coast, Tuticorin, Bombay; PAKISTAN : coasts of Sind, E. Pakistan.

Remarks.—It grows to about 304 mm. (a foot) in length.

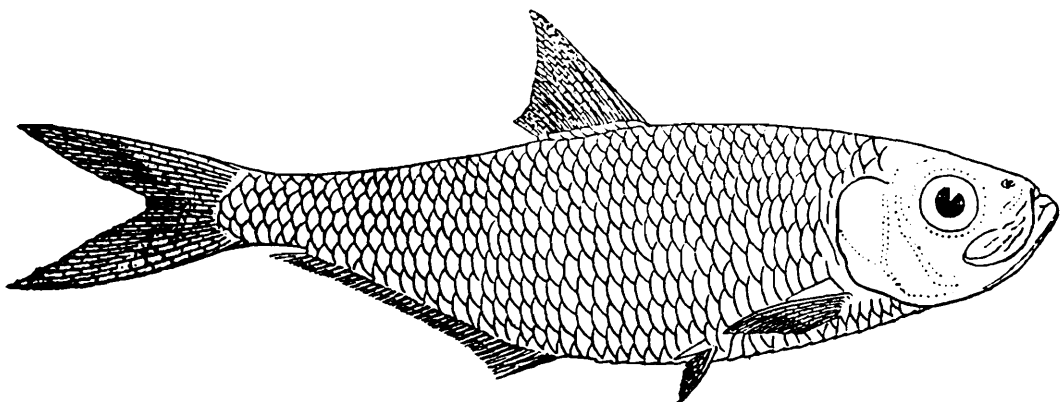
64. *Ilisha motius* (Ham.)

(Text-fig. 44)

1822. *Clupanodon motius* Hamilton, *Fish. Ganges*, pp. 251, 383 (type-locality : Brahmaputra river).

1889. *Pellona motius* Day, *Fauna Brit. India*, Fish., 1, p. 381.

Head 5, depth 4 to 4.2 in total length. Eyes 3 in head. Maxilla reaches to middle of eye. Ventral profile more convex than dorsal



TEXT-FIG. 44.—Lateral view of *Ilisha motius* (Ham.). (After Day).

profile. Dorsal entirely in front of anal origin; origin slightly nearer to snout end than to caudal base. Anal rays 40-41. Lateral line scales 43-45; lateral transverse scales 12-13. Preventral scutes 15-16; postventral scutes 7-8.

Distribution.—INDIA : Brahmaputra river, Assam, Pulta, Ganges mouth, W. Bengal, Orissa ; PAKISTAN : E. Pakistan.

Remarks.—This fish does not appear to exceed about 102 mm. (4 inches) in length. It descends as low as the coast.

35. Genus *Pellona* V

1847. *Pellona* Valenciennes, *Hist. nat. Poiss.*, 20, p. 300. (Type, *P. orbignyana* V., designated by Gill, *Proc. Acad. nat. Sci. Philad.*, p. 38, 1861.)

65. *Pellona ditchela* V

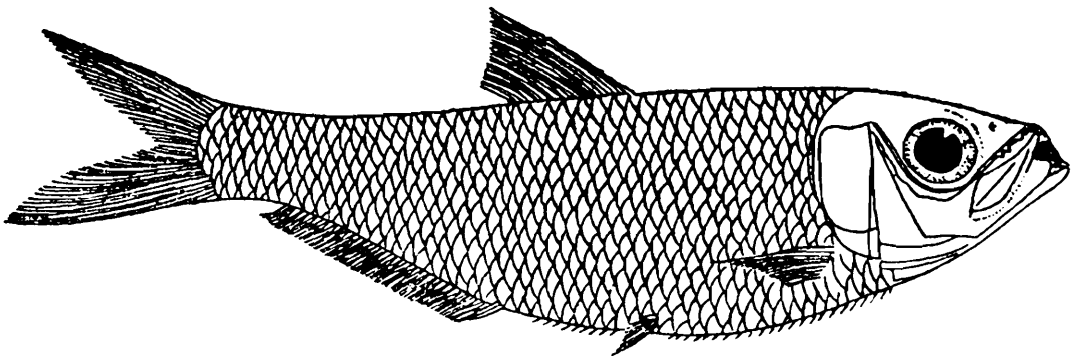
(Text-fig. 45)

1847. *Pellona ditchela* Valenciennes, *Hist. nat. Poiss.*, 20, p. 314 (type-locality : Vizagapatam).

1889. *Pellona ditchela* Day, *Fauna Brit. India.*, Fish., 1, p. 381.

1889. *Pellona hoevenii* Day, *Fauna Brit. India*, Fish., 1, p. 382.

Head 4·5, depth 4·5 in total length. Eyes about 3 in head. Maxilla extends to middle of eye ; a toothed bone between maxilla and premaxilla. Ventral profile rather more convex than dorsal profile. Dorsal entirely in advance of anal origin ; origin nearer to snout end than to caudal base. Anal rays 33-38. Lateral line scales 40-44 ; lateral transverse scales 11-13. Preventral scales 23 ; postventral scutes 10.



TEXT-FIG. 45.—Lateral view of *Pellona ditchela* V. (After Weber & Beaufort).

Distribution.—INDIA : Coromandel coast, Vizagapatam, Madras.—Burma, Ceylon, East Africa, Madagascar, Malaya, Malay Archipelago, Philippines, Queensland.

Remarks.—It grows to about 203 mm. (8 inches) in length.

36. Genus *Opisthopterus* Gill

1861. *Opisthopterus* Gill, *Proc. Acad. nat. Sci. Philad.*, p. 38. (Type, *Pristigaster tartoor* C., orthotypic.)

66. *Opisthopterus tardoore* (C.)

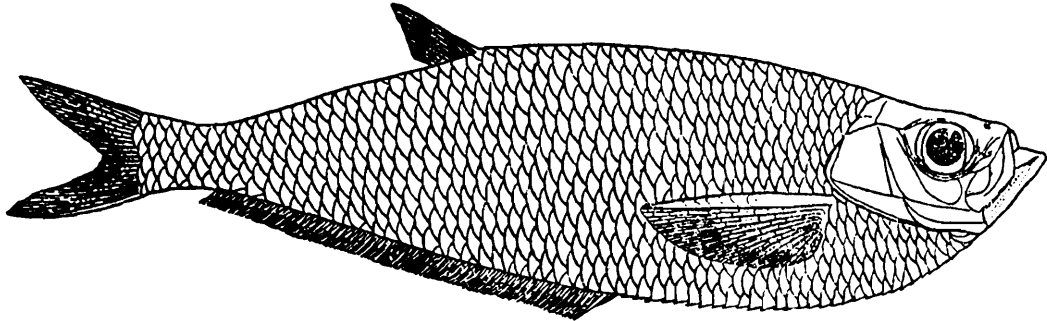
(Text-fig. 46)

1829. *Pristigaster tardoore* Cuvier, *Regne Animal.*, ed. 2, p. 32 (type-locality : Vizagapatam).

1889. *Opisthopterus tartoor* Day, *Fauna Brit. India*, Fish., 1, p. 384.

Head 5·5 to 5·7, depth 3·6 to 4 in total length. Eyes 2·7 to 3 in head. Maxilla oblique, about half of head length, reaching to anterior third

or middle of eye. Lower jaw very prominent. Ventral profile more convex than dorsal profile in the anterior part. Body much compressed. Dorsal origin far behind anal origin and nearer to caudal base than to pectoral base. Anal long with 53-66 rays. Pelvics absent. Lateral line scales 43-50 ; lateral transverse scales 12-15. Lower gill rakers 28. Silvery, light gray above.



TEXT-FIG. 46.—Lateral view of *Opisthopterus tardoore* (C.). (After Day).

Distribution.—INDIA : Vizagapatam, Tuticorin, Coromandel coast, Travancore-Cochin coast, Calicut, Malabar coast ; PAKISTAN : coasts of Sind, Karachi and Makran.—Burma, Ceylon, Malaya, Malay Archipelago, Siam, China.

Remarks.—It attains at least 228 mm. (9 inches) in length.

37. Genus *Raconda* Gray

1831. *Raconda* Gray, *Zool. Miscell.*, 1, p. 9. (Type, *R. russelliana* Gray, monotypic.)

1833-34. *Apterygia* Gray, *Ill. Ind. Zool. Hardwicke*, 2, pl. 92, fig. 1. (Type, *A. ramcarate* Gray, monotypic.)

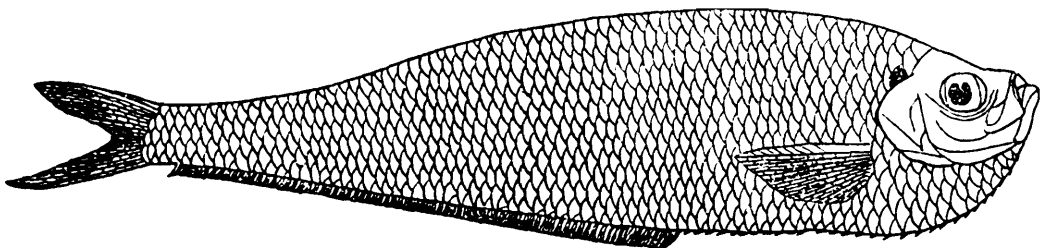
67. *Raconda russelliana* Gray

(Text-fig. 47)

1831. *Raconda russelliana* Gray, *Zool. Miscell.*, 1, p. 9. (Type-locality : Saugor rocks.)

1889. *Raconda russelliana* Day, *Fauna Brit. India, Fish.*, 1, p. 384.

Head 6.5 to 7, depth 4.2 to 4.5 in total length. Eyes 3 to 3.2 in head. Maxilla oblique, extending to middle of eye. Lower jaw very prominent, its end forming a portion of the dorsal profile which is concave above orbit. Anterior portion of ventral profile very convex. Body



TEXT-FIG. 47.—Lateral view of *Raconda russelliana* Gray. (After Day).

strongly compressed. Dorsal and pelvics absent. Anal very long with 83-92 rays. Lateral line scales 60-64 ; lateral transverse scales 12. Lower gill rakers 28. A narrow dark bluish band along back succeeded by a light bronze line which is divided by a lighter and wider band from

a broad silvery one passing from head to caudal fin ; a deep brown or black spot on shoulder, which is often continued on to opercle.

Distribution.—INDIA : Saugor Is., Sunderbans, W. Bengal coast, Bay of Bengal, Travancore-Cochin coast, Bombay ; PAKISTAN : coasts of Sind, E. Pakistan.—Burma, Malay Peninsula, Malay Archipelago, Cochin-China.

Remarks.—It grows to 203 mm. (8 inches) in length. The young are common in the Sunderbans near the mouth of the Ganges.

38. Genus *Gonialosa* Regan

1917. *Gonialosa* Regan, *Ann. Mag. nat. Hist.*, (8) 19, p. 315. (Type, *Chatoessus modestus* Day, orthotypic.)

1931. *Indialosa* Herre & Myers, *Lingnan Sci. J.*, 10, p. 238. (Type, *Clupanodon manmina* Ham., orthotypic.)

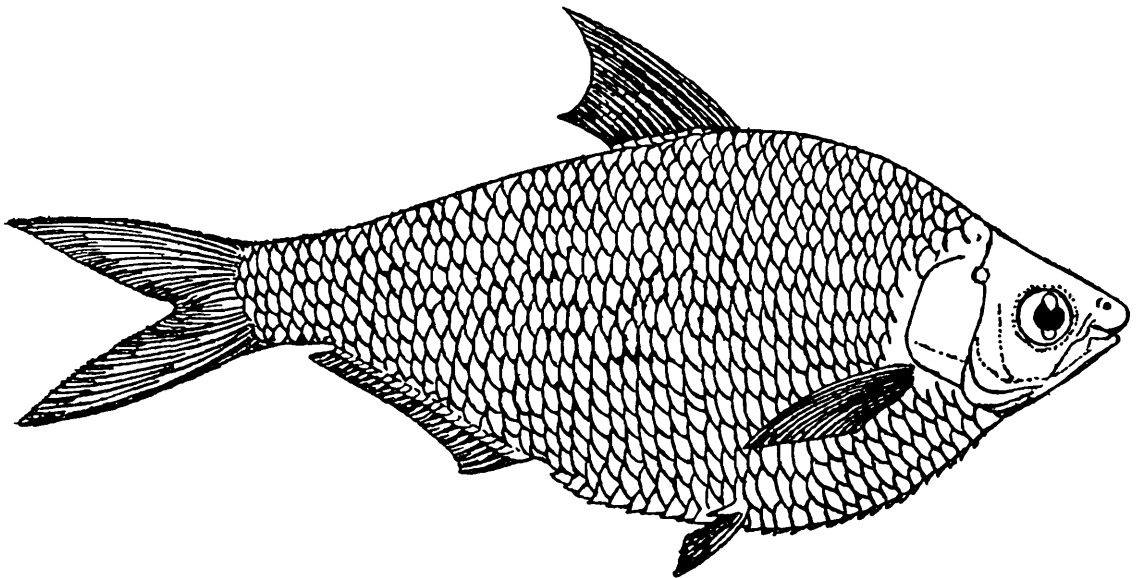
68. *Gonialosa manmina* (Ham.)

(Text-fig. 48)

1822. *Clupanodon manmina* Hamilton, *Fish. Ganges*, pp. 247, 383 (type-locality : most of the freshwater branches of the Ganges).

1889. *Chatoessus manmina* Day, *Fauna Brit. India*, Fish., 1, p. 387.

Head 4.6 to 5, depth 3.6 to 3.7 in total length. Eyes 3 to 3.2 in head. Maxilla short, not reaching eye. Snout prominent. Ventral profile rather more convex than dorsal profile. Dorsal origin nearer to snout end than to base of caudal, and a little in front of pelvic origin. Pectoral reaches pelvic. Lateral line scales 58-65 ; lateral transverse scales 21-25. Silvery glossed with gold ; cheeks purplish, back bluish green.



TEXT-FIG. 48.—Lateral view of *Gonialosa manmina* (Ham.). (After Day).

Distribution.—INDIA : the affluents and main streams of the Ganges, Jumna, Brahmaputra and Mahanadi, spreading through the tanks and estuaries of the major Indian rivers except in the Deccan, southern and western India ; PAKISTAN : Sind, Karachi, Makran, E. Pakistan coasts.

Remarks.—It attains at least 279 mm. (11 inches) in length.

39. Genus *Nematalosa* Regan

1917. *Nematalosa* Regan, *Ann. Mag. nat. Hist.*, (8) 19, p. 312. (Type, *Clupea nasus* Bl.)

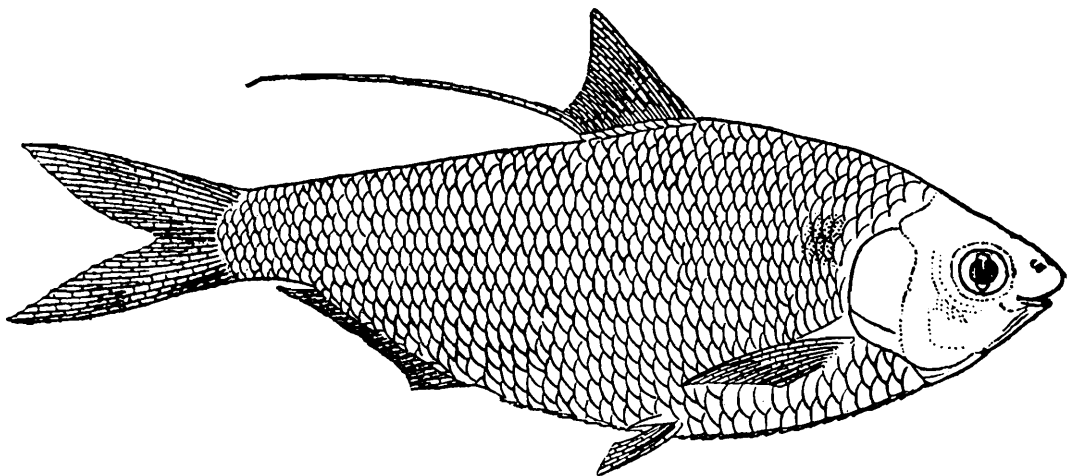
69. *Nematalosa nasus* (Bl.)

(Text-fig. 49)

1795. *Clupea nasus* Bloch, *Naturg. Ausland. Fische*, 9, p. 116, pl. 419, fig. 1 (type-locality : Malabar).

1889. *Chatoessus nasus* Day, *Fauna Brit. India*, Fish., 1, p. 387.

Head 4.5 to 5, depth 3.2 to 3.5 in total length. Eyes 3.2 to 4 in head. Maxilla short, not reaching eye. Snout prominent. Ventral and dorsal profiles more or less equal. Dorsal origin in the middle between pectoral base and front base of anal, nearer to snout end than to caudal base ; last dorsal ray elongated often to reach base of caudal. Pectorals as long as head, reaching pelvics. Pelvic origin below anterior rays of dorsal. Lateral line scales 45-50 ; lateral transverse scales 15-19. Greenish gray above becoming dull silvery shot with gold at sides ; often a bluish shoulder spot, fins yellowish stained black.



TEXT-FIG. 49.—Lateral view of *Nematalosa nasus* (Bl.). (After Day).

Distribution.—INDIA : Pulta, Calcutta, W. Bengal coast, Puri, Chilka Lake, Orissa coast, Coromandel coast, Madras, Travancore-Cochin coast, Calicut, Malabar coast, Bombay ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Iraq, Philippines.

Remarks.—It grows to about 203 mm. (8 inches) in length. It is good eating but bony. It ascends brackish waters.

40. Genus *Anodontostoma* Blkr.

1849. *Anodontostoma* Bleeker, *Verh. Bat. Gen.*, 22, p. 15. (Type, *A. hasseltii* Blkr.)

70. *Anodontostoma chacunda* (Ham.)

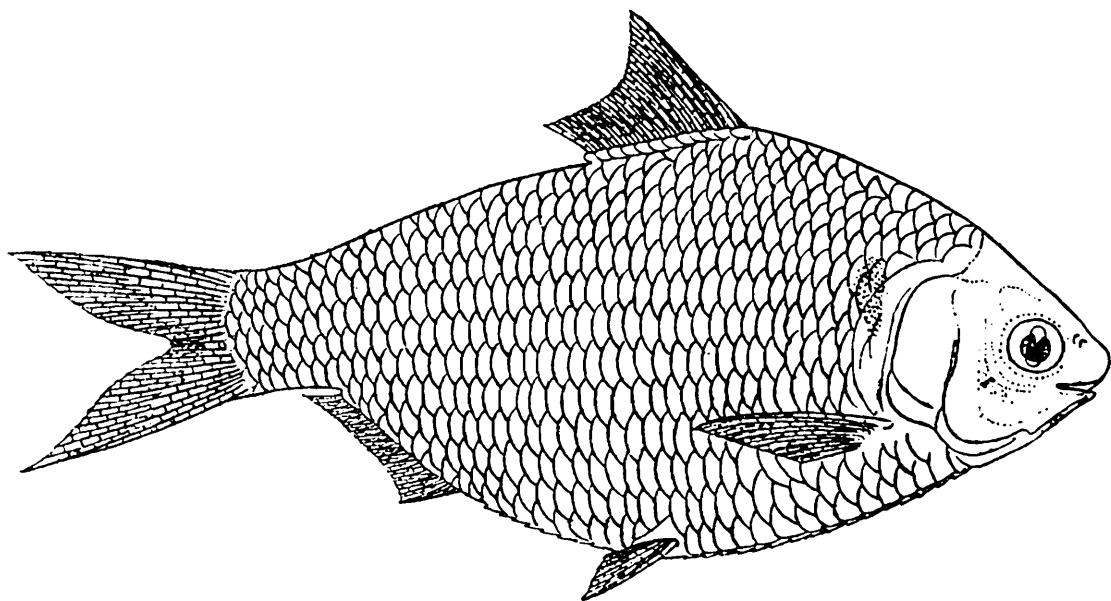
(Text-fig. 50)

1822. *Clupanodon chacunda* Hamilton, *Fish. Ganges*, pp. 246, 383 (type-locality : Gangetic estuaries).

1889. *Chatoessus chacunda* Day, *Fauna Brit. India*, Fish., 1, p. 386.

Head 5 to 5.2, depth 2.7 to 3 in total length. Eyes 3 to 3.5 in head. Maxilla short, not extending to middle of eye. Snout very prominent. Dorsal and ventral profiles deeply arched. Dorsal origin in advance of pelvic origin, which is below middle of dorsal. Pectorals as long as head excluding snout. Lateral line scales 40-42 ; lateral transverse scales

12-15. Grayish above, becoming silvery shot with gold and purple below ; lines formed of spots along rows of scales in the upper third of body.



TEXT-FIG. 50.—Lateral view of *Anodontostoma chacunda* (Ham.). (After Day).

Distribution.—INDIA : estuaries of the Ganges, Chilka Lake, Tuticorin, Coromandel coast, Travancore-Cochin coast, Bombay, Andamans; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Malay Peninsula, Malay Archipelago, Siam, Philippines, Melanesia.

Remarks.—It attains at least 203 mm. (8 inches) in length. It ascends brackish waters.

XVII. Family ENGRAULIDAE

41. Genus *Setipinna* Swns.

1839. *Setipinna* Swainson, *Nat. Hist. Animal.*, 2, p. 292. [Type, *S. megalura* Swns.=*Clupea phasa* (Ham.).]

1868. *Telara* Gunther, *Cat. Fish. Brit. Mus.*, 7, p. 401. (Type, *Clupea telara* Ham., tautotypic.)

71. *Setipinna phasa* (Ham.)

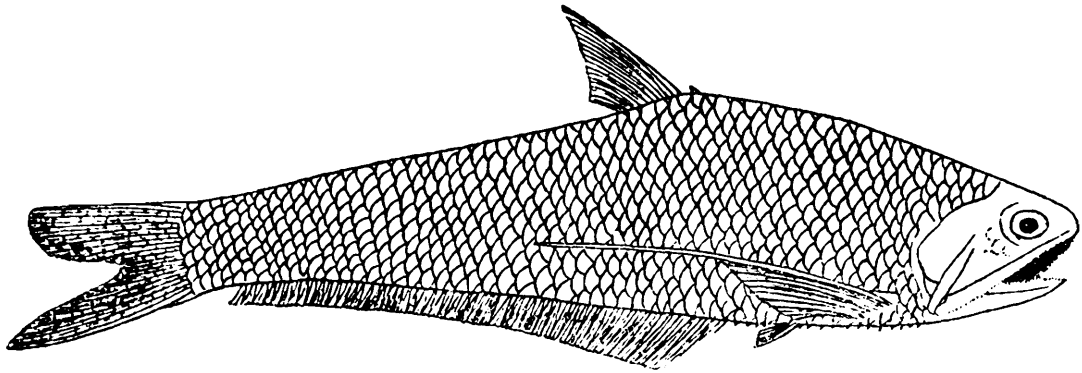
(Text-fig. 51)

1822. *Clupea phasa* Hamilton, *Fish. Ganges*, pp. 240, 382 (type-locality : brackish rivers of Bengal).

1889. *Engraulis telara* Day, *Fauna Brit. India*, Fish., 1, p. 392.

Head 6 to 7, height 4.5 in total length. Eyes 4.5 in head. Maxilla extends opposite gill opening. Snout prominent. Dorsal profile more arched than ventral profile. Dorsal origin a little behind anal origin, much nearer to snout end than to base of caudal. Pectoral with its upper ray elongated, which often reaches middle of anal. Anal with 70-80 rays, the length of its base being more than half the distance from snout end to caudal. Lateral line scales 52 ; lateral transverse scales 14. Lower gill rakers 18. Greenish along back and silvery shot with gold along sides ; dorsal and caudal yellow, stained with black at their upper

edges ; pectoral yellowish in young, but of deep, blue-black in adults except the elongated ray which is mostly uncoloured like pelvics and anal.



TEXT-FIG. 51.—Lateral view of *Setipinna phasa* (Ham.). (After Day).

Distribution.—INDIA : Cachar, Assam, high up in the Ganges, at Monghyr and in most of its larger branches and tributaries, Pulta, Calcutta, mouth of the Ganges, Orissa, Andamans ; PAKISTAN : mouth of the Ganges, E. Pakistan.—Burma.

Remarks.—It attains at least 304 mm. (a foot) in length. It is common in the sea, brackish and freshwaters.

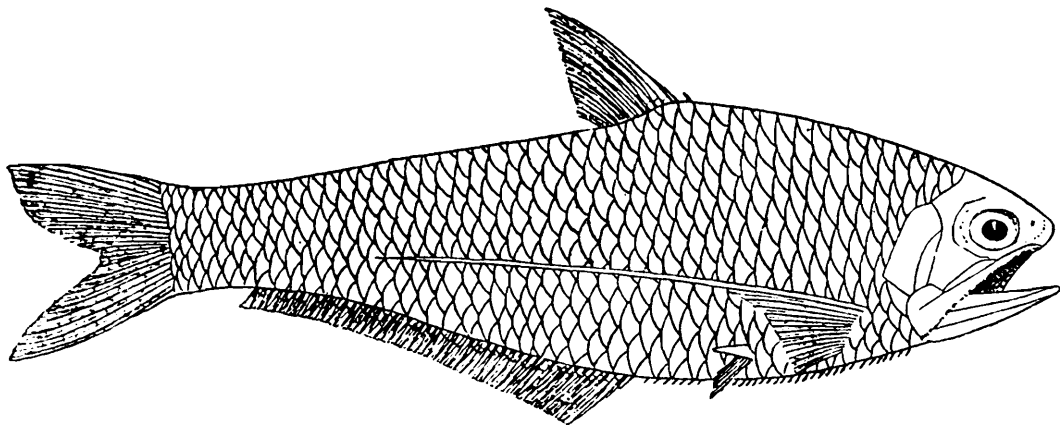
72. *Setipinna taty* (V.)

(Text-fig. 52)

1848. *Engraulis taty* Valenciennes, *Hist. nat. Poiss.*, 21, p. 60 (type-locality : Pondicherry).

1889. *Engraulis taty* Day, *Fauna Brit. India*, Fish., 1, p. 393.

Head 6 to 6.5, depth 3.7 to 4 in total length. Eyes 4 in head. Maxilla reaches beyond mandibular joint. Snout projecting over lower jaw. Dorsal and ventral profiles more or less equally arched. Dorsal origin in front of anal origin and much nearer to snout end than to caudal base. Pectoral with its upper ray prolonged. Anal with 51-60 rays, its base



TEXT-FIG. 52.—Lateral view of *Setipinna taty* (V.). (After Day).

being nearly half as long as the total length excluding the caudal. Lateral line scales 42-46 ; lateral transverse scales 12. Lower gill rakers 15-16. Back greenish or greenish-yellow, stained with black becoming silvery on sides ; fins yellowish, dorsal and pectoral with some black ; caudal black edged.

Distribution.—INDIA : Orissa coast, Coromandel coast, Malabar coast, Travancore-Cochin coast.—Burma, Ceylon, Malay Peninsula, Malay Archipelago, Siam, China.

Remarks.—It attains at least 152 mm. (6 inches) in length. It ascends estuaries and brackish waters and is eaten either fresh or salted.

42. Genus *Coilia* Gray

1831. *Coilia* Gray, *Zool. Miscell.*, p. 9. (Type, *C. hamiltonii* Gray, monotypic.)

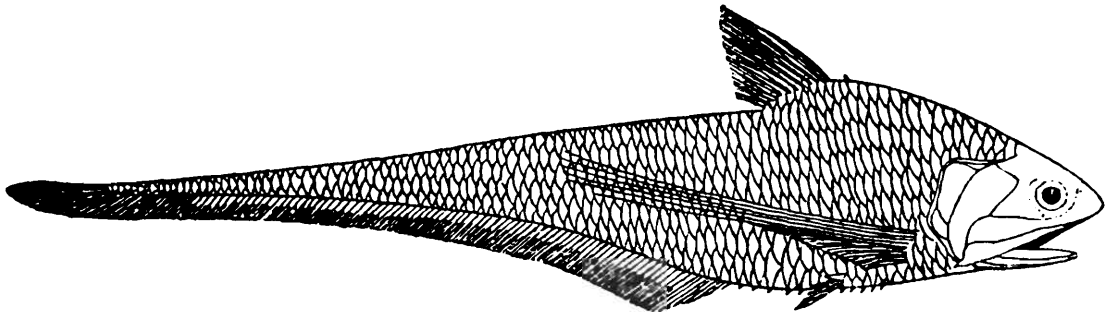
73. *Coilia dussumieri* V

(Text-fig. 53)

1848. *Coilia dussumieri* Valenciennes, *Hist. nat. Poiss.*, 21, p. 81, pl. 610 (type-locality : Bombay).

1889. *Coilia dussumieri* Day, *Fauna Brit. India*, Fish., 1, p. 397, fig. 122.

Head 6 to 6.5, depth 5.3 in total length. Eyes 4 to 4.2 in head. Maxilla extends beyond head. Snout prominent. Ventral profile gradiently concave behind pelvics. Dorsal origin nearer to anterior part of anal base than to snout end ; the distance between snout end and first dorsal ray $\frac{1}{4}$ of total length. Pectoral with its upper 5-6 rays produced to reach about middle of total length. Anal long with 105 rays. Lateral line scales 80 ; lateral transverse scales 9. Golden with 2 or 3 rows of round burnished golden spots along lower half of body.



TEXT-FIG. 53.—Lateral view of *Coilia dussumieri* V. (After Day).

Distribution.—INDIA : Malta river, W Bengal, W Bengal coast, Orissa coast, Coromandel coast, Pondicherry, Malabar coast, Bombay ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Malaya, Malay Archipelago, Siam.

Remarks.—It attains at least 177 mm. (7 inches) in length. It ascends estuaries and brackish waters. Very numerous caught at Bombay.

43. Genus *Anchoviella* Fowler

1911. *Anchoviella* Fowler, *Proc. Acad. nat. Sci. Philad.*, p. 211. (Type, *Engraulis perfasciatus* Poey, orthotypic.)

74. *Anchoviella commersonii* (Lac.)

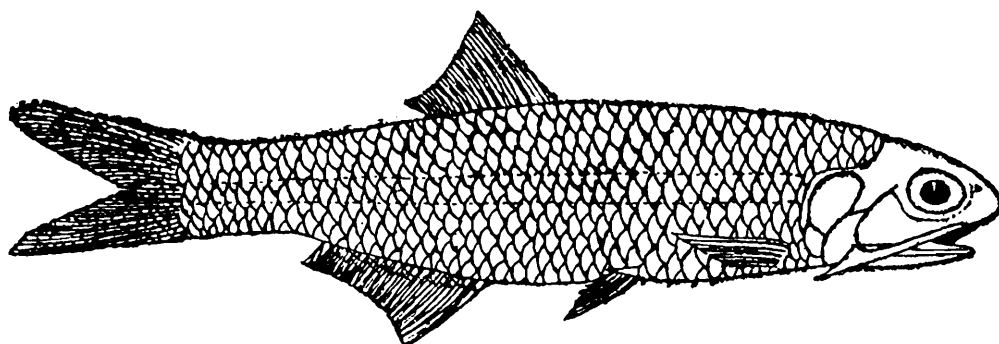
(Text-fig. 54)

1803. *Stolephorus commersonii* Lacepede, *Hist. nat. Poiss.*, 5, pp. 381, 382, pl. 12, fig. 1 (type-locality : not given).

1889. *Engraulis commersonianus* Day, *Fauna Brit. India*, Fish., 1, p. 394.

Head 5 to 5.5, depth 5.2 to 5.7 in total length. Eyes 3.5 in head. Maxilla continued to gill opening. Snout pointed, projecting beyond

and overhanging mouth. Dorsal origin nearer to caudal base than to snout end, behind pelvic origin. Anal origin below middle of dorsal base. Abdominal scutes between pectorals and pelvics 6-8. Lateral line scales 38-40. Greenish gray above and silvery-buff at sides and below ; opercle shot with gold ; a broad, shining, silvery band on side from opercle to centre of caudal ; fins yellowish with minute black dots ; caudal tinged blue.



TEXT-FIG. 54.—Lateral view of *Anchoviella commersonii* (Lac.). (After Day).

Distribution.—INDIA : W. Bengal coast, Puri, Orissa coast, Chilka Lake, Tuticorin, Coromandel coast, Travancore-Cochin coast ; PAKISTAN: coasts of Sind, E. Pakistan.—Ceylon, Zanzibar, Mauritius, Malaya, Malay Archipelago, Philippines, China, Polynesia.

Remarks.—It attains about 203 mm. (8 inches) in length, and is captured in large numbers on the Travancore-Cochin coast where it is much esteemed for eating.

75. *Anchoviella indica* (v. Hass.)

1823. *Engraulis indica* van Hasselt, *Algem. Konst. Letterbode*, p. 329 (type-locality : Java).

1889. *Engraulis indica* Day, *Fauna Brit. India*, Fish., 1, p. 394.

Head 4.6 to 5, depth 6 to 6.5 in total length. Eyes 3.5 in head. Maxilla reaches front border of preopercle. Snout pointed, overhanging mouth. Dorsal origin nearer to base of caudal than to tip of snout, its first half in front of anal origin. Abdominal scales between pectorals and pelvics 4-5. Lateral line scales 40. Greenish above and silvery at sides, with some dark spots behind occiput ; a brilliant, silvery, lateral band.

Distribution.—INDIA : Chilka Lake, Vizagapatam, Tuticorin, Coromandel coast, Travancore-Cochin coast, Malabar coast, Andamans.—Zanzibar, Malay Peninsula, Malay Archipelago, Philippines, Siam, China, Melanesia, Polynesia.

Remarks.—It attains about 127 mm. (5 inches) in length and ascends tidal rivers.

76. *Anchoviella tri* (Blkr.)

1852. *Engraulis tri* Bleeker, *Verh. Bat. Gen.*, 24, p. 40 (type-locality : Batavia).

1889. *Engraulis tri* Day, *Fauna Brit. India*, Fish., 1, p. 395.

Head 5 to 5.2, depth 5 to 5.2 in total length. Eyes 3.5 in head. Maxilla reaches gill opening. Snout overhanging mouth. Dorsal origin between front edge of eye and base of caudal. Anal origin below middle of dorsal. Abdominal scales between pectoral and pelvics 4.

Lateral line scales 32-35. Silvery shot with purple ; a brilliant, silvery, lateral band from opposite eye to caudal base ; a dark spot behind occiput.

Distribution.—INDIA : the Hoogly at Calcutta, W Bengal coast, Travancore-Cochin coast, Canara, Malabar coast, Bombay ; PAKISTAN : coasts of Sind, E. Pakistan.—Malay Peninsula, Malay Archipelago, Philippines.

Remarks.—It attains about 102 mm. (4 inches) in length. It ascends estuaries and tidal rivers. This, along with the above two anchovies forms an important item of the fishery of the Travancore-Cochin coast.

44. Genus *Thrissocles* Jordan & Evermann

1817. *Thrissa* (nec Rafinesque, 1815) Cuvier, *Regne Animal.*, 2, ed. 1, p. 176. (Type, *Clupea setirostris* Brouss., logotypic ; inadmissible.)

1917. *Thrissocles* Jordan & Evermann, *Gen. Fish.*, p. 98. (Type, *Clupea setirostris* Brouss., orthotypic.)

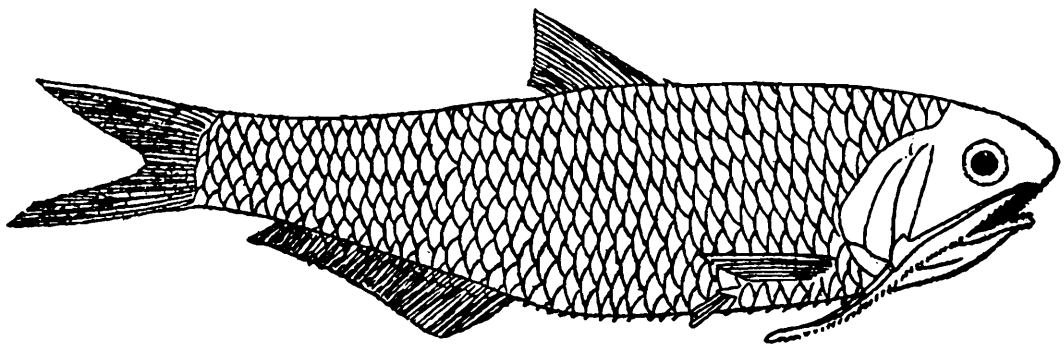
77. *Thrissocles dussumieri* (V.)

(Text-fig. 55)

1848. *Engraulis dussumieri* Valenciennes, *Hist. nat. Poiss.*, 21, p. 69 (typo-locality : not given).

1889. *Engraulis dussumieri* Day, *Fauna Brit. India*, Fish., 1, p. 391.

Head 4.5 to 4.6, depth 4.2 to 4.5 in total length. Eyes 4 in head. Snout projects considerably over lower jaw ; cleft of mouth extends far behind postorbital margin. Maxilla much elongated posteriorly, reaching pelvic base. Dorsal origin nearer to snout end than to caudal base and in the middle between the pelvic base and the front end of anal base. Pelvic origin in front of dorsal origin. Anal origin behind dorsal base. Abdominal scutes 22-24. Gill rakers 16-20. Coppery above, silvery below ; a black shoulder spot ; caudal straw-coloured, black edged.



TEXT-FIG. 55.—Lateral view of *Thrissocles dussumieri* (V.). (After Day).

Distribution.—INDIA : Madras, Tuticorin, Coromandel coast, Travancore-Cochin coast, Calicut, Malabar coast, Bombay ; PAKISTAN : coast of Sind.—Burma, Malaya, Siam, Malay Archipelago, China, Philippines.

Remarks.—It grows to about 152 mm. (6 inches) in length.

78. *Thrissocles hamiltonii* (Gray)

1833-34. *Thrissa hamiltonii* Gray, *Ill. Ind. Zool. Hardwicke*, 2, p. 92, fig. 3 (Type-locality : India).

1889. *Engraulis hamiltonii* Day, *Fauna Brit. India*, Fish., 1, p. 389.

Head 5.2 to 5.5, depth 4.2 in total length. Eyes 4.2 in head. Snout slightly projecting over lower jaw. Maxilla nearly reaches pectoral base. Dorsal origin nearer to snout end than to caudal base. Anal origin just behind last dorsal ray. Abdominal scutes 26. Gill rakers 13. Bronze along back, becoming purplish golden below ; often a silvery lateral band ; fins yellowish, dorsal edged with black.

Distribution.—INDIA : the Hooghly at Pulta and Calcutta, W. Bengal coast, Vizagapatam, Pondicherry, Coromandel coast, Malabar coast, Bombay ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Malay Peninsula, Siam, Malay Archipelago, Philippines, China, Australia.

Remarks.—It grows to 228 mm. (9 inches) in length. It ascends estuaries and tidal rivers.

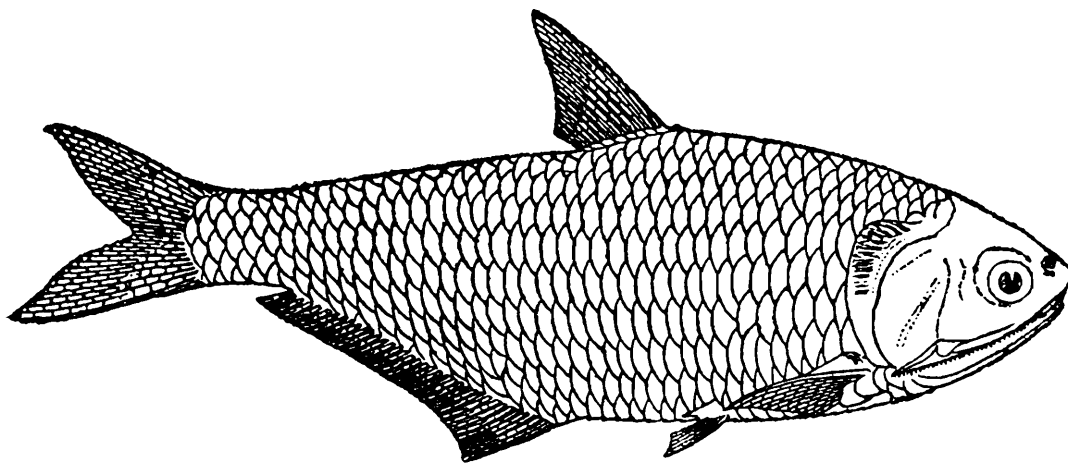
79. *Thrissocles malabaricus* (Bl.)

(Text-fig. 56)

1795. *Clupea malabaricus* Bloch, *Naturl. Ausland. Fische*, 9, p. 155, pl. 432 (type-locality : Tranquebar).

1889. *Engraulis malabaricus* Day, *Fauna Brit. India*, Fish., 1, p. 389, fig. 121.

Head 5, depth 3.7 in total length. Eyes 4.2 in head. Snout slightly in advance of lower jaw. Dorsal origin nearer to snout end than to caudal base. Anal origin just behind last dorsal ray. Abdominal scutes 27. Gill rakers 21-25. Silvery shot with gold and purple ; black venules on shoulders ; fins yellow ; dorsal and caudal tipped black.



TEXT-FIG. 56.—Lateral view of *Thrissocles malabaricus* (Bl.). (After Day).

Distribution.—INDIA : Chilka Lake, Orissa coast, Vizagapatam, Coromandel coast, Travancore-Cochin coast, Malabar coast ; PAKISTAN : coasts of Sind, Karachi, Makran.—Celebes.

Remarks.—It attains at least 152 mm. (6 inches) in length.

80. *Thrissocles mystax* (Schn.)

1801. *Clupea mystax* Schneider, *Syst. Ichth. Bloch*, p. 426, pl. 183, (type-locality : Malabar).

1889. *Engraulis mystax* Day, *Fauna Brit. India*, Fish., 1, p. 390.

Head 5, depth 4.5 to 4.7 in total length. Eyes 4.5 in head. Snout projects beyond lower jaw. Maxilla extends to pectoral base. Dorsal origin midway between anterior margin of orbit and caudal base. Anal

origin behind last dorsal ray; anal base more than 3 times in standard length. Abdominal scutes 25-26. Gill rakers 13. Silvery tinged with purple; black venules on shoulder; dorsal and caudal yellow.

Distribution.—INDIA: Chilka Lake, Orissa coast, Madras, Tuticorin, Coromandel coast, Travancore-Cochin coast, Malabar coast, Bombay; PAKISTAN: coasts of Sind, E. Pakstan.—Burma, Ceylon, Malay Peninsula, Malay Archipelago, Siam, China, Philippines, Queensland.

Remarks.—It grows to 228 mm. (9 inches) in length. It ascends estuaries and brackish waters.

81. *Thrissocles purava* (Ham.)

1822. *Clupea purava* Hamilton, *Fish. Ganges*, pp. 238, 382 (type-locality: the estuaries of the Ganges).

1889. *Engraulis purava* Day, *Fauna Brit. India*, Fish., 1, p. 393.

Head 5.7 to 6, depth 4.2 to 4.5 in total length. Eyes 4.5 to 5 in head. Snout slightly projects beyond lower jaw. Maxilla reaches pectoral base. Dorsal origin rather nearer to caudal base than to snout end. Anal origin behind dorsal base; anal base 2.6 times in standard length. Abdominal scutes 25-27. Gill rakers 11. Steel blue along back, becoming silvery on sides; dorsal and caudal yellowish, other fins pale white.

Distribution.—INDIA: Hoogly at Pulta and Calcutta, estuaries of the Ganges, W. Bengal coast, Chilka Lake, Orissa coast, Madras, Tuticorin, Coromandel coast, Travancore-Cochin coast, Calicut, Malabar coast; PAKISTAN: coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Malaya, Malay Archipelago.

Remarks.—It attains at least 304 mm. (a foot) in length. It ascends estuaries and tidal rivers.

Suborder Chirocentroidei

XVIII. Family CHIROCENTRIDAE

45. Genus *Chirocentrus* C.

1817. *Chirocentrus* Cuvier, *Regne Animal.*, 2, ed. 1, p. 178, (Type, *Clupea dorab* Forsk., monotypic.)

82. *Chirocentrus dorab* (Forsk.)

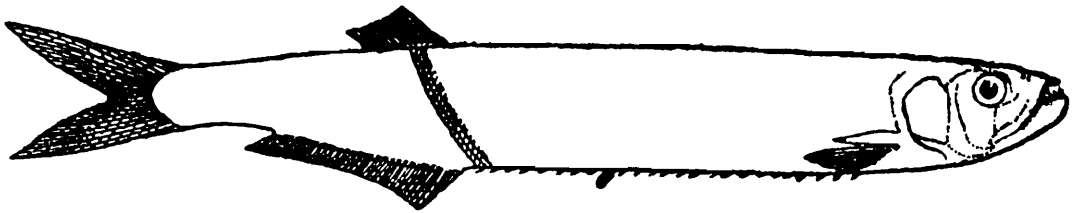
(Text-fig. 57)

1775. *Clupea dorab* Forskal, *Descript. Animal.*, pp. xiii, 72 (type-locality: Djedda, Red Sea).

1889. *Chirocentrus dorab* Day, *Fauna Brit. India*, Fish., 1, p. 368, fig. 114.

Head 6.5 to 7.2, depth 6.5 to 9 in total length. Eyes 4.2 in head. Lower jaw longer. Maxilla reaches to below hind border of eye. Mouth large, set with fang-like teeth. Dorsal in the posterior third of body, above anal; its origin a little ahead of anal origin. Pelvic origin midway between snout end and caudal base. Lower abdominal margin sharp, cutting, with short hair-like rays. Scales small, deciduous. Lateral line indistinct or absent. Bluish black above, becoming silvery shot, with purple on sides and abdomen; fins hyaline, caudal yellowish.

Distribution.—INDIA : W. Bengal coast, Orissa coast, Vizagapatam, Coromandel coast, Travancore-Cochin coast, Malabar coast; PAKISTAN :



TEXT-FIG. 57.—Lateral view of *Chirocentrus dorab* (Forsk.). (After Day).

coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Red Sea, Zanzibar, Natal, Mauritius, Malay Peninsula, Siam, China, Formosa, Malay Archipelago, Philippines, Melanesia, Australia.

Remarks.—It grows to about 3,657 mm. (12 feet) in length. When just captured it bites at everything near it.

Suborder Chanoidei

XIX. Family CHANIDAE

46. Genus *Chanos* Lac.

1803. *Chanos* Lacepede, *Hist. nat. Poiss.*, p. 395. (Type, *C. arabicus* Lac., monotypic.)

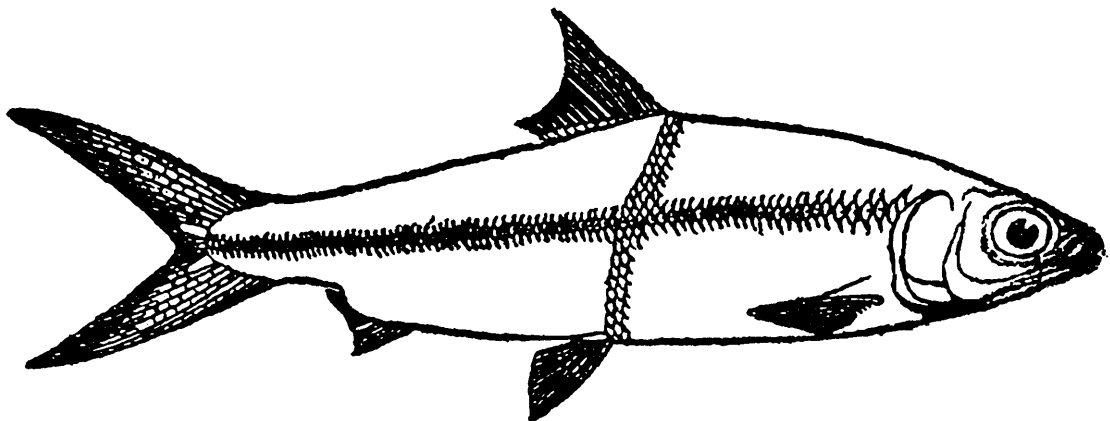
83. *Chanos chanos* (Forsk.)

(Text-fig. 58)

1775. *Mugil chanos* Forskal, *Descript. Animal.*, pp. xic, 74 (type-locality : Djedda, Red Sea).

1889. *Chanos salmoneus* Day, *Fauna Brit. India*, Fish., 1, p. 403, fig. 127.

Head 5.2 to 5.5, depth 4.6 to 5.2 in total length. Eyes 3.5 to 3.7 in head. Upper surface of head flat. Upper jaw overhanging lower jaw ; mouth small, anterior, transverse. Dorsal origin midway between front border of eye and caudal base, in front of pelvic origin. Anal



TEXT-FIG. 58.—Lateral view of *Chanos chanos* (Forsk.). (After Day).

small. Caudal deeply forked. Scales rather small, 80-90 in the lateral line and 12-15 in the transverse series. Bluish gray above, sides and abdomen silvery ; dorsal and caudal dusky ; pectorals, pelvies, and anal dotted with black along their margins.

Distribution.—INDIA : Chilka Lake, Orissa coast, Vizagapatam, Coromandel coast, Travancore-Cochin coast, Malabar coast.—Ceylon, Red Sea, East coast of Africa, Malay Peninsula, Malay Archipelago, Philippines, China, Japan, Australia, Melanesia, Polynesia.

Remarks.—It attains at least 914 mm. (3 feet) in length. It ascends estuaries, brackish water lakes and tidal rivers. Much esteemed as food.

Suborder Salmonoidei

XX. Family SALMONIDAE

47. Genus *Salmo* L.

1758. *Salmo* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 308. (Type, *S. salar* L.)

84. *Salmo trutta fario* L.

1758. *Salmo fario* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 309 (type-locality : Europe).

Head 4·5, depth 4·5 in total length. Eyes 4·3 in head. Mouth moderate. Pelvics below dorsal. Adipose dorsal above anal. Caudal slightly forked. Lateral line scales 115-130. Brownish, not spotted below lateral line.

Distribution.—INDIA : freshwaters of Kulu Valley, Punjab (I), Kashmir ; PAKISTAN : freshwaters of W. Punjab.—Eurasia., N. America (introduced), Australia (introduced).

Remarks.—It attains 406 mm. (1½ feet) in length. It is an introduced fish of considerable sport value for the anglers. Much esteemed as food.

85. *Salmo gairdnerii gairdnerii* Richardson

1836. *Salmo gairdnerii* Richardson, *Faun. Bor. Amer.*, 3, p. 221 (type-locality : Columbia river at Port Vancouver).

Head 4, depth 3·8 in total length. Eyes 5 in head. Mouth small. Pelvics below dorsal. Adipose dorsal above anal. Caudal distinctly forked. Lateral line scales 127-160. Steel blue with a red lateral band ; no spots below lateral line.

Distribution.—INDIA : freshwaters of Nilgiris, Western Ghats, Kashmir, Western Himalayas ; PAKISTAN : freshwaters of W. Punjab.—Ceylon (introduced), British Columbia to California, England (introduced), S. Africa (introduced), Australia (introduced).

Remarks.—It grows to about 381 mm. (1½ feet) in length. It is an introduced fish of great sport value to anglers and is much esteemed as food.

86. *Salmo levenensis* Walker

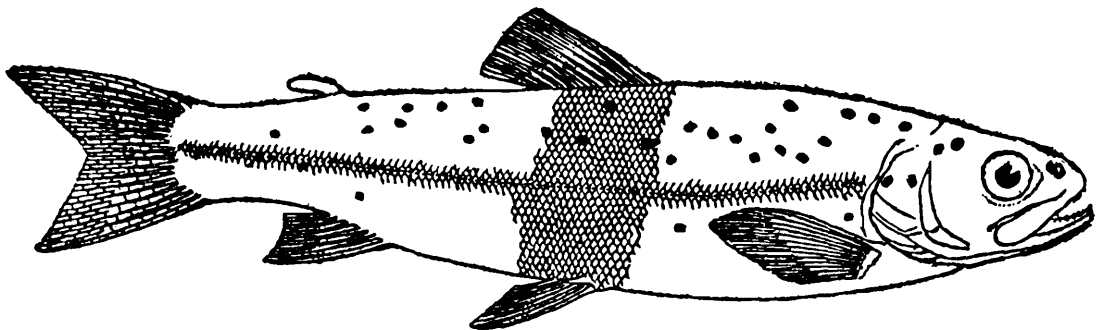
(Text-fig. 59)

1808. *Salmo levenensis* Walker, *Wern. Mem.*, 1, p. 541. (type-locality : Loch Leven, England).

Head 4, depth 4 in standard length. Eyes 4·2 in head. Mouth moderate. Pelvics below dorsal. Adipose dorsal above anal. Caudal

forked. Lateral line scales 120-130. Greenish with spots above lateral line.

Distribution.—INDIA : freshwaters of Nilgiris, Western Ghats.—England, Scotland, S. Africa (introduced), Australia (introduced).



TEXT-FIG. 59.—Lateral view of *Salmo levenensis* Walker. (After Day).

Remarks.—It grows to about 381 mm. ($1\frac{1}{4}$ feet) in length. It is an introduced fish of great sport value to anglers and is much esteemed as food.

Suborder Notopteroidei

XXI. Family NOTOPTERIDAE

48. Genus *Notopterus* Lac.

800. *Notopterus* Lacepede, *Hist. nat. Poiss.*, 2, p. 189. (Type, *Gymnotus notopterus* Pallas, tautotypic.)

1934. *Chitala* Fowler, *Proc. Acad. nat. Sci. Philad.*, 85, p. 244. (Type, *Mystus chitala* Ham., tautotypic.)

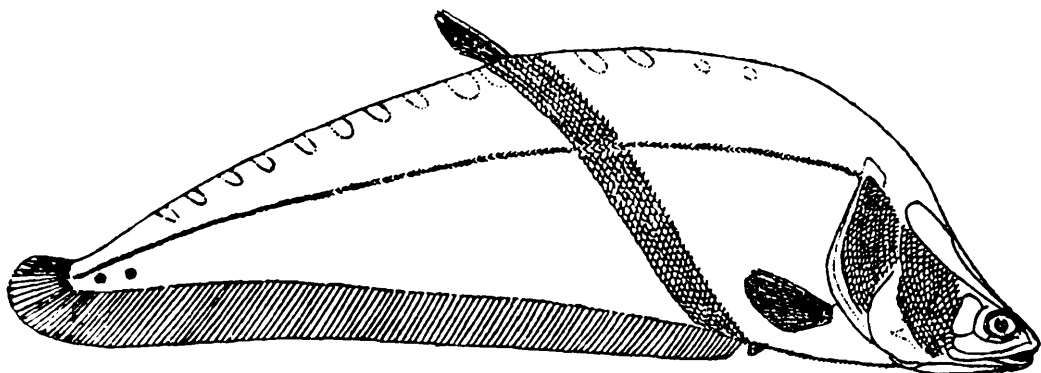
87. *Notopterus chitala* (Ham.)

(Text-fig. 60)

1822. *Mystus chitala* Hamilton, *Fish. Ganges*, pp. 236, 382 (type-locality : larger freshwater rivers of Bengal).

1889. *Notopterus chitala* Day, *Fauna Brit. India*, Fish., 7, p. 407.

Head 4.5 to 5, depth 3.5 to 4 in total length. Eyes 7 to 8 in head. Upper profile of head deeply concave. Maxilla extends by one eye-



TEXT-FIG. 60.—Lateral view of *Notopterus chitala* (Ham.). (After Day).

diameter beyond postorbital margin. Preorbital entire. Dorsal when present small, in the caudal region ; its origin far behind pelvic origin.

Pelvics small. Anal and caudal united. Scales on opercle not larger than those on body ; about 180 in the lateral line. Copper brown above, silvery at sides and abdomen ; with about 15 transverse, grayish silvery bars joining over back.

Distribution.—INDIA : larger freshwater rivers of U. P., Bihar, the Hoogly at Calcutta, W. Bengal, Assam ; PAKISTAN : larger freshwater rivers of E. Pakistan.—Burma, Siam, Malay Archipelago.

Remarks.—It attains at least 1,219 mm. (4 feet) in length.

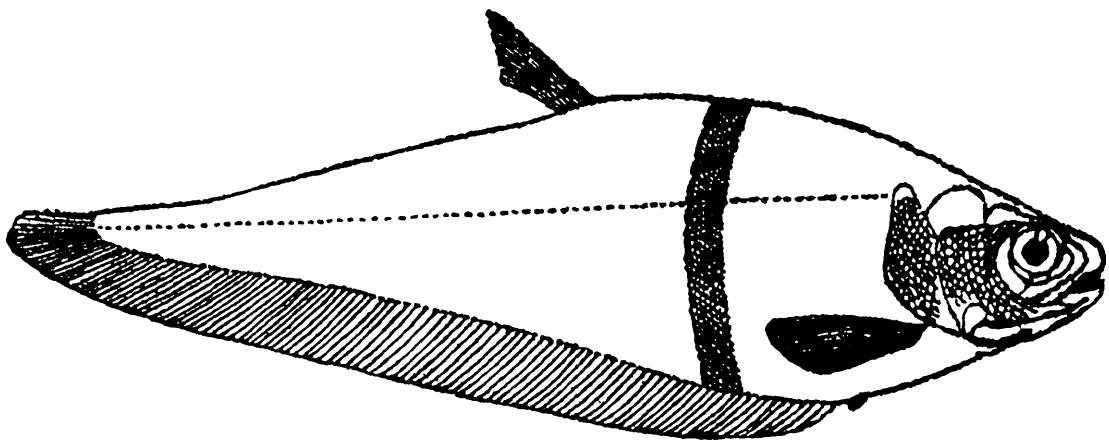
88. *Notopterus notopterus* (Pallas)

(Text-fig. 61)

1769. *Gymnotus notopterus* Pallas, *Spicil. Zool.*, 7, pl. 6, fig. 2 (type-locality : Indian Ocean).

1889. *Notopterus kapirot* Day, *Fauna Brit. India*, Fish., 1, p. 406.

Length 5 to 5.5, depth 3.5 to 4 in total length. Eyes 4.5 to 5 in head. Dorsal profile not so convex as ventral profile. Maxilla reaches to midorbit. Preorbital serrated. Dorsal small, in the caudal region ; its origin midway between snout and caudal end, far behind the pelvic origin. Pelvics rudimentary. Anal and caudal united. Scales on opercle larger than those on body ; about 225 in the lateral line. Silvery becoming grayish on back ; with some gloss of yellow on head ; many fine grayish spots all over ; eyes golden.



TEXT-FIG. 61.—Lateral view of *Notopterus notopterus* (Pallas). (After Day).

Distribution.—INDIA : ponds, fresh and brackish waters of E. Punjab, U. P., W. Bengal, Assam, Chilka Lake, Orissa, Madras, Deccan Deolali, Poona, Malabar ; PAKISTAN : ponds, fresh and brackish, waters of W Punjab, E. Pakistan.—Burma, Malay Peninsula, Malay Archipelago, Siam.

Remarks.—It grows to 609 mm. (2 feet) or more in length.

Order SCOPELIFORMES

XXII. Family SYNODIADE

49. Genus *Harpodon* Le Sueur

1825. *Harpodon* Le Sueur, *J. Acad. nat. Sci. Philad.*, p. 48. (Type, *Salmo microps* Le Sueur = *Osmerus nehereus* Ham.)

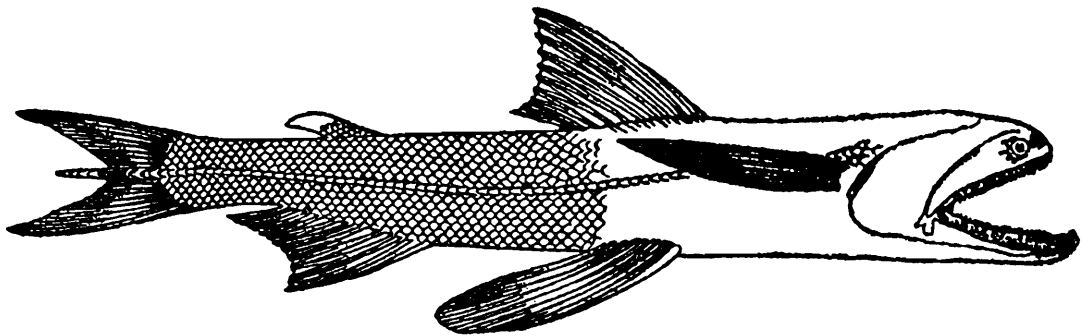
89. *Harpodon nehereus* (Ham.)

(Text-fig. 62)

1822. *Osmerus nehereus* Hamilton, *Fish Ganges*, pp. 209, 380 (type-locality : mouth of the Ganges).

1889. *Harpodon nehereus* Day, *Fauna Brit. India*, Fish., 1, p. 412.

Head 5.2 to 6, depth 6.5 to 7.5 in total length. Eyes 1.6 in head. Snout short, obtuse. Lower jaw longer than upper jaw, cleft of mouth reaching preopercular angle. Teeth curved and erectile. Dorsal origin nearer to snout end than to caudal base and midway between anal and pectoral bases. Adipose dorsal present. Pelvics long, reaching beyond anal origin ; origin nearly opposite to dorsal origin. Anal origin much nearer to caudal. Caudal trilobed. Scales diaphanous and distinguished with difficulty in the fresh fish. Lateral line lightly keeled. Phosphorescent when alive ; mostly semitransparent like gelatine with abdomen bluish silvery ; with minute starlike black or brownish dots.



TEXT-FIG. 62.—Lateral view of *Harpodon nehereus* (Ham.) (After Day).

Distribution.—INDIA : Maltah river, Diamond Harbour, Sandheads, mouth of the Hoogly river, estuaries of W. Bengal, Madras, Coromandel coast, Travancore-Cochin coast, Malabar coast ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Zanzibar, Malaya, Malay Archipelago, China.

Remarks.—It attains at least 381 mm. (1½ feet) in length. It is more commonly found on the western coast from Bombay to Ratnagiri along the Konkan coast and upto the Gulf of Cambay along the Gujerat coast. It forms an important fishery in the Bombay State.

50. Genus *Saurida* V

1849. *Saurida* Valenciennes, *Hist. nat. Poiss.*, 22, p. 499. (Type, *Salmo tumbil* Bl., logotypic.)

90. *Saurida tumbil* (Bl.)

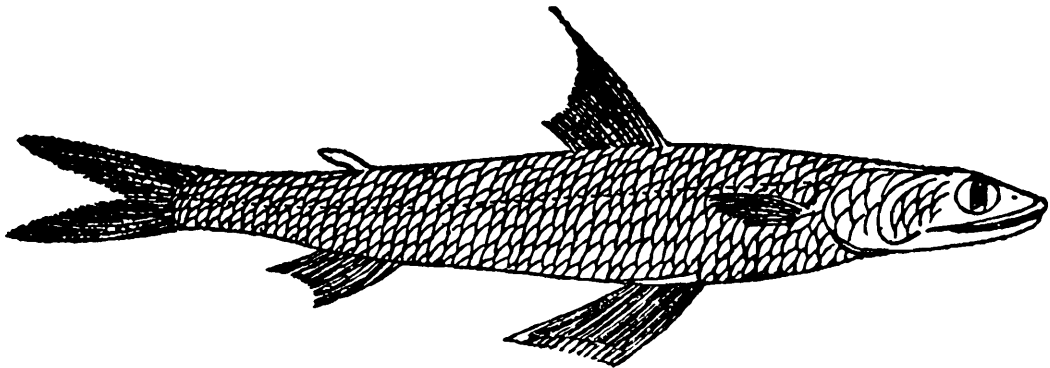
(Text-fig. 63)

1795. *Salmo tumbil* Bloch, *Naturg. Ausland. Fische*, 9, p. 112, pl. 430 (type-locality : not given).

1889. *Saurida tumbil* Day, *Fauna Brit. India*, Fish., 1, p. 410, fig. 131.

Head 4.5 to 5.3, depth 7.5 to 8 in total length. Eyes with board adipose lids, 5 in head. Snout pointed, cleft of mouth extending to 1.5 eye diameters behind orbit. Teeth in two bands on palate. Dorsal origin nearer to snout end than to caudal base. Adipose dorsal present. Pelvics with nine rays, inner rays not longer than outer rays ; origin in

front of dorsal origin. Anal origin nearer to caudal base than to pelvic base. Lateral line scales 54-63 ; lateral transverse scales $14\frac{1}{2}/7$. Brownish gray along back, becoming dull white shot with yellow beneath ; dorsal and upper lobe of caudal often dotted dusky.



TEXT-FIG. 63.—Lateral view of *Saurida tumbil* (Bl.). (After Day).

Distribution.—INDIA : W Bengal coast, Orissa coast, Madras, Coromandel coast, Travancore-Cochin coast, Malabar coast, Bombay, Andamans ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Red Sea, Madagascar, Zanzibar, Malay Archipelago, Philippines, Formosa, China, Japan, Australia, Sandwich Islands.

Remarks.—It grows to about 304 mm. (a foot) in length.

51. Genus *Trachinocephalus* Gill

1861. *Trachinocephalus* Gill, *Proc. Acad. nat. Sci. Philad. Suppl.*, p. 53. (Type, *Salmo myops* Schn., orthotypic.)

1897. *Goodella* Ogilby, *Proc. Linn. Soc. N. S.*, 22, p. 249. (Type, *G. hypozona* Ogilby, orthotypic.)

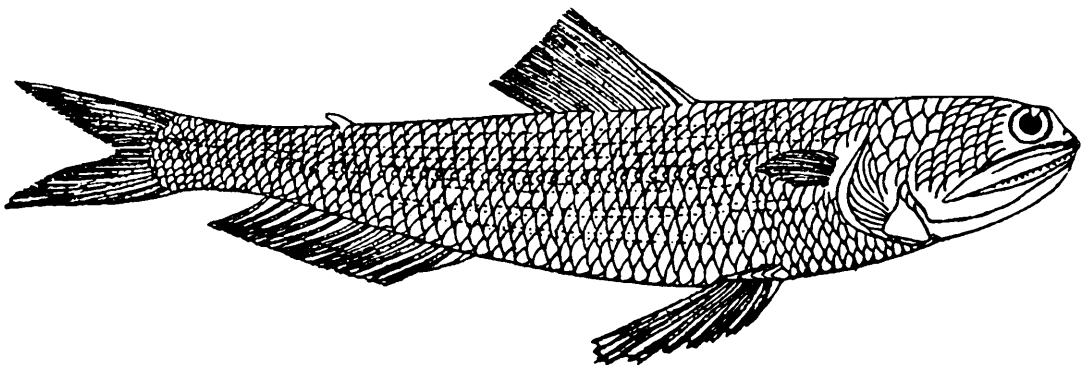
91. *Trachinocephalus myops* (Schn.)

(Text-fig. 64)

1801. *Salmo myops* Schneider, *Syst. Ichth. Bloch*, p. 421, (type-locality : St. Helena).

1889. *Saurus myops* Day, *Fauna Brit. India*, Fish., 1, p. 409, fig. 130.

Head 4.2, depth 6 in total length. Eyes 6 in head. Snout rather obtuse, short. Cleft of mouth oblique, extending 2 eye diameters behind



TEXT-FIG. 64.—Lateral view of *Trichinocephalus myops* (Schn.). (After Day).

orbit. A single band of teeth on palate. Dorsal origin midway between snout end and adipose dorsal. Adipose dorsal small. Pectorals small. Pelvics with 8 rays, inner rays being longer than outer rays ; origin much

in front of dorsal origin. Anal longer than dorsal, with 15-16 rays. Lateral line scales 54-58, lateral transverse scales $3\frac{1}{2}/7$. Golden brown in the upper half of body, paler at sides and silvery below ; with 3 or 4 black edged, longitudinal lines ; dorsal with 2 of 3 rows of yellow spots ; outer half of anal yellow.

Distribution.—INDIA : Travancore-Cochin coast ; PAKISTAN : coast of Sind.—Natal, Malay Archipelago, Philippines, Formosa, China, Japan, Oceania.

Remarks.—It attains 381 mm. ($1\frac{1}{4}$ feet) in length.

Order CYPRINIFORMES

Division Cyprini

Suborder Cyprinoidei

XXII. Family CYPRINIDAE

52. Genus *Chela* Ham.

1822. *Chela* Hamilton, *Fish. Ganges*, p. 383, (Type, *Cyprinus cachius* Ham., designated by Bleeker in 1862.)

1868. *Cachius* Gunther, *Cat. Fish. Brit. Mus.*, 7, p. 339. (Type, *C. atpar* Ham.)

92. *Chela atpar* (Ham.)

1822. *Cyprinus cachius* Hamilton, *Fish Ganges*, pp. 258, 384 (type-locality : the Ganges, about the commencement of the Delta).

1889. *Perilampus atpar* Day, *Fauna Brit. India*, Fish., 1, p. 359.

Head 5.5 to 6, depth 4 to 4.2 in total length. Eyes 3 to 4 in length. Cleft of mouth moderately oblique, directed upwards. Dorsal origin opposite to the second third of anal. Pectorals not reaching anal. Pelvic with an elongated ray reaching middle or even end of anal base. Anal with 22-24 rays. Lateral line scales 55-65 ; 4 rows of scales between lateral line and pelvic base. Silvery, with a burnished lateral band ; dorsal and caudal yellow.

Distribution.—INDIA : freshwaters of Assam, W. Bengal, Orissa, M. P., Madras and Mysore states ; PAKISTAN : freshwaters of E. Pakistan.—Burma.

Remarks.—This larvicidal fish grows to 102 mm. (4 inches) in length.

93. *Chela laubuca* (Ham.)

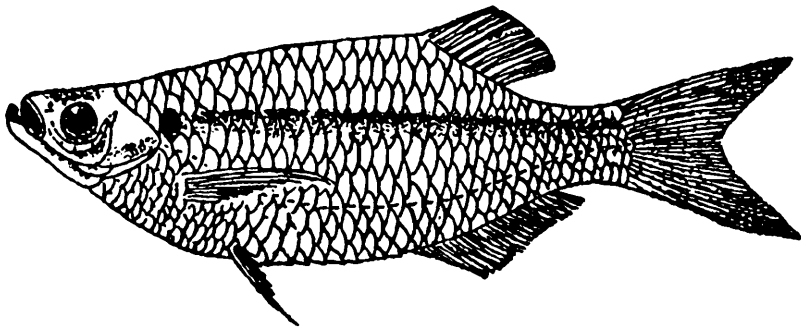
(Text-fig. 65)

1822. *Cyprinus laubuca* Hamilton, *Fish. Ganges*, pp. 260, 380 (type-locality : ponds of the northern parts of Bengal).

1889. *Perilampus laubuca* Day, *Fauna Brit. India*, Fish., 1, p. 360, fig. 112.

Head 5 to 6, depth 3.5 to 4.2 in total length. Eyes 3 to 3.5 in head. Cleft of mouth very much oblique, abruptly directed upwards. Dorsal origin midway between hind border of eye and the extremity of the caudal fin, slightly behind anal origin. Pectoral reaching anal. Pelvic with an elongated ray extending to middle or end of anal base. Anal

with 19-23 rays. Lateral line scales 34-37 ; $3\frac{1}{2}$ rows of scales between lateral line and pelvic base. Silvery, with a few golden vertical stripes when alive ; fine dots over body.



TEXT-FIG. 65.—Lateral view of *Chela laubuca* (Ham.). (After Day).

Distribution.—INDIA : freshwaters of Assam, W. Bengal, Orissa. Central India (M. P.) ; PAKISTAN : freshwaters of E. Pakistan.—Burma, Ceylon, Sumatra, Siam.

Remarks.—This larvicidal fish grows to 89 mm. ($3\frac{1}{2}$ inches) in length.

53. Genus *Oxygaster* v. Hass.

1823. *Oxygaster* van Hasselt, *Algem. Konst. Letterbode*, 1, p. 132. (Type, *O. anomalura* v. Hass.)

94. *Oxygaster bacaila* (Ham.)

1822. *Cyprinus bacaila* Hamilton, *Fish. Ganges*, pp. 265, 384, pl. 8, fig. 76 (type-locality : freshwater rivers of all the Gangetic provinces).

1889. *Chela bacaila* Day, *Fauna Brit. India*, Fish., 1, p. 367.

Head 5.2 to 6, depth 5.5 to 6 in total length. Eyes 3.5 to 3.7 in head. Snout longer than eye. Cleft of mouth reaches to below first fourth of eye. Keeled portion of ventral profile commences opposite pectoral fin. Suborbital ring of bones broad, nearly covering cheek. Dorsal origin half in advance of anal. Anal rays 13-15. Lateral line scales 86-100 ; lateral transverse scales 17-19/6-10. Uniform silvery.

Distribution.—INDIA : freshwaters of Assam, W Bengal, Punjab (I), U. P., Bihar, Orissa, Baroda, Nepal state or throughout India, except Malabar, Travancore-Cochin, Mysore and Madras ; PAKISTAN : freshwaters of W Punjab, E. Pakistan.

Remarks.—It attains at least 177 mm. (7 inches) in length.

95. *Oxygaster clupeoides* (Bl.)

1795. *Cyprinus clupeoides* Bloch, *Naturg. Ausland. Fische*, 12, p. 49, pl. 408, fig. (type-locality : Tranquebar).

1889. *Chela clupeoides* Day, *Fauna Brit. India*, Fish., 1, p. 366.

Head 5.5 to 5.7, depth 5.5 (to 7.5 in nourished examples) in total length. Eyes 4 in head. Snout equals eye diameter. Cleft of mouth nearly reaches to below first fourth of eye. A knob at the symphysis of the lower jaw. Keeled portion of ventral profile commences opposite pectoral fin. Suborbital ring of bones almost covering cheek. Dorsal origin half in advance of anal. Anal rays 13-14. Lateral line scales 80-93 ; lateral transverse scales 12-15/6 ; 2 rows of scales between lateral line and pelvic base. Silvery.

Distribution.—INDIA : freshwaters of Cutch, Baroda, M. P., the Deccan, Madras and Mysore states.—Burma.

Remarks.—It grows to 152 mm. (6 inches) in length and is very good eating.

96. *Oxygaster gora* (Ham.)

1822. *Cyprinus gora* Hamilton, *Fish. Ganges*, pp. 263, 384 (type-locality : Ganges and its tributaries).

1889. *Chela gora* Day, *Fauna Brit. India*, Fish., 1, p. 362.

Head 5 to 5.2, depth 6 in total length. Eyes 5 in head. Snout longer than eye. Cleft of mouth reaches to below first fourth of eye. Keeled portion of ventral profile commences behind pelvics. Suborbital ring of bones covering two-thirds of cheek. Dorsal origin slightly in front of anal origin. Anal rays 15-16. Lateral line scales 140-160 ; lateral transverse scales 18-20/18. Silvery.

Distribution.—INDIA : freshwaters of Assam, W. Bengal, Punjab (I), U. P., Bihar, Orissa ; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.

Remarks.—It attains at least 228 mm. (9 inches) in length.

54. Genus *Barilius* Ham.

1822. *Barilius* Hamilton, *Fish. Ganges*, p. 384. (Type, *Cyprinus barila* Ham., tautotypic.)

97. *Barilius barila* Ham.

1822. *Barilius barila* Hamilton, *Fish. Ganges*, pp. 267, 384 (type-locality : rivers of northern Bengal).

1889. *Barilius barila* Day, *Fauna Brit. India*, Fish., 1, p. 348.

Head 5 to 5.5, depth 5.2 to 5.5 in total length. Eyes 3.2 to 4 in head. Jaws equal. Maxilla reaches to below first third of eye. Third suborbital bone wide, nearly touching preopercular ridge. A small rostral pair of barbels. Dorsal origin midway between postorbital margin and caudal base ; almost entirely in front of anal. Anal with 13 rays. Lateral line scales 43-46 ; 1½ to 2 rows between lateral line and pelvic base. Predorsal scales 18. Silvery, with 14 to 15 vertical blue bars on side.

Distribution.—INDIA : freshwaters of Manipur, Assam, W. Bengal, Delhi, U. P., Bihar, Orissa, M. P., and Mysore states ; PAKISTAN : freshwaters of E. Pakistan.

Remarks.—It grows to 102 mm. (4 inches) in length.

98. *Barilius bendelisis* (Ham.)

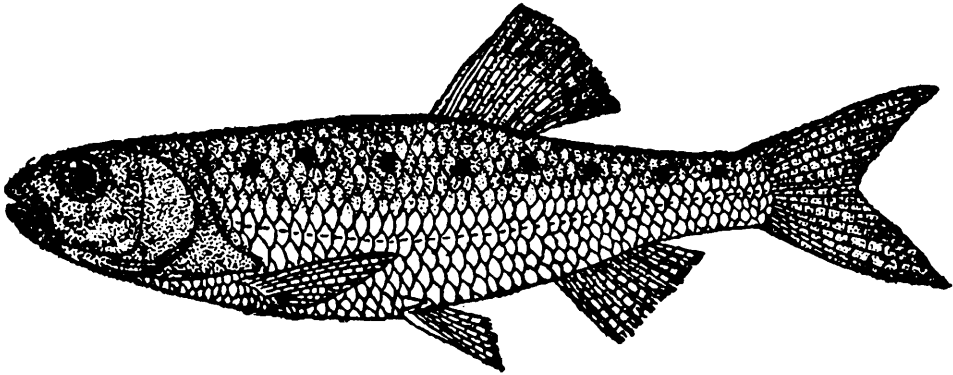
(Text-fig. 66)

1807. *Cyprinus bendelisis* Hamilton, *Journey Mysore*, 3, p. 345, pl. 32 (type-locality : rivers of Mysore).

1889. *Barilius bendelisis* Day, *Fauna Brit. India*, Fish., 1, p. 347.

Head 4.6 to 5.2, depth 4.5 (to 5.2 in young) in total length. Eyes 4.2 to 4.6 in head. Maxilla reaches to anterior third of eye. Third suborbital bone varying from equal to twice as high as uncovered part below it. Four short barbels, rostral pair occasionally absent. Dorsal origin nearer to caudal base than to snout end, its base, not extending to over anal. Anal rays 9-10. Pectorals with outer rays thickened.

Lateral line scales 40-43 ; $2\frac{1}{2}$ to $3\frac{1}{2}$ rows between lateral line and pelvic base. Predorsal scales 20. Slaty gray above, becoming purplish silvery at sides ; short, vertical bars which become indistinct in adults ; dorsal, and caudal edged with gray ; other fins whitish, tinged with orange.



TEXT-FIG. 66.—Lateral view of *Barilius bendelisis* (Ham.). (After Day).

Distribution.—INDIA : freshwaters of Assam, W. Bengal, Punjab(I), Simla, U. P., Bihar, Coimbatore, Palghat, Mettupalayam, Nilgiris ; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.—Ceylon.

Remarks.—It attains at least 152 mm. (6 inches) in length.

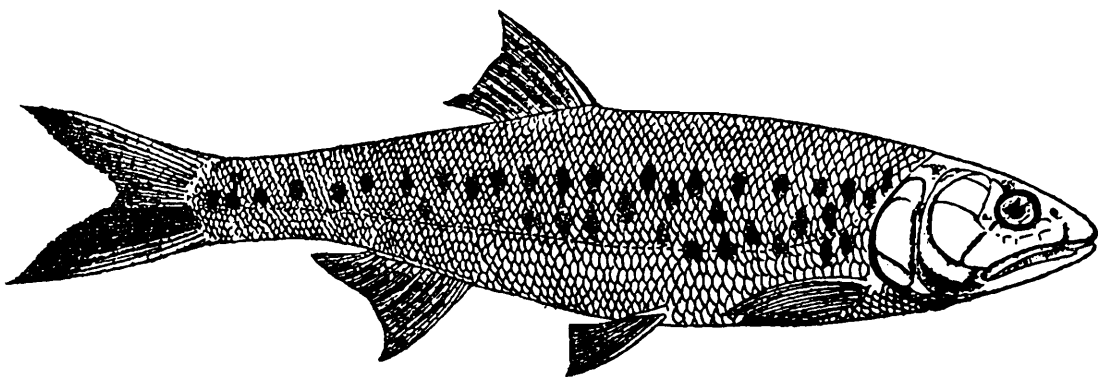
99. *Barilius bola* (Ham.)

(Text-fig. 67)

1822. *Cyprinus bola* Hamilton, *Fish. Ganges*, pp. 274, 285 (type-locality : Brahmaputra).

1889. *Barilius bola* Day, *Fauna Brit. India*, Fish., 1, p. 352, fig. 110.

Head 4.5 to 4.6, depth 5 to 6 in total length. Eyes 4.5 to 7, in the middle of head. Mouth deeply cleft, maxilla extending by about an eye diameter beyond postorbital margin. A knob above symphysis of lower jaw. Suborbital bone wider than opercle. No barbels. Dorsal origin midway between angle of preopercle and caudal base. Anal with 13 rays ; origin just behind dorsal base. Lateral line scales 88-94 ; $4\frac{1}{2}$ to 5 rows between lateral line and pelvic base. Predorsal scales 40. Silvery with 2 or more vertical rows of bluish blotches along sides ; lower half of dorsal grayish, caudal orange, tinted grayish black.



TEXT-FIG. 67.—Lateral view of *Barilius bola* (Ham.). (After Day).

Distribution.—INDIA : freshwaters of Assam, W. Bengal, E. Punjab, U.P., Bihar and Orissa states ; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.—Burma.

Remarks.—It is an important game fish attaining at least 304 mm. (a foot) in length.

100. *Barilius gatensis* (V.)

1844. *Leuciscus gatensis* Valenciennes, *Hist. nat. Poiss.*, 18, pl. 503, p. 309 (type-locality : Western Ghats).

1889. *Barilius gatensis* Day, *Fauna Brit. India*, Fish., 1, p. 349.

Head 4.3 to 4.5, depth 4 to 4.5 in total length. Eyes 3 to 4.5 in head. Cleft of mouth and maxilla extending to below middle of eyes. Third suborbital bone nearly thrice as broad as the uncovered part of cheek below it. Two very minute pairs of barbules which sometimes may be absent. Dorsal origin midway between middle of caudal fin and end of snout. Anal with 15-17 rays ; origin before post-end of dorsal base. Pectorals with outer rays stiff. Lateral line scales 39-40 ; $2\frac{1}{2}$ rows between lateral line and pelvic base ; silvery gray, with about 15 vertical bars descending from back ; dorsal and anal with dark base and light margins.

Distribution.—INDIA : freshwaters of Peninsular India, Coorg, Mysore, Western Ghats, Travancore-Cochin, Malabar, Nilgiris.

Remarks.—It attains at least 152 mm. (6 inches) in length.

101. *Barilius vagra* Ham.

1822. *Barilius vagra* Hamilton, *Fish. Ganges*, pp. 269, 385 (type-locality : the Ganges at Patna).

1889. *Barilius vagra* Day, *Fauna Brit. India*, Fish., 1, p. 345.

Head 5 to 5.5, depth 5 to 6 in total length. Eyes 3.5 to 4 in head. Lower jaw slightly longer ; maxilla reaches to below middle of eye. Third suborbital bone about twice as broad as the uncovered part of cheek below it. Two pairs of barbels, maxillary very short, rostral about half as long as head. Dorsal origin midway between hind edge of eye and root of caudal. Anal with 13-15 rays ; origin just before post-end of dorsal base. Lateral line scales 42-44 ; 2 to $2\frac{1}{2}$ rows between lateral line and pelvic base. Predorsal scales 20. Silvery, with 10 to 14 bluish bars descending from back ; fins yellowish, caudal edges gray.

Distribution.—INDIA : freshwaters of Assam, W. Bengal, Bihar, E. Punjab, Western Himalayas, Nepal ; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.—Ceylon.

Remarks.—It attains about 127 mm. (5 inches) in length.

55. Genus *Danio* Hamilton

1822. *Danio* Hamilton, *Fish. Ganges*, pp. 321, 390. (Type, *Cyprinus dangila* Ham.)

1916. *Brachydanio* Weber & de Beaufort, *Fish. Indo-Austral. Archipel.*, 3, p. 85. (Type, *B. albolineata* Blyth.)

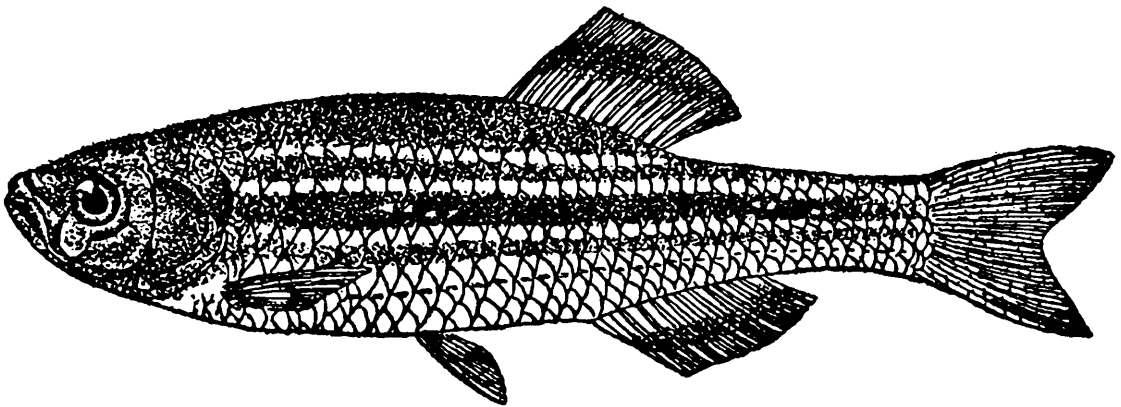
102. *Danio aequipinnatus* (Mc Clell.)

(Text-fig. 68)

1839. *Perilampus aequipinnatus* Mc Clelland, *Asiat. Res.*, 19, p. 393, pl. 60, fig. 1 (type-locality : Assam.)

1889. *Danio aequipinnatus* Day, *Fauna Brit. India*, Fish., 1, P. 356.

Head 5, depth 4 to 4.5 in total length. Eyes 4 in head. Cleft of mouth oblique, extending to below front margin of eye. A blunt knob at the symphysis of lower jaw. Third suborbital almost touches preopercular ridge. Barbels 2 pairs, rostral half as long as and maxillary much shorter than eyes. Dorsal origin midway between centre of eyes and base of caudal. Pectorals as long as head without snout, nearly reaching pelvics. Lateral line scales 32-34; $1\frac{1}{2}$ rows between lateral line and pelvic base. Predorsal scales 13. Yellowish white with a wide bluish, lateral band, extending from eye to centre of caudal base; another narrow band above and two other lighter ones below them; fins yellowish, dorsal and anal with a broad, bluish band.



TEXT-FIG. 68.—Lateral view of *Danio aequipinnatus* Mc Clell. (After Day).

Distribution.—INDIA : freshwaters of Assam, Manipur, W Bengal, Eastern Himalayas, Darjeeling, Sikkim, Peninsular India, Nagpur, Satara, Poona, Western Ghats, Mysore, Travancore-Cochin, Malabar ; PAKISTAN : freshwaters of E. Pakistan.—Burma, Ceylon, Siam.

Remarks.—It attains 152 mm. (6 inches) in length.

103. *Danio devario* (Ham.)

1822. *Cyprinus devario* Hamilton, *Fish. Ganges*, pp. 341, 393, pl. 6, fig. 94 (type-locality : rivers and ponds of Bengal).

1889. *Danio devario* Day, *Fauna Brit. India, Fish.*, 1, p. 354.

Head 5 to 5.2, depth 3.2 to 4 in total length. Eyes 3 in head. Lower jaw longer, maxilla reaching below front margin of eye. Third suborbital bone broad. No barbels. Dorsal origin in front of anal origin and midway between anterior border of eye and base of caudal. Lateral line scales 41-48; $2\frac{1}{2}$ rows between lateral line and pelvic base. Predorsal scales 16. Greenish above, silvery at sides; front part of body reticulated at its centre by steel blue lines divided from one another by narrow, vertical, yellow bands; three bluish lines, divided by yellow bands extending backwards to caudal.

Distribution.—INDIA : freshwaters of Assam, W. Bengal, Eastern Himalayas, E. Punjab, U.P., Western Himalayas, Bihar, Orissa, M.P., Ahmedabad ; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.

Remarks.—It attains 102 mm. (4 inches) in length.

56. Genus *Esomus* Swainson

1839. *Esomus* Swainson, *Nat. Hist. Fish.*, 2, pp. 185, 285. (Type, *E. vittatus* Swns.=*Cyprinus danrica* Ham., haplotypic.)
 1842. *Nuria Valenciennes*, *Hist. nat. Poiss.*, 1, p. 238. (Type, *N. thermoicos* V., logotypic.)

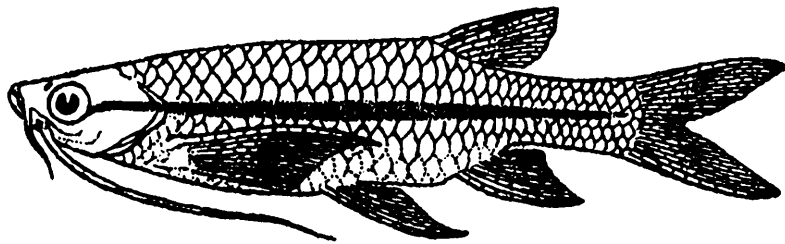
104. *Esomus danrica* (Ham.)

(Text-fig. 69)

1822. *Cyprinus danrica* Hamilton, *Fish. Ganges*, pp. 325, 390, pl. 16, fig.88 (type-locality : ponds and ditches of Bengal).

1889. *Nuria danrica* Day, *Fauna Brit. India*, Fish., p. 1, 334.

Head 5.2 to 5.5, depth 5.5 in total length. Eyes 3.2 to 3.5 in head. Mouth obliquely upwards. Suborbitals broad. Barbels 2 pairs, maxillary reaching to base of pelvics or even caudal. Dorsal origin nearer



TEXT-FIG. 69.—Lateral view of *Esomus danrica* (Ham.). (After Day).

to caudal base than to pectoral base. Lateral line present or absent ; lateral line scales 30-34 ; 2 rows between lateral line and pelvic base. Predorsal scales 18. Pale olive above, silvery below ; with a broad, black lateral band which sometimes may be absent.

Distribution.—INDIA : freshwaters of Assam, W. Bengal, E. Punjab, U.P., Bihar, M.P., Orissa, Madras, Ahmedabad ; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.—Burma, Ceylon, Malaya, Malaya Archipelago, Siam.

Remarks.—This larvicidal fish attains at least 127 mm. (5 inches) in length.

57. Genus *Rasbora* Blkr.

1859. *Rasbora* Bleeker, *N t. Tijdschr. Ned.-Ind.*, 20, p. 435. (Type, *Cyprinus rasbora* Ham., tautotypic.)

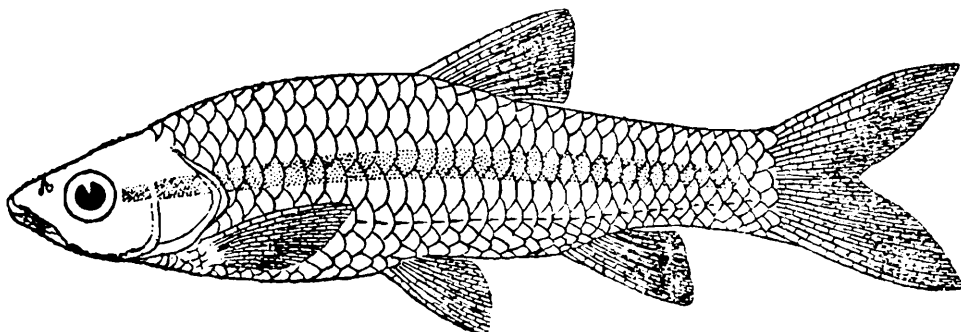
105. *Rasbora daniconius* (Ham.)

(Text-fig. 70)

1822. *Cyprinus daniconius* Hamilton, *Fish. Ganges*, pp. 327, 391, pl. 15, fig. 89 (type-locality : the rivers of southern Bengal).

1889. *Rasbora daniconius* Day, *Fauna Brit. India*, Fish., 1, p. 336.

Head 4.5 to 5, depth 4.5 to 6 in total length. Eyes 3.6 to 4 in head. Cleft of mouth reaches to below front border of eye. Dorsal profile



TEXT-FIG. 70.—Lateral view of *Rasbora daniconius* (Ham.). (After Day).

Dorsal profile more convex than ventral profile. No barbels. Dorsal origin nearer to caudal base than to snout end, equidistant between pelvic and anal origins or nearer to pelvic origin. Pectorals do not reach pelvic base.

Lateral line scales 31-34 ; 2 rows between lateral line and pelvic base. Predorsal scales 14. Greenish yellow above, silvery at sides with a blue-black lateral stripe narrowly edged with golden yellow ; often the lateral stripe exists at its termination towards caudal region or in some young specimens it may be bright silvery ; fins pale orange, caudal lobes often tipped gray.

Distribution.—INDIA : freshwaters of all the Indian states ; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.—Burma, Ceylon, Malaya.

Remarks.—It attains about 203 mm. (8 inches) in length.

106. *Rasbora rasbora* (Ham.)

1822. *Cyprinus rasbora* Hamilton, *Fish. Ganges*, pp. 329, 391, pl. 2, fig. 90 (type-locality : ponds of Bengal).

1889. *Rasbora buchanani* Day, *Fauna Brit. India*, Fish., 1, p. 337, fig. 107.

Head 5, depth 4 in total length. Eyes 3.5 in head. Cleft of mouth almost reaches front edge of eye. Ventral profile more convex than dorsal profile. No barbels. Dorsal origin nearer to caudal base than to front edge of eye. Pectorals almost reaches pelvic base. Lateral line scales 26-29 ; 2 rows between lateral line and pelvic base. Predorsal scales 12. Olive brown above, silvery at sides with a faint, lateral streak.

Distribution.—INDIA : freshwaters of all the Indian states ; most common in the valley of the Ganges and along the Coromandel coast ; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.—Burma, Malaya, Siam.

Remarks.—It attains 102-128 mm. (4 to 5 inches) in length.

58. Genus *Amblypharyngodon* Blkr.

1843. *Mola* (nec Koelreuter, 1770) Heckel, *Abbild. Besch. Fische Syr. Gutten Cypr.*, p. 257. (Type, *Cyprinus mola* Ham., inadmissible.)

1859. *Amblypharyngodon* Bleeker, *Nat. Tijdschr. Ned.-Ind.*, p. 433. (Type, (*Cyprinus mola* Ham., orthotypic.)

1865. *Brachygramma* Day, *Proc. zool. Soc. Lond.*, p. 296. (Type, *B. jerdoni* Day, orthotypic.)

107. *Amblypharyngodon mola* (Ham.)

1822. *Cyprinus mola* Hamilton, *Fish. Ganges*, pp. 334, 392, pl. 38, fig. 92 (type-locality : ponds and freshwater rivers in every part of the Gangetic provinces).

1889. *Amblypharyngodon mola* Day, *Fauna Brit. India*, Fish., 1, p. 291, fig. 101.

Head 5, depth 4 to 4.2 in total length. Eyes 3.5 to 4 in head. Dorsal profile more convex than ventral profile. Dorsal origin midway between front border of eye and caudal base, behind pelvic origin. Lateral line ceases after 15 scales ; 9-10 rows between it and pelvic base. With a silvery lateral band ; dorsal and caudal usually with dark markings.

Distribution.—INDIA : freshwaters of all the Indian states except the Malabar coast ; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.—Burma.

Remarks.—It attains 75 mm. (2½ inches) in length.

59. Genus *Aspidoparia* Heckel

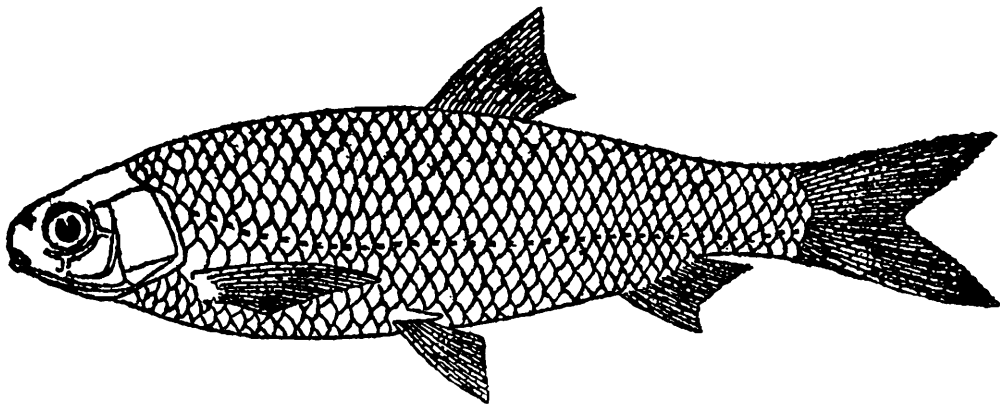
1843. *Aspidoparia* Heckel, in Fenzl. *Abbild. Thiere Pfl. Syr. Fish.*, p. 186. (Type, *A. sardina* Heckel=*A. morar* Ham.)
 1859. *Morara* Bleeker, *Nat. Tijds. Ned. Indie*, 20, p. 102. (Type, *Cyprinus morar* Ham., orthotypic.)

108. *Aspidoparia morar* (Ham.)

(Text-fig. 71)

1882. *Cyprinus morar* Hamilton, *Fish. Ganges*, pp. 264, 381, pl. 31, fig. 75 (type-locality : rivers Yamuna and Tista, two large but distant branches of the Ganges).
 1889. *Aspidoparia morar* Day, *Fauna Brit. India, Fish.*, 1, p. 338, fig. 108.

Head 5 to 5·7, depth 4 to 5·2 in total length. Eyes 3·6 in head. Snout very obtuse. Upper jaw overhanging lower jaw. Cheeks covered by broad suborbital ring of bones. Dorsal origin midway between hind margin of eye and base of caudal, behind pelvic origin. Lateral line scales 38-42 ; $2\frac{1}{2}$ to 3 rows between lateral line and pelvic base. Predorsal scales 20. Back light brown, divided from the silvery side by a burnished streak.



TEXT-FIG. 71.—Lateral view of *Aspidoparia morar* (Ham.). (After Day).

Distribution.—INDIA : freshwaters of all the Indian states except the western coast and localities south of the Kistna river ; PAKISTAN : freshwaters of W. Punjab and E. Pakistan.—Burma, Siam.

Remarks.—It attains at least 177 mm. (7 inches) in length.

60. Genus *Chagunius* H. M. Smith

1938. *Chagunius* H. M. Smith, *Proc. biol. Soc. Wash.*, 51, p. 157. Type-*Cyprinus chagunio* Ham., orthotypic.)

109. *Chagunius chagunio* (Ham.)

1922. *Cyprinus chagunio* Hamilton, *Fish. Ganges*, pp. 295, 387 (type-locality : the Yamuna and in the northern rivers of Bihar and Bengal.)
 1889. *Barbus chagunio* Day, *Fauna Brit. India, Fish.*, 1, p. 259, fig. 103.

Head 4·5 to 5, depth 4 to 4·2 in total length. Eyes 5 to 6·5 in head. Suborbital region, cheeks and anterior superior margin of orbit covered with numerous pores. Mouth more or less inferior, directed upwards. Two pairs of barbels, longer than eye. Dorsal origin midway between end of snout and base of caudal. Dorsal spine strong, bony and serrated, its length more than head excluding snout. Posterior anal rays

elongated in males. Lateral line complete, with 44-47 scales in the longitudinal series ; $5\frac{1}{2}$ to $6\frac{1}{2}$ rows between lateral line and pelvic base, Predorsal scales 15. Uniform silvery shot with pink ; fins reddish with lighter edges ; dorsal edged black.

Distribution.—INDIA : freshwaters of Assam, W. Bengal, Darjeeling, Eastern Himalayas, E. Punjab, Western Himalayas, U.P., Bihar, Orissa, but not recorded from the Peninsular India ; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.—Burma, Siam.

Remarks.—It attains 457 mm. ($1\frac{1}{2}$ feet) in length.

61. Genus *Acrossocheilus* Oshima

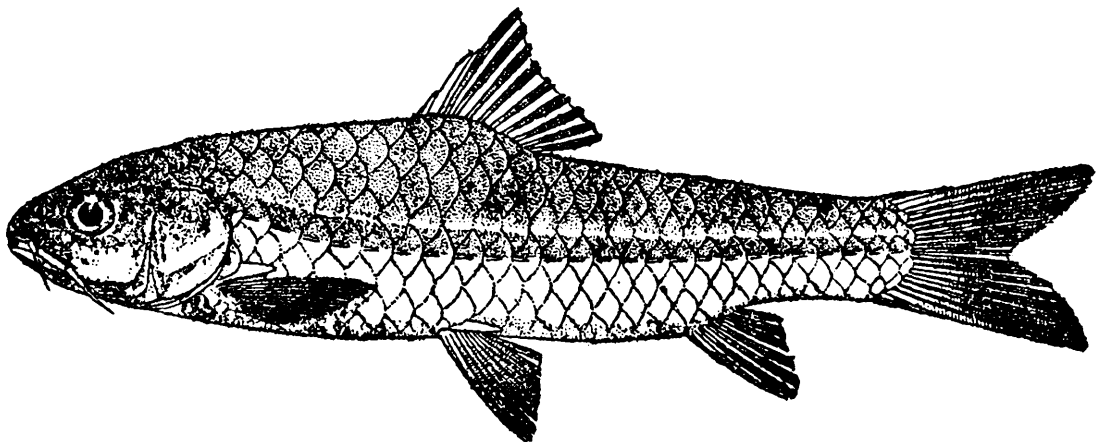
1919. *Acrossocheilus* Oshima, *Ann. Carnegie Mus.*, 12, p. 206. (Type, *Gymnostomus formosanus* Regan, orthotypic.)
 1916. *Lissocheilus* (*nec* Zittel, 1882) Weber & de Beaufort, *Fish. Indo-Austral. Archipel.*, 3, p. 167. (Type, *L. sumatranus* Weber & de Beaufort, orthotypic ; inadmissible).

110. *Acrossocheilus hexagonolepis* (Mc Clell.)

(Text-fig. 72)

1839. *Burbus hexagonolepis* Mc Clelland, *Asiat. Res.*, 19, pp. 270, 336, pl. 41, fig. 3 (type-locality : Upper Assam).
 1889. *Burbus hexagonolepis* Day, *Fauna Brit. India*, Fish., 1, p. 306.
 1889. *Barbus dukai* Day, *Fauna Brit. India*, Fish., 1, p. 306.

Head 4.5 to 5.6, depth 4.3 to 5.5 in total length. Eyes 2.6 to 4.2 in head, relatively larger in young specimens and situated mostly in anterior half of head. Sides of snout and suborbital region with horny tubercles. Lips thin, continuous round angles of mouth, with the labial fold widely interrupted in the middle. Two pairs of barbels, longer than eye. Dorsal



TEXT-FIG. 72.—Lateral view of *Acrossocheilus hexagonolepis* (Mc Clell.). (After Hora).

origin opposite to or slightly in front of pelvic origin ; dorsal spine usually strong, bony, smooth, about as long as head excluding snout. Lateral line scales 22-32 ; $2\frac{1}{2}$ to $3\frac{1}{2}$ rows of scales between lateral line and pelvic base. Predorsal scales 8-10, olive green superiorly, silvery-white below, with a golden yellow lateral band above lateral line ; fins mainly slate-gray paling towards their margins.

Distribution.—INDIA : freshwaters of Assam, E. Bengal, Darjeeling, Eastern Himalayas, Nepal ; PAKISTAN : freshwaters of E. Pakistan.—Burma, Malaya, Malay Archipelago, Siam.

Remarks.—It is an important game fish and attains 609 mm. (2 feet) and more in length.

62. Genus *Tor* Gray

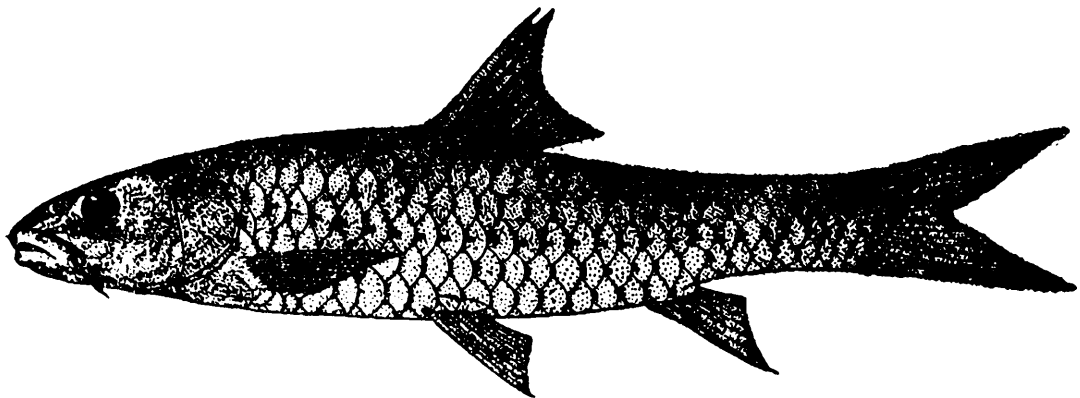
1833-34. *Tor* Gray, *Ill. Ind. Zool. Hardwicke*, 2, p. 96. (Type, *Cyprinus tor* Ham.=*Tor hamiltoni* Gray, monotypic.)

111. *Tor khudree* (Sykes)

(Text-fig. 73)

1838. *Barbus khudree* Sykes, *Proc. zool. Soc. Lond.*, p. 159 (type-locality Mota Mola river, 8 miles east of Poona).

Head 4.5 to 4.7, depth 4.3 to 4.6 in total length. Eyes 5.5 to 7 in head, in the anterior half of head. Sides of snout and suborbital region tuberculated. Lips thick, with the labial fold continuous. Two pairs of barbels, longer than eye. Dorsal origin opposite to pelvic origin; dorsal spine strong, smooth, about as long as head without snout. Lateral line scales 25-27; 3-4 rows between lateral line and pelvic base. Dark olive superiorly becoming creamy, yellowish white below; fins bluish gray, often tipped yellowish pink.



TEXT-FIG. 73.—Lateral view of *Tor khudree* (Sykes). (After Day).

Distribution.—INDIA : freshwaters of U.P., Orissa and Peninsular India.

Remarks.—It is a game fish growing to 1,447 mm. (4 feet and 9 inches) in length.

112. *Tor mussullah* (Sykes)

1838. *Barbus mussullah* Sykes, *Proc. zool. Soc. Lond.*, p. 154 (type-locality : Seroor or Sisur on the Ghod river).

Head 4.6 to 5, depth 3.5 to 3.7 in total length. Eyes about 6 in head, in the anterior half of head. Dorsal profile more sharply arched than ventral profile. Sides of snout and suborbital region tuberculated. Lips fleshy with the labial fold continuous. Maxillary barbels longer than rostrals. Dorsal origin in the middle of the back and opposite to pelvic origin; dorsal spine strong, smooth, as long as head excluding snout. Lateral line scales 26-27; 3½ rows between lateral line and pelvic base; dark bronze above, reddish cream below; young ones rather silvery at sides shot with pink; fins reddish gray, with bright blue streaks.

Distribution.—INDIA : freshwaters of Peninsular India.

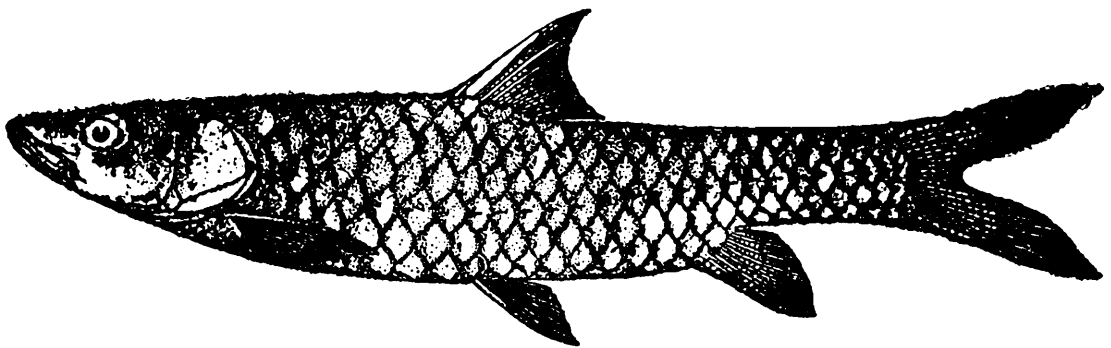
Remarks. - It is a game fish and attains 1,219 mm. (4 feet) in length.

113. *Tor putitora* (Ham.)

(Text-fig. 74)

1822. *Cyprinus putitora* Hamilton, *Fish. Ganges*, pp. 303, 388 (type-locality : eastern parts of Bengal).
 1889. *Barbus tor* (nec Hamilton) Day, *Fauna Brit. India*, Fish., 1, p. 307.

Head 4 to 4.5, depth 5.5 to 7 in total length. Eyes 3 to 5.3 in head, in the anterior half of head. Dorsal and ventral profiles gently arched, equal. Lips thick with the labial groove continuous. Two pairs of barbels, more or less of equal length and as long as eye. Dorsal origin midway between tip of snout and base of caudal, dorsal spine bony, strong, smooth, equal to or shorter than body height. Lateral line scales 25-28; $2\frac{1}{2}$ rows between lateral line and pelvic base. Predorsal scales 9: usually greenish above, light pink at sides, with a silvery white abdomen; a broad, light grayish blue or purplish lateral band; fins mostly grayish green, pectorals, pelvics, anal and caudal often shot with pink.



TEXT-FIG. 74.—Lateral view of *Tor putitora* (Ham.). (After Hora).

Distribution.—INDIA : freshwaters of E. Punjab, U.P., Western Himalayas, Nepal, Darjeeling Dt., W Bengal, Assam, Eastern Himalayas; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.

Remarks.—It is a games fish and grows to about 2,743 mm. (9 feet) in length.

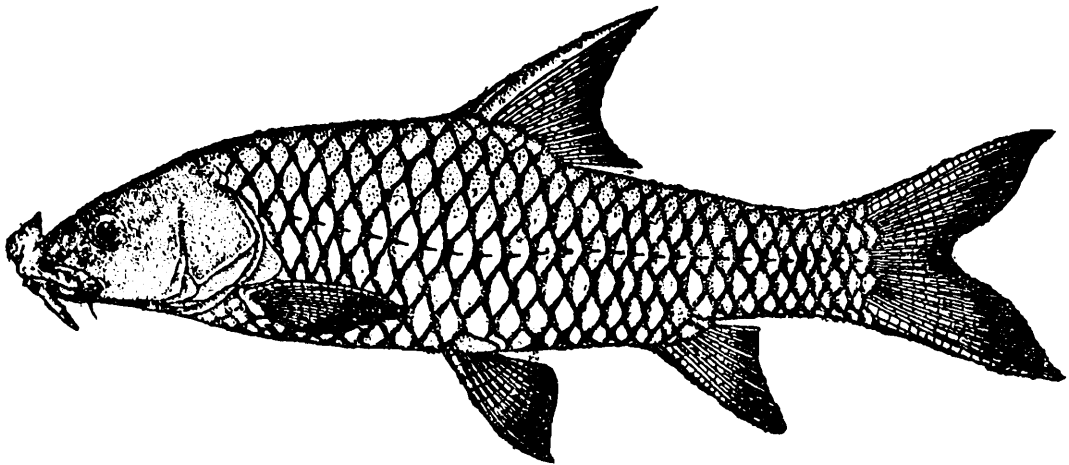
114. *Tor tor* (Ham.)

(Text-fig. 75)

1822. *Cyprinus tor* Hamilton, *Fish. Ganges*, pp. 305, 388 (type-locality : the Mahananda).
 1889. *Barbus tor* Day, *Fauna Brit. India*, Fish., 1, p. 307, fig. 104.

Head 4.7 to 5, depth 4 to 4.2 in total length. Eyes 3 to 4 in head, nearer to snout end than to opercular border. Lips thick, fleshy, with the labial fold continuous. Dorsal profile more sharply arched than ventral profile. Two pairs of barbels, maxillary slightly longer than rostral but shorter than eye. Dorsal fin opposite to or slightly in front of pelvic origin; dorsal spine smooth, bony, shorter than depth of body. Lateral line scales 22-27; $2\frac{1}{2}$ rows between lateral line and pelvic base. Grayish green dorsally, with sides of body in the middle of a

pinkish colour which is replaced by greenish gold above and light olive green below ; fins usually orange.



TEXT-FIG. 75.—Lateral view of *Tor tor* (Ham.). (After Hora).

Distribution.—INDIA : freshwaters of E. Punjab, U.P., Western Himalayas, Bihar, Darjeeling Dt., W. Bengal, Assam, Eastern Himalayas, M.P., PAKISTAN : freshwaters of W Punjab, E. Pakistan.—China.

Remarks.—It is an important game fish and attains about 1,524 mm. (5 feet) in length.

63. Genus *Puntius* Ham.

1792. *Mystus* (*nec* Scopoli, 1777) Walbaum, *Artedi Pisc.*, 3, p. 586. (Type, *Cyprinus barbatus* L., monotypic ; inadmissible.)
1817. *Barbus* (*nec* Cuvier, *Tabl. Element.*, p. 234, 1798) Cuvier, *Regne Animal.*, 2, ed. 1, p. 192. (Type, *Cyprinus barbatus* L., tautotypic, inadmissible.)
1822. *Puntius* Hamilton, *Fish. Ganges*, pp. 310, 388. (Type, *Cyprinus sophore* Ham., designated by Bleeker, *Alt. Ichth. Ind. Neerl.*, 3, p. 27, 1863.)

115. *Puntius amphibia* (V.)

1842. *Capoeta amphibia* Valenciennes, *Hist. nat. Poiss.*, 16, p. 282, pl. 478 (type-locality : Bombay).
1889. *Barbus amphibioides* Day, *Fauna Brit. India*, Fish., 1, p. 322.

Head 4 to 4.7 depth 4.2 to 5 in total length. Eyes 3.5 in head. Interorbital almost flat. A thin maxillary pair of barbels reaching to midorbit. Dorsal origin slightly in advance of pelvic origin and nearer to tip of snout than to base of caudal. Lateral line complete, with 23 to 24 scales in the longitudinal series ; 2 rows between it and the pelvic base. Predorsal scales 8. Steel blue superiorly, white shot with gold on sides and below ; often with a lateral, crimson band and black spot on the caudal peduncle ; fins yellowish, dorsal edged black.

Distribution.—INDIA : freshwaters of U.P., Orissa, Madras, Central India, Deccan, Mysore, M.P., Travancore-Cochin, Bombay, Western coast of India.—Ceylon.

Remarks.—It attains at least 152 mm. (6 inches) in length.

116. *Puntius carnaticus* (Jerdon)

1849. *Barbus carnaticus* Jerdon, *Mad. J. Lit. Sci.*, 15, p. 311 (type-locality : the Bhowany river).

1889. *Barbus carnaticus* Day, *Fauna Brit. India*, Fish., 1, p. 305.

Head 5.7, depth 3 to 4 in total length. Eyes 3 to 4 in head. Interorbital flat. Dorsal profile more convex than ventral profile. Two pairs of barbels, shorter than eye. Dorsal origin in front of pelvic origin and midway between snout and caudal base. Lateral line complete, with 32 scales in the longitudinal series ; $3\frac{1}{2}$ rows between it and pelvic base. Predorsal scales 12. Greenish brown above, dull white glossed with gold on sides and below ; fins grayish.

Distribution.—INDIA : freshwaters of the Nilgiris, Wynaad and Canara hills, Western Ghats.

Remarks.—It grows upto 11.34 kilogrammes (25 lbs.) in weight.

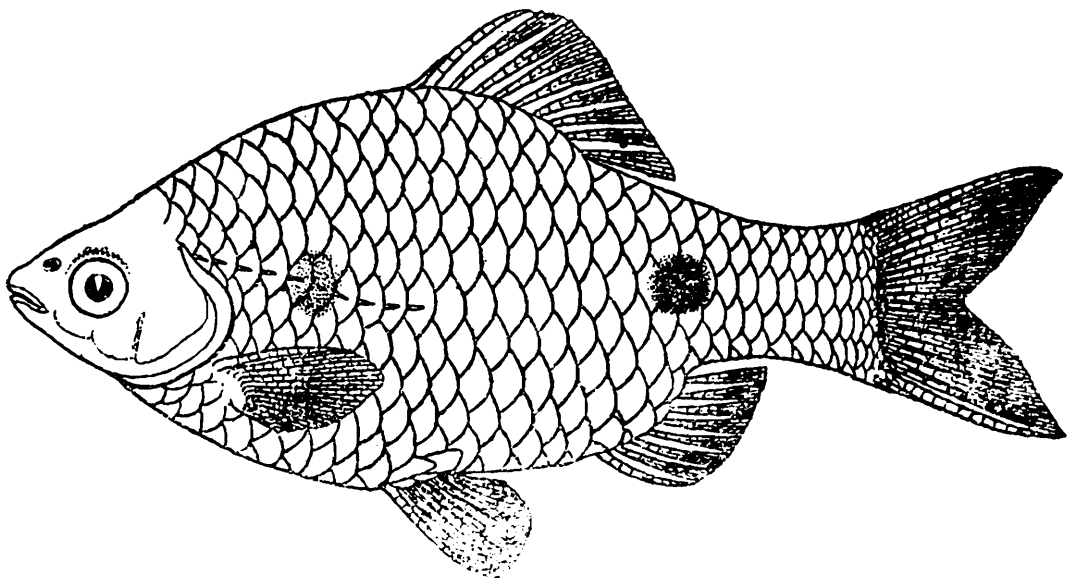
117. *Puntius conchoni* (Ham.)

(Text-fig. 76)

1822. *Cyprinus conchoni* Hamilton, *Fish. Ganges*, pp. 317, 389 (type-locality : Ponds of northeast of Bengal, and in the rivers Kosi and Ami).

1889. *Barbus conchoni* Day, *Fauna Brit. India*, Fish., 1, p. 325.

Head 5, depth 2.6 in total length. Eyes 3 in head. Profiles elevated ; a slight concavity over nape. No barbels. Dorsal origin in front of pelvic origin and midway between the anterior border eye and base of caudal. Dorsal spine moderately strong, serrated, as long as head without snout. Lateral line incomplete, ceasing after 18 scales ; 4 to $4\frac{1}{2}$ rows between it and the pelvic base. Predorsal scales 9. Greenish gray dorsally becoming silvery towards sides ; a large round black, lateral spot above posterior part of anal ; fins orange, dorsal with its upper half black.



TEXT-FIG. 76.—Lateral view of *Puntius conchoni* (Ham.). (After Day).

Distribution—INDIA : freshwaters of E. Punjab, U.P., Western Himalayas, Bihar, Darjeeling Dt., W. Bengal, Assam, Eastern Himalayas, Deccan, Travancore-Cochin ; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.

Remarks.—It attains at least 127 mm. (5 inches) in length.

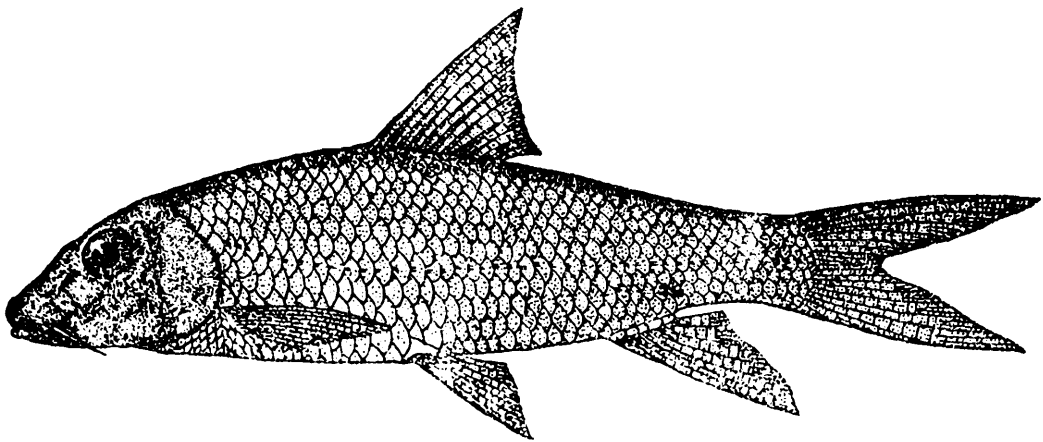
118. *Puntius curmuca* (Ham.)

(Text-fig. 77)

1807. *Cyprinus curmuca* Hamilton, *Journey Mysore*, 3, p. 344, pl. 30 (type-locality : Western Ghats of India).

1889. *Barbus curmuca* Day, *Fauna Brit. India*, Fish., 1, p. 310.

Head 5, depth 5 in total length. Eyes 4·3 in head. Dorsal profile more convex than ventral profile. Snout conical. Interorbital transversally concave. In adults a band of tubercles from preorbital along the cheek. Two maxillary pairs of barbels, the upper half as long as and the lower as long as eye. Dorsal origin in front of pelvic origin, slightly



TEXT-FIG. 77.—Lateral view of *Puntius curmuca* (Ham.). (After Day).

nearer to snout than to base of caudal. Lateral line complete with 41 scales ; $3\frac{1}{2}$ rows between it and pelvic base. Predorsal scales 15. Silvery gray becoming lighter on sides and beneath ; caudal tipped black ; in the young middle third of caudal orange.

Distribution.—INDIA : freshwaters of Travancore-Cochin, Western Ghats.

Remarks.—It attains at least 1,219 mm. (4 feet) in length.

119. *Puntius filamentosus* (V.)

(Text-fig. 78)

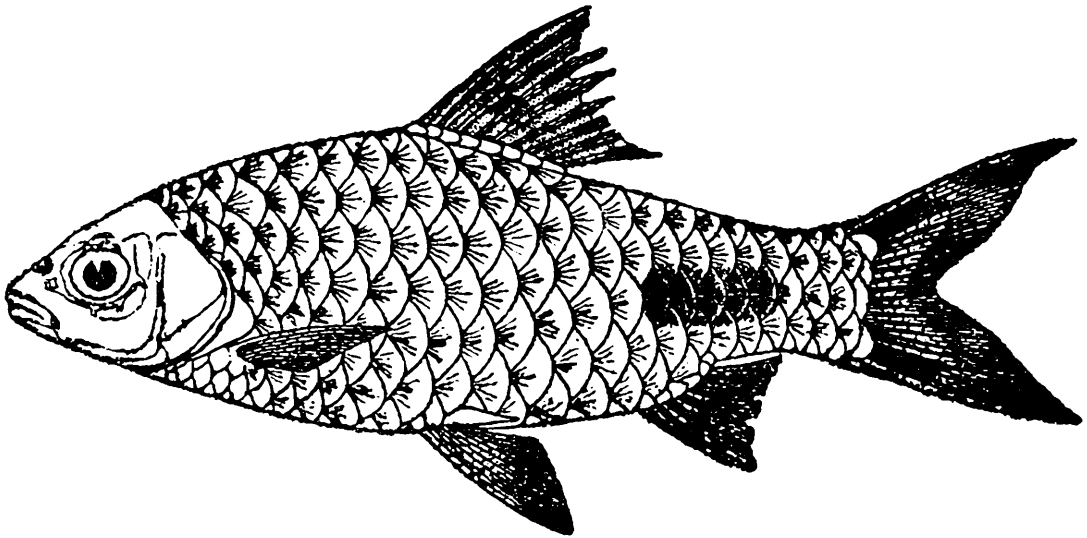
1844. *Leucius filamentosus* Valenciennes, *Hist. nat. Poiss.*, 17, p. 96 pl. 492 (type-locality : d' Alypey=Alleppey).

1889. *Barbus filamentosus* Day, *Fauna Brit. India*, Fish., 1, p. 333.

1889. *Barbus mahecola* Day, *Fauna Brit. India*, Fish., 1, p. 323, fig. 105.

Head 4·7 to 5, depth 3 to 3·5 in total length. Eyes 3·2 to 3·5 in head. Body compressed, elevated. Snout tuberculated. A thin pair of maxillary barbels extending to midorbit, or very minute or absent. Dorsal origin a little nearer to snout than to caudal base or midway between them ; dorsal spine, feeble. Lateral line complete with 21 scales in th

longitudinal series ; 2 to $3\frac{1}{2}$ rows between it and pelvic base. Silvery white ; a dark blotch on the lateral line from the 14th or 18th scale ; caudal red and tipped black ; dorsal and ventral black.



TEXT-FIG. 78.—Lateral view of *Puntius filamentosus* (V.). (After Day).

Distribution.—INDIA : freshwaters of Travancore-Cochin. Mysore. —Ceylon.

Remarks.—It attains 152 mm. (6 inches) in length.

120. *Puntius jerdoni* (Day)

1870. *Barbus* (*Barbodes*) *jerdoni* Day, *Proc. zool. Soc. Lond.*, p. 372 (type-locality : Mangalore).
 1889. *Barbus jerdoni* Day, *Fauna Brit. India*, Fish., 1, p. 312.
 1889. *Barbus pulchellus* Day, *Fauna Brit. India*, Fish., 1, p. 311.
 1889. *Barbus dobsoni* Day, *Fauna Brit. India*, Fish., 1, p. 312.
 1919. *Barbus jerdoni* var. *macivere* Annandale, *Rec. Indian Mus.*, 16, p. 137.

Head 5 to 5.2, depth 4 in total length. Eyes 3 to 3.5 in head. Interorbital nearly flat. Dorsal profile sharply arched to the commencement of dorsal fin. Barbels 2 pairs, maxillary as long as eye, rostral shorter. Dorsal origin midway between snout and caudal base : dorsal spine smooth, weak. Lateral line complete, with 27-28 scales in the longitudinal series ; $2\frac{1}{2}$ to $3\frac{1}{2}$ rows between it and pelvic base. Silvery ; fins orange coloured, edged black.

Distribution.—INDIA : freshwaters of Mysore, Canara, Poona, Deccan.
Remarks.—It grows to 457 mm. (12 feet) in length.

121. *Puntius kolus* (Sykes)

1841. *Barbus kolus* Sykes, *Trans. zool. Soc. Lond.*, 2, p. 357, pl. 62, fig. 1 (type-locality : Mota Mola river, 8 miles east of Poona).
 1889. *Barbus kolus* Day, *Fauna Brit. India*, Fish., 1, p. 319.

Head 5.2 to 5.5, depth 4 to 4.5 in total length. Eyes 3.7 to 4 in head. Interorbital flat. Dorsal profile sharply arched from occiput to commencement of dorsal fin. Barbels 2, reaching beyond midorbit. Dorsal origin in advance of pelvic origin, nearer to snout than to caudal base. Lateral line complete, with 40-43 scales in the longitudinal series ; 4 to 5 rows between it and pelvic base. Silvery shot with yellow ; dorsal, caudal and anal tipped gray.

Distribution.—INDIA : freshwaters of M.P., Deolali, Deccan and throughout the Kistna, Tungabhadra and Godavari rivers.—Malaya.

Remarks.—It attains 304 mm. (a foot) upwards in length.

122. *Puntius sarana* (Ham.)

1822. *Cyprinus sarana* Hamilton, *Fish. Ganges*, pp. 307, 388 (type-locality : ponds and rivers of India).

1889. *Barbus sarana* Day, *Fauna Brit. India*, Fish., 1, p. 300.

1889. *Barbus chrysopoma* Day, *Fauna Brit. India*, Fish., 1, p. 301.

1889. *Barbus pinnauratus* Day, *Fauna Brit. India*, Fish., 1, p. 301.

Head 5 to 5.2, depth 3.5 to 3.6 in total length. Eyes 4.5 to 4.7 in head. Dorsal profile more elevated than ventral profile. Barbels 4, rostral pair as long as and maxillary equal to or 1.5 times eye diameter. Dorsal origin slightly nearer to snout than to caudal base, opposite pelvic origin ; dorsal spine strong, bony serrated. Lateral line complete, 32-34 scales in the longitudinal series ; 3½ to 4 rows between it and pelvic base. Predorsal scales 10-11. Dark gray above and silvery below, often with horizontal bands along the rows of scales in the upper half of body.

Distribution.—Freshwaters throughout INDIA and PAKISTAN.—Burma, Ceylon, Siam, China,

Remarks.—It attains 304 mm. (a foot) in length.

123. *Puntius sophore* (Ham.)

1822. *Cyprinus sophore* Hamilton, *Fish. Ganges*, pp. 310, 389 (type-locality : ponds of Bengal).

1889. *Barbus stigma* Day, *Fauna Brit. India*, Fish., 1, p. 329.

Head 5, depth 3.5 to 3.7 in total length. Eyes 3.5 to 4 in head. Dorsal profile more convex than ventral profile. Barbels absent. Dorsal origin slightly in advance of pelvic origin and midway between snout end and caudal base. Lateral line complete, 23-26 scales in the longitudinal series ; 3 to 3½ rows between it and pelvic base. Predorsal scales 8-9. Silvery, often with scarlet, lateral band ; a round black blotch at the root of caudal.

Distribution.—INDIA : freshwaters throughout India below 2,000 ft. altitude ; PAKISTAN ; freshwaters of W. Punjab, E. Pakistan.—Burma, China.

Remarks.—It attains at least 127 mm. (5 inches) in length.

124. *Puntius thomassi* (Day)

1873. *Barbus (Barbodes) thomassi* Day, *Proc. zool. Soc. Lond.*, p. 707 (type-locality : S. Canara).

1889. *Barbus thomassi* Day, *Fauna Brit. India*, Fish., 1, p. 311.

Head 5.7 to 6.2, depth 4 to 4.5 in total length. Eyes high up, 3.7 to 4 in head. Dorsal and ventral profiles more or less equal. Snout pointed. Interorbital slightly convex. Barbels 4, maxillary not so long as eye, rostral shorter. Dorsal origin midway between snout end and caudal base, anterior to pelvic origin ; dorsal spine weak. Lateral line complete, 31-34 scales in the longitudinal series ; 2½ rows between

it and pelvic base. Predorsal scales 12. Silvery along back, each scale with a red lunule ; fins of lake colour, stained with grayish black.

Distribution.—INDIA : freshwaters of S. Canara.

Remarks.—It attains at least 1,066 mm. ($3\frac{1}{2}$ feet) in length.

125. *Puntius ticto* (Ham.)

1822. *Cyprinus ticto* Hamilton, *Fish. Ganges*, pp. 314, 389, pl. 8, fig. 87 (type-locality : southeastern parts of Bengal).

1889. *Barbus ticto* Day, *Fauna Brit. India*, Fish., 1, p. 325.

1889. *Barbus punctatus* Day, *Fauna Brit. India*, Fish., 1, p. 326.

Head 3 to 4, depth 3 to 3.5 in total length. Eyes 2.5 to 3 in head. Dorsal profile a little more convex than ventral profile. No barbels. Dorsal origin midway between snout and caudal base ; dorsal spine moderately strong, serrated. Lateral line incomplete or often complete ; 22 to 26 scales in the lateral line ; 3 or 4 rows between it and of pelvic base. Predorsal scales 8-11. Silvery, often with 2 lateral spots, the anterior one extending over 3rd and 4th scales and the posterior one over 18th and 19th scales of the lateral line.

Distribution.—Freshwaters throughout INDIA and PAKISTAN.—Burma, Ceylon, Siam.

Remarks.—It attains 102 mm. (4 inches) in length.

64. Genus *Catla* V

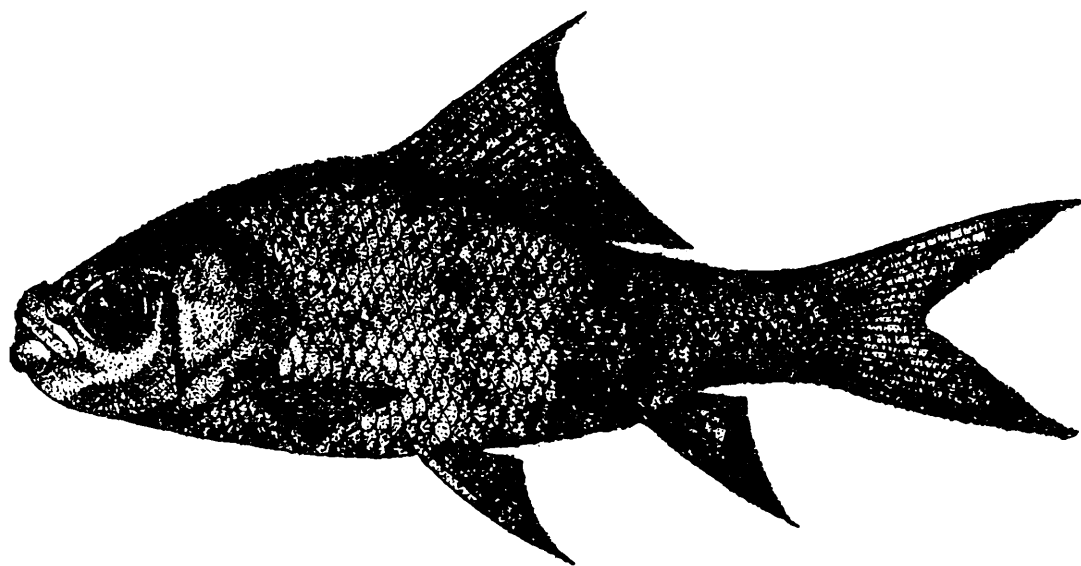
1844. *Catla* Valenciennes, *Hist. nat. Poiss.*, 18, p. 140. (Type, *Cyprinus catla* Ham., tautotypic.)

126. *Catla catla* (Ham.)

(Text-fig. 79)

1822. *Cyprinus catla* Hamilton, *Fish. Ganges*, pp. 287, 387, pl. 13, fig. 81 (type-locality : in the rivers and tanks of Bengal).

1889. *Catla b Buchanan* Day, *Fauna Brit. India*, Fish., 1, p. 287, fig. 99.



TEXT-FIG. 79.—Lateral view of *Catla catla* (Ham.). (After Day).

Head 4.2 to 4.7, depth 3 to 3.5 in total length. Eyes in front half of head ; 6 to 7 in head. Dorsal profile more convex than that of ventral. Dorsal origin before pelvic origin, rays 17-19. Anal shorter than dorsal, 8 rays. All fins rather elongated. Lateral line with 40-43

scales in the longitudinal series ; $5\frac{1}{2}$ to $6\frac{1}{2}$ rows between it and pelvic base. Grayish above, silvery on sides and below ; fins dark.

Distribution.—INDIA : freshwaters throughout India down south to the Kistna river (but recently employed largely for stocking tanks in southern India) ; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.—Burma, Ceylon.

Remarks.—It is an important food fish attaining at least 1,828 mm. (6 feet) in length, and is largely employed in pond culture throughout India especially in Bengal.

65. Genus *Cirrhinus* (Oken) C.

1817. *Cirrhinus* (Oken) Cuvier, *Regne Animal.*, 2, ed. 1, p. 193. (Type : *Cyprinus cirrhosus* Bl.)

127. *Cirrhinus cirrhosa* (Bl.)

1797. *Cyprinus cirrhosa* Bloch, *Ichth.*, 12, p. 52, fig. 411 (type-locality : the Cauvery).

1889. *Cirrhina cirrhosa* Day, *Fauna Brit. India, Fish.*, 1, p. 277.

Head 5.5 to 6, depth 4.5 to 5 in total length. Eyes 3.2 in head. Dorsal profile more convex than ventral profile. Upper lip entire. Barbels 4, maxillary a third of eye, rostral a little longer. Dorsal as high as body, with 17-19 rays ; origin considerably in front of pelvic origin, midway between snout and hind end of anal base ; first few rays often elongated. $5\frac{1}{2}$ to $6\frac{1}{2}$ rows of scales between lateral line and pelvic base ; 42-44 in the longitudinal series. Silvery, every scale with a red centre barring along the belly where it is of a dull yellowish white ; fins tinted gray.

Distribution.—INDIA : the Godavari, Kistna and Cauvery in southern India and the Narbudda and Pench rivers in M.P.

Remarks.—It grows to 457 mm. ($1\frac{1}{2}$ feet) in length.

128. *Cirrhinus fulungee* (Sykes)

1841. *Chondrostoma fulungee* Sykes, *Trans. zool. Soc. Lond.*, 2, p. 358 (type-locality : Poona waterways).

1889. *Cirrhina fulungee* Day, *Fauna Brit. India, Fish.*, 1, p. 280.

Head 5.7, depth 5.2 in total length. Eyes 3 in head. Dorsal and ventral profiles rather equally convex. Upper lip entire ; lower jaw with a tubercle above symphysis. Barbels 2, only the short rostral. Dorsal almost as high as body, with 10 rays ; origin ahead of pelvic origin, midway between snout end and hind end of anal base. $6\frac{1}{2}$ rows of scales between lateral line and pelvic base ; 48 in the longitudinal series. Brownish gray above, silvery below with a light bluish lateral band ; dorsal and caudal stained gray.

Distribution.—INDIA : freshwaters of Poona, Deccan, Mysore.

Remarks.—It attains at least 304 mm. (a foot) in length.

129. *Cirrhinus mrigala* (Ham.)

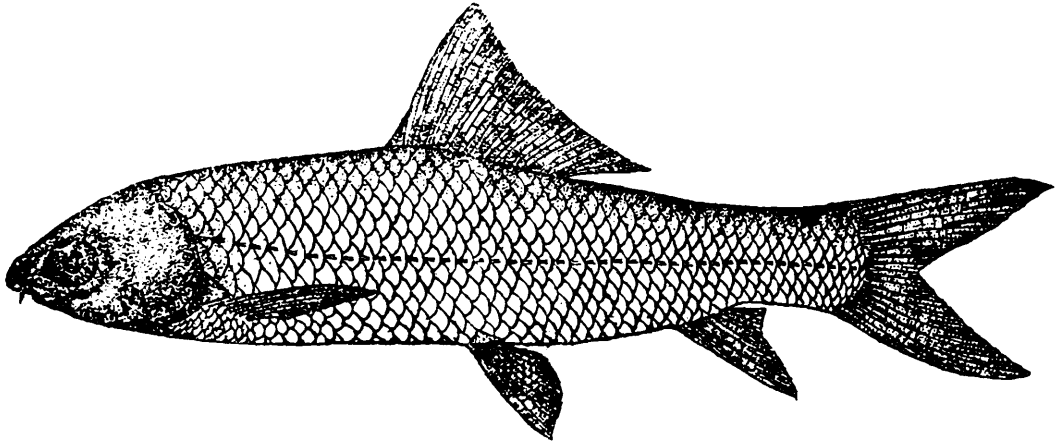
(Text-fig. 80)

1822. *Cyprinus mrigala* Hamilton, *Fish. Ganges*, pp. 279, 386, pl. 6, fig. 79 (type-locality : ponds and freshwater rivers of the Gangetic provinces).

1889. *Cirrhina mrigala* Day, *Fauna Brit. India, Fish.*, 1, p. 278.

in Head 5 to 5.2, depth 4 to 5.5 in total length. Eyes 3.5 to 4 in head, the anterior half of head. Dorsal profile slightly more convex than

ventral profile. Upper lip entire. Barbels 2, only the short rostral. Dorsal nearly as high as body, with 15-16 rays ; origin much in front of pelvic origin, nearer to snout than to caudal base. $4\frac{1}{2}$ to 6 rows of scales between lateral line and pelvic base ; 40-45 scales in the longitudinal series. Dark gray with a coppery tinge along back, becoming silvery below ; pectorals, pelvic and anal orange, tinted with black, eyes golden.



TEXT-FIG. 80.—Lateral view of *Cirrhina mrigala* (Ham.). (After Day).

Distribution.—INDIA : rivers and tanks in W. Bengal, Darjeeling Dt., Eastern Himalayas, E. Punjab, U.P., Western Himalayas, Madras, Deccan, Bombay (introduced), Ahmedabad, Cutch ; PAKISTAN : rivers and tanks in W Punjab, E. Pakistan.—Burma.

Remarks.—It is an excellent species for stocking tanks and gives good sport on the rod ; grows to 914 mm. (3 feet) in length.

130. *Cirrhinus reba* (Ham.)

1822. *Cyprinus reba* Hamilton, *Fish. Ganges*, pp. 289, 386 (type-locality : rivers and ponds of Bengal and Bihar).

1889. *Cirrhina reba* Day, *Fauna Brit. India*, Fish., 1, p. 279, fig. 96.

Head 6 to 6.5, depth 4 to 4.5 in total length. Eyes 4 in head. Dorsal profile slightly more convex than ventral profile. Upper lip fringed in the young, often entire in adults ; a thin cartilaginous layer covering lower jaw. Barbels, a pair of short rostrals, or none. Dorsal with 10-11 rays ; origin anterior to pelvic origin, nearer to snout than to caudal base. Scales hexagonal ; 35-38 along lateral line in the longitudinal series, $7/9$ in transverse series. Silvery ; scales darkest at their edges, forming bluish longitudinal bands above lateral line, young often with a leaden coloured lateral band.

Distribution.—Freshwaters throughout INDIA and PAKISTAN.

Remarks.—It grows to about 304 mm. (a foot) in length.

66. Genus *Garra* Ham.

1822. *Garra* Hamilton, *Fish. Ganges*, p. 393. (Type, *Cyprinus lamta* Ham.)

1842. *Discognathus* Heckel, *Ichth. in Russegger's Reisen in Europe und Africa*, 1, p. 1071. (Type, *D. variabilis* Heckel, haplotypic.)

131. *Garra gotyla* (Gray)

1832-33. *Cyprinus gotyla* Gray, *Ill. Ind. Zool. Hardwicke*, 2, pl. 88, figs. 3, 3a (type-locality : Northern India).

1889. *Discognathus lamta* Day, *Fauna Brit. India, Fish.*, 1, p. 246 (part).

Head 4.7, depth 5.2 in total length. Eyes 5 to 6 in head, in the hind half of head. Snout with a well developed proboscis. Mental disc broader than long. Barbels 4. Dorsal origin in front of pelvic origin. Lateral line scales 34. Caudal deeply forked. Bluish gray above and pale yellow below.

Distribution.—INDIA : freshwaters of Assam, Darjeeling Dt., Eastern Himalayas, Simla, E. Punjab, U.P., Western Himalayas ; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.

Remarks.—It attains at least 152 mm. (6 inches) in length.

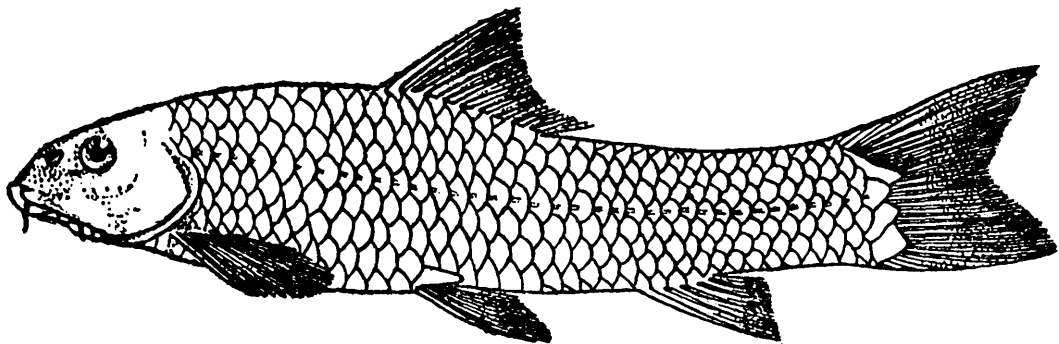
132. *Garra mullya* (Sykes)

(Text-fig. 81)

1841. *Chondrostoma mullya* Sykes, *Trans. zool. Soc. Lond.*, 2, p. 359, pl. 62, fig. 3 (type locality : Poona waterways).

1889. *Discognathus lamta* Day, *Fauna Brit. India, Fish.*, 1, p. 246 (part).

Head 5 to 5.5, depth 5 to 6 in total length. Eyes 5 in head. Snout without well developed proboscis. Barbels 4. Dorsal profile more arched than ventral profile. Dorsal origin in advance of pelvic origin. Lateral line scales 36. Caudal almost truncate. Olivaceous green above, pale yellow beneath.



TEXT-FIG. 81.—Lateral view of *Garra mullya* (Sykes). (After Hora).

Distribution.—INDIA : freshwaters of U.P., Bihar, Orissa, M.P., Kathiawar, Bombay, Poona, Deolali, Mysore, Malabar, Travancore-Cochin.

Remarks.—It attains about 127 mm. (5 inches) in length.

67. Genus *Labeo* C.

1817. *Labeo* Cuvier, *Regne Animal.*, 2, ed. 1, p. 194. (Type, *Cyprinus niloticus* Forskal.)

1822. *Marulius* Hamilton, *Fish. Ganges*, p. 391. (Type, *Cyprinus morala* Ham. = *Cyprinus angra* Ham.)

133. *Labeo bata* (Ham.)

1822. *Cyprinus bata* Hamilton, *Fish. Ganges*, pp. 283, 386 (type-locality : rivers and ponds of Bengal).

1889. *Labeo bata* Day, *Fauna Brit. India, Fish.*, 1, p. 268.

Head 5.5 to 5.7, depth 4.3 to 4.7 in total length. Eyes 4 to 4.3 in head. Dorsal profile more convex than ventral profile. Lips thin, continuous; a tubercle inside lower jaw above symphysis; no horny covering inside jaws. A pair of very short maxillary barbels. Dorsal with 11-12 rays; origin nearer to snout end than to caudal base. Lateral line with 37-40 scales in the longitudinal, 7/6-7 in transverse series. Gray above and silvery below with lower fins tinted orange, young often with 3 or 4 small, lateral black spots

Distribution.—INDIA : freshwaters of Assam, Darjeeling Dt., W. Bengal, Orissa, M.P., and in the Kistna and Godavari; PAKISTAN : freshwaters of E. Pakistan.

Remarks.—It attains 609 mm. (2 feet) in length and is used extensively for stocking tanks.

134. *Labeo boga* (Ham.)

1822. *Cyprinus boga* Hamilton, *Fish. Ganges*, pp. 286, 386, pl. 28, fig. 80 (type-locality : the Brahmaputra).

1889. *Labeo boga* Day, *Fauna Brit. India*, Fish., 1, p. 269.

Head 5.2 to 5.5, depth 5.5 to 5.7 in total length. Eyes nearly in anterior half of head; 3.7 to 4 in head. Dorsal profile more convex than ventral profile. Lips somewhat thick; a thin horny layer to inner surface of lower jaw. Snout with tubercles. Two minute maxillary barbels. Dorsal with 11-13 rays; origin considerably in advance of pelvic origin, nearer to snout than to caudal base. Lateral line with 37-39 scales in the longitudinal and 6-7/7 in the transverse series. Orange, often with a dark, shoulder spot; fins of a reddish tinge.

Distribution.—INDIA : freshwaters of E. Punjab, U.P., Bihar, Darjeeling Dt., W. Bengal, Orissa, Madras; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.—Burma.

Remarks.—It attains 304 mm. (a foot) in length.

135. *Labeo boggut* (Sykes)

1841. *Chondrostoma boggut* Sykes, *Trans. zool. Soc. Lond.*, 2, p. 359 (type-locality : Poona water-ways).

1889. *Labeo boggut* Day, *Fauna Brit. India*, Fish., 1, p. 269.

Head 5.5 to 6, depth 5.5 to 6.2 in total length. Eyes 4.5 to 5 in head. Dorsal profile somewhat more arched than ventral profile. Lower lip fimbriated with a horny covering inside. Snout thick, with a few tubercles. A pair of short maxillary barbels. Dorsal with 11-12 rays; origin nearer to snout than to caudal base. Lateral line with 60-65 scales in the longitudinal and 11-12/14 in transverse series. Silvery, darkest above; fins orange often with a few lateral lines or a bluish band and a dark spot near caudal base.

Distribution.—INDIA : freshwaters of E. Punjab, U.P., Bihar, W. Bengal, M.P., Ahmedabad, Cutch, Bombay, Deccan, Poona, Deolali, Madras; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.—Malaya.

Remarks.—It attains at least 190 mm. (7 inches) in length.

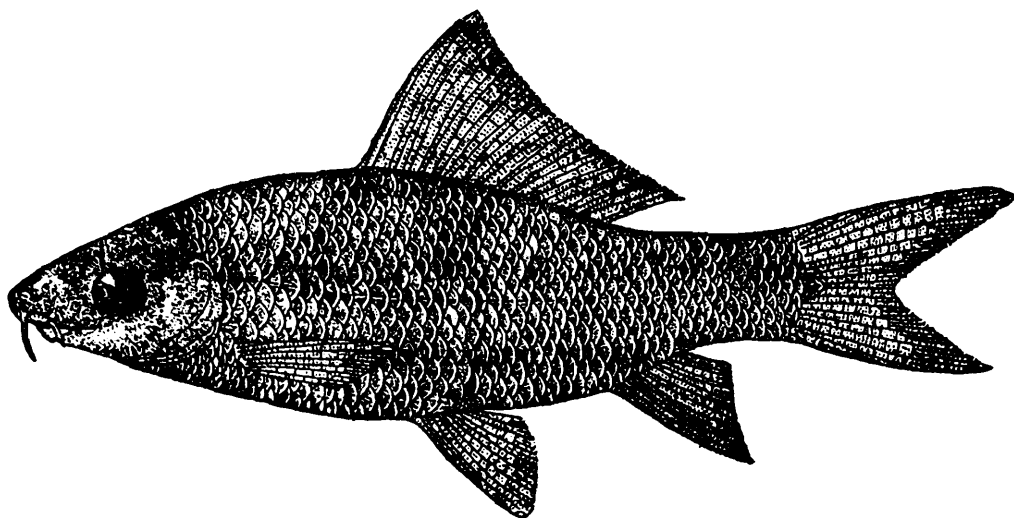
136. *Labeo calbasu* (Ham.)

(Text-fig. 82)

1822. *Cyprinus calbasu* Hamilton, *Fish. Ganges*, pp. 297, 387, pl. 2, fig. 83 (type-locality : rivers and ponds of Bengal and in the western provinces).

1889. *Labeo calbasu* Day, *Fauna Brit. India*, Fish., 1, p. 259.

Head 5 to 6, depth 4 in total length. Eyes 4 to 5 in head. Dorsal and ventral profiles about equally convex. Lips thick, fringed, lower one more so. Snout obtuse, with pores. Barbels 4, rostrals the longer, nearly equal to eye. Dorsal with 16-18 rays ; origin ahead of pelvic origin, midway between snout and caudal base. Lateral line with 40-44 scales in the longitudinal and $7\frac{1}{2}/8$ in the transverse series. Blackish green becoming lighter below ; fins black, upper tip of caudal usually edged white.



TEXT-FIG. 82.—Lateral view of *Labeo calbasu* (Ham.). (After Day).

Distribution.—INDIA : freshwaters of E. Punjab, U.P., Bihar, Darjeeling Dt., Assam, W. Bengal, Orissa, down south to the Kistna river, Ahmedabad, Cutch, Bombay (introduced), Deccan, Malabar, Madras, (introduced) ; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.—Burma, Siam, Yunnan.

Remarks.—It is an important food and game fish attaining 914 mm. (3 feet) in length and is used largely in stocking tanks.

137. *Labeo dero* (Ham.)

1822. *Cyprinus dero* Hamilton, *Fish. Ganges*, pp. 277, 385, pl. 17, fig. 78 (type-locality : the Brahmaputra).

1889. *Labeo diplostomus* Day, *Fauna Brit. India*, Fish., 1, p. 265.

Head 6, depth 5.2 to 5.7 in total length. Eyes 5.5 in head. Dorsal profile more convex than ventral profile. Lips continuous ; a horny covering to inside of lower jaw. Snout with an indistinct lateral lobe, often with some pores. Barbels, a pair of short maxillary. Dorsal with 13 rays ; origin midway between snout end and post-end of anal fin. Lateral line with 41-43 scales in the longitudinal and 11-12/14 in transverse series. Dark gray superiorly, silvery on sides and below ; scales often marked red.

Distribution.—INDIA : freshwaters of Assam, Darjeeling Dt., Eastern Himalayas, E. Punjab, U.P., Western Himalayas ; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.—China.

Remarks.—It attains about 254 mm. (10 inches) in length.

138. *Labeo fimbriatus* (Bl.)

1797. *Cyprinus fimbriatus* Bloch, *Ichth.*, 12, p. 50, pl. 409 (type-locality : Madras).

1889. *Labeo fimbriatus* Day, *Fauna Brit. India*, Fish., 1, p. 258.

Head 6.2 to 6.5, depth 4 to 4.5 in total length. Eyes 3.7 to 4.5 in head. Dorsal profile more arched than ventral profile. Lips thick, continuous and fringed ; lower jaw with a horny covering inside. Snout obtuse, somewhat swollen and studded with pores. Barbels 4, short. Dorsal with 19-22 rays ; origin nearer to snout than to caudal base. Lateral line scales 44-47 in the longitudinal and 9-10/8 in the transverse series. Silvery along back, lighter on sides and below ; fins stained black, often, a diffused dusky blotch at the caudal base.

Distribution.—INDIA : freshwaters of E. Punjab, U.P., Orissa, M.P., Madras, Deccan, Deolali, Poona, Ahmedabad ; PAKISTAN : freshwaters of W. Punjab.

Remarks.—It attains 457 mm. (1½ feet) in length and is good eating.

139. *Labeo gonius* (Ham.)

1822. *Cyprinus gonius* Hamilton, *Fish. Ganges*, pp. 292, 387 (type-locality : freshwater rivers and ponds of Bengal).

1889. *Labeo gonius* Day, *Fauna Brit. India*, Fish., 1, p. 261.

Head 5 to 5.5, depth 4 to 4.5 in total length. Eyes 4.5 to 5 in head. Dorsal profile more convex than abdominal profile. Lips thick, fringed ; horny covering inside of both jaws. Snout tuberculated. Barbels 4, short. Dorsal with 16-18 rays ; origin nearer to snout than to caudal base, with the pelvic origin under middle of dorsal base. Lateral line scales 74-84 in the longitudinal and 16/17 in the transverse series. Greenish gray becoming lighter below ; scales darkest at their margins, many with red lunules on them.

Distribution.—INDIA ; freshwaters of Assam, Darjeeling Dt., W. Bengal, Bihar, U.P., Orissa, as low as the Kistna ; PAKISTAN : freshwaters of E. Pakistan.—Burma.

Remarks.—It attains nearly 1,524 mm. (5 feet) in length.

140. *Labeo rohita* (Ham.)

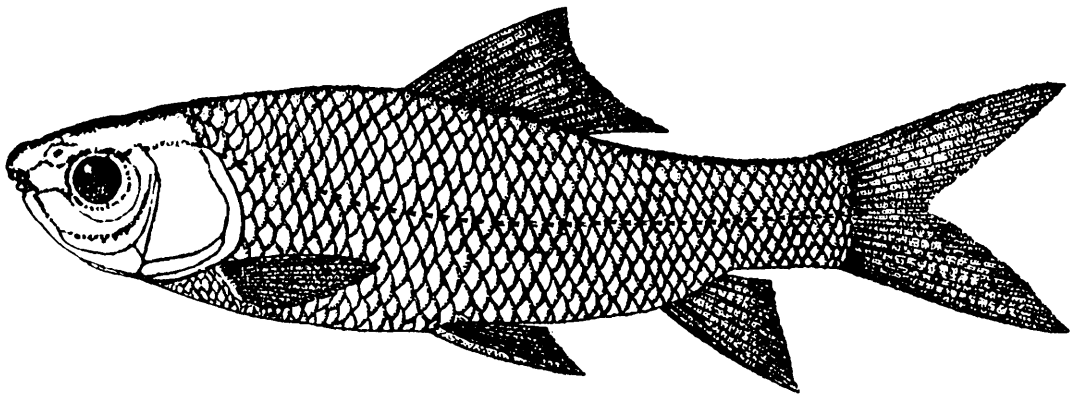
(Text-fig. 83)

1822. *Cyprinus rohita* Hamilton, *Fish. Ganges*, pp. 301, 388, pl. 36, fig. 85 (type-locality : freshwater rivers of the Gangetic provinces).

1889. *Labeo rohita* Day, *Fauna Brit. India*, Fish., 1, p. 262.

Head 4.5 to 5, depth 4.5 in total length. Eyes 4 to 6 in head. Dorsal profile more arched than ventral profile. Lips thick, fringed. Snout obtuse, depressed. Barbels, a short thin maxillary pair ; a rostral pair rarely present. Dorsal with 15-16 rays ; origin midway between snout

and caudal base, with pelvic origin below the third or fourth ray. Lateral line with 40-42 scales in the longitudinal and $6\frac{1}{2}/9$ in the transverse series. Bluish or brownish along back, becoming silvery on sides and below ; fins sometimes black.



TEXT-FIG. 83.—Lateral view of *Labeo rohita* (Ham.). (After Day).

Distribution.—INDIA : freshwaters of E. Punjab, U.P., Bihar, Darjeeling Dt., W. Bengal, Assam, Orissa, M.P., Ahmedabad, Bombay (introduced) ; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.—Burma.

Remarks.—It attains 914 mm. (3 feet) in length and is chiefly used for stocking tanks.

68. Genus *Schismatorhynchus* Blkr.

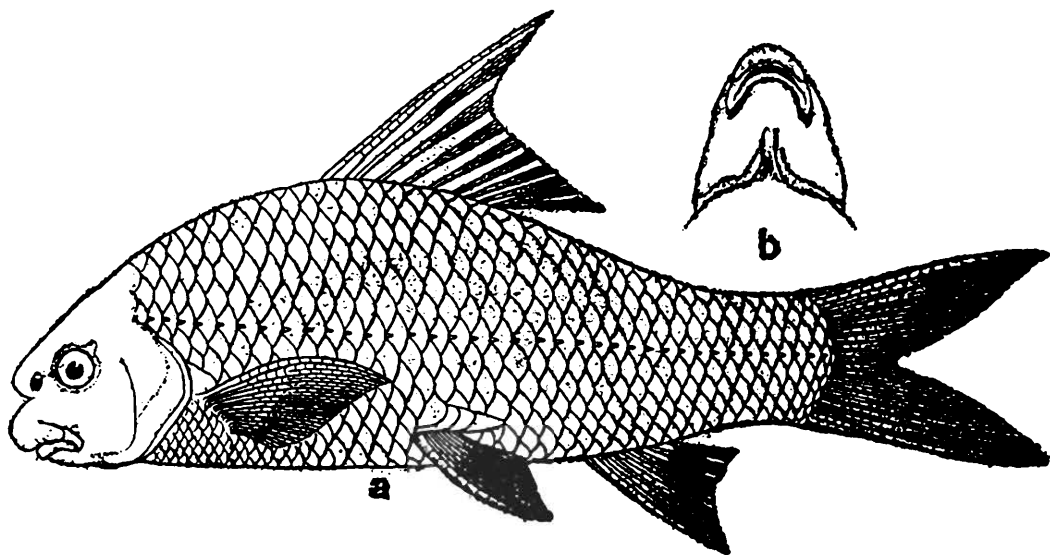
(Text-fig. 84)

1855. *Schismatorhynchus* Bleeker, *Nat. Tijdschr. Ned.-Ind.*, 9, p. 258. (Type, *Lobocheilus heterorhynchus* Blkr., orthotypic.)

141. *Schismatorhynchus* (*Nukta*) *nukta* (Sykes)

1841. *Cyprinus nukta* Sykes, *Trans. zool. Soc. Lond.*, 2, p. 355 (type-locality : Mahloongeh, 18 miles north of Poona from the Indranee river).

1889. *Labeo nukta* Day, *Fauna Brit. India, Fish.*, 1, p. 270.



TEXT-FIG. 84.—(a) Lateral view of *Schismatorhynchus* (*Nukta*) *nukta* (Sykes).
Ventral view of head of same. (After Day).

Head 5 to 6.2, depth 4.5 in total length. Eyes 6 in head. Dorsal profile arched, ventral profile nearly horizontal. Lips not fringed, with a thin deciduous horny layer internally. A deep groove across snout

Barbels, a pair of rudimentary maxillaries. Dorsal with 11 rays ; origin midway between snout and post-end of anal base. Lateral line badly marked, with 37-38 scales in the longitudinal and 6/9 in the transverse series. Silvery, with reddish marks on scales ; fins reddish, caudal edged with gray.

Distribution.—INDIA : freshwaters of Deolali, Poona, Mysore.

Remarks.—It attains at least 304 mm. (a foot) in length.

69. Genus *Osteobrama* Heckel

1842. *Osteobrama* Heckel, *Ichth. in Russegger's Reisen in Europe, Asian und Africa*, 1, p. 1033. (Type, *Cyprinus cotio* Ham., logotypic.)

142. *Osteobrama cotio* (Ham.)

1822. *Cyprinus cotio* Hamilton, *Fish. Ganges*, pp. 339, pl. 39, fig. 93 (type-locality: ponds and ditches of Bengal).
1889. *Rohtee cotio* Day, *Fauna Brit. India*, Fish., 1, p. 340.

Head 5.5 to 6, depth 3 to 3.3 in total length. Eyes 2.5 to 3 in head. Profile over nape concave. Upper jaw slightly longer. Barbels absent or rudimentary. Dorsal origin nearer to snout than to base of caudal ; dorsal spine weak, serrated. Anal with 29-36 rays. Lateral line scales 55-70 ; lateral transverse scales 9-15/14-21. Predorsal scales 24. Silvery, darkest superiorly ; often with a silvery lateral band.

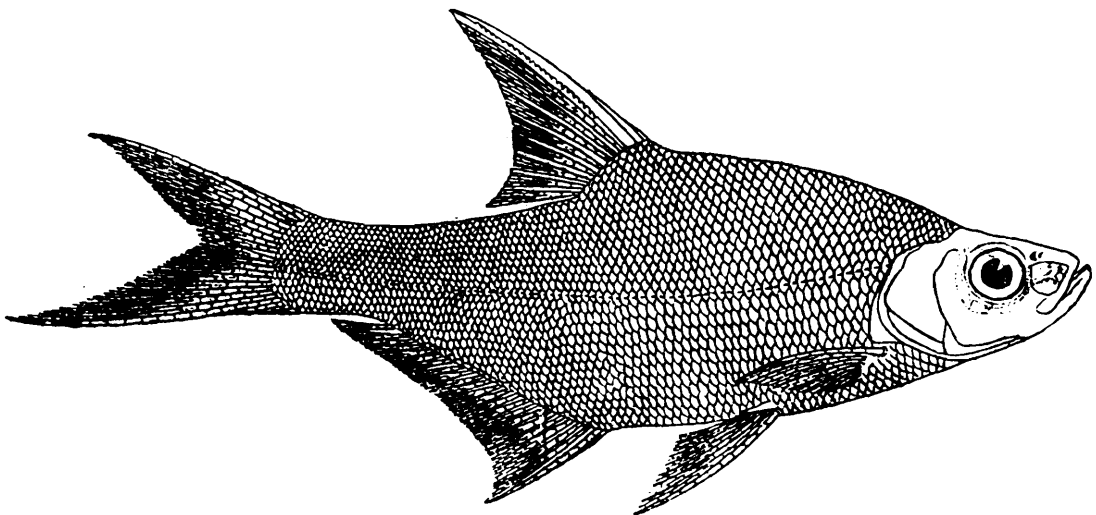
Distribution.—INDIA : freshwaters throughout India except Malabar and south of the Kistna ; PAKISTAN : freshwaters of W Punjab, E. Pakistan.—Burma, China.

Remarks.—It attains at least 152 mm. (6 inches) in length.

143. *Osteobrama vigorsii* (Sykes)

(Text-fig. 85)

1841. *Rohtee vigorsii* Sykes, *Trans. zool. Soc. Lond.*, 2, p. 364, pl. 63 (type-locality : the Beema river at Pairgaon).
1889. *Rohtee vigorsii* Day, *Fauna Brit. India*, Fish, 1 p. 341.



TEXT-FIG. 85.—Lateral view of *Osteobrama vigorsii* Sykes. (After Day).

Head 5, depth 3 to 4 in total length. Eyes 3 to 3.5 in head. A concavity over nape. Lower jaw somewhat longer. Barbels absent or rudimentary. Dorsal origin midway between pelvic and anal origins ; dorsal spine strong, serrated. Anal with 25-28 rays. Lateral line scales

75-80 ; lateral transverse scales 16-18/21. Predorsal scales 34. Greenish gray above, silvery on sides ; snout black ; caudal tinted gray, young with a lateral silvery band.

Distribution.—INDIA : freshwaters of Orissa, M.P., Deccan, Poona and Deolali and the Kistna and Godavari rivers.

Remarks.—It attains at least 228 mm. (9 inches) in length.

70. Genus *Rohtee* Sykes

1839. *Rohtee* Sykes, *Proc. zool. Soc. Lond.*, p. 16. (Type, *Rohree ogilbii* Sykes, designated by Bleeker, in *Ned. Tijds. Dierk.*, 1, pp. 11, 218, 1863.)

1868. *Mystacoleucus* Gunther, *Cat. Fish. Brit. Mus.*, 7, p. 206. (Type, *Systemus (Copoeta) padangensis* Blkr., orthotypic.)

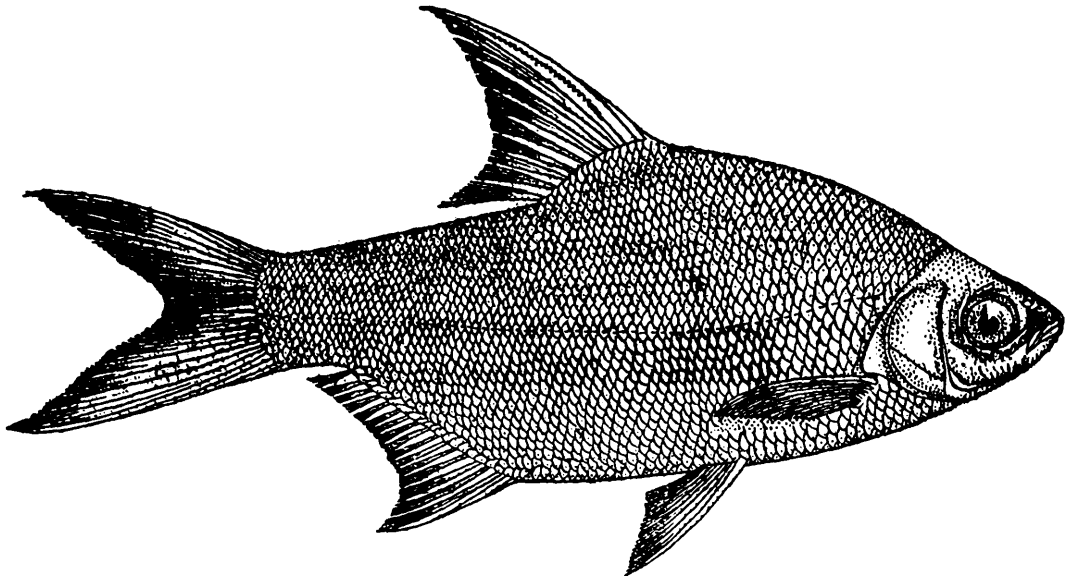
144. *Rohtee ogilbii* Sykes

(Text-fig. 86)

1839. *Rohtee ogilbii* Sykes, *Trans. zool. Soc. Lond.*, 2, p. 364, fig. 2 (Type-locality : the Beema river at Pairgaon).

1889. *Rohtee ogilbii* Day, *Fauna Brit. India, Fish.*, 1, p. 342.

Head 5 to 6, depth 3 to 3.2 in total length. Eyes 2.6 to 3.5 in head. Dorsal profile more convex than ventral profile. Lower jaw shoret. Barbels absent. Dorsal origin midway between snout and caudal base dorsal spine strong, serrated. Anal with 16 rays. Lateral line scales 55 ; lateral transverse scales 13/11. Purplish silvery superiorly becoming silvery white below ; young with 4 or 5 lateral cross bends.



TEXT-FIG. 86.—Lateral view of *Rohtee ogilbii* (Sykes). (After Day).

Distribution.—INDIA : freshwaters of Deccan, Deolali, Poona, Mysore.

Remarks.—It attains at least 152 mm. (6 inches) in length.

71. Genus *Semiplotus* Blkr.

1859. *Semiplotus* Bleeker, *Nat. Tijdschr. Ned.-Ind.*, 20. (Type, *Cyprinus semiplotus* Mc Clell., tautotypic.)

145. *Semiplotus semiplotus* (Mc Clell.)

1839. *Cyprinus semplotus* Mc Clelland, *Asiat. Res.*, **19**, p. 274, fig. 2 (type-locality : the Brahmaputra in upper Assam).
 1889. *Semiplotus macclellandi* Day, *Fauna Brit. India*, Fish., **1**, p. 281, fig. 97.

Head 5.5 to 6, depth 3.5 in total length. Eyes in the middle of head, 4 to 6 in head. Dorsal profile more arched than ventral profile. Snout obtuse, thickened, tuberculated. Lower jaw with an internal horny layer. No barbels. Dorsal origin midway between snout end and post-end of anal base ; dorsal spine bony, entire. Lateral line scales 27-33 ; $3\frac{1}{2}$ rows between lateral line and pelvic base. Leaden silvery, darkest superiorly ; paired fins and anal orange.

Distribution.—INDIA : freshwaters of Terai and Duars, Darjeeling Dt., W. Bengal, Assam.—Burma.

Remarks.—It attains at least 609 mm. (2 feet) in length.

72. Genus *Schizothorax* Heckel

1838. *Schizothorax* Heckel, *Fisch. Caschmir*, p. 11 (Type, *Schizothorax palgiostomus* Heck., designated by Bleeker in *Ned. Tijds. Dierk.*, **1**, pp. 179-186, 1863.)
 1839. *Oreinus* Mc Clelland, *Asiat. Res.*, **19**, p. 273. (Type, *O. guttatus* Mc Clell., logotypic ; regarded by Gistel as preoccupied by *Oreina* ; inadmissible.)

146. *Schizothorax molesworthii* (Chaudhuri)

1913. *Oreinus molesworthii* Chaudhuri, *Rec. Indian Mus.*, **8**, pp. 247, 248, pl. 7, fig. 2, 2a, 2b (type-locality : Yembung, Abor).

Head 4.5, depth 4 in total length. Eyes 5 in head, nearer to snout end than to posterior border of head. Barbels 4, maxillary pair $\frac{3}{4}$ eye, rostral smaller. Lower jaw with a suctorial disc. Dorsal origin in front of pelvic origin, midway between anterior border of eye and base of caudal ; dorsal spine serrated. Lateral line scales 113 ; lateral transverse scales 21/24. Bluish black superiorly, lighter below.

Distribution.—INDIA : freshwaters of Darjeeling Dt., W. Bengal, Assam, Eastern Himalayas.—Sikkim, Nepal, Szechwan.

Remarks.—It attains about 304 mm. (a foot) in length.

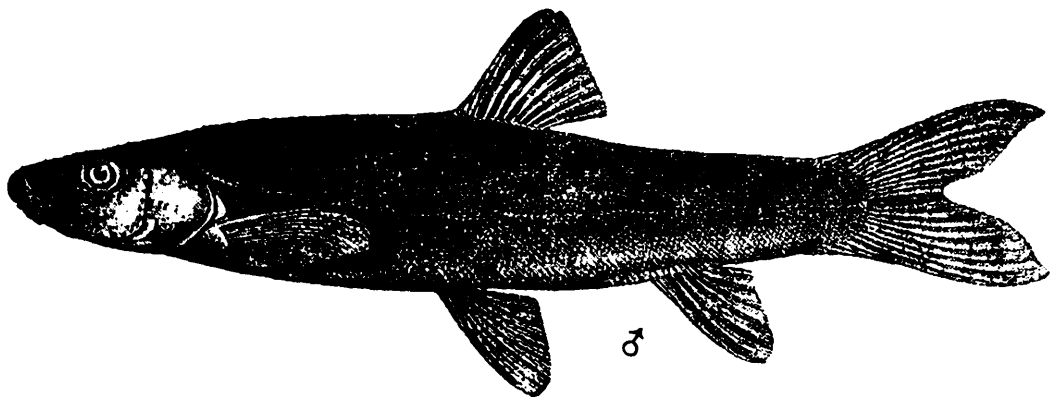
147. *Schizothorax plagiostomus* Heckel

(Text-fig. 87)

1838. *Schizothorax plagiostomus* Heckel, *Fisch. Caschmir*, p. 16, pl. 1 (type-locality : Kashmir).
 1889. *Oreinus plagiostomus* Day, *Fauna Brit. India*, Fish., **1**, p. 250.
 1889. *Oreinus sinuatus* Day, *Fauna Brit. India*, Fish., **1**, p. 258.]

Head 5.5 to 6, depth 5.5 to 7.5 in total length. Eyes 6 to 8 in head, in the front half of head. Barbels 4, of about equal length and less than eye diameter. Lower jaw with a suctorial disc. Dorsal origin a little in advance of pelvic origin and midway between end of snout and

base of caudal ; dorsal spine moderately serrated. Lateral line scales 105-110 ; 16-20 rows between lateral line and pelvic base. Grayish silvery above and lighter below ; often with some black spots.



TEXT-FIG. 87.—Lateral view of *Schizothorax plagiostomus* Heckel. (After Misra).

Distribution.—INDIA : freshwaters of Kashmir, Assam, Eastern Himalayas ; PAKISTAN.—Afghanistan, Bhutan.

Remarks.—It attains 609 mm. (2 feet) in length.

73. *Schizothoraichthys* Misra

(Type, *Schizothorax esocinus* Heckel, orthotypic ; for generic description, see p. 48.)

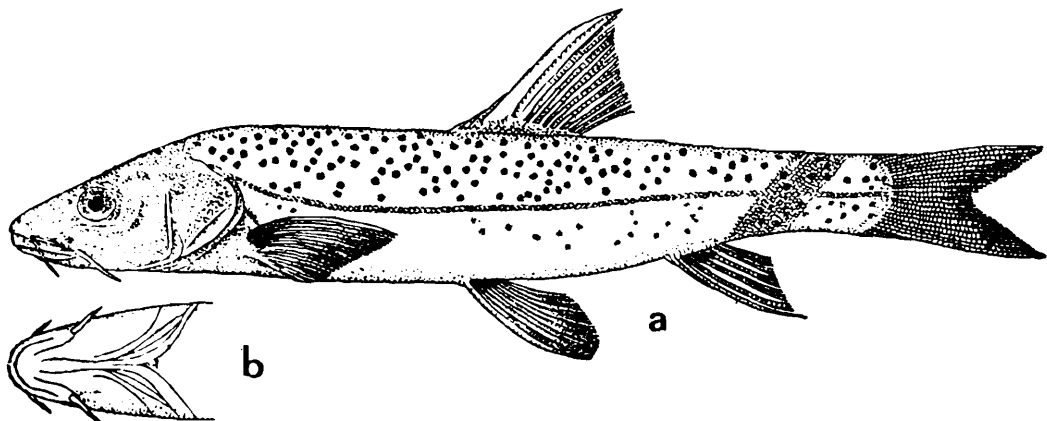
148. *Schizothoraichthys esocinus* (Heckel)

(Text-fig. 88)

1838. *Schizothorax esocinus* Heckel, *Fisch. Caschmir*, p. 48, pl. 9 (type locality : Kashmir).

1889. *Schizothorax esocinus* Day, *Fauna Brit. India*, Fish., 1, p. 254.

Head 4.2 to 4.5, depth 7.2 in total length. Eyes 6.5 in head, in the anterior half of head. Lower labial fold interrupted in the middle. Barbels 4, rostral pair more than half longer than eye, the maxillary a little shorter. Dorsal origin slightly nearer to caudal base than to snout



TEXT-FIG. 88.—(a) Lateral view of *Schizothoraichthys esocinus* (Heckel). (b) Ventral view of head of same. (After Day).

end ; dorsal spine bony, serrated. Silvery, with numerous black spots.

Distribution.—INDIA : freshwaters of Kashmir and Ladak ; W Pakistan.—Afghanistan.

Remarks.— It attains at least 457 mm. (1½ feet) in length.

149. *Schizothoraichthys progastus* (Mc Clell.).

1839. *Oreinus progastus* Mc Clelland, *Asiat. Res.*, 19, pp. 274, 343, pl. 40, fig. 4 (type-locality : rapids in upper Assam).

1889. *Schizothorax progastus* Day, *Fauna Brit. India*, Fish., 1, p. 253.

Head 5.2 to 5.5, depth 6 in total length. Eyes 4.5 to 6 in head ; in the middle of head. Lower lip with a central lobe and a lateral one on either side. Barbels 4; rostral pair about as long as eye, maxillary shorter. Dorsal origin slightly in advance of pelvic origin, midway between snout end and caudal base ; dorsal spine strong, serrated. Lateral line scales 150-160 ; about 18 rows between lateral line and pelvic base. Uniform silvery, often with a few fine spots ; fins dark edged.

Distribution.—INDIA : Himalayas, from the head waters of the Ganges to Saddyia in upper Assam through Nepal and Darjeeling Dt., W. Bengal ; common at Hardwar, U.P.

Remarks.—It attains 508 mm. (1 foot 8 inches) in length.

74. Genus *Osteochilus* Gthr.

1868. *Osteochilus* Gunther, *Cat. Fish. Brit. Mus.*, 7, p. 40. (Type, *Rohita melanopleura* Blkr.)

1942. *Osteochilichthys* Hora, *Rec. Indian Mus.*, 44, pp. 8, 9. (Type, *Scaphiodon thomassi* Day, orthotypic.)

150. *Osteochilus* (*Osteochilichthys*) *nashii* (Day)

1868. *Barbus nashii* Day, *Proc. zool. Soc. Lond.*, p. 584 (type-locality : Coorg district).

1889. *Scaphiodon nashii* Day, *Fauna Brit. India*, Fish., 1, p. 285.

Head 5.2 to 6, depth 4 to 5 in total length. Eyes 3 to 4 in head. Snout broadly acute, with pappillae in adults, overhanging mouth. Mouth transverse. Lips thin, not continuous in adults. A thick, internal horny covering to lower jaws in adults. Barbels absent. Dorsal origin nearer to snout than to caudal base ; last undivided dorsal ray articulated ; pelvic origin below middle of dorsal. Lateral line scales 40-43 ; lateral transverse scales 7/7. Redish brown above, silvery below ; a black band from eye to centre of caudal ; young silvery gray superiorly and silvery below, with the lateral band terminating in a black blotch at the caudal base ; dorsal and anal with a dark band.

Distribution.—INDIA: freshwaters of Mysore, Coorg, Canara, Wynaad.

Remarks.—It attains at least 165 mm. ($6\frac{1}{2}$ inches) in length.

151. *Osteochilus* (*Osteochilichthys*) *thomassi* (Day)

1877. *Scaphiodon thomassi* Day, *Fish. India*, p. 551, pl. 134, fig. 1 (type-locality : South Canara).

1889. *Scaphiodon thomassi* Day, *Fauna Brit. India*, Fish., 1, p. 285.

Head 5.2 to 6, depth 3.5 in total length. Eyes 4.3 in head. Snout obtuse, with large pores, overhanging mouth. Mouth transverse. Lips not continuous, upper one fringed. A horny layer inside lower jaw. No barbels. Dorsal origin nearer to snout than to base of caudal ; last undivided dorsal ray articulated. Pelvic origin below 4th or 5th dorsal ray. Lateral line scales 39 ; lateral transverse scales 7/7. Dull silvery above and dull white below, with a faint, silvery, lateral band ; a dark band on dorsal.

Distribution.—INDIA : freshwaters of Canara.

Remarks.—It attains at least 177 mm. (7 inches) in length.

75. Genus *Carassius* Nilsson

1832. *Carassius* Nilsson, *Prodrom. Ichth. Scandinav.*, 4, p. 290. (Type, *Cyprinus carassius* L., orthotypic.)

152. *Carassius carassius* (L.)

1758. *Cyprinus carassius* Linnaeus, *Syst. Nat.*, ed. 10, p. 321, 322 (type-locality : China, Japan).
1889. *Carassius auratus* Day, *Fauna Brit. India*, Fish., 1, p. 283 (foot note).

Domesticated ; depth of body varies from 2.5 to 3 or even less in total length. Eyes large, protruding. Mouth terminal, arched. Snout obtuse, rounded. Barbels 4. Fins abnormal ; dorsal reduced or even absent ; caudal enlarged with 3 or 4 lobes, and with a stiff serrated spine. Golden to dark olivaceous.

Distribution.—Introduced in ponds in INDIA and PAKISTAN, while its original home is China and Japan. It is domesticated and forms many varieties.

Remarks.—It grows upto 177 mm. (7 inches) in length.

76. Genus *Crossocheilus* v. Hass.

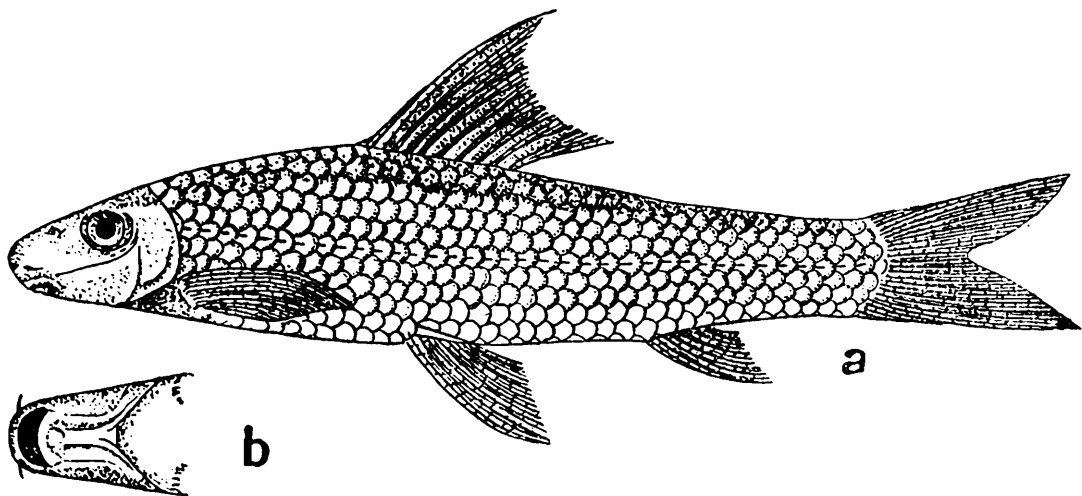
1823. *Crossocheilus* van Hasselt, *Algem. Konst. Letterbode*, 2, p. 132. (Type, *C. oblongus* V.)

153. *Crossocheilus latius latius* (Ham.)

(Text-fig. 89)

1822. *Cyprinus latius* Hamilton, *Fish. Ganges*, pp. 345, 393 (type-locality : the Tista).
1889. *Cirrhina latius* Day, *Fauna Brit. India*, Fish., 1, p. 279.

Head 6 to 6.5, depth 5.5 to 7 in total length. Eyes slightly behind middle of head in adult, 3.5 to 5 in head. Dorsal profile more convex



TEXT-FIG. 89.—(a) Lateral view of *Crossocheilus latius latius* (Ham.). (b) Ventral view of head of same. (After Day).

than ventral profile. Snout overhanging mouth, with a small lateral lobe. Upper lip deeply indented on the edge ; lower lip with a sharp horny covering. Barbels 4. Dorsal origin midway between snout

end and caudal base in the young and nearer to snout in the adult. Lateral line scales 38-40 ; $3\frac{1}{2}$ to $4\frac{1}{2}$ rows of scales between lateral line and pelvic base. Brownish olive superiorly and lighter on sides, with irregular black spots ; dorsal and caudal yellowish, other fins orange.

Distribution.—INDIA : hill streams from plains level to 2,000 ft. of U.P., Bihar, W. Bengal, Deccan ; PAKISTAN : E. Pakistan.

Remarks.—It grows upto 152 mm. (6 inches) in length.

77. Genus *Thynnichthys* Blkr.

1859. *Thynnichthys* Bleeker, *Nat. Tijdschr. Ned.-Ind.*, 20, p. 417. (Type, *Leuciscus thynnoides* Blkr., orthotypic.)

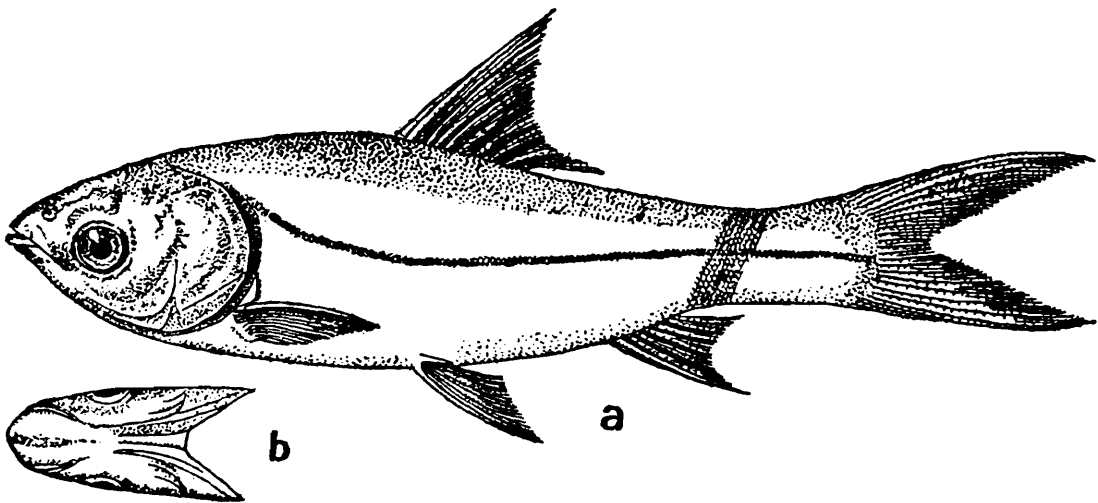
154. *Thynnichthys sandkhol* (Sykes)

(Text-fig. 90)

1841. *Leuciscus sandkhol* Sykes, *Trans. zool. Soc. Lond.*, 2, p. 363 (type-locality : the Goreh river at Kullumb).

1889. *Thynnichthys sandkhol* Day, *Fauna Brit. India*, Fish., 1, p. 289.

Head 4 to 4.5, depth 3.2 to 4 in total length. Eyes in the middle of depth of body, 3 to 5 in head. No barbels. Dorsal profile more convex than ventral profile. Dorsal origin slightly in advance of pelvic origin, midway between snout and caudal base. No dorsal spine. Anal origin at some distance behind end of dorsal base. Scales small, about 110 in lateral line ; 17 to 19 rows between lateral line and pelvic base. Silvery, head purplish.



TEXT-FIG. 90.—(a) Lateral view of *Thynnichthys sandkhol* (Sykes). (b) ventral view of head of same. (After Day).

Distribution.—INDIA : Mahanadi, Godavari and Kistna rivers.

Remarks.—It attains above 457 mm. ($1\frac{1}{2}$ feet) in length.

XXIV Family COBITIDAE

71. Genus *Botia* Gray

1831. *Botia* Gray, *Zool. Misc.*, p. 8. (Type, *Botia almorhae* Gray.)

155. *Botia dario* (Ham.)

1822. *Cobitis dario* Hamilton, *Fish. Ganges*, pp. 354, 394, pl. 29, fig. 95 (type-locality ; northern rivers of Bengal).

1889. *Botia dario* Day, *Fauna Brit. India*, Fish., 1, p. 216.

Head 4.5 to 5, depth 4.5 to 5 in total length. Eyes almost in the middle of head. Snout rather obtuse. Suborbital spine reaches to below hind edge of eye. Barbels 8. Dorsal origin midway between snout end and caudal base ; dorsal rays 12-13. Scales indistinct. Seven or 8 oblique bands from back to below ; caudal with 2 or 3 or more cross bands.

Distribution.—INDIA : freshwaters of Assam, W. Bengal, Bihar, U.P. ; PAKISTAN : freshwaters of E. Pakistan.

Remarks.—It attains 89 mm. (3½ inches) in length.

156. *Botia dayi* Hora

1889. *Botia geto* (nec Ham.) Day, *Fauna Brit. India*, Fish., 1, p. 217, fig. 77.

1932. *Botia dayi* Hora, *Rec. Indian Mus.*, 34, pp. 571, 572, (type-locality : The Mahanadi at base of the Darjeeling Himalayas).

Head 4.8 to 5.2, depth 4 to 5 in total length. Eyes in the posterior half of head, 6 to 7 in head. Snout pointed. Barbels 8. Dorsal origin midway between snout end and caudal base or often nearer to caudal base ; dorsal rays 11-12. Scales minute. With irregular, reticulated, brown, cross bands which enclose yellowish spots of different sizes ; fins cross banded.

Distribution.—INDIA : freshwaters of E. Punjab, U.P., Himalayas, Valley of the Ganges, Jumna and Sone rivers, Bihar, Assam ; PAKISTAN : freshwaters of W Punjab.

Remarks.—It attains 122 mm. (4.8 inches) in length.

79. Genus *Noemacheilus* van Hass.

1823. *Noemacheilus* van Hasselt, *Algem. Konst. Letterbode*, 2, p. 133. (Type, *Cobitis fasciatus* v. Hass.)

157. *Noemacheilus botia* (Ham.)

1822. *Cobitis botia* Hamilton, *Fish. Ganges*, pp. 350, 394 (type-locality : the rivers of north-eastern parts of Bengal).

1889. *Nemachilus botia* Day, *Fauna Brit. India*, Fish., 1, 227.

Head 4.5 to 5.5, depth 4.7 in total length. Eyes 3.7 to 4 in head. Barbels, 6, maxillary pair extending to below hind border of eye. Dorsal origin slightly nearer to snout than to caudal base ; dorsal rays 12-14, dorsal base equals head. Pelvic origin under middle of dorsal. Caudal slightly notched. Scales indistinct. Lateral line complete ; 12 rows of scales between it and pelvic base. Grayish, with 10-14 short, vertical bars on lateral line and a number of blotches above, which often form bands over back ; a black ocellus on upper part of the base of caudal which bears 7 irregular bars of a >shape ; dorsal orange, with rows of black spots.

Distribution.—INDIA : freshwaters of E. Punjab, U.P., Western Himalayas, Darjeeling Dt., W Bengal, Eastern Himalayas, Assam, Bihar ; PAKISTAN : freshwaters of W. Punjab, E. Pakistan.

Remarks.—It attains at least 76 mm. (3 inches) in length.

158. *Noemachilus botia aureus* Day

1878. *Nemachilus botia aureus* Day, *Fish. India*, p. 614, pl. 156, fig. 4 (type-locality : Assam).

1889. *Nemachilus botia* var. *aureus* Day, *Fauna Brit. India*, Fish., 1, p. 227.

Dorsal with 11-12 rays and of a less extent than the above species. Lateral line ceases opposite hind end of dorsal. Other characters as given for the above species.

Distribution.—INDIA : freshwaters of Deccan, Deolali, Poona, Orissa.

Remarks.—It attains about 76 mm. (3 inches) in length.

Division SILURI

Suborder Siluroidei

XXV Family ARIIDAE

80. Genus *Tachysurus* Lac.

1803. *Tachysurus* Lacepede, *Hist. nat. Poiss.*, 5, p. 150 (Type, *T. sinensis* Lac.)

1840. *Arius* Valenciennes, *Hist. nat. Poiss.*, 15, p. 53. (Type, *Pimelodus arius* Ham., tautotypic.)

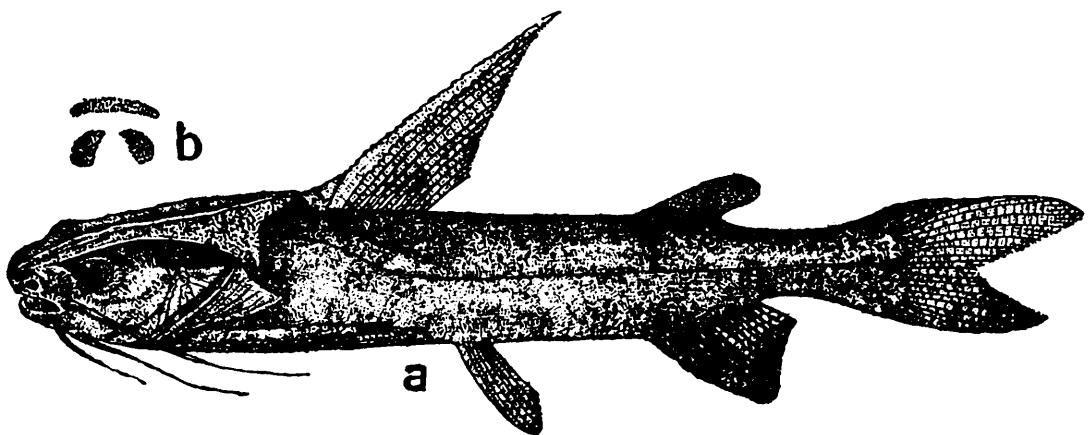
159. *Tachysurus caelatus* (V.)

(Text-fig. 91)

1840. *Arius caelatus* Valenciennes, *Hist. nat. Poiss.*, 15, p. 66 (type-locality : Bombay).

1889. *Arius caelatus* Day, *Fauna Brit. India*, Fish., 1, p. 194.

Head 4.5 to 4.6, depth 6.5 in total length. Eyes 6 to 9 in head. Width of mouth equals postorbital length of head. Upper surface of head and



TEXT-FIG. 91.—(a) Lateral view of *Tachysurus caelatus* (V.). (b) Palatine dentition of same. (After Day).

occipital process strongly granulated, with a deep median, longitudinal groove not reaching base of occipital process. Occipital process somewhat keeled, as broad as or a little broader at its base than it is long, and

reaches the basal bone of dorsal. Barbels 6, maxillaries extending to middle of pectoral fins. Teeth villiform on palate, in 2 widely placed triangular patches; vomerine confluent with palatine. Dorsal spine very strong, serrated, nearly as long as head. Pectoral spines strong, serrated, but shorter than dorsal spine. Anal rays 19. Bluish gray superiorly, becoming white below.

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Pondicherry, Coromandel, Orissa, ascending tidal rivers and being not uncommon at Calcutta; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Malaya, Malay-Archipelago, Siam.

Remarks.—It attains at least 304 mm. (a foot) in length.

160. *Tachysurus dussumieri* (V.)

1840. *Arius dussumieri* Valenciennes. *Hist. nat. Poiss.*, 15, p. 48. (type-locality : Malabar).

1889. *Arius dussumieri* Day, *Fauna Brit. India*, Fish., 1, p. 188.

Head 4 to 4.5, depth 5 in total length. Eyes 6.5 in head. Width of gape of mouth equals nearly half of head length. Median, longitudinal groove on head rather shallow, extending to base of occipital process. Occipital process strongly keeled, as wide at its base as it is long, reaching basal bone of dorsal. A few scattered granulations on the posterior part of head and over the base of occipital process. Barbels 6, maxillary pair reaching just beyond pectoral base. Teeth obtusely conical or globular on palate, in four widely separated patches; those on either side of vomer smaller than palatine patches. Dorsal spine, strong, serrated, as long as head without snout. Pectoral spine a little shorter than dorsal spine. Bluish gray superiorly, lighter on sides; fins dark externally.

Distribution.—INDIA : coasts of Malabar, Travancore-Cochin.—Ceylon, South Africa.

Remarks.—It attains at least 304 mm. (a foot) in length.

161. *Tachysurus gagora* (Ham.)

1822. *Pimelodus gagora* Hamilton, *Fish. Ganges*, pp. 167, 376 (type-locality : estuaries of Bengal).

1889. *Arius gagora* Day, *Fauna Brit. India*, Fish., 1, p. 185.

Head 4 to 4.2, depth 6.7 in total length. Eyes 7 to 8 in head. Width of gape of mouth a little less than half of head length. Occipital region granulated. Median, longitudinal groove on head deep, narrow, reaching base of occipital process. Occipital process keeled, a little longer than wide at its base, extends to basal bone of dorsal. Barbels 6, maxillary pair not as long as head. Palatine teeth globular, in two semi-ovate patches. Dorsal spine of moderate strength, serrated, as long as postorbital part of head. Pectoral spines serrated, stronger than dorsal spine, equal to it in length. Purplish gray above, dull white beneath; a black spot on adipose dorsal; other fins stained gray.

Distribution.—INDIA : seas, estuaries and tidal rivers of Orissa and W. Bengal; PAKISTAN : seas and estuaries of E. Pakistan.—Siam.

Remarks.—It attains at least 457 mm. (1½ feet) in length.

162. *Tachysurus maculatus* (Thunberg)

1792. *Silurus maculatus* Thunberg, *Kon. Vet. Akad. Oya. Handl. Stockholm*, 13, p. 31, pl. 1, fig. 2 (type-locality : Japan).
 1889. *Arius falcarius* Day, *Fauna Brit. India, Fish.*, 1, p. 182.

Head 4 to 5, depth 5.2 to 6 in total length. Eyes 5.5 to 6 in head. Width of gape of mouth about equal to half of head length. The median, longitudinal groove on head does not extend to base of occipital process. Occipital process keeled, longer than wide at its base, extends to basal bone of dorsal. Barbels 6, maxillaries black extending to hind border of head. The villiform band of teeth in the premaxillaries 4 times as long as broad ; palatine teeth globular, in two elongated semi-triangular patches, parallel to one another along the median line with their external edge convex. Dorsal spine equal to head without snout, strong, serrated. Pectoral spines a little longer than dorsal spine. Bluish gray on back, dull white below ; fins grayish ; a black blotch on adipose and often on anal.

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, ascending tidal rivers having been found at Calcutta ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Siam, Malaya, Malay Archipelago, Philippines, China.

Remarks.—It attains about 381 mm. (1½ feet) in length.

163. *Tachysurus sagor* (Ham.)

1822. *Pimelodus sagor* Hamilton, *Fish. Ganges*, pp. 169, 376, (type-locality : estuaries of Bengal).
 1889. *Arius sagor* Day, *Fauna Brit. India, Fish.*, 1, p. 141.

Head 4.2 to 4.5, depth 5 in total length. Eyes 6.5 to 7 in head. Width of gape of mouth equals half of head length. Upper surface of head granulated in radiating lines. Median, longitudinal groove on head shallow, extending to a little behind postorbit. Occipital process one half wider at its base than it is long, reaches basal bone of dorsal. Barbels 6, maxillaries extending to middle or end of pectoral spine. Palatine teeth in two confluent villiform patches meeting in the median line. Dorsal spine strong, as long as head without snout. Pectoral spines stronger, of the same length as dorsal spine. Greenish brown above lighter below, sometimes with narrow vertical bands of spots ; fins stained dark.

Distribution.—INDIA : coasts of Bombay, Pondicherry, Coromandel and seas, estuaries and tidal rivers of W. Bengal ; PAKISTAN : seas and estuaries of Sind, E. Pakistan.—Malaya, Malay Archipelago, Siam.

Remarks.—It attains at least 914 mm. (3 feet) in length.

164. *Tachysurus sona* (Ham.)

1822. *Pimelodus sona* Hamilton, *Fish. Ganges*, pp. 172, 376, (type-locality : estuaries of Bengal).
 1889. *Arius sona* Day, *Fauna Brit. India, Fish.*, 1, p. 179.

Head 4, depth 6 in total length. Eyes 7 to 9 in head. Width of gape of mouth equals two-thirds of head. Median, longitudinal groove on head wide, not extending as far as base of occipital process. Occipital

process keeled, as wide as or a little wider than long, reaching basal bone of dorsal. Upper surface of head with radiating granulations. Barbels 6, maxillary pair extending to hind border of head. Palatine teeth in two, somewhat, triangular, villiform patches, connected anteriorly with two, small patches of vomerine teeth. Dorsal spine strong, as long as head excluding snout. Pectoral spine stronger, a little shorter than dorsal spine. Brownish superiorly, bluish shot with gold on sides and dull white on abdomen ; fins bluish black.

Distribution.—INDIA : coasts of Bombay, Malabar and seas, estuaries and tidal rivers of W. Bengal ; PAKISTAN : seas and estuaries of Sind, E. Pakistan.—Ceylon, Malaya, Malay Archipelago.

Remarks.—It attains at least 914 mm. (3 feet) in length.

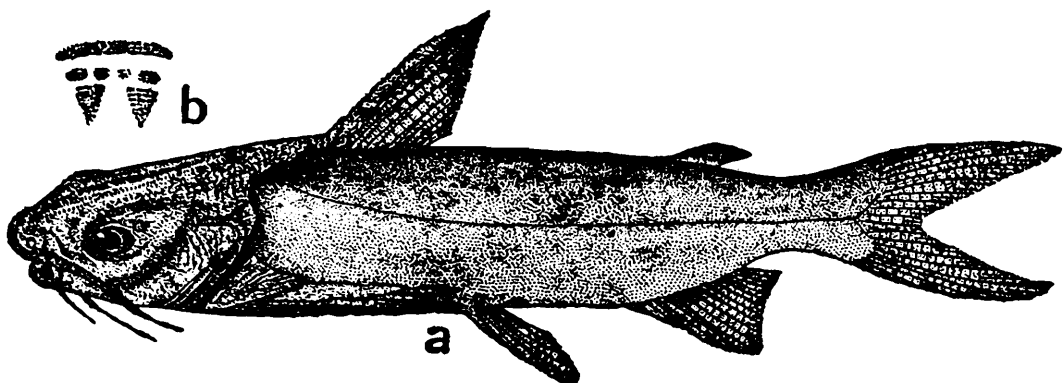
165. *Tachysurus thalassinus* (Rüpp.)

(Text-fig. 92)

1835. *Bagrus thalassinus* Ruppell, *Neue Wirbelth. Fische*, p. 75, pl. 20, fig. 2 (type-locality : Massaua, Red Sea).

1889. *Arius thalassinus* Day, *Fauna Brit. India*, Fish., 1, p. 181.

Head 4.5, depth 5.5 to 6 in total length. Eyes 5 in head, with the longest diameter obliquely transverse. Upper surface of head granulated. Median, longitudinal groove on head narrow reaching opposite hind edge of opercle. Occipital process keeled, a little longer than wide at its base, extending to basal bone of dorsal. Barbels 6, maxillaries just



TEXT-FIG. 92.—(a) Lateral view of *Tachysurus thalassinus* (Rüpp.), (b) Palatine dentition of same. (After Day).

reaching pectoral base. Teeth on palate villiform, those on each side forming a triangle of 3 patches. Dorsal spine as long as or a little longer than head without snout. Pectoral spine strong, a little shorter than dorsal spine. Silvery gray or brownish on back, lighter below ; upper half of adipose dorsal black ; granules on head with golden sheen.

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Pondicherry, Coromandel, Orissa, W. Bengal and Andamans ; PAKISTAN : coasts of Sind, E. Pakistan.—Burma, Ceylon, Iraq, E. Africa, Malaya, Malay Archipelago, Philippines, Siam.

Remarks.—It attains at least 609 mm. (2 feet) in length and often ascends tidal rivers.

81. Genus *Hemipimelodus* Blkr.

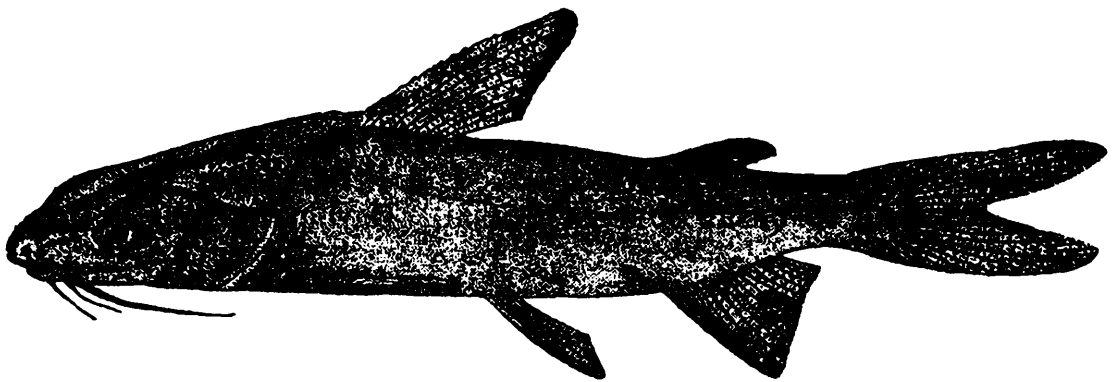
1858. *Hemipimelodus* Bleeker, *Ichth. Arch. Ind. Prodr.*, 1, Siluri, p. 236.
(Type, *Pimelodus borneensis* Blkr., orthotypic.)

166. *Hemipimelodus jatius* (Ham.)

(Text-fig. 93)

1822. *Pimelodus jatius* Hamilton, *Fish. Ganges*, pp. 171, 376 (type-locality :
estuaries of Bengal).
1889. *Arius jatius* Day, *Fauna Brit. India*, Fish., 1, p. 186.

Head 4.2, depth 5.2 in total length. Eyes 4.5 to 5 in head. Gape of mouth equals one-third of head length. Upper surface of head, granulated. Median longitudinal groove on head narrow, continued nearly to base of occipital process. Occipital process keeled, as wide at its base as long, and touches basal bone of dorsal. Barbels 6, maxillaries shorter than head. No teeth on plate. Dorsal spine strong, as long as head without snout. Pectoral spine as long as dorsal spine. Bluish dark superiorly and lighter below ; fins yellowish ; lower caudal lobe tinted gray ; a deep black spot on adipose dorsal.



TEXT-FIG. 93.— Lateral view of *Hemipimelodus jatius* (Ham.).

Distribution.—INDIA : seas, estuaries and tidal rivers of Orissa and W. Bengal ; PAKISTAN : seas, estuaries and tidal rivers of E. Pakistan.—Burma, Ceylon.

Remarks.—It attains 304 mm. (a foot) in length.

82. Genus *Osteogeniosus* Blkr.

1846. *Osteogeniosus* Bleeker, *Nat. Gen. Arch. Ned.-India*, 3(2), p. 173. (Type,
O. macrocephalus Blkr., orthotypic).

167. *Osteogeniosus militaris* (L.)

1758. *Silurus militaris* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 305 (type-locality
Asia).
1889. *Osteogeniosus militaris* Day, *Fauna Brit. India*, Fish., 1, p. 190.

Head 4.2 to 4.5, depth 5.5 to 6.5 in total length. Eyes 7 in head. The greatest width of head equals its length behind angle of mouth. Width of gape of mouth equals half head length. Median longitudinal groove of moderate width, reaching so far as occipital process. Upper

surface of head rather smooth. Occipital process $2\frac{1}{2}$ times as long as wide at its base and one third of head length. Barbels 2, semi-osseous a little longer than head. Teeth on palate in two, somewhat crescentic patches converging in front. Dorsal spine as long as head excluding snout. Pectoral spines stronger, reaching about half way to pelvics. Silvery, dark on back ; fins tinged with red.

Distribution.—INDIA : coasts of Travancore-Cochin, Coromandel, Orissa.—Ceylon, Malaya, Malay Archipelago, Siam.

Remarks.—It attains 355 mm. ($1\frac{1}{8}$ feet) in length and ascends tidal rivers and estuaries.

XXVI. Family PLOTOSIDAE

83. Genus *Plotosus* Lac.

1803. *Plotosus* Lacepede, *Hist. nat. Poiss.*, 5, p. 129. (Type, *Platystacus anguillaris* Bl.)

168. *Plotosus auguillaris* (Bl.)

1797. *Platystacus anguillaris* Bloch, *Syst. Ichth.*, 11, p. 49, pl. 373, figs. 1, 2 (type-locality : Malabar).

1889. *Plotosus arab* Day, *Fauna Brit. India*, Fish., 1, p. 113.

Head 5 to 5.5, depth 7 to 8 in total length. Eyes 5 to 6.5 in head, in the middle of head length. Width of gape of mouth equals 0.4 of head length. Greatest width of head equals its length behind angle of mouth. Barbels 8, nasal reaching postorbit, maxillary 0.5 to 0.6 as long as head ; the 2 mandibular pairs shorter. Dorsal spine rather strong, 0.3 as long as head. Anal rays 169-190. Chestnut brown with two bluish white lateral bands, the superior one from above eyes along base of dorsal and the inferior from maxilla along middle of side of the body ; bands said to disappear with age ; vertical fins black edged.

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W Bengal, Andamans ; PAKISTAN : coasts of Makran, Sind, Karachi. E. Pakistan.—Burma, Ceylon, Red Sea, S. Africa, Malaya, Malay Archipelago, Siam, Philippines, China, Japan, Australia, Melanesia, Polynesia.

Remarks.—It attains at least 304 mm. (a foot) in length and ascends estuaries and tidal rivers.

169. *Plotosus canius* Ham.

(Text-fig. 94)

1822. *Plotosus canius* Hamilton, *Fish. Ganges*, pp. 142, 374, pl. 15, fig. 44 (type-locality : rivers of the southern parts of Bengal).

1889. *Plotosus canius* Day, *Fauna Brit. India*, Fish., 1, p. 113, fig. 47.

Head 4.5 to 5.5, depth 7 to 7.5 in total length. Eyes 10-11 in head. Width of head equals its length behind angle of mouth. Barbels 8, nasal almost reaching nape, maxillary the end of opercle or pectoral

base ; outer mandibular pair slightly longer than inner one. Dorsal spine 0·4 in head length. Anal rays 242-271. Uniform brown, with vertical fins edged black.



TEXT-FIG. 94.—Lateral view of *Plotosus canius* Ham. (After Day).

Distribution.—INDIA : estuaries along the coasts of Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal, Andamans ; PAKISTAN : estuaries along the coasts of Sind, E. Pakistan.—Burma, Ceylon, Malaya, Malay Archipelago, Siam, Philippines.

Remarks.—It attains 914 mm. (3 feet) in length.

XXVII. Family SILURIDAE

84. Genus *Ompok* Lac.

1803. *Ompok* Lacepede, *Hist. nat. Poiss.*, 5, p. 49. (Type, *O. siluroides* Lac.)
 1822. *Callichrous* Hamilton, *Fish. Ganges*, p. 149. (Type, *Silurus bimaculatus* Bl.)

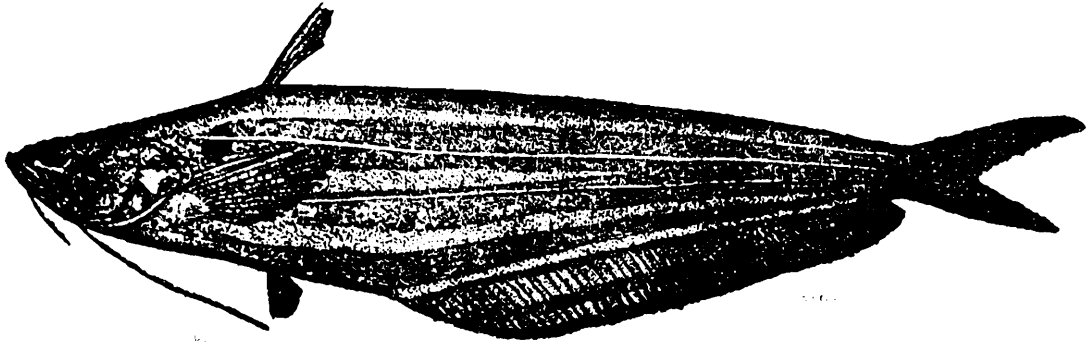
170. *Ompok bimaculatus* (Bl.)

(Text-fig. 95)

1797. *Silurus bimaculatus* Bloch, *Syst. Ichth.*, 11, p. 17, pl. 369 (type-locality : Malabar).
 1889. *Callichrous sindensis* Day, *Fauna Brit. India*, Fish., 1, p. 130.
 1889. *Callichrous bimaculatus* Day, *Fauna Brit. India*, Fish., 1, p. 131.
 1889. *Callichrous malabaricus* Day, *Fauna Brit. India*, Fish., 1, p. 133.
 1889. *Callichrous pabda* Day, *Fauna Brit. India*, Fish., 1, p. 133.
 1889. *Callichrous macrophthalmus* Day, *Fauna Brit. India*, Fish., 1, p. 152.

Head 5 to 7, depth 5 to 6 in total length. Eyes 4 to 5·5 in head, Lower jaw prominent. Width of gape of mouth equals postorbital length of head. Barbels 4 or 2, or the mandibular pair rudimentary ; maxillary pair reach middle of pectoral or the commencement of anal. Teeth in two small patches on either side of vomer, not confluent in the median line. Dorsal short, without spine (and rarely absent) ; origin in advance of pelvic origin, much nearer to snout end than to caudal base. Pectoral with a moderately strong spine, serrated or entire. Pelvic with 8 rays. Anal very long, with 54 to 73 rays, ceasing close to

the forked caudal. Silvery, shot with purple ; a black spot on shoulder and often one or two faint, black, lateral bands in upper part of body.



TEXT-FIG. 95.—Lateral view of *Ompok bimaculatus* (Bl.). (After Day).

Distribution.—INDIA : freshwaters of Kashmir, E. Punjab, U.P., Bihar, Manipur, Assam, W. Bengal, Orissa, M.P., Madras, Bombay, Malabar, Travancore-Cochin, Mysore, Deccan ; PAKISTAN.—Ceylon, Burma, Malaya, Malay Archipelago, Siam, Chusan, Yunan.

Remarks.—It attains at least 304 mm. (a foot) in length.

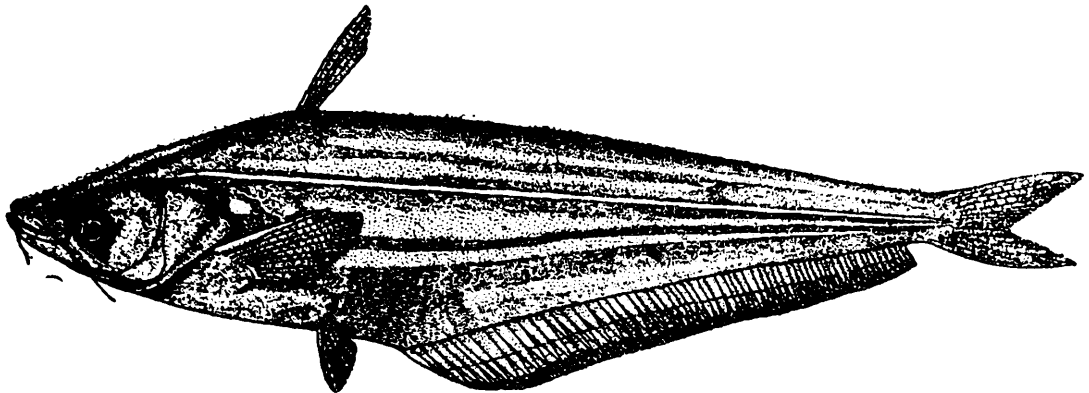
171. *Ompok pabo* (Ham.)

(Text-fig. 96)

1822. *Silurus pabo* Hamilton, *Fish. Ganges*, pp. 153, 375, pl. 22, fig. 48 (type-locality : the Brahmaputra, towards Assam).

1889. *Callichrous pabo* Day, *Fauna Brit. India*, Fish., 1, p. 132.

Head 5 to 5.2, depth 5 to 5.5 in total length. Eyes 4 to 4.5 in head. Lower jaw in advance of upper. Width of gape of mouth equals half of head length. Barbels 4, maxillary pair extending upto hind border of eye. Teeth in two transverse patches not meeting medially. Dorsal short, spineless ; origin nearer to snout end than to caudal base and in front of pelvic origin. Pectoral spine serrated or rarely smooth,



TEXT-FIG. 96.—Lateral view of *Ompok pabo* (Ham.). (After Day).

half as long as head. Pelvic with 10 or 9 rays. Anal with 66—71 rays, not united with the forked caudal. Silvery with a faint shoulder spot.

Distribution.—INDIA : freshwaters of Assam, Darjeeling Dt., W Bengal ; PAKISTAN : freshwaters of W. Pakistan.—Burma.

Remarks.—It attains 241 mm. (9½ inches) in length.

85. Genus *Silurus* L.

1758. *Silurus* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 304. (Type, *S. glanis* L.)

172. *Silurus cochinchinensis* V

(Text-fig. 97)

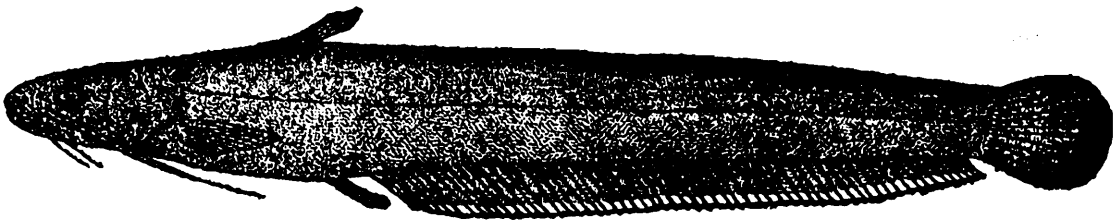
1839. *Silurus cochinchinensis* Valenciennes, *Hist. nat. Poiss.*, 14, p. 252 (type-locality : Cochin China).

1889. *Silurus cochinchinensis* Day, *Fauna Brit. India*, Fish., 1, p. 120.

1889. *Silurus wynnadensis* Day, *Fauna Brit. India*, Fish., 1, p. 119, fig. 50.

1889. *Silurus afghana* Day, *Fauna Brit. India*, Fish., 1, p. 199.

Head 6 to 6.5, depth 6.5 in total length. Eyes small, in anterior half of head, above angle of mouth. Upper jaw slightly longer. Dorsal profile almost horizontal. Width of head equals its length behind nostrils. Barbels 4, maxillaries about twice head length, mandibular pairs, a little shorter than head. Vomerine teeth in two oval patches not confluent in the median line. Dorsal short, spineless; origin in front of pelvic origin. Pectoral spine short, strong smooth. Anal long, with 62-64 rays, slightly united with the rounded caudal. Leaden



TEXT-FIG. 97.—Lateral view of *Silurus cochinchinensis* V. (After Day).

superiorly, purplish below and covered all over with minute specks which often form an irregular finger mark on shoulder; caudal often yellow.

Distribution.—INDIA : freshwaters of Assam, Darjeeling Dt., Eastern Himalayas, Mysore, Malabar, Western Ghats.—Burma, Malay Peninsula, Siam, Cochin China.

Remarks.—It attains about 182 mm. (7.2 inches) in length.

86. Genus *Wallago* Blkr.

1851. *Wallago* Bleeker, *Nat. Tijdschr. Ned.-India*, 2, p. 198. (Type, *Silurus mulleri* Blkr., designated by Bleeker.)

1938. *Wallagonia* Myers, *Copeia*, No. 2, p. 98. (Type, *Wallago leeri* Blkr., orthotypic.)

173. *Wallago attu* (Schn.)

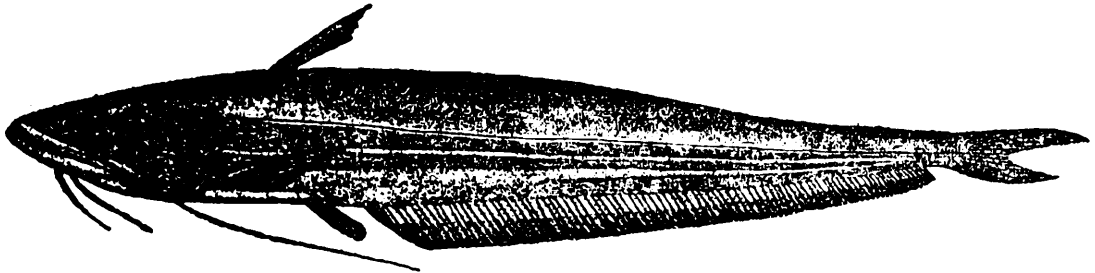
(Text-fig. 98)

1801. *Silurus attu* Schneider, *Syst. Ichth. Bloch*, p. 338, pl. 75 (type-locality : Malabar).

1889. *Wallago attu* Day, *Fauna Brit. India*, Fish., 1, p. 126, fig. 54.

Head 5 to 5.5, depth 6.5 in total length. Eyes nearly 7 to 8 in head. Dorsal profile nearly straight. Width of head a little less than its length

and equals half its height. Snout rather produced. Cleft of mouth extends to nearly an eye diameter behind orbit ; lower jaw more prominent. Barbels 4, maxillary twice as long as head, mandibular ones of the same length as snout. Teeth numerous, cardiform in both jaws ; an oblique patch on either side of vomer. Dorsal short, spineless ; origin above or a little in front of pelvic origin. Pectoral spine moderately strong and finely serrated. Caudal forked not united with anal. Uniform silvery gray becoming lighter below.



TEXT-FIG. 98.—Lateral view of *Wallago attu* (Schn.). (After Day).

Distribution.—INDIA : freshwaters of E. Punjab, U.P., Bihar, Darjeeling Dt., W. Bengal, Manipur, Assam, Orissa, Deolali, M.I., Madras, Ahmedabad, Bombay, Malabar, Travancore-Cochin ; PAKISTAN : freshwaters of W. Punjab, Sind, E. Pakistan.—Burma, Ceylon, Malay Archipelago, Siam, Indo-China, W. Yunan.

Remarks.—It attains 1,828 mm. (6 feet) in length and is often found in tidal rivers.

XXVIII. Family SCHILBEIDAE

87. Genus *Ailia* Gray

1831. *Ailia* Gray, *Ill. Ind. Zool. Faunæwicke.*, 1, p. 85. (Type, *A. bengalensis* Gray.)

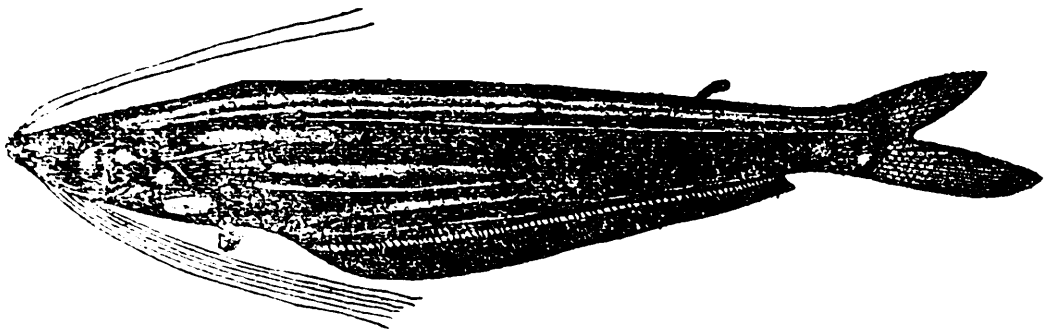
1871. *Aillichthys* Day, *Proc. zool. Soc. Lond.*, p. 712. (Type, *A. punctata* Day.)

174. *Ailia coila* (Ham.)

(Text-fig. 99)

1822. *Malapterurus coila* Hamilton, *Fish. Ganges*, pp. 158, 375 (type-locality : freshwater rivers of Bengal).

1889. *Ailia coila* Day, *Fauna Brit. India, Fish.*, 1, p. 134, fig. 58.



TEXT-FIG. 99.—Lateral view of *Ailia coila* (Ham.). (After Day).

Head 6 to 7, depth 5.2 to 6 in total length. Eyes 3.5 to 3.7 in head. Width of gape of mouth equals 1/3 of head length. Upper jaw longer.

Cleft of mouth extends to midorbit. Barbels 8, long, extending to almost the middle of body length without the caudal. Villiform teeth in jaws and in two small patches on vomer. No dorsal, but a small, posterior adipose dorsal. Pectoral spine slender. Anal long, with 59-75 rays. Silvery.

Distribution.—INDIA : freshwaters of Delhi, U.P., Bihar, Darjeeling Dt., W. Bengal, Assam, Nepal, Orissa, M.P., Kistna river, Madras ; PAKISTAN : Indus river, Sind, W. Punjab, E. Pakistan.

Remarks.—It attains at least 177 mm. (7 inches) in length.

88. Genus *Clupisoma* Swainson

1839. *Clupisoma* Swainson, *Nat. Hist. Fish. Animal.*, 2, p. 306. (Type, *Silurus garua* Ham., haplotypic.)

1858. *Schilbeichthys* Bleeker, *De Visschen Van den Ind. Archipel.*, 1, p. 253. (Type, *Silurus garua* Ham., orthotypic.)

1862. *Pseudeutropius* Bleeker, *Versl. gewone Vergad. Akad. Amst.*, 14, p. 398. (Type, *P. brachypterus* Blkr., orthotypic.)

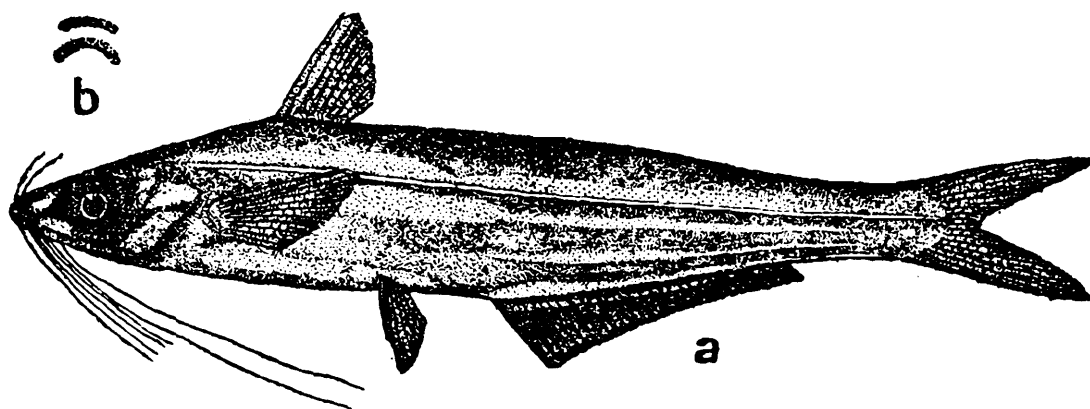
175. *Clupisoma garua* (Ham.)

(Text-fig. 100)

1822. *Silurus garua* Hamilton, *Fish. Ganges*, pp. 156, 375, pl. 21, fig. 50 (type-locality : freshwater rivers of the Gangetic provinces).

1889. *Pseudeutropius garua* Day, *Fauna Brit. India*, Fish., 1, p. 141.

Head 5.5 to 6.5, depth 5.5 to 7 in total length. Eyes 3.5 to 4 in head ; with broad, circular, adipose lid and situated partly on the lower surface of head. Upper jaw longer. Width of gape of mouth two-fifth in head length. Occipital process nearly 4 times as long as it is wide at its base, not reaching basal bone of dorsal. Barbels 8, maxillary pair extending to middle or end of pelvic fin. Palatine teeth in a semilunar band ; teeth on vomer contiguous with those on palate, each patch being semi-circular internally ; vomerine patches often with an interspace between



TEXT-FIG.. 100.—(a) Lateral view of *Clupisoma garua* (Ham.). (b) Palatine dentition of same. (After Day).

them. Dorsal spine slender, serrated, as long as head behind nostrils. Pectoral spine stronger, serrated, as long as or a little longer than dorsal spine. Adipose dorsal present in the young and absent in the adult. Anal rays 29-36. Silvery gray above, lighter below ; fins tinted gray.

Distribution.—INDIA : freshwaters of E. Punjab, U.P., Bihar, Darjeeling Dt., W. Bengal, Assam, Nepal, Orissa, M.P., PAKISTAN : freshwaters of Sind, W. Punjab, E. Pakistan.—Burma.

Remarks.—It attains upwards of 609 mm. (2 feet) in length.

89. Genus *Eutropiichthys* Blkr.

1862. *Eutropiichthys* Bleeker, *Versl. gewone Vergad. Akad. Amst.*, 14, p. 398. (Type, *E. vacha* Ham., orthotypic.)

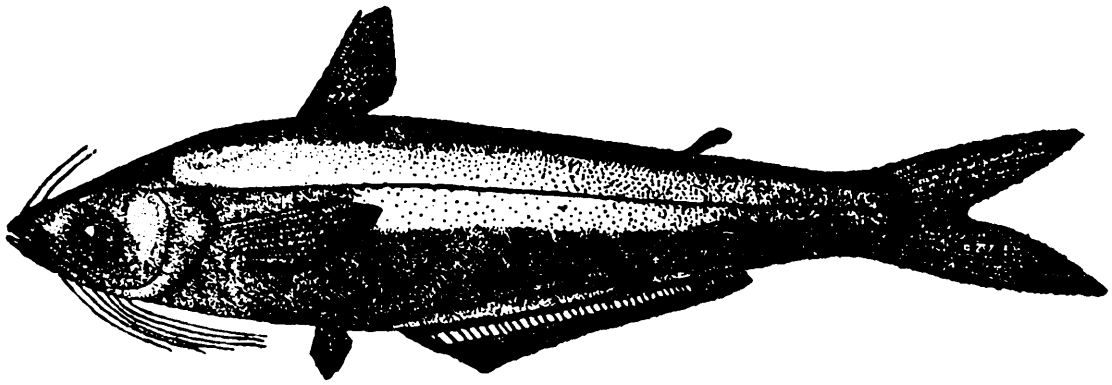
176. *Eutropiichthys vacha* (Ham.)

(Text-fig. 101)

1822. *Pimelodus vacha* Hamilton, *Fish. Ganges*, pp. 196, 378, pl. 19, fig. 6 (type-locality : larger freshwater rivers of the Gangetic provinces).

1889. *Eutropiichthys vacha* Day, *Fauna Brit. India*, Fish., 1, p. 128, fig. 55.

Head 5.5 to 5.7, depth 5 to 5.5 in total length. Eyes 3.5 to 3.7 in head with broad adipose lids. Cleft of mouth oblique reaching beyond midorbit. Snout compressed, pointed. Upper jaw slightly longer. Barbels 8, maxillaries reaching end of preopercle or even as long as head, nasals reaching just behind head. Teeth in a pyriform band on palatine,



TEXT-FIG. 101.—Lateral view of *Eutropiichthys vacha* (Ham.). (After Day).

which with those on vomer form an uninterrupted band. Dorsal spine thin, serrated, as long as head without snout. Pectoral spine serrated, as long as dorsal spine. Anal with 44 to 51 rays. Grayish silvery, darkest along back ; pectoral and caudal edged black.

Distribution.—INDIA : freshwaters of E. Punjab, U.P., Bihar, Darjeeling Dt., W. Bengal, Calcutta, Orissa, M.P., Nepal ; PAKISTAN : freshwaters of Sind, W. Punjab, E. Pakistan.—Burma.

Remarks.—It attains upwards of 304 mm. (a foot) in length and is good eating.

90. Genus *Pangasius* V

1840. *Pangasius Valenciennes*, *Hist. nat. Poiss.*, 15, p. 45. (Type *Pimelodus pangasius* Ham., tautotypic.)

1862. *Pseudopangasius* Bleeker, *Versl. gewone Vergad. Akad. Amst.*, 14, p. 399. (Type, *P. polyuranodon* Blkr., orthotypic.)

1904. *Neopangasius* Popta, *Notes Leiden Mus.*, 24, p. 180. (Type, *N. neiuwenhuisii* Popta, orthotypic.)

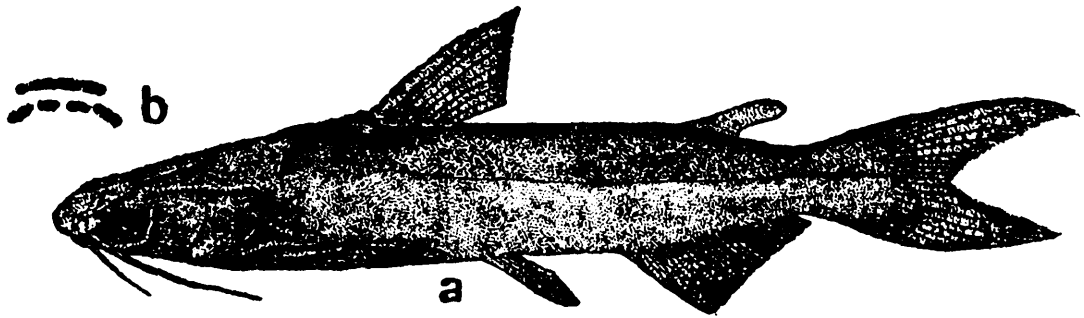
177. *Pangasius pangasius* (Ham.)

(Text-fig. 102)

1882. *Pimelodus pangasius* Hamilton, *Fish. Ganges*, pp. 163, 376, pl. 33, fig. 52 (type-locality : estuaries of Bengal).

1889. *Pangasius b Buchananani* Day, *Fauna Brit. India*, Fish., 1, p. 142, fig. 61.

Head 5.5 to 6, depth 4 to 5 in total length. Eyes in the anterior half of head, partly on the lower surface of head. Upper jaw longer. Cleft of mouth reaches opposite centre of front edge of eye. Width of gape of mouth equals nearly half head length. Barbels 4, maxillary pair extending to pectoral base. Palatine teeth in a crescentic row, vomerine patches separate from or nearly confluent with those on palate. Dorsal spine serrated, moderately strong, as long as head behind angle of mouth. Pectoral spine serrated, strong, as long as dorsal spine or head. Anal with 31-34 rays. Silvery, darkest superiorly, shot with



TEXT-FIG. 102.—(a) Lateral view of *Pangasius pangasius* (Ham.). (b) Palatine dentition of same. (After Day).

purple on sides ; cheeks and under surface of head golden.

Distribution.—INDIA : freshwaters of U. P., Bihar, Darjeeling Dt., W. Bengal, Assam, Orissa, M. P., Madras, the Bhavani river in South India ; PAKISTAN : freshwaters of E. Pakistan.—Burma, Malaya, Malay Archipelago, Siam.

Remarks.—It attains 1,219 mm. (4 feet) in length and is a foul feeder. It descends tidal rivers and estuaries.

91. Genus *Silonia* Swainson

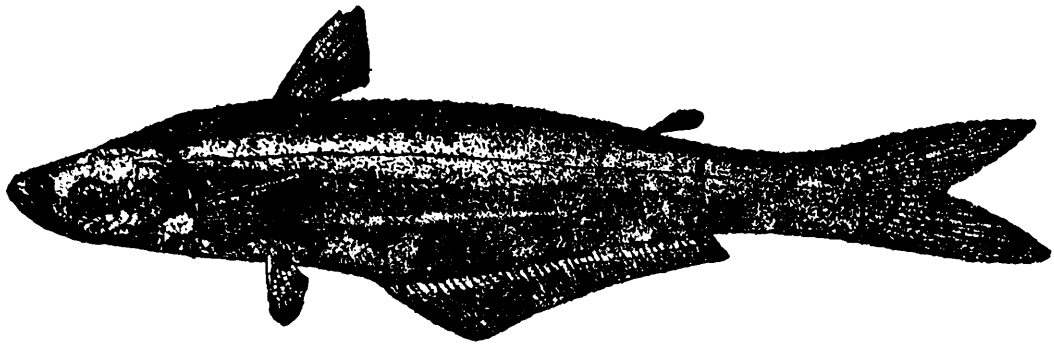
1839. *Silonia* Swainson, *Nat. Hist. Fish. Animal.*, 2, p. 305. (Type, *Pimelodus silondia* Ham., logotypic.)
 1840. *Silundia* Valenciennes, *Hist. nat. Poiss.*, 15, p. 49. (Type, *Pimelodus silondia* Ham., tautotypic.)
 1941. *Silanopangasius* Hora, *Rec. Indian Mus.*, 43, p. 98. (Type, *Ageneiosus childreni* Sykes, orthotypic.)

178. *Silonia silondia* (Ham.)

1822. *Pimelodus silondia* Hamilton, *Fish. Ganges*, pp. 160, 375, pl. 7, fig. 50 (type-locality : the Gangetic provinces).
 1889. *Silundia gangetica* Day, *Fauna Brit. India, Fish.*, 1, p. 145, fig. 62.

Head 5.2, depth 5 to 5.2 in total length. Eyes 4 to 4.5 in head ; with narrow adipose eye lids. Lower jaw longer. Snout somewhat broad. Width of gape of mouth more than half of head length. Cleft of mouth does not extend to below eye. A pair of minute maxillary barbels, mandibular ones usually absent. Teeth in jaws villiform, those

on palate in a crescentic, uninterrupted band. Dorsal spine somewhat weak, finely serrated, as long as head behind midorbit. Pectoral spine stronger, serrated, as long as head excluding snout. Pelvic origin under posterior dorsal rays. Anal with 40-46 rays.



TEXT-FIG. 103.—Lateral view of *Silonia silondia* (Ham.). (After Day).

Distribution.—INDIA : freshwaters of E. Punjab, U. P., Bihar, Darjeeling Dt., W. Bengal, Orissa, M.P. ; PAKISTAN: W. Punjab, Chittagong, E. Pakistan.—Burma.

Remarks.—It attains 1,828 mm. (6 feet) or more in length and descends tidal rivers and estuaries.

XXIX. Family SACCOBRANCHIDAE (HETEROPNEUSTIDAE)

92. Genus *Heteropneustes* Muller

1839. *Heteropneustes* Muller, *Abh. preuss. Akad. Wiss.*, p. 243. (Type, *Silurus fossilis* Bl., orthotypic.)

1840. *Saccobranchus* Valenciennes, *Hist. nat. Poiss.*, 15, p. 339. (Type, *Silurus singio* Ham., haplotypic).

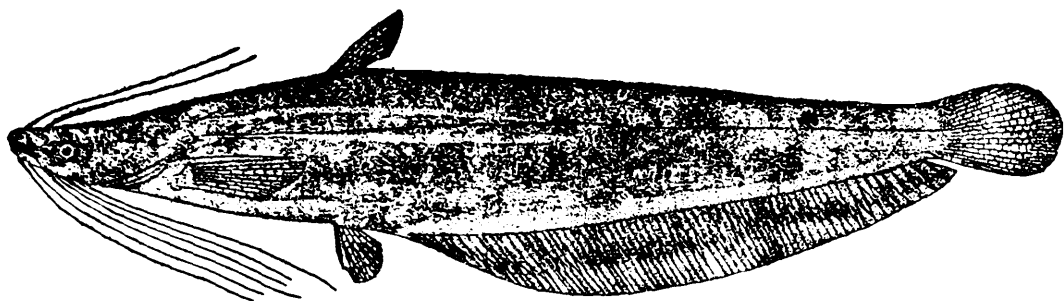
179. *Heteropneustes fossilis* (Bl.)

(Text-fig. 104)

1794. *Silurus fossilis* Bloch, *Naturg. Ausland. Fische*, 8, p. 46, pl. 370, fig. 2 (type-locality : Tranquebar).

1889. *Saccobranchus fossilis* Day, *Fauna Brit. India*, Fish., 1, p. 125, fig. 53.

Head 5.5 to 7, depth 5 to 8 (depending on food or season) in total length. Eyes 2 to 3 diameters from snout end. Width of gape of mouth 2.2 to 2.5 in head length. Barbels 8, maxillaries reaching middle of



TEXT-FIG. 104.—Lateral view of *Heteropneustes fossilis* (Bl.). (After Day).

pectoral or even to pelvic base. Vomerine teeth in a pyriform patch on either side, converging anteriorly and diverging posteriorly. Dorsal short, spineless, origin before anterior third of body. Pelvic origin below

dorsal origin. Pectoral spine serrated, from $\frac{2}{3}$ to $\frac{3}{4}$ as long as head. Anal long, with 60-79 rays, not united with caudal. Leadens, often with two lateral, yellowish bands ; young sometimes reddish brown.

Distribution.—INDIA : freshwaters throughout India ; PAKISTAN : freshwaters of E. and W. Pakistan.—Burma, Ceylon, Siam, Indo-China.

Remarks.—It attains 304 mm. (a foot) in length or more.

XXX. Family CLARIIDAE

93. Genus *Clarias* Scopoli

1777. *Clarias* Scopoli, *Introd. Hist. Nat.*, p. 455. (Type, *Clarias orontis* Gthr.)

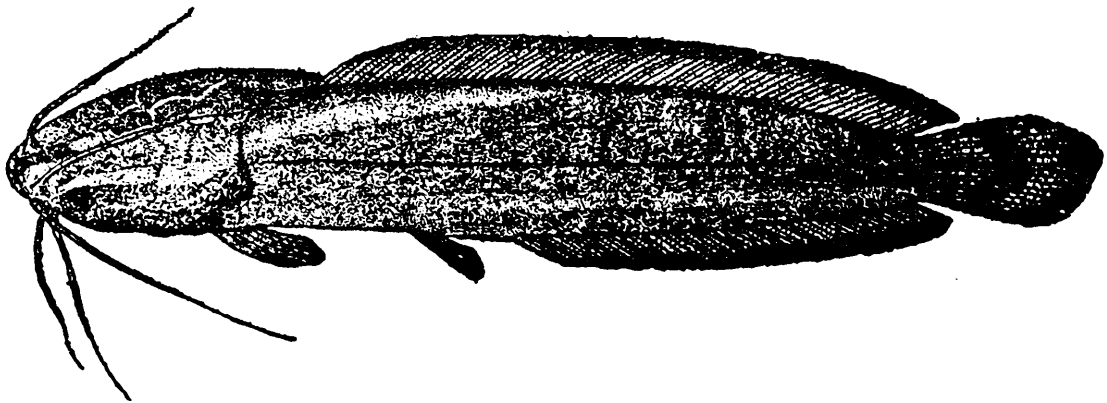
180. *Clarias batrachus* (L.)

(Text-fig. 105)

1758. *Silurus batrachus* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 305. (type-locality : Asia ; Africa).

1889. *Clarias magur* Day, *Fauna Brit. India, Fish.*, 1, p. 115, figs. 48, 49.

Head (to end of gill covers) 5·6, depth 6·5 to 7·5 in total length. Eyes 8 in head. Upper jaw longer, Width of gape of mouth equals about half of head length. Two depressions on head, an oblong one more or less behind eyes, another oval one towards the nape. Occipital process rounded behind, its width at the base being more than twice its length. Barbels 8, maxillary reaching base or middle of pectoral. Vomerine teeth villiform, in an uninterrupted band. Pectoral spine finely serrated.



TEXT-FIG. 105.—Lateral view of *Clarias batrachus* (L.). (After Day).

Dorsal long, spineless with 62-76 rays. Anal rays 45-58. Caudal free. Dying green or dark brownish above, lighter beneath ; vertical fins often with reddish margins.

Distribution.—INDIA : fresh and brackish waters of the plains of India ; PAKISTAN : fresh and brackish waters of the plains of E. and W. Pakistan.—Burma, Ceylon, Malaya, Malay Archipelago, Siam, Indo-China, Philippines, Hongkong, China.

Remarks.—It attains 457 mm. ($1\frac{1}{2}$ feet) in length.

XXXI. Family BAGRIDAE

94. Genus *Mystus* Scopoli

1763. *Mystus* Gronow, *Zoophyl. Gronovius Animal.*, p. 124. (Type, *Bagrus halepensis* Heckel=*Silurus pelusius* Solander ; inadmissible.)
1777. *Mystus* Scopoli, *Introd. Hist. Nat.*, p. 451. (Type, *Bagrus halepensis* Heckel=*Silurus pelusius* Solander).
1856. *Macrones* (nec Newman, 1841) Dumeril, *Mém. Acad. Sci., Paris*, 27, p. 279. (Type, *Bagrus lamarrii* V, inadmissible.)
1919. *Aoria* Jordan *Proc. Acad. nat. Sci. Philad.*, p. 341. (Type, *Bagrus lamarrii* V.)
1939. *Aorichthya* Wu, *Sinensia*, 10, p. 131. [(Type, *Macrones lamarrii* (v), orthotype)].
1940. *Macronichthys* White & Moy Thomas, *Ann. Mag. nat. Hist.*, 5, p. 505. (Type, *Bagrus lamarrii* v.)
1954. *Osteobagrus* Jayaram, *Rec. Indian Mus.*, 51, p. 548. (Type, *Mystus aor* (Ham., orthotypic.)

181. *Mystus aor* (Ham.)

1822. *Pimelodus aor* Hamilton, *Fish. Ganges*, pp. 205, 379, pl. 20, fig. 68 (type-locality : rivers of Bengal or in upper parts of the Gangetic estuaries, where water is not very salt).
1889. *Macrones aor* Day, *Fauna Brit. India, Fish.*, 1, p. 149.

Head 4.5 to 5, depth 6 in total length. Eyes 5 to 8 in head ; transversely oval. Snout, broad, depressed. Width of gape less than half head length. Upper jaw longer. The median longitudinal furrow on head extends to base of occipital process. Occipital process does not reach half way to basal bone of dorsal, there being an intermediate interneural shield. Barbels 8, maxillaries reaching caudal base or even beyond. Palatine teeth in an uninterrupted, semilunar, transverse band. Pectoral spine rugose, stronger than dorsal, but shorter being equal to nearly half head length. Base of adipose dorsal equals that of rayed dorsal or even more ; interspace between them equals half base of rayed dorsal. Pelvic origin below last dorsal rays. Anal rays 12-13. Bluish leaden above, becoming white on abdomen ; fins yellowish, tinted gray. a black spot on adipose dorsal.

Distribution. INDIA : freshwaters of E. Panjab, U. P., Bihar, W. Bengal, Assam, Orissa, M. P. ; PAKISTAN : freshwaters of Sind, W Punjab, E. Pakistan.—Burma.

Remarks.—It is said to attain 1,828 mm. (6 feet) in length.

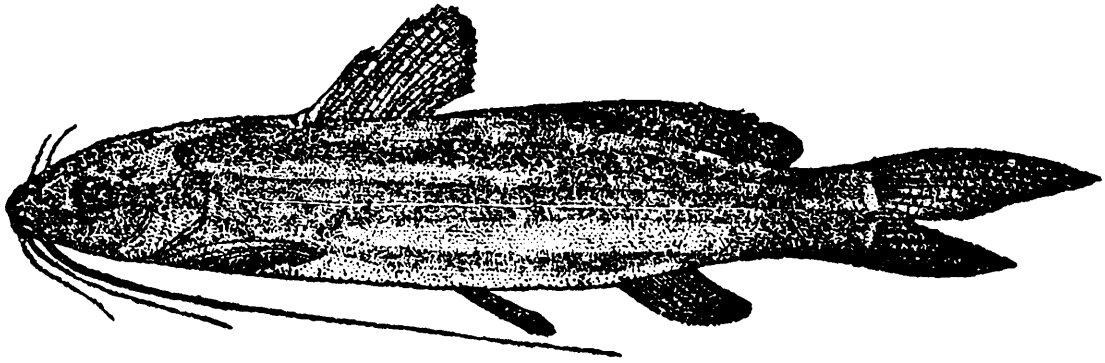
182. *Mystus bleekeri* (Day)

(Text-fig. 106)

1877. *Macrones bleekeri* Day, *Fish. India*, p. 451, p. 101, fig. 1 (type-locality : Sind, Jamuna, upper waters of Ganges, Burma).
1889. *Macrones bleekeri* Day, *Fauna Brit. India, Fish.*, 1, p. 162.

Head 5.2 to 5.5, depth 5 in total length. Eyes 4.5 in head. Snout somewhat obtuse. Width of gape of mouth equals half of head length. The median, longitudinal groove on head shallow, reaching to base of occipital process. Occipital process not grooved, twice as long as broad at its base, touching basal bone of dorsal. Barbels 8, maxillary extending to anal. Teeth on palate in an uninterrupted, semilunar band. Pectoral spine serrated, stronger than dorsal, of the same length as head without snout. Origin of adipose dorsal just behind rayed dorsal, its base twice head length. Anal rays 9-10. Brownish gray with two

light longitudinal bands one above the other below the lateral lines ; a dark shoulder spot and dark band along middle of anal.



TEXT-FIG. 106.—Lateral view of *Mystus bleekeri* (Day). (After Day).

Distribution.—INDIA : freshwaters of E. Punjab, Darjeeling Dt., W. Bengal, Assam, Baroda, Jamuna and Upper waters of the Ganges ; PAKISTAN : freshwaters of Sind.—Burma, Malaya.

Remarks.—It attains at least 89 mm. ($3\frac{1}{2}$ inches) in length and descends the upper reaches of the tidal rivers of Bengal.

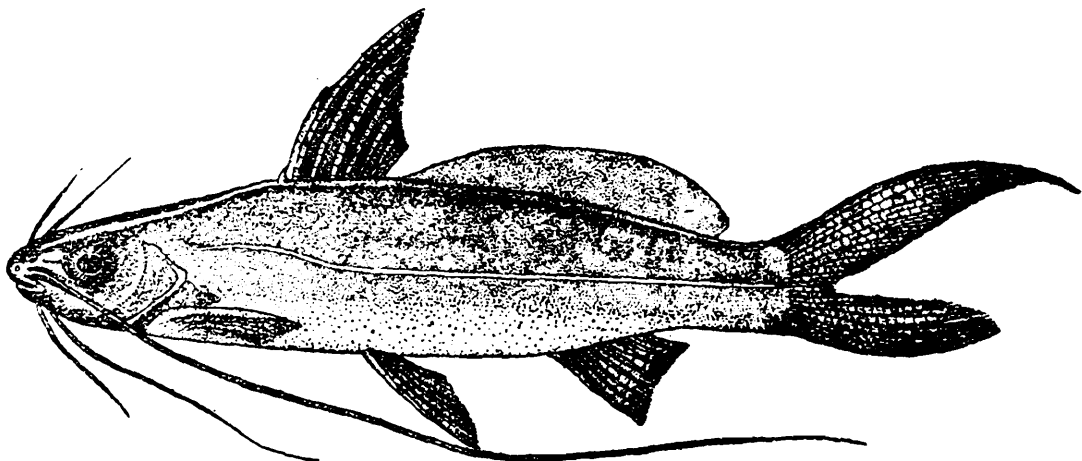
183. *Mystus cavasius* (Ham.)

(Text-fig. 107)

1822. *Pimelodus cavasius* Hamilton, *Fish. Ganges*, pp. 203, 379, pl. 11, fig. 6 (larger freshwater rivers of the Gangetic provinces).

1889. *Macrones cavasius* Day, *Fauna Brit. India*, Fish., 1, p. 155.

Head 6 to 6.2, depth 5.5 in total length. Eyes 3.2 to 3.5 in head. Snout somewhat obtuse. Upper jaw longer. Width of gape of mouth less than half of head length. Cleft of mouth extends to below orbit. The median longitudinal groove wide, extending to base of occipital process. Occipital process with a shallow, narrow groove along its posterior half, three or four times as long as wide at its base and touching



TEXT-FIG. 107.—Lateral view of *Mystus cavasius* (Ham.). (After Day).

basal bone of dorsal. Barbels 8, maxillary pair extending beyond caudal base. Palatine teeth in a continuous, crescentic band. Pectoral spine serrated, as long as, but stronger than dorsal spine. Adipose dorsal arises just behind rayed dorsal ; its base 3 times as long as the base of rayed dorsal. Pelvic origin just behind base of dorsal. Anal rays 11-13.

Leadens above and yellowish on abdomen and cheeks, often with a bluish band along the lateral line ; pectorals, pelvics and anal dull white.

Distribution.—INDIA : freshwaters of E. Punjab, U. P., Bihar, Darjeeling Dt., W. Bengal, Assam, Orissa, M. P., Madras, Mysore, Ahmedabad, Baroda, Bombay, Travancore-Cochin ; PAKISTAN : freshwaters of Sind, W. Punjab, E. Pakistan.—Burma, Siam, Malay Archipelago, China.

Remarks.—It attains about 457 mm. ($1\frac{1}{2}$ feet) in length.

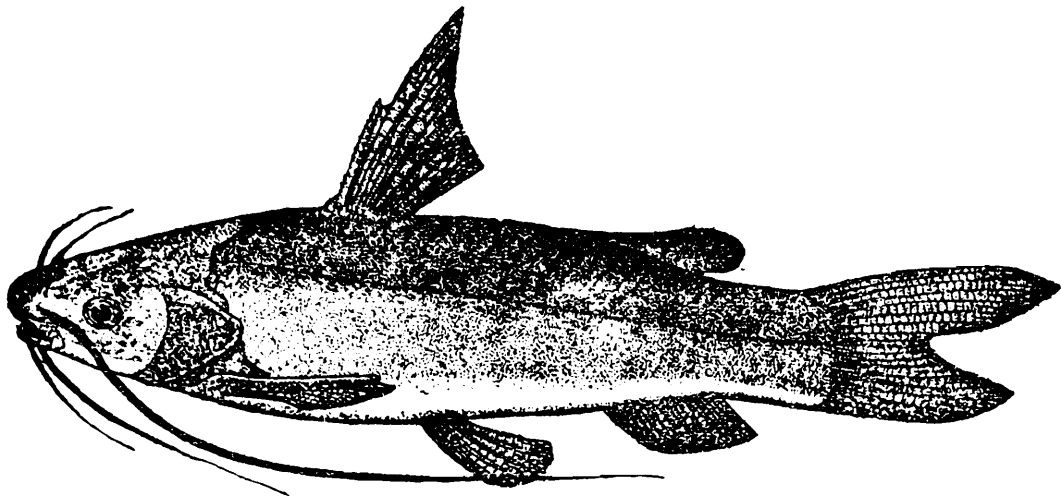
184. *Mystus gulio* (Ham.)

(Text-fig. 108)

1822. *Pimelodus gulio* Hamilton, *Fish. Ganges*, pp. 201, 379, pl. 23, fig. 6, (type-locality : higher parts of the Gangetic estuaries where the water is not very salt).

1889. *Macrones gulio* Day, *Fauna Brit. India*, Fish., 1, p. 151, fig. 64.

Head 4.2 to 4.6, depth 5 to 5.7 in total length. Eyes 5 to 6 in head. Snout broad, somewhat depressed. Upper jaw rather longer. The median longitudinal groove on head lanceolate, reaching to opposite postorbit. Occipital process rounded posteriorly, half longer than wide at its base, with a wide interspace between it and the basal bone of dorsal (in the adult). Barbels 8, maxillaries extending to middle or end of pelvics. Teeth in a narrow, continuous crescentic band on palate. Dorsal spine half as long as head, strong, serrated. Pectoral spine strong, serrated, as long as head without snout. Pelvic origin just behind last



TEXT-FIG. 108.—Lateral view of *Mystus gulio* (Ham.). (After Day).

dorsal ray. Adipose dorsal with a short base equaling nearly half of the interspace between it and rayed dorsal. Anal rays 12-15. Deep bluish brown above becoming dull white below ; maxillary barbels and outer half of fins dark.

Distribution.—INDIA : seas, estuaries and tidal waters of W. Bengal, Orissa, Madras, Travancore-Cochin, Malabar, Bombay ; PAKISTAN : seas, estuaries and tidal waters of Sind, E. Pakistan.—Burma, Ceylon, Malaya, Malay Archipelago, Siam.

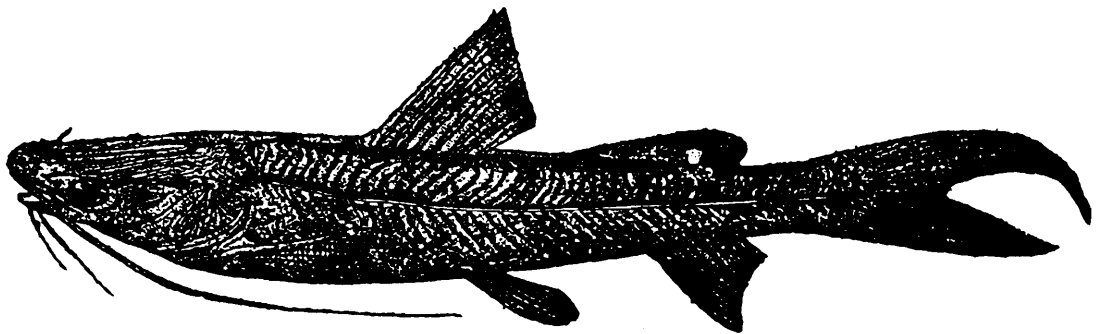
Remarks.—It attains 457 mm. ($1\frac{1}{2}$ feet) in length.

185. *Mystus seenghala* (Sykes)

(Text-fig. 109)

1839. *Platystoma seenghala* Sykes, *Trans. zool. Soc. Lond.*, 2, p. 371, pl. 65, fig. 2 (type-locality : Mota Mola river at Poona).1889. *Macrones seenghala* Day, *Fauna Brit. India, Fish.*, 1, p. 150.

Head 4·5, depth 7·5 to 8 in total length. Eyes 7 to 8 in head. Upper jaw longer. Cleft of mouth shallow. Width of gape of mouth equals $\frac{1}{3}$ of head length. The median longitudinal groove on head extends to base of occipital process. Occipital process twice as long as wide at its base, separated from basal bone of dorsal by an intermediate, interneural shield from 4 times as long as broad in the young, to half that width in the adult. Barbels 8, maxillary pair reaching to middle or just beyond

TEXT-FIG. 109.—Lateral view of *Mystus seenghala* (Sykes). (After Day).

rayed dorsal. Palatine teeth in a continuous, crescentic band. Dorsal spine weak, rugose, as long as head, extending to snout. Pectoral spine stronger than dorsal spine, serrated, half as long as head. Pelvic origin behind last ray of dorsal. Base of adipose dorsal equals or slightly exceeds that of rayed dorsal, the interspace between the two fins being of the same length. Anal rays 11-12. Brownish gray superiorly and silvery on sides and abdomen ; a black spot on hind end of base of adipose dorsal.

Distribution.—INDIA : freshwaters of E. Punjab, U.P., Darjeeling Dt., W. Bengal, Assam, M. P., Ahmedabad, Poona, Deccan, down south to Kistna river.—Yunnan.

Remarks.—It attains at least 381 mm. ($1\frac{1}{4}$ feet) in length.

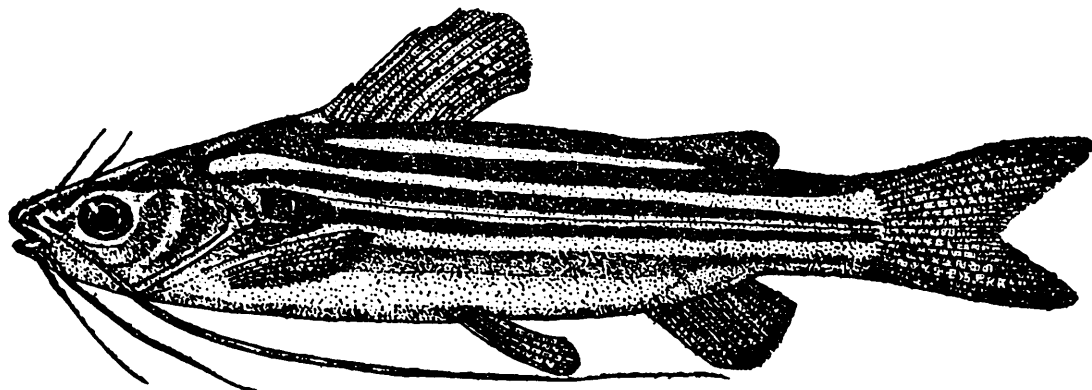
186. *Mystus vittatus* (Bl.)

(Text-fig. 110)

1797. *Silurus vittatus* Bloch, *Ichth.*, pl. 371, fig. 2 (type-locality : Tranquebar).1889. *Macrones vittatus* Day, *Fauna Brit. India, Fish.*, 1, p. 157.

Head 4·7 to 5, depth 5 in total length. Eyes 4·5 to 6 in head. Median longitudinal groove on head extends to midway behind postorbit. Occipital process rough, 3 times as long as wide at its base, often separated from basal bone of dorsal by a short interspace. Barbels 8, maxillaries extending to pelvics. Teeth in a semilunar band across palate. Dorsal spine finely serrated, half as long as head. Pectoral spine serrated, as long as head excluding snout. Base of adipose dorsal usually of the same

length as the interspace between the two fins. Anal with 9-12 rays, Silvery gray or golden, with 2 or more light bluish or silvery longitudinal bands on sides ; fins usually edged black.



TEXT-FIG. 110.—Lateral view of *Mystus vittatus* (Bl.). (After Day).

Distribution.—INDIA : freshwaters of E. Punjab, U. P., Bihar, Darjeeling Dt., W. Bengal, Assam, Orissa, M.P., Madras, Travancore-Cochin ; PAKISTAN : freshwaters of Sind, W. Punjab, E. Pakistan.—Burma, Ceylon, Siam.

Remarks.—It attains 177-203 mm. (7-8 inches) in length.

95. Genus *Rita* Blkr.

1858. *Rita* Bleeker, *De Visschen Van den Ind. Archipel.*, 1, p. 60. (Type, *Pimelodus rita* Ham., tautotypic.)

187. *Rita chrysea* Day

1877. *Rita chrysea* Day, *Fish. India*, p. 455, pl. 104, fig. 1 (type-locality : Orissa).

1889. *Rita chrysea* Day, *Fauna Brit. India*, Fish., 1, p. 167.

Head 4.2, depth 6 in total length. Eyes 4 in head. Upper jaw longer. Width of mouth equals nearly 1/3 of head length. Occipital process as wide at its base as it is long, notched anteriorly to receive the basal bone of dorsal, cubito-humeral process as long as head without snout. Barbels 6, nasal minute, maxillaries extending to pectoral base. Teeth villiform in both jaws ; 2 or 3 inner rows in lower jaw molar-like ; palatine teeth molariform, in two patches converging in their front halves. Dorsal spine strong, coarsely serrated, half longer than head, reaching to about middle of adipose dorsal. Pectoral spine serrated, longer than head. Yellowish, fins edged gray.

Distribution.—INDIA : freshwaters of Orissa, M. P.

Remarks.—It attains at least 177 mm. (7 inches) in length.

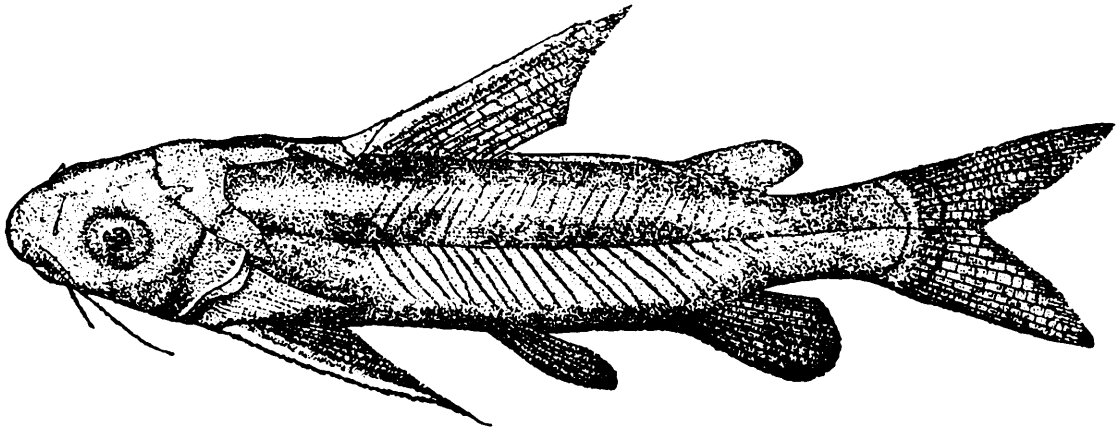
188. *Rita kuturnee* (Sykes)

(Text-fig. 111)

1841. *Phractocephalus kuturnee* Sykes, *Trans. zool. Soc. Lond.*, 2, p. 372, pl. 65, fig. 3 (type-locality : Beema river at Pairgaon).

1889. *Rita hastata* Day, *Fauna Brit. India*, Fish., 1, p. 168.

Head 4·2 to 4·5, depth 6 in total length. Eyes 4·5 to 5 in head. Upper jaw longer. Width of mouth $\frac{3}{8}$ of head. Occipital process half longer than wide at its base and anteriorly emarginate to receive basal bone of dorsal. Cubito-humeral process as long as head, sharply pointed behind. Barbels 6, nasal short, maxillary reaching pectoral base. Teeth in villiform or cardiform rows in both jaws; palatines in two widely separate



TEXT-FIG 111.—Lateral view of *Rita kuturnee* (Sykes). (After Day).

elliptical patches, those in front pointed and those behind granular. Dorsal spine moderately strong, finely serrated, as long as or slightly longer than head. Pectoral spine serrated, stronger, a little longer than dorsal spine. Brownish superiorly, silvery on sides.

Distribution.—INDIA: freshwaters of M. P., Deccan, Poona, Tungabhadra and Kistna rivers.

Remarks.—It attains about 304 mm. (1 foot) in length.

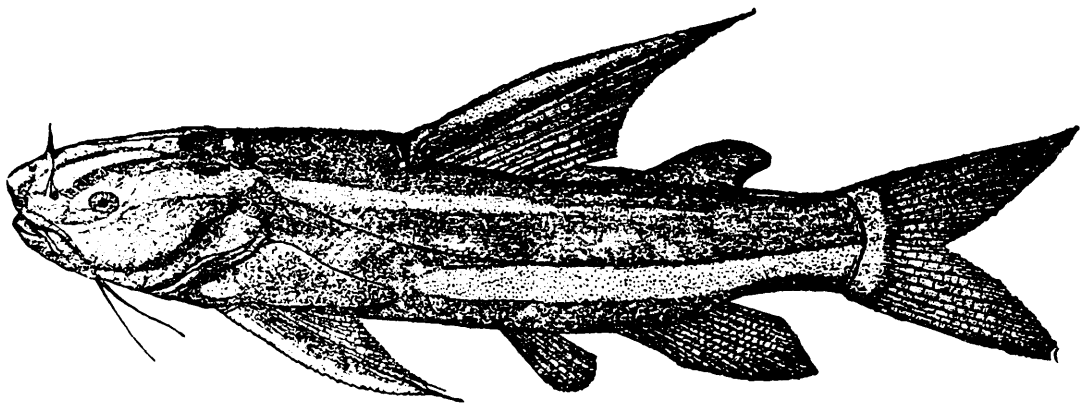
189. *Rita rita* (Ham.)

(Text-fig. 112)

1822. *Pimelodus rita* Hamilton, *Fish. Ganges*, pp. 165, 376, pl. 24, fig. 53 (type-locality: estuaries of Bengal).

1889. *Rita buchamani* Day, *Fauna Brit. India*, Fish., 1, 165, fig. 66.

Head 4 to 4·3, depth 5·5 to 6 in total length. Eyes 8 to 10 in head. Upper jaw longer. Width of mouth nearly half of head length. The



TEXT-FIG. 112.—Lateral view of *Rita rita* (Ham.). (After Day).

occipital process about as long as wide at its base, notched in front to accommodate basal bone of dorsal. Cubito-humeral process about $\frac{3}{4}$ of head, granulated. Barbels 6, nasal very short, mandibular extending

to end of head. Teeth villiform in upper jaw and in the anterior part of lower jaw ; internally 2 or 3 rows of rounded teeth ; palatine teeth rounded, in two elliptical patches, wide apart along the median line. Dorsal spine very strong, serrated, as long as or $1/3$ longer than head. Pectoral spine serrated rather shorter than dorsal spine. Greenish gray above becoming lighter below.

Distribution.—INDIA : freshwaters of U. P., Bihar, Darjeeling Dt., W Bengal ; PAKISTAN : freshwaters of Sind, E. Pakistan.—Burma.

Remarks.—It attains at least 1,219 mm. (4 feet) in length.

XXXII. Family SISORIDAE

96. Genus *Bagarius* Blkr.

1853. *Bagarius* Bleeker, *Verh. Bat. Gen.*, 25, p. 121. (Type, *Pimelodus bagarius* Ham., tautotypic.)

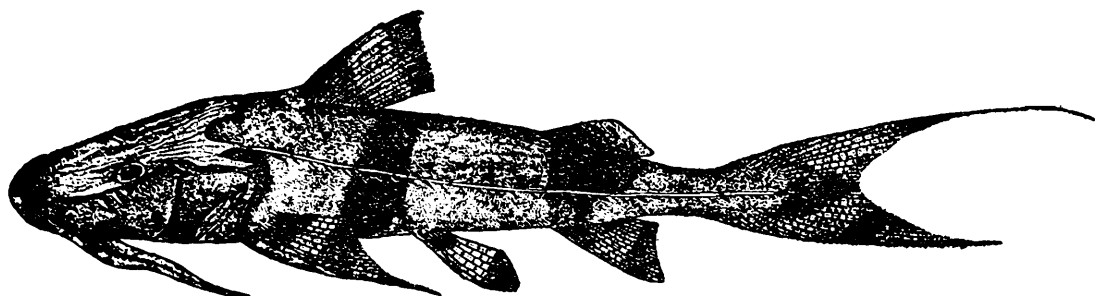
190. *Bagarius bagarius* (Ham.)

(Text-fig. 113)

1822. *Pimelodus bagarius* Hamilton, *Fish. Ganges*, pp. 186, 378, pl. 7, fig. 62 (type-locality : the Ganges).

1889. *Bagarius yarrellii* Day, *Fauna Brit. India*, Fish., 1, p. 194, fig. 71.

Head depressed, 3.7, depth 5 in total length (without prolonged caudal ray). Eyes small, in the middle of head. Upper jaw longer. Gape of mouth about half of head length. Barbels 8, maxillary with broad bases, longer than head. Teeth in jaws pointed, of unequal sizes ; no palatine teeth. Dorsal spine smooth, the bony portion as long as head without snout. Pectoral spine stronger than and as long as dorsal spine, serrated. Base of adipose dorsal equals that of rayed dorsal. Caudal deeply forked, its upper lobe prolonged. Skin scabrous, greyish yellow, with large, irregular, brown and black markings and cross bands ; all fins with a black base and often a dark band.



TEXT-FIG. 113.—Lateral view of *Bagarius bagarius* (Ham.). (After Day).

Distribution.—INDIA : freshwaters of Delhi, U. P., Bihar, Darjeeling Dt., W. Bengal, Manipur, Assam, Orissa, Poona, Deccan.—Burma, Malaya, Malay Archipelago, Siam, Indo-China.

Remarks.—It attains 1,524 mm. (5 feet) in length.

ORDER ANGUILLIFORMES

Suborder Anguilloidei

XXXIII. Family ANGUILLIDAE

97. Genus *Anguilla* Shaw

1803. *Anguilla* Shaw, *General Zool.*, 4, p. 15. (Type, *A. vulgaris* Shaw.)

191. *Anguilla bengalensis* (Gray & Hardw.)

1833-34. *Muraena bengalensis* Gray & Hardwicke, *Ill. Ind. Zool. Hardwicke*, 2, pl. 95, fig. 5 (type-locality : the Ganges).

1889. *Anguilla bengalensis* Day, *Fauna Brit. India*, Fish., 1, p. 86.

Head 3 to 3·1 in the distance between snout and vent, broader than body. Snout not broad. Lower jaw prominent. Cleft of mouth deep, extends beyond postorbit, equals about one-third of head length. The vomerine band of teeth does not reach behind so far as the maxillary one ; mandibular teeth, divided by a longitudinal groove. Dorsal origin nearly in the middle of the interspace between gill opening and anal origin ; the distance between dorsal and anal origins equals head length. Pectorals less than head length. Brownish above, yellowish below, often with black spots superiorly.

Distribution.—INDIA : freshwaters and seas of India and Andamans ; PAKISTAN : freshwaters and seas of Pakistan.—Burma, Malay Archipelago, China.

Remarks.—It attains 1,219 mm. (4 feet) and upwards in length.

XXXIV Family MURAENIDAE

98. Genus *Muraena* L.

1758. *Muraena* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 244. (Type, *M. helena* L.)

1795. *Gymnothorax* Bloch, *Naturg. Ausland. Fische*, 8, p. 83. (Type, *G. muraena* Bl. = *Muraena helena* L., inadmissible according to opinion 93 of the international commission of Zoological Nomenclature.)

192. *Muraena pseudothyrsoidea* Blkr.

1852. *Muraena pseudothyrsoidea* Bleeker, *Nat. Tijdschr. Ned.-Ind.*, 3, p. 778 (type-locality : Celebes).

1889. *Muraena pseudothyrsoidea* Day, *Fauna Brit. India*, Fish., 1, p. 79.

Head 3·5 to 3·6 in the distance between end of snout and vent. Tail slightly shorter than trunk. Eyes 1·6 to 2 diameters in length of snout, nearer to snout end than to angle of mouth. Cleft of mouth 2·2 in head length. Gill opening about one-third wider than eye. Teeth uniserial, 18-20 in either mandible, two anterior canines ; one or two anterior vomerine series subulate, larger than those in premaxillaries. Brownish, covered with fine dark spots on head and body, amongst which are reticulated yellow lines more distinct in caudal region ; fins often edged white.

Distribution.—INDIA : coasts of India, more common at Bombay, Malabar and Travancore-Cochin shores ; PAKISTAN : common on Sind coast.—Burma, Ceylon, Arabia, Zanzibar, Malay Archipelago, Philippines, China, Formosa, Queensland.

Remarks.—It attains at least 609 mm. (2 feet) in length.

193. *Muraena tile* (Ham.)

1882. *Muraenophis tile* Hamilton, *Fish. Ganges*, pp. 18, 363 (type-locality : estuaries near Calcutta).

1889. *Muraena tile* Day, *Fauna Brit. India*, Fish., 1, p. 76, fig. 31.

Head 3·7 to 4·2 in the distance between snout end and vent. Tail a little shorter or of same length as trunk. Eyes somewhat smaller, nearer to angle of mouth than to end of snout. Cleft of mouth 3·3 in head length. Anterior nasal tubes short. Gill opening nearly as wide as eye. Teeth biserial, except the lateral ones of the lower jaw ; canines small. Brownish yellow, or greenish becoming lighter below ; small white spots bordered with gray which may disappear with age.

Distribution.—INDIA : coasts of W. Bengal, Andamans, more common in the estuaries of Bengal ; PAKISTAN : coasts and estuaries of Sind, Karachi, Makran, E. Pakistan.—Bourbon, Malaya, Malay Archipelago, Philippines, Honolulu.

Remarks.—It attains at least 509 mm. (2 feet) in length and ascends tidal rivers and is common in the Hooghly at Calcutta.

XXXV. Family MURAENESOCIDAE

99. Genus *Muraenesox* Mc Clell.

1844. *Muraenesox* Mc Clelland, *J. nat. Hist. Calcutta*, 4, p. 408. (Type *M. tricuspidata* Mc Clell.)

194. *Muraenesox cinereus* (Forsk.)

1775. *Muraena cinereus* Forskal, *Descript. Animal.*, pp. xx, 22 (type-locality : Red Sea).

1889. *Muraenesox cinereus* Day, *Fauna Brit. India*, Fish., 1, p. 91.

Head 2·5 to 2·6 in the distance between snout end and vent. Trunk slightly shorter than tail. Eyes 2·2 to 2·5 in length of snout. Cleft of mouth less than half of head length. Upper jaw longer. Teeth on vomer large, straight, compressed, with an anterior and posterior basal lobe ; mandibular teeth much smaller, those in external row not bent outwards. Dorsal origin slightly in front of gill opening. Pectoral 3·2 in head. Silvery, becoming dull white below ; vertical fins yellowish, edged black ; pectorals yellow or black.

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Burma, Ceylon, Red Sea, Arabia, S. and E. coasts of Africa, Malaya, Malay Archipelago, Siam, Philippines, China, Korea, Japan, Australia, Melanesia, Polynesia.

Remarks.—It attains at least 914 mm. (3 feet) in length. It ascends tidal rivers and estuaries.

195. *Muraenesox talabon* (C.)

1829. *Conger talabon* Cuvier, *Regne Animal.*, 2, ed. 2, p. 350 (on *Talabon* Russell, *Fish. Coromandel*, 1, p. 27, pl. 38, 1803 ; type-locality : Vizagapatam).

1889. *Muraenesox talabon* Day, *Fauna Brit. India*, Fish., 1, p. 90, fig. 38.

Head 3 in the distance between snout end and vent. Trunk nearly $\frac{1}{4}$ shorter than tail. Eyes 3 in snout length. Cleft of mouth almost equals half of head length. Upper jaw longer. Vomerine teeth moderately large, lanceolate, widely set, without basal lobes ; mandibular teeth smaller, those in external row not directed outwards. Dorsal origin a little in advance of pectoral base. Olive above becoming brown posteriorly, dull white below ; throat, cheeks and gill covers shot with golden tint ; vertical fins black edged.

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Coromandel, Andamans ; PAKISTAN : coasts of Sind.—Burma, Malaya, Malay Archipelago, Siam, Cochin China, China, Philippines.

Remarks.—It attains 3,048 mm. (10 feet) in length.

XXXVI. Family OPHICHTHYIDAE

100. Genus *Lamnostoma* Kaup

1856. *Lamnostoma* Kaup, *Arch. Naturgesch.*, 22, p. 49. (Type, *L. pictum* Kaup, logotypic.)

196. *Lamnostoma orientalis* (Mc Clell.)

1845. *Dolophis orientalis* Mc Clelland, *Calcutta J. nat. Hist.*, 5, p. 213 (type-locality : Madras).

1889. *Ophichthys orientalis* Day, *Fauna Brit. India*, Fish., 1, p. 96.

Head 3.5 to 4 in the distance between end of snout and vent. Trunk and tail of same length. Eyes small, slightly behind middle of head. Snout prominent. Gill opening as longitudinal slits, nearly parallel to each other. Teeth pointed, in a single row. Dorsal and anal low ; dorsal origin at a short distance behind gill openings. Pectorals absent. Olive above and lighter beneath.

Distribution.—INDIA : coasts of Travancore-Cochin, Madras, Coromandel as high as Orissa.—Ceylon, Madagascar, New Guinea, Philippines.

Remarks.—It attains at least 304 mm. (a foot) in length.

101. Genus *Pisodonophis* Kaup

1856. *Pisodonophis* Kaup, *Arch. Naturgesch.*, 22, p. 47. (Type, *P. concolorus* Kaup, logotypic.)

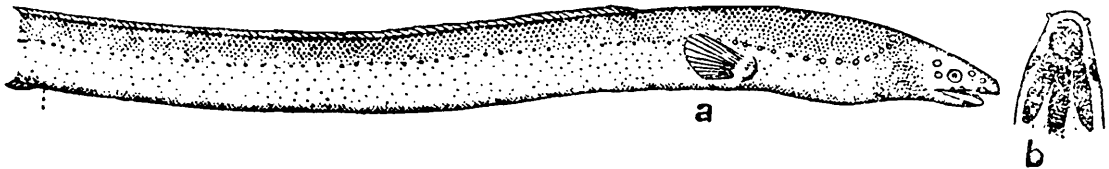
197. *Pisodonophis boro* (Ham.)

(Text-fig. 114)

1822. *Ophisurus boro* Hamilton, *Fish. Ganges*, p. 20, pl. 5, fig. 5 (type-locality : estuaries near Calcutta).

1889. *Ophichthys boro* Day, *Fauna Brit. India*, Fish., 1, p. 94.

Head 3.5 to 4 in the distance between snout and vent. Trunk nearly $\frac{2}{3}$ of total length. Eyes 2-3 diameters from the snout tip and nearer to angle of mouth. Upper jaw longer. Cleft of mouth extends beyond postorbit. Teeth variable, usually granular in a large patch on maxilla and in many smaller rows on premaxilla ; vomerine teeth large, in several rows ; mandible, with two external rows of granular and one internal row of pointed teeth. Dorsal and anal low, not quite extending to caudal tip ; dorsal origin at a distance from pectoral base. Pectorals rounded or pointed. Greenish olive superiorly with many minute black spots ; pale greenish white below.



TEXT-FIG. 114.—(a) Lateral view of *Pisodonophis boro* (Ham.). (b) Palatine dentition of same. (After Day).

Distribution.—INDIA : seas and estuaries of W. Bengal ; PAKISTAN : seas and estuaries of E. Pakistan.—Burma, S. Africa, Malaya, Malay Archipelago, Siam, Formosa, China, Philippines, Melanesia.

Remarks.—It attains 914 mm. (3 feet) in length and ascends tidal rivers.

ORDER BELONIFORMES

Suborder Scomberesocoidei

XXXVII. Family BELONIDAE

102. Genus *Strongylura* v. Hass.

1823. *Strongylura* van Hasselt, *Algem. Konst. Letterbode*, 2, p. 130. (Type, *S. caudimaculata* v. Hass. = *Belone strongylura* v. Hass.)

1833. *Tylosurus* Cocco, *Giorn. Sci. Lett. Sicilia*, 42, p. 18. (Type, *T. contrain* Cocco = *Esoc imperialis* Raf.)

198. *Strongylura crocodilus* (Le Sueur)

1821. *Belone crocodilus* Le Sueur, *J. Acad. nat. Sci. Philad.*, 2, p. 129 (type-locality : Mauritius).

1889. *Belone choram* Day, *Fauna Brit. India*, Fish., 1, p. 419.

Head 3.3 to 3.5, depth 12 to 14 in total length. Eyes 2 in postorbital length of head. A wide shallow, longitudinal groove on upper surface of head. Superciliary region straited. No teeth on vomer. Dorsal with 22-23 rays ; origin in posterior one-third of body length, with hind rays nearly touching caudal base. Anal with 19-20 rays, opposite dorsal. Pelvic origin midway between front border of eye and caudal base. Lateral line keeled along free portion of tail. 25 rows of scales between lateral line and dorsal base. Bluish green above and lighter beneath ; a silvery, lateral band.

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Pakistan: coasts of Sind.—Burma, Ceylon, Red Sea, S. and E. coasts of Africa, Malaya, Malay Archipelago, Siam, Tonkin, Philippines, Formosa, Melanesia, Polynesia, Japan.

Remarks.—It attains 1,066 mm. ($3\frac{1}{2}$ feet) in length.

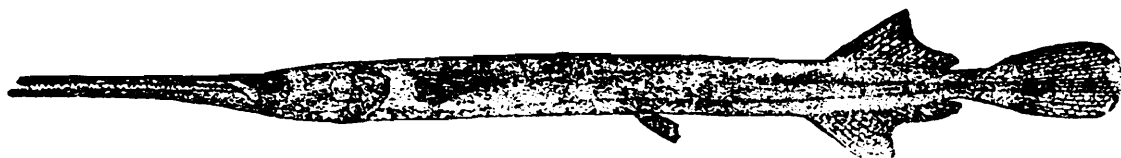
199. *Strongylura strongylura* (v. Hass.)

(Text-fig. 115)

1823. *Belone strongylura* van Hasselt, *Algem. Konst. Letterbode*, 1, p. 130 (type-locality : Batavia, Java).

1889. *Belone strongylura* Day, *Fauna Brit. India*, Fish., 1, p. 421.

Head 2.6 to 3, depth 13 to 14 in total length. Eyes 3.5 in postorbital length of head. A shallow, median groove on upper surface of head. Superciliary region not striated. Teeth in jaws widely separated, sharp, straight, not very large, none on vomer. Dorsal with 13-15 rays ; origin behind anal origin, posterior rays not extending to caudal base. Anal with 16-18 rays, in the last third of the body length. Pelvic origin midway between orbit and caudal base. Lateral line not keeled, free portion of



TEXT-FIG. 115.—Lateral view of *Strongylura strongylura* (v. Hass.) (After Day).

tail compressed, deeper than wide, 11 rows of scales between lateral line and dorsal base. Bluish green, with minute brown dots, becoming silvery on sides and white below ; a deep blue longitudinal band bordered below by another broader one of silver, along hind half of sides.

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Madras, Coromandel, Orissa, W. Bengal, Andamans ; PAKISTAN : coasts of Sind, Chittagong, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Malaya, Malay Archipelago, Siam, Cochin China, Hongkong, Formosa, China, Philippines, Melanesia, N. Australia, Queensland.

Remarks.—It attains 609 mm. (2 feet) or more in length and ascends tidal rivers and lakes and is not uncommon at Calcutta.

103. Genus *Xenentodon* Regan

1911. *Xenentodon* Regan, *Ann. Mag. nat. Hist.*, (8) 7, p. 332. (Type, *Belone cancila* Ham., orthotypic.)

200. *Xenentodon cancila* (Ham.)

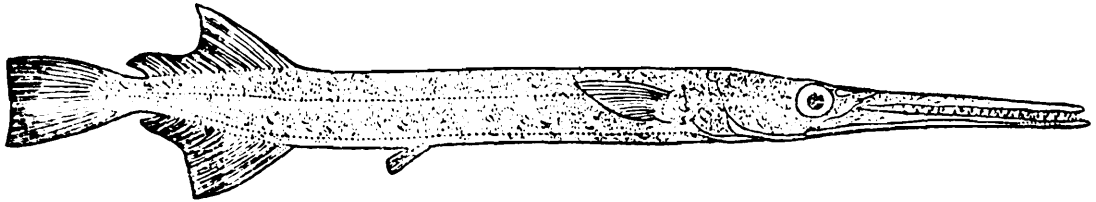
(Text-fig. 116)

1822. *Esox cancila* Hamilton, *Fish. Ganges*, pp. 213, 380, pl. 27, fig. 70 (type-locality : ponds and smaller rivers of the Gangetic provinces).

1889. *Belone cancila* Day, *Fauna Brit. India*, Fish., 1, p. 420, fig. 136.

Head 2.6 to 2.7, depth 8 to 12 in total length. Eyes 3 to 3.2 diameters from hind edge of opercle. A deep median, longitudinal groove on upper surface of head. Superciliary region not striated. A row of large, widely separated teeth in jaws, with an external row of numerous ones ;

no teeth on vomer. Dorsal with 15-18 rays ; origin opposite to anal at a distance at least twice as far from front border of eye, as it is from tip of the caudal. Anal with 16-18 rays. Pelvic origin nearer to caudal base than to hind border of eye. Lateral line not keeled, free portion of tail compressed, deeper than wide. 20-30 rows of scales between lateral line and dorsal base. Greenish gray above and lighter below with abdomen whitish ; a dark edged silvery stripe from opposite eye to middle of caudal base ; often 4 or 5 lateral blotches between pectoral and anal bases.



TEXT-FIG. 116.—Lateral view of *Xenentodon cancila* (Ham.). (After Day).

Distribution.—INDIA : freshwaters of Ahmedabad, Bombay, E. Punjab, U. P., Bihar, Darjeeling Dt., W Bengal, Assam, Orissa, M. P., Madras, Mysore, Deolali, Poona, Deccan, Malabar, Travancore-Cochin ; PAKISTAN : freshwaters of Sind, W. Punjab, E. Pakistan.—Burma, Ceylon, Malaya, Siam.

Remarks.—It attains at least 304 mm. (a foot) in length.

Suborder Exocoetoidei

XXXVIII. Family HEMIRHAMPHIDAE

104. Genus *Hemiramphus* C.

1817. *Hemiramphus* Cuvier, *Regne Animal.*, 2, ed. 1, p. 186. (Type, *Esox brasiliensis* L.)

201. *Hemiramphus far* (Forsk.)

1775. *Esox far* Forskal, *Descript. Animal.*, p. 67 (type-locality : Lohaja, Red Sea).

1889. *Hemiramphus far* Day, *Fauna Brit. India*, Fish., 1, p. 424.

Head 2.7 to 3, beak 5, depth 8.5 to 12 in total length. Eyes 1.5 in postorbital length. Triangular portion of upper jaw wider than long. Teeth small, tricuspidate. Dorsal origin considerably in front of anal origin. Anal about half as long as dorsal with 10-12 rays. Pelvic origin in the last third of the distance between midorbit and caudal base. Dark bluish green above and lighter beneath ; a silvery lateral stripe and four dark lateral blotches.

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Madras, Coromandel, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, East Pakistan.—Burma, Red Sea, S. and E. coasts of Africa, Malaya, Malay Archipelago, Siam, China Riu Kiu, Philippines, Melanesia, Micronesia, Polynesia, N. Australia

Remarks.—It attains 381 mm. (1½ feet) in length.

202. *Hemiramphus gaimardi* V

1846. *Hemiramphus gaimardi* Valenciennes, *Hist. nat. Poiss.*, **19**, p. 36
(type-locality : Moluccas : Amboina : New Guinea : Port Jackson).
1889. *Hemirhamphus limbatus* Day, *Fauna Brit. India*, Fish., **1**, p. 426.

Head 3.1 to 3.2, beak 6.3 to 6.5, depth 9 to 10 in total length. Eyes 1.3 to 1.6 in postorbital length. Triangular portion of upper jaw keeled along median line, half wider at its base than it is long. Teeth minute, in many rows in both jaws, tricuspidate. Dorsal origin very slightly in advance of anal origin. Anal with 13-15 rays ; base a little shorter than that of dorsal. Pelvic origin nearly midway between eye and caudal or often nearer to caudal. 5 rows of scales between lateral line and dorsal base. Bluish green, with a brilliant lateral band ; vertical fins tinted gray.

Distribution.—INDIA, coasts of Bombay, Malabar, Travancore-Cochin, Madras, Coromandel, Orissa, West Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, East Pakistan.—Burma, Ceylon, Malay Archipelago, Siam, Philippines, China, New South Wales.

Remarks.—It attains 304 mm. (a foot) in length and ascends estuaries, tidal rivers and even freshwaters. It is the most common species of the Coromandel coast of India.

203. *Hemiramphus georgii* V

1846. *Hemiramphus georgii* Valenciennes, *Hist. nat. Poiss.*, **19**, p. 37,
pl. 555 (type-locality : Mahe Bay, Malabar, India).
1889. *Hemirhamphus georgii* Day, *Fauna Brit. India*, Fish., **1**, p. 424.

Head 2.7, beak 4.6, depth 10-13 in total length. Eyes 1.5 to 1.6 in postorbital length. Triangular portion of upper jaw a little longer than wide at its base, convex, not scaled. Teeth in a few rows in both jaws, mostly pointed but some tricuspid. Dorsal origin a little anterior to anal origin, in the last fourth of the distance between front border of eye and base of caudal. Anal rays 13-14, base 2/3 that of dorsal. Pelvic origin in the last third of the distance between angle of mouth and base of caudal. 5 rows of scales between lateral line and dorsal base. Bluish green, with a wide, silvery, lateral band.

Distribution.—INDIA, coasts of Bombay, Malabar, Travancore-Cochin, Madras, Coromandel, Andamans ; PAKISTAN : coasts of Sind, Karachi, Makran.—Burma, Ceylon, Seychelles, Mauritius, Malaya, Malay Archipelago, Siam, Philippines, Formosa, Seychelles, China, Micronesia, Mauritius.

Remarks.—It attains 304 mm. (a foot) in length.

105. Genus *Xenarchopterus* Gill

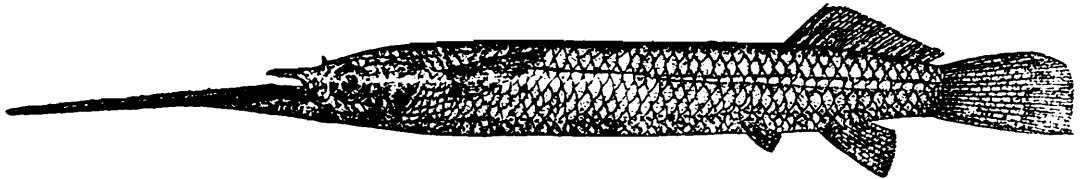
1863. *Xenarchopterus* Gill, *Proc. Acad. Sci. Philad.*, p. 273, (Type, *Hemiramphus dispar* V., orthotypic).

204. *Xenarchopterus buffonis* (V.)

(Text-fig. 117)

1846. *Hemiramphus buffonis* Valenciennes, *Hist. nat. Poiss.*, 19, p. 48
(type-locality : Pulo Pinan).
1889. *Hemirhamphus buffonis* Day, *Fauna Brit. India*, Fish., 1, p. 427.

Head 2.1 to 2.5, beak 3.1 to 3.5, depth 8.5 to 9 in total length. Eyes 1.5 in postorbital length. Triangular portion of upper jaw $\frac{1}{4}$ wider at its base than it is long. A barbel at the posterior nostrils, $\frac{1}{2}$ eye in length. Teeth conical in both jaws. Dorsal origin in front of anal origin. Anal with 10-12 rays ; origin below the third or fourth dorsal ray. Pelvics



TEXT-FIG. 117.—Lateral view of *Xenarchopterus buffonis* (V.). (After Day).

small ; origin in the last third of the distance between eye and caudal base. Caudal rounded. Dull bluish green with a narrow, silvery, lateral band ; upper half of dorsal black.

Distribution.—INDIA, coasts of Bombay, Malabar, Travancore-Cochin, Madras, Coromandel, Orissa, West Bengal, Andamans ; PAKISTAN ; coasts of Sind, East Pakistan.—Malaya, Malay Archipelago, Philippines, Melanesia, Micronesia.

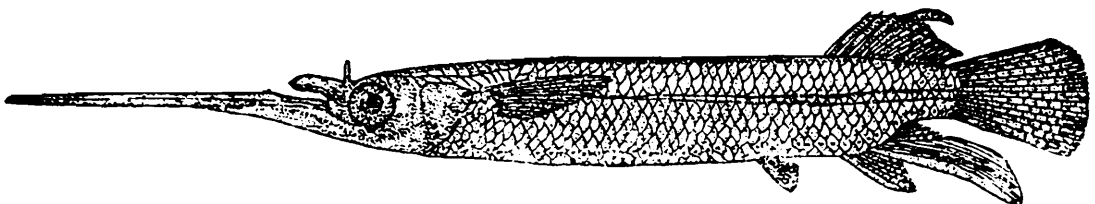
Remarks.—It attains at least 203 mm. (8 inches) in length and ascends estuaries and tidal rivers.

205. *Xenarchopterus dispar* (V.)

(Text-fig. 118)

1846. *Hemiramphus dispar* Valenciennes, *Hist. nat. Poiss.*, 19, pp. 58-62,
fig. 558 (type-locality : Java).
1889. *Hemirhamphus dispar* Day, *Fauna Brit. India*, Fish., 1, p. 126.

Head 2.3 to 2.5, beak 4.5, depth 11 in total length. Eye 1.3 in postorbital length. Triangular portion of upper jaw as broad at its base as it is long. A nasal barbel $\frac{2}{3}$ as long as eye. Dorsal origin about 3 rays anterior to anal origin. Anal with 11-12 rays, the 6th and 7th often thickened, elongated. Pelvic origin in the last third of the distance between tip of upper jaw and base of caudal. Caudal cut square or slightly rounded. Greenish blue with a lateral band.



TEXT-FIG. 118.—Lateral view of *Xenarchopterus dispar* (V.). (After Day).

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal, Andamans ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Seychelles, Malaya, Malay Archipelago, Siam, Philippines, Melanesia, Polynesia, Queensland.

Remarks.—It attains about 203 mm. (8 inches) in length and ascends estuaries and tidal rivers.

206. *Xenarchopterus ectuntio* (Ham.)

1822. *Esox ectuntio* Hamilton, *Fish. Ganges*, pp. 212, 380, (type-locality : small rivers and ponds of the Gangetic provinces).

1889. *Hemirhamphus ectuntio* Day, *Fauna Brit. India*, Fish., 1, p. 427.

Head 2.5 to 2.7, beak 5.5, depth 11 in total length. Eyes 2.2 to 2.5 in postorbital length. Triangular portion of upper jaw as long as broad at its base. Upper surface of head flat. A short nasal barbel may be present or absent. Teeth in jaws fine, conical. Dorsal origin in front of anal origin. Anal rays 10-12, some thickened in male. Pelvic origin in the last third of the distance between the eye and the caudal base. Caudal rounded. Dull greenish brown with a narrow, indistinct, lateral band ; end of upper jaw milk white.

Distribution.—INDIA : seas, estuaries and tidal rivers of W. Bengal ; PAKISTAN : seas, estuaries and tidal rivers of E. Pakistan.—Burma, Malaya, Malay Archipelago, Siam, Hongkong, China.

Remarks.—It grows to at least 152 mm. (6 inches) in length.

XXXIX. Family EXOCOETIDAE

106. Genus *Parexocoetus* Blkr.

1866. *Parexocoetus* Bleeker, *Ned. Tijds. Dierk.*, 3, p. 126. (Type, *Exocoetus mento* V., orthotypic).

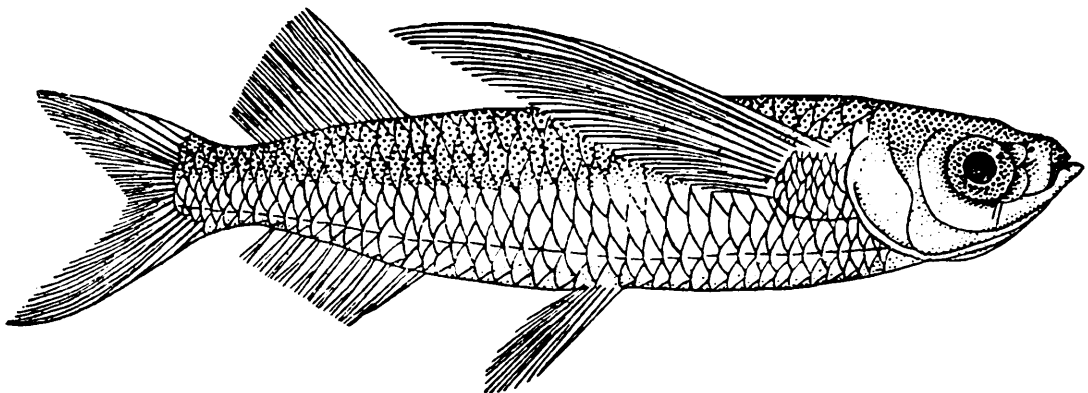
207. *Parexocoetus brachypterus* (Richardson)

(Text-fig. 119)

1846. *Exocoetus brachypterus* Richardson, *Ichth. China, Japan*, p. 265 (type-locality : Tahiti).

1889. *Exocoetus mento* Day, *Fauna Brit. India*, Fish., 1, p. 431.

Head 4.7, depth 5.2 in total length. Eyes 2.6 to 3 in head. Interorbital space smooth, with two grooves diverging from snout towards



TEXT-FIG. 119.—Lateral view of *Parexocoetus brachypterus* (Richardson). (After Day). occiput and ceasing opposite midorbit. Lower jaw a little longer, with a tubercle at the symphysis. No barbels. Teeth in jaws villiform, in a

simple row in lower and in many rows in upper jaws ; a large patch of villiform teeth on vomer and palatines. Dorsal as high as body ; origin opposite to anal. Pectorals reach to middle or end of dorsal. Pelvics nearly extend to anus or anal base. Anal rays 10-11. Lateral line scales 44. Bluish gray becoming silvery below ; dorsal black, upper half of pectoral black, white edged ; pelvics white ; anal white with a dark base.

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Madras, Coromandel, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Burma, Red Sea, South Africa, Malaya, Malay Archipelago, Philippines, China, Melanesia, Micronesia, Hawaii, Australia, West Atlantic, north of Newport.

Remarks.—It attains 203 mm. (8 inches) in length and is very common in large numbers at Madras during cold season.

107. Genus *Exocoetus* L.

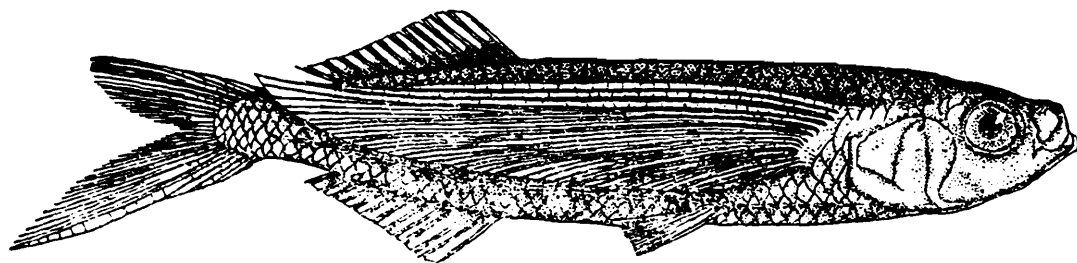
1758. *Exocoetus* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 316. (Type, *E. volitans* L., monotypic)

208. *Exocoetus volitans* L.

(Text-fig. 120)

1758. *Exocoetus volitans* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 316. (Type-locality : seas of Europe and America).
1889. *Exocoetus evolans* Day, *Fauna Brit. India*, Fish., 1, p. 429.

Head 5, depth 6 in total length. Eyes 3.5 in head. Interorbital flat. Dorsal not half so long as head ; origin above or a little in advance of anal origin. Pectorals reach caudal base. Pelvics small ; origin nearer to snout end than to caudal base. Anal rays 13-15. Lateral line scales 40-42. Bluish above becoming silvery below ; pectoral gray or black, white edged.



TEXT-FIG. 120.—Lateral view of *Exocoetus volitans* L. (After Day).

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Madras, Coromandel, Andamans ; PAKISTAN ; coasts of Sind, Karachi, Makran.—Ceylon, South Africa, Malay Archipelago, China, Japan, Melanesia, Polynesia, Hawaii ; tropical and subtropical parts of Indian, Pacific and Atlantic Oceans reaching far into temperate regions.

Remarks.—It attains at least 228 mm. (9 inches) in length.

108. Genus *Cypselurus* Swainson

1839. *Cypselurus* Swainson, *Nat. Hist. Fish. Animals*, 2, p. 296. (Type, *Exocoetus nuttalli* Le Sueur=*Exocoetus furcatus* Mitchill, logotypic.)

209. *Cypselurus altipennis* (V.)

1846. *Exocoetus altipennis* Valenciennes, *Hist. nat. Poiss.*, 19, p. 80, pl. 560. (Type-locality : East Indies : Cape of Good Hope).

1889. *Exocoetus altipennis* Day, *Fauna Brit. India*, Fish., 1, p. 430.

Head 5.2 to 5.5, depth of 7 to 7.5 in total length. Eyes 2.7 in head. Dorsal origin midway between postorbit and end of lower caudal lobe ; two-third as high as body. Pelvics much longer than head extending to middle of anal or a little more. Anal rays 10-12 ; origin below middle of dorsal. Lateral line scales 52. Bluish above and silvery below ; pectorals almost black with the first ray white and an oblique band in the hinder margin.

Distribution.—INDIA ; coast of Bombay ; PAKISTAN : coast of Sind.—Red Sea, Cape of Good Hope, Malay Archipelago, Philippines, Australia, Micronesia, Polynesia, Hawaii.

Remarks.—It attains at least 304 mm. (a foot) in length.

Order CYPRINODONTIFORMES

Suborder Cyprinodontoidei

XL. Family CYPRINODONTIDAE

109. Genus *Aplocheilus* Mc Clell.

1839. *Aplocheilus* Mc Clelland, *Asiat. Res.*, 19, p. 301. (Type, *A. chrysostigmus* Mc Clell. = *Esox panchax* Ham., logotypic.)

1846. *Panchax* Valenciennes, *Hist. nat. Poiss.*, 18, p. 380. (Type, *Esox panchax* Ham., tautotypic.)

210. *Aplocheilus blochii* (Arnold)

1911. *Haplochilus panchax* var. *blochii* Arnold, *Wschv. Terrar.-u. Terrarienk.*, 8, p. 672.

1916. *Panchax parvus* Raj, *Rec. Indian Mus.*, 12, p. 268 (rivers and tanks of Madras city).

Head 4.5, depth 5 in total length. Eyes 3.7 in head. No teeth on vomer. Dorsal origin above the last anal rays. Pectorals nearly as long as head. Pelvics small, without any elongated ray. Anal rays 14. Lateral line scales 27-29. Light olive with a black spot extending from the 2nd to the fourth dorsal ray.

Distribution.—INDIA : fresh and brackish waters of Cutch, Ahmedabad, Madras ; PAKISTAN : fresh and brackish waters of Sind.—Ceylon.

Remarks.—It attains about 63 mm. (2½ inches) in length.

211. *Aplocheilus lineatum* (V.)

(Text-fig. 121)

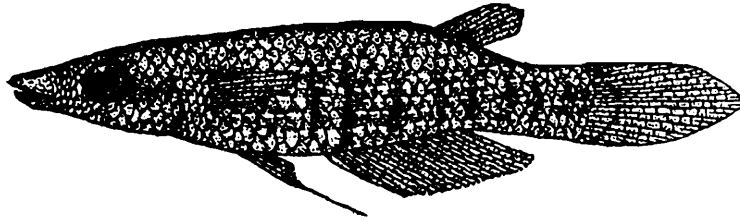
1846. *Panchax lineatum* Valenciennes, *Hist. nat. Poiss.*, 18, p. 381 (type-locality : Bombay).

1889. *Haplochilus rubrostigma* Day, *Fauna Brit. India*, Fish., 1, p. 416.

1889. *Haplochilus lineatum* Day, *Fauna Brit. India*, Fish., 1, p. 416.

Head 4.2 to 4.7, depth 5 to 5.5 in total length. Eyes 3.2 to 3.5 in head. Jaws nearly equal. Maxilla reaches to below first third of eye.

Teeth on vomer. Dorsal origin above the last few anal rays. Pectorals about as long as head. Pelvics with the second ray prolonged and



TEXT-FIG. 121.—Lateral view of *Aplocheilus lineatum* (V.). (After Day).

reaching to middle of anal. Anal rays 15-18. Central caudal rays elongated. Lateral line scales 32-34. Colour varies with season and sex ; male usually with 8-10 vertical black bands passing down from sides to abdomen ; female reddish brown above, yellowish on sides and below.

Distribution.—INDIA : fresh and brackish waters along the coast of Bombay, Wynaad, Malabar, Travancore-Cochin, Coorg, Madras, Coromandel.—Ceylon.

Remarks.—It attains 102 mm. (4 inches) in length and is a well known larvicidal fish.

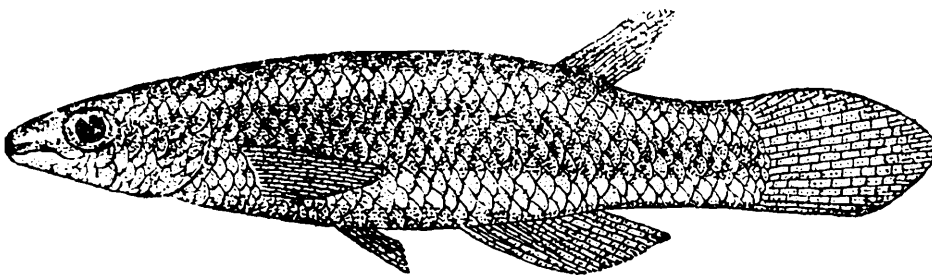
212. *Aplocheilus panchax* (Ham.)

(Text-fig. 122)

1822. *Esox panchax* Hamilton, *Fish. Ganges*, pp. 211, 380, pl. 3, fig. 69 (type-locality : ditches and ponds of Bengal).

1889. *Haplochilus panchax* Day, *Fauna Brit. India*, Fish., 1, p. 417.

Head 4 to 4.3, depth 4.7 to 5 in total length. Eyes 3.3 in head. Lower jaw oblique, longer, maxilla reaching to below first third of eye. No teeth on vomer. Dorsal origin above the last anal rays. Pectorals almost as long as head. Pelvics small without any elongated ray. Anal rays 15-17. Caudal rounded. Lateral line scales 31-34. A white occipital spot ; greenish above, dull white beneath ; fins yellow, lower third of dorsal with a large black spot ; dorsal, caudal and anal edged with orange.



TEXT-FIG. 122.—Lateral view of *Aplocheilus panchax* (Ham.). (After Day).

Distribution.—INDIA : fresh and brackish waters of East Punjab, Uttar Pradesh, Bihar, W. Bengal, Assam, Orissa, M. P., PAKISTAN : fresh and brackish waters of W. Punjab, E. Pakistan.—Burma, Ceylon, Malaya, Malay Archipelago, Siam.

Remarks.—It attains 89 mm. ($3\frac{1}{2}$ inches) in length and is a larvicidal fish.

110. Genus *Oryzias* Jordan & Snyder

1906. *Oryzias* Jordan & Snyder, *Proc. U.S. nat. Mus.*, **31**, p. 289. (Type, *Poecilia latipes* T. & S., orthotypic).

213. *Oryzias melastigmus* (Mc Clell.)

1839. *Aplocheilus melastigmus* Mc Clelland, *Asiat. Res.*, **1**, pp. 301, 427, pl. 42, fig. 3 (type-locality : tanks in Calcutta).
1889. *Haplochilus melanostigma* Day, *Fauna Brit. India*, *Fish.*, **1**, p. 415.

Head 4.2, depth 3.7 to 4 in total length. Eyes 3 in head. Lower jaw slightly longer, maxilla not reaching to below front edge of eye. No teeth on vomer. Dorsal origin above the last fourth of anal. Pectorals as long as head. Pelvics small, without any elongated ray. Anal rays 20-24. Caudal rounded. Lateral line scales 27. Dull green above, dull white below, with a narrow dark line along middle of side ending in a dull spot at the centre of caudal base ; anal white edged.

Distribution.—INDIA : fresh and brackish waters of Wynaad, Malabar, Madras, Orissa, Lower W Bengal ; Pakistan : Lower E. Bengal.—Burma, Ceylon.

Remarks.—It attains at least 38 mm. (1½ inches) in length and is a good larvicidal fish.

111. Genus *Aphanius* Nardo

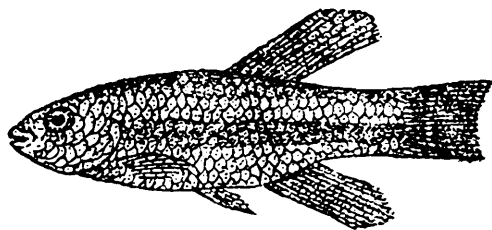
1827. *Aphanius* Nardo, *Giorn. Fisica de Pavia*, **1**, pp. 1723. (Type, *A. nanus* Nardo=*Cyprinodon calaritanus* V.).

214. *Aphanius dispar* (Rupp.)

(Text-fig. 123)

1828. *Lebias dispar* Ruppell, *Atl. Fische*, p. 66, pl. 18, fig. 1 (type-locality : Abyssinia).
1889. *Cyprinodon dispar* Day, *Fauna Brit. India*, *Fish.*, **1**, p. 414, fig. 134.

Head 3.7 to 4, depth 3.7 to 4 in total length. Eyes 3.2 in head. Lower jaw slightly longer, maxilla not reaching to below front edge of eye. Dorsal elevated in male with its origin midway between eye and caudal base ; not elevated in female, with its origin midway between opercle and caudal base. Anal rays 10. Pelvics elongated in males but



TEXT-FIG. 123.—Lateral view of *Aphanius dispar* (Rüpp.). (After Hora & Mukerji).

normal in females. Caudal lunate. Lateral line scales 25-27. Males greenish yellow reticulated with gray ; dorsal and anal spotted ; caudal yellowish with a white edged crescentic black band ; female silvery with 7-9 narrow vertical bands.

Distribution.—INDIA : fresh and brackish waters of Cutch ; PAKISTAN : fresh and brackish waters of Baluchistan, Sind.—Abyssinia, Palestine, shores of Red and Dead Seas, Iraq.

Remarks.—It attains about 25 mm. (1 inch) in length. It is a larvicidal fish.

XLI. Family PÆCILIDAE

112. Genus *Gambusia* Poey

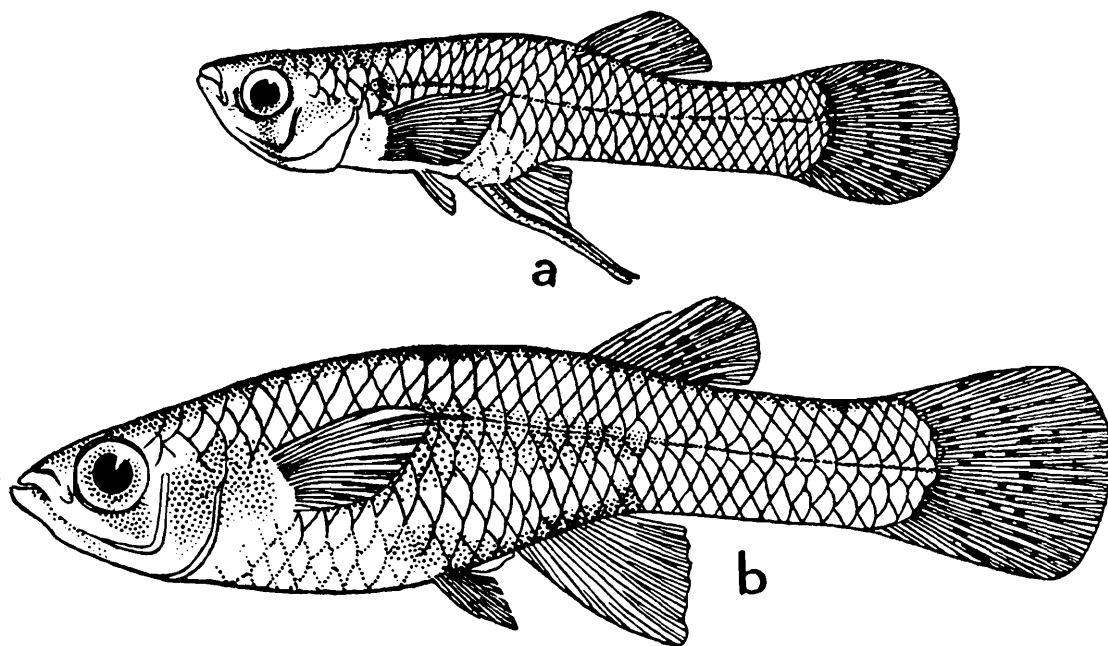
1854. *Gambusia* Poey, *Mem. Hist. Nat. Cuba*, 1, 382. (Type, *G. punctata* Poey, orthotypic.)

215. *Gambusia affinis patruelis* (Baird & Girard)

(Text-fig. 124)

1853. *Heterandria patruelis* Baird and Girard, *Proc. Acad. nat. Sci. Philad.*, 6, p. 390 (type-locality : Rio Sabinal, Texas).

Head 3.6 to 4, depth 3.5 to 4 in standard length. Eyes 3 in head. Dorsal origin in the middle of body in males and midway between front margin of eye and tip of caudal in females. Anal rays 8-10, with anal processes of the male longer than head. Lateral line scales 32. Faint dark lines in upper half of caudal ; sides of body irregularly dotted black ; 2 or 3 cross bands of dots on the dorsal and caudal ; often uniform brownish olive.



TEXT-FIG. 124.—Lateral view of *Gambusia patruelis* Baird & Girard. (a) Male. (b) Female. (After Hora & Mukerji).

Distribution.—INDIA : exotic, introduced in many states in India ; PAKISTAN : exotic, introduced in several important places in E. and W. Pakistan.—Burma (introduced), Ceylon, (introduced), Malaya (introduced), Philippines (introduced) Hawaii introduced), Formosa (introduced), Italy (introduced), native, to Southern United States northward to Illinois.

Order BERYCIFORMES

XLII. Family HOLOCENTRIDAE (Berycidae)

113. Genus **Holocentrus** Scopoli

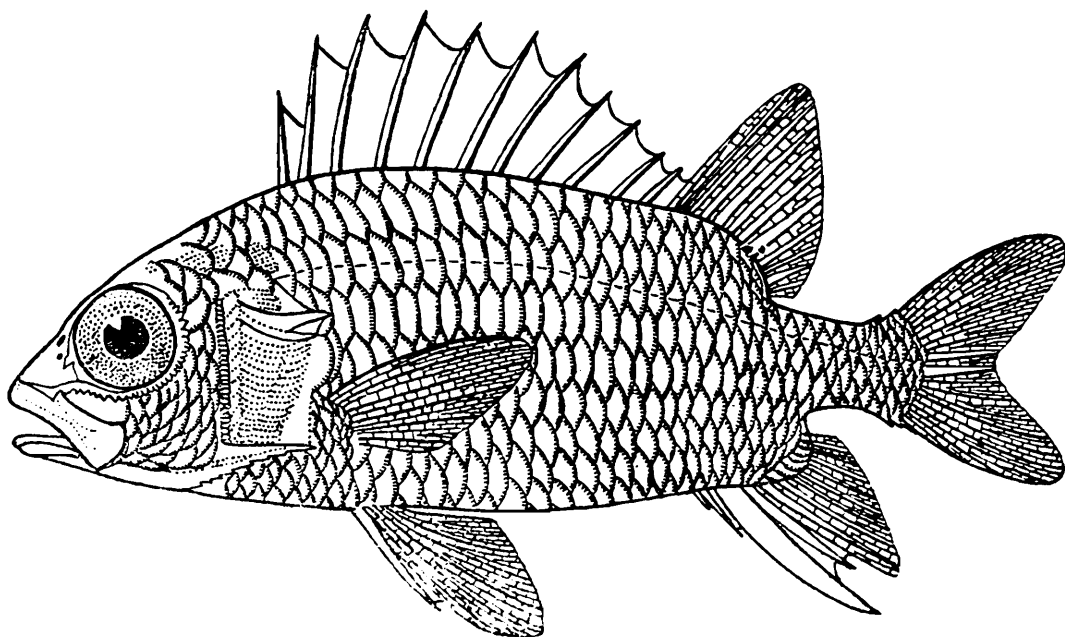
1763. *Holocentrus* Gronow, *Zoophyl. Gronovius Animal.*, p. 65. (Type, *H. sogo* Bl., inadmissible).
 1777. *Holocentrus* Scopoli, *Introd. Hist. Nat.*, p. 449. (Type, *H. sogo* Bl.)

216. **Holocentrus rubra** (Forsk.)

(Text-fig. 125)

1775. *Sciaena rubra* Forskal, *Descript. Animal.*, p. 48 (type-locality : Arabia).
 1889. *Holocentrum rubrum* Day, *Fauna Brit. India*, Fish., 1. p. 96, fig. 44.

Head 3·5 to 3·7, depth 3·2 to 3·5 in total length. Eyes 2·5 to 2·7 in head. Interorbital 3·5 to 4 in head. Maxilla extends to midorbit, Opercle with 2 spines ; outer edges lightly serrated. Two simple, rostral spines on each side. Teeth villiform. Lateral line scales 35-39. Red with 7-8 silvery bands in the adult ; young silvery with white longitudinal rosy bands.



TEXT-FIG. 125.—Lateral view of *Holocentrus rubra* (Forsk.). (After Day).

Distribution.—INDIA ; coasts of Bombay, Malabar, Travancore-Cochin, Madras, Coromandel, Orissa, W. Bengal ; PAKISTAN ; coasts of Sind, E. Pakistan.—Burma, Ceylon, Red Sea, S. Africa, Malaya, Malay Archipelago, Siam, China, Japan, Philippines, Australia, Melanesia, Micronesia.

Remarks.—It attains at least 228 mm. (9 inches) in length.

217. **Holocentrus spinifera** (Forsk.)

1775. *Sciaena spinifera* Forskal, *Descript. Animal.*, p. 49 ((type-locality) : Djedda, Red Sea).

Head 3·2 to 3·5, depth 3·2 to 3·3 in total length. Eyes 3·2 to 3·5 in head. Interorbital 5 in head. Maxilla reaches to below first third or middle of orbit. Opercle with 2 or 3 flat spines. Bifid rostral spine on each side. Teeth villiform. Lateral line scales 42. Uniform rosy searlet.

Distribution.—INDIA : Andamans.—Red Sea, Madagascar, Philippines, Queensland, Melanesia, Micronesia, Polynesia.

Remarks.—It attains at least 406 mm. (a foot and 4 inches) in length.

Order MUGILIFORMES

Suborder Sphyraenoidei

XLIII. Family SPHYRAENTIDAE

114. Genus *Sphyraena* Walbaum

1778. *Sphyraena* Klein, *Gesellschaft Schauplatz*, 1, p. 464. (Type, *Esox sphyraena* L., inadmissible.)
 1792. *Sphyraena* Walbaum, *Ichth.*, pp. 94, 484. (Type, *Esox sphyraena* L., tautotypic.)
 1793. *Sphyraena* Rose, *Artedi Pesci.*, p. 52. (Type, *Esox sphyraena* L.)
 1801. *Sphyraena* Schneider, *Syst. Ichth. Bloch*, p. 109. (Type, *Esox sphyraena* L., tautotypic.)

218. *Sphyraena acutipinnis* Day

1877. *Sphyraena acutipinnis* Day, *Fish. India*, p. 342, pl. 79, fig. 1 (type-locality : Sind).
 1889. *Sphyraena acutipinnis* Day, *Fauna Brit. India, Fish.*, 2, p. 366.

Head 3.5, depth 9.5 in total length. Eyes 6 in head. Lower jaw longer. Maxilla does not extend to below anterior border of eye. Angle of preopercle rounded. Opercle with single point. Teeth large and cutting. Lateral line scales 120 ; lateral transverse scales 14/18. Dark leaden above and dull white beneath ; fins gray.

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Orissa, W. Bengal ; PAKISTAN ; coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon.

Remarks.—It attains at least 609 mm. (2 feet) in length.

219. *Sphyraena jello* C.

1829. *Sphyraena jello* Cuvier, *Hist. nat. Poiss.*, 3, p. 259 (type-locality : Vizagapatam).
 1889. *Sphyraena jello* Day, *Fauna Brit. India, Fish.*, 2, p. 335.

Head 3.5 to 4, depth 8 to 9 in total length. Eyes 5 to 6.5 in head. Maxilla reaches to below front border or first third of eye. Angle of preopercle obliquely rounded. Opercle with two points. Teeth large and cutting. Lateral line scales 120 ; lateral transverse scales 18/22. Silvery gray becoming white below ; often with short vertical gray bands, about 22 ; pelvics whitish, other fins yellowish with dark points.

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN ; coasts of Sind, E. Pakistan.—Burma, Ceylon, Red Sea, Seychelles, Madagascar, S. and E. coasts of Africa, Malaya, Malay Archipelago, Siam, Hongkong, China, Formosa, Riu Kiu Islands, Philippines, Melanesia, Polynesia.

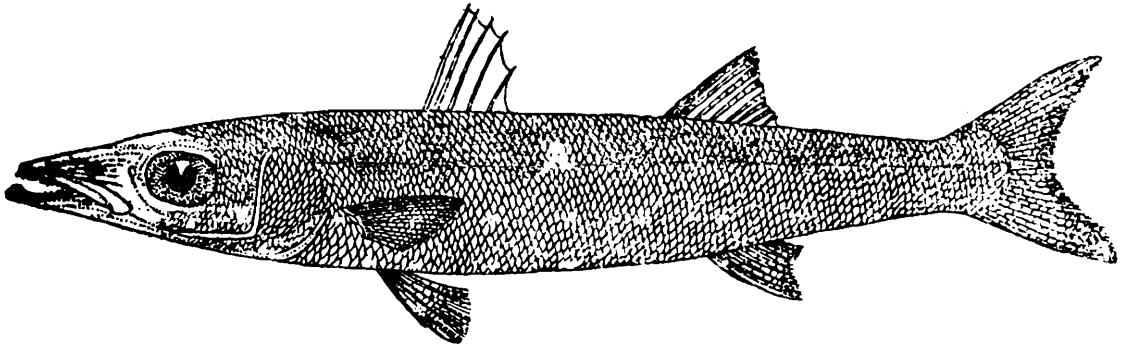
Remarks.—It attains at least 1,524 mm. (5 feet) in length.

220. *Sphyraena obtusata* C.

(Text-fig. 126)

1829. *Sphyraena obtusata* Cuvier, *Hist. nat. Poiss.*, 3, p. 324, pl. 10, fig. 2 (type-locality : Pondicherry : Malabar).1889. *Sphyraena obtusata* Day, *Fauna Brit. India*, Fish., 2, p. 337, fig. 112.

Head 3·5, depth 6·5 in total length. Eyes 4 to 4·2 in head. Maxilla reaches nearly to front border of eye. Preopercle nearly rectangular with its angle a little produced. Opercle with one point. Teeth large and cutting. Lateral line scales 90; lateral transverse scales 9/17. Greyish green above becoming whitish below; pectorals greenish, other fins yellowish.

TEXT-FIG. 126.—Lateral view of *Sphyraena obtusata* C. (After Day).

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal; PAKISTAN : coasts of Sind, E. Pakistan.—Burma, Ceylon, Red Sea, Madagascar, E. and S. coasts of Africa, Malaya, Malay Archipelago, Siam, Hongkong, Canton, Korea, Riu Kiu Islands, Philippines, Melanesia, Micronesia, Polynesia, Australia, New Zealand.

Remarks.—Specimens upto 406 mm. (a foot and 4 inches) have been obtained.

Suborder Mugiloidei

XLIV Family MUGILIDAE

115. Genus *Mugil* L.1758. *Mugil* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 316. (Type, *M. cephalus* L., monotypic.)✓ 221. *Mugil cephalus* L.1758. *Mugil cephalus* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 316 (type-locality : European Ocean).1889. *Mugil oeur* Day, *Fauna Brit. India*, Fish., 2, p. 348.

Head 4·5 to 4·6, depth 5·3 to 5·6 in total length. Eyes with broad adipose lids, 4·6 in head. Interorbital flat. Dorsal profile from snout to dorsal base nearly horizontal. Maxilla not visible. Preorbital neither notched nor bent. Upper lip thin forming mesially the front end of snout. Mandibles joined at right angle with a notch at their point of junction. Teeth distinct in both jaws. First dorsal origin midway between snout end and caudal base. Pectorals above middle

of depth of body, as long as head behind eyes. Anal origin opposite second dorsal with its base slightly longer than that of 2nd dorsal. Caudal with pointed lobes. Predorsal scales 23. Lateral line scales 32-44. Greyish along back, silvery below ; a dark line along each row of scale in upper half of body.

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal ; PAKISTAN : coasts of Makran, Sind, Karachi, E. Pakistan.—Burma, Ceylon, Red Sea, Socotra, Madagascar, Mauritius, Bourbon, S. and E. coasts of Africa, Malaya, Malay Archipelago, Formosa, China, Korea, Philippines, Melanesia, Micronesia, Hawaii, Queensland, N. Australia, also recorded from Mediterranean, New York, Panama, S. California, Monterey to Chile.

Remarks.—It attains at least 914 mm. (3 feet) in length. The season for capturing these fishes along the western coasts of India commences about the middle of November when they swarm close in shore in order to enter estuaries and mouths of large rivers to deposit their ova. They continue to be very numerous until February.

222. *Mugil parsia* Ham.

(Text-fig. 127)

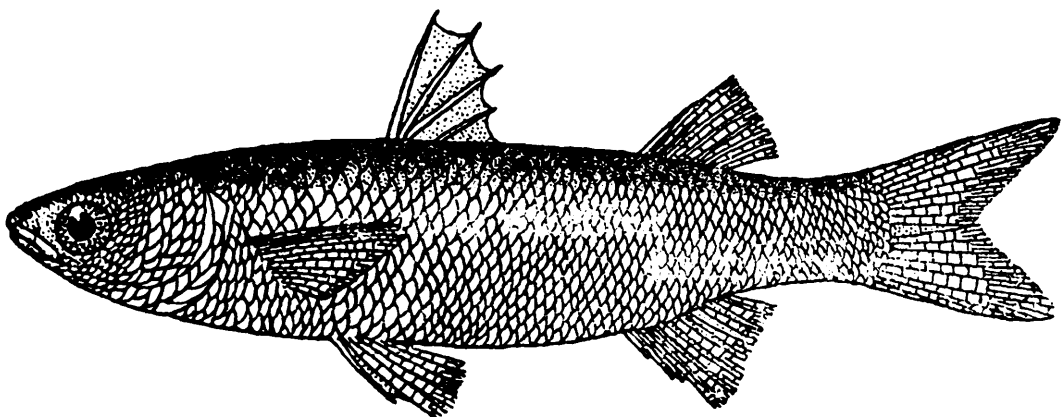
1822. *Mugil parsia* Hamilton, *Fish. Ganges*, pp. 215, 380, pl. 17, fig. 71 (type-locality : freshwater rivers of Bengal).

1889. *Mugil parsia* Day, *Fauna Brit. India*, Fish., 2, p. 344.

1889. *Mugil dussumieri* Day, *Fauna Brit. India*, Fish., 2, p. 347.

1889. *Mugil subviridis* Day, *Fauna Brit. India*, Fish., 2, p. 348.

Head 5 to 5.5, depth 4.3 to 5 in total length. Eyes with adipose lids, 3.5 to 4.2 in head. Maxilla visible. Preorbital slightly bent, serrated. Upper lip moderately thick, forming more or less front end of snout. Mandible meet at an obtuse angle. Teeth distinct in upper jaw. First dorsal origin about midway between snout and caudal base. Anal origin about half in advance of the second dorsal. Predorsal scales 18-22. Lateral line scales 29-35. Greenish olive becoming lighter below.



TEXT-FIG. 127.—Lateral view of *Mugil parsia* (Ham.). (After Day).

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore Cochin, W. Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Burma, Ceylon, Malaya, Malay Archipelago, Siam, Philippines, Melanesia, Queensland.

Remarks.—It attains 152 mm. (6 inches) in length and ascends estuaries.

223. *Mugil strongylocephalus* Richardson

1846. *Mugil strongylocephalus* Richardson, *Ichth. China, Japan*, p. 249 (type-locality : Sea of China : Hongkong).
1889. *Mugil cunnesius* Day, *Fauna Brit. India, Fish.*, 2, p. 342.

Head 5.2 to 5.5, depth 4.5 in total length. Eyes with broad adipose lids, 3.5 to 4 in head. Maxilla visible. Upper lip forming end of snout. Preorbital bent, not notched, finely serrated. Mandibles meet at an acute angle with a notch at point of junction. Teeth minute in jaws. Opercle without spine. First dorsal origin nearer to snout than to base of caudal. Anal origin nearly two-third in front of second dorsal origin. Pectorals above middle of depth of body, as long as head. Predorsal scales 18 ; lateral line scales 33-35. Silvery grey superiorly and lighter below, with a dark spot in the axilla.

Distribution.—Estuaries and seas of INDIA and PAKISTAN.—Ceylon, S. Africa, Malaya, Malay Archipelago, Hongkong, Philippines, Polynesia, Queensland.

Remarks.—It grows up to 304 mm. (a foot) in length.

224. *Mugil tade* Forsk.

1775. *Mugil tade* Forskal, *Descript. Animal.*, p. 74 (type-locality : Arabia).
1889. *Mugil tade* Day, *Fauna Brit. India, Fish.*, 2, p. 344.
1889. *Mugil belanak* Day, *Fauna Brit. India, Fish.*, 2, p. 345.

Head 4.5 to 5.2, depth 5.5 to 6 in total length. Eyes with adipose lids, 4.5 to 6 in head. Maxilla visible. Preorbital bent, notched or not notched, serrated. Upper lip moderately thick or thin forming end of snout. Teeth minute, distinct. Opercle without spine. First dorsal origin midway between snout end or front edge of eye and caudal base. Pectorals in the middle of depth of body, about as long as head. Predorsal scales 18-20 ; lateral line scales 33-35. Olivaceous above silvery below, with 5-7 indistinct, dark longitudinal lines corresponding to rows of scales.

Distribution.—INDIA : coasts of Orissa, Andamans, W. Bengal ; PAKISTAN : coast of E. Pakistan.—Burma, Ceylon, Red Sea, Socotra, Malay Archipelago, Siam, Amoy, Philippines, Melanesia, Micronesia, Polynesia, Queensland.

Remarks.—It attains 470 mm. in length and ascends estuaries and tidal rivers. It is very common in the Hooghly at Calcutta.

116. Genus *Chelon* Rose

1793. *Chelon* Rose, *Arledi Pisc.*, ed. 2, p. 118. (Type, *Mugil chelo* C.V.)
1884. *Liza* Jordan & Swain, *Proc. U.S. nat. Mus.*, 7, p. 261. (Type, *Mugil capito* C., orthotypic.)
1830. *Ellochelon* Whitby, *Aust. Zool.*, 6, p. 251. (Type, *Mugil vaigiensis* Q. G., orthotypic.)
1948. *Oxymugil* Whitby, *Aust. Zool.*, 11, p. 271, fig. 7. (Type, *Mugil acutus* V., orthotypic.)

225. *Chelon macrolepis* (Smith)

1849. *Mugil macrolepis* Smith, *Ill. Zool. S. Africa*, 4, pl. 28, fig. 2 (type-locality : rivers and freshwater lakes of South Africa).
 1889. *Mugil borneensis* Day, *Fauna Brit. India*, Fish., 2, p. 353.
 1889. *Mugil troschelii* Day, *Fauna Brit. India*, Fish., 2, p. 355.

Head 4.5 to 5, depth 4.5 to 5 in total length. Eyes without adipose lids, 3.2 to 4 in head. Upper lip moderately thick forming end of snout. Maxilla visible. Preorbital scales, emarginate, serrated. Teeth minute. Opercle without spine. First dorsal origin midway between front border of eye and caudal base. Anal origin a third or half in advance of second dorsal origin. Caudal lunate. Predorsal scales 18-21. Lateral line scales 31-34. Silvery.

Distribution.—INDIA : coasts of Travancore-Cochin, Orissa, West Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Burma, Ceylon, E. and S. coasts of Africa, Malaya, Malay Archipelago, China, Japan, Philippines, Melanesia, Micronesia, Polynesia.

Remarks.—It attains at least 152 mm. (6 inches) in length and ascends brackish and freshwaters upto tidal influence.

226. *Chelon oligolepis* (Blkr.)

1859. *Mugil oligolepis* Bleeker, *Nat. Tijdschr. Ned.-Ind.*, 16, p. 27 (type-locality : Sumbawa).
 1889. *Mugil oligolepis* Day, *Fauna Brit. India*, Fish., 2, p. 355.

Head 4.6, depth 3.5 in total length. Eyes without adipose lids, 3.5 in head. Interorbital flat. Dorsal profile from above pectoral fin to snout steep. Maxilla visible. Upper lip thin forming end of snout. Preorbital slightly bent, serrated, not notched. Teeth not visible. Opercle without spine. First dorsal origin between front border of eye and caudal base. Second dorsal origin behind the first third of anal. Pectoral as long as head excluding snout. Caudal emarginate. Predorsal scales 17. Lateral line scales 26-28. Silvery.

Distribution.—INDIA : coasts of Bombay, estuaries of the Ganges at Sundarbans ; PAKISTAN : coasts of Sind, E. Pakistan.—Burma, Ceylon, S. Africa, Malaya, Malay Archipelago, Philippines.

Remarks.—Specimens measuring 150-280 mm. have been obtained.

227. *Chelon vaigiensis* (Q.G.)

1825. *Mugil vaigiensis* Quoy and Gaimard, *Voy. " Uranie," Zool.*, p. 337, pl. 59, fig. 2 (type-locality : Waigiu).
 1889. *Mugil vaigiensis* Day, *Fauna Brit. India*, Fish., 2, p. 356.

Head 4.6 to 5, depth 5 to 5.2 in total length. Eyes without adipose lids, 4.2 to 4.5 in head. Head depressed, body short. Snout obtuse, upper lip forming end of snout. Mandibles forming an obtuse angle. Maxilla visible, reaching to below front third of eye. Preorbital bent, slightly serrated, not notched. Teeth very minute. Opercle without spine. First dorsal origin midway between front border of eye and base of caudal. Predorsal scales 15-16. Lateral line scales 26-27. Brownish above, dull white below, with a dark line along each row of scales ; fins usually dark grey.

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Coromandel : PAKISTAN : coasts of Sind, Karachi, Makran.—Burma, Ceylon, Red Sea, South Africa, Malaya, Malay Archipelago, Siam, China, Philippines, Melanesia, Micronesia, Polynesia, Queensland,

Remarks.—It attains 304 mm. (a foot) or more in length and is good eating.

117. Genus *Sicamugil* Fowler

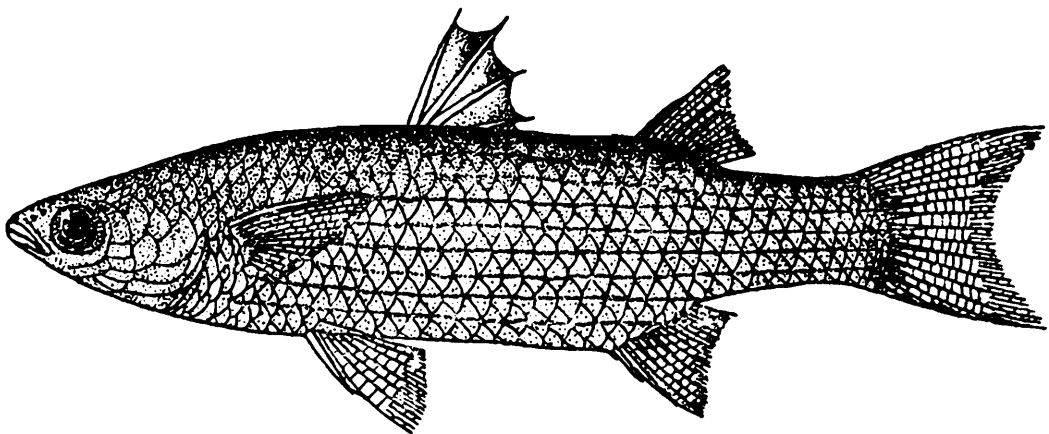
1939. *Sicamugil* Fowler, *Notul. Nat. Philadelphia*, 17, p. 9, fig. 1. (Type, *Mugil hamiltonii* Day, orthotypic.)

228. *Sicamugil cascasia* (Ham.)

(Text-fig. 128)

1822. *Mugil cascasia* Hamilton, *Fish. Ganges*, pp. 217, 380 (type-locality : northern rivers of Bengal).
1889. *Mugil cascasia* Day, *Fauna Brit. India*, Fish., 2, p. 351.

Head 4.5, depth 4.5 to 5.2 in total length. Eyes without adipose lids, 3.5 to 4 in head. Head flattened above. Interorbital 2.5 in head. Maxilla faintly visible. Extremity of upper lip does not form end of snout. Opercle with a spine. First dorsal much nearer to snout than to caudal base. Teeth minute. Pectorals in the middle of depth of



TEXT-FIG. 128.—Lateral view of *Sicamugil cascasia* (Ham.). (After Day).

body, as long as head without snout. Anal origin opposite second dorsal origin. Caudal lunate. Lateral line scales 36-39. Yellowish olive on top of head, greyish on back becoming silvery white below. Fins not coloured.

Distribution.—INDIA : Delhi, Upper waters of the Ganges and Jumna, Kanpur, Allahabad, Banaras and certainly as low as Patna, the Brahmaputra.—Ceylon.

Remarks.—It attains 102 mm. (4 inches) in length and is found in fresh waters.

118. Genus *Rhinomugil* Gill

1863. *Rhinomugil* Gill, *Proc. Acad. nat. Sci. Philad.*, 15, p. 169. (Type, *Mugil corsula* Ham., orthotypic.)

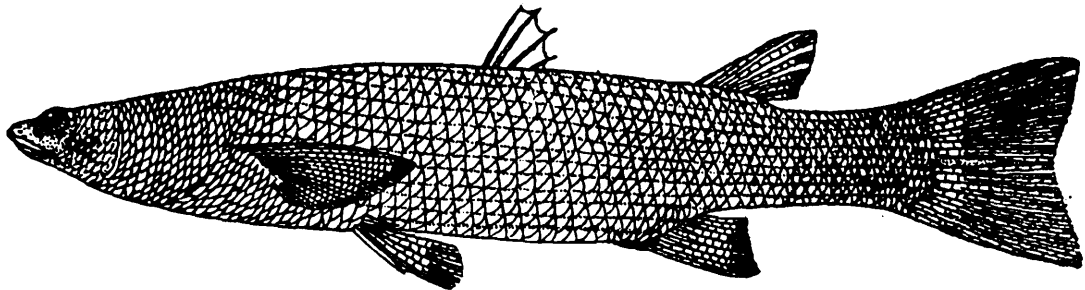
229. *Rhinomugil corsula* (Ham.)

(Text-fig. 129)

1822. *Mugil corsula* Hamilton, *Fish. Ganges*, pp. 221, 381, pl. 9, fig. 97 (type-locality : rivers of the Gangetic provinces and in the southern parts of Bengal).

1889. *Mugil corsula* Day, *Fauna Brit. India*, Fish., 2, p. 345.

Head 4.5 to 4.8, depth 6 to 6.5 in total length. Eyes without adipose lids, elevated, 7 in head. Head depressed, dorsal profile nearly horizontal. Upper jaw longer, overhung by snout. Maxilla visible, reaching below middle of eye. Preorbital not notched, serrated. Teeth minute. Opercle without spine. First dorsal origin a little nearer to caudal base than to snout end. Anal with its first 7 rays in front of second dorsal. Caudal slightly emarginate. Predorsal scales 28. Lateral line scales 48-52. Dull brown above becoming lighter below ; dorsal and caudal tinted grey ; eyes golden.



TEXT-FIG. 129.—Lateral view of *Rhinomugil corsula* (Ham.). (After Day).

Distribution.—INDIA : E. Punjab, Allahabad, Banaras, Patna, Calcutta, Orissa ; PAKISTAN : West Punjab, East Pakistan.

Remarks.—It attains 457 mm. (a foot and a half) or more in length and is found in estuaries and freshwaters far above the tidal influence.

Order POLYNEMIFORMES

XLV. Family POLYNEMIDAE

119. Genus *Eleutheronema* Blkr.

1862. *Eleutheronema* Bleeker, *Versl. Akad. Amsterdam*, 14, p. 110. (Type, *Polynemus tetradactylus* Shaw, orthotypic.)

230. *Eleutheronema tetradactylus* (Shaw)

1804. *Polynemus tetradactylus* Shaw, *General Zool.*, 5, p. 155 (type-locality : Vizagapatam).

1889. *Polynemus tetradactylus* Day, *Fauna Brit. India*, Fish., 2, p. 106.

Head 5, depth 5 to 6 in total length. Eyes 4.5 to 5 in head. Maxilla reaches to below an eye diameter behind orbit. Teeth viliform. Pectoral with 4 free rays, extending to pelvics. Distance between pelvic and anal bases equals head length minus snout. Least depth of caudal peduncle equals half of head length. Lateral line scales 75-85. Silvery green above becoming yellowish white below. Dorsal and caudal greyish, pelvics and anal pale orange in their outer half ; a dark shoulder spot.

Distribution.—INDIA : coasts of Bombay, Ahmedabad, Travancore-Cochin, Coromandel, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Malaya, Malay Archipelago, Siam, Amoy, Hongkong, Philippines, Queensland.

Remarks.—It attains 1,828 mm. (6 feet) and upwards in length, is excellent eating and ascends higher up the rivers than any others of the family. The young are numerous in the Hooghly at Calcutta.

120. Genus *Polydactylus* Lac.

1803. *Polydactylus* Lacepède, *Hist. nat. Poiss.*, 5, p. 419. (Type, *P. plumieri* Lac.)

231. *Polydactylus indicus* (Shaw)

1804. *Polynemus indicus* Shaw, *General Zool.*, 5, p. 155 (type-locality : Vizagapatam).
1889. *Polynemus indicus* Day, *Fauna Brit. India*, Fish., 2, p. 105.

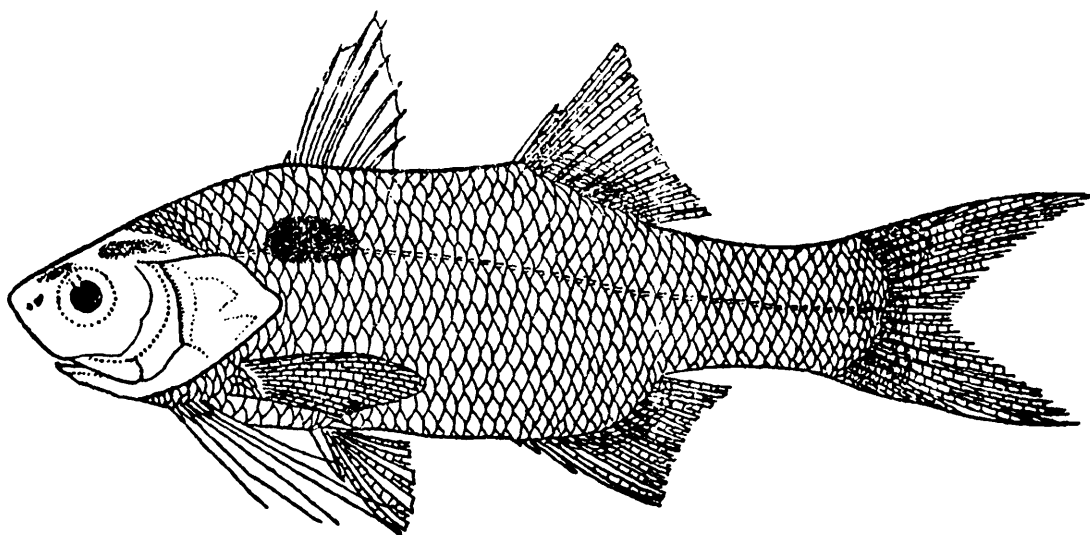
Head 4.2 to 4.5, depth 6 in total length (excluding the filamentous prolongation of tail). Eyes 7 in head. Maxilla reaches far behind orbit. Teeth villiform. Pectoral with 5 free rays, the longest reaching anal. Distance between pelvics and anal bases longer than head length. Least height of caudal peduncle equals two-fifth of head length. Lateral line scales 70-75. Purplish black above becoming silvery white shot with gold below. Dorsal and anal tinted grey.

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Madagascar, Mauritius, S. Africa, Malaya, Malay Archipelago, Philippines, Melanesia, Queensland.

232. *Polydactylus sextarius* (Schn.)

(Text-fig. 130)

1801. *Polynemus sextarius* Schneider, *Syst. Ichth. Bloch*, p. 18, pl. 4 (type-locality : Tranquebar).
1889. *Polynemus sextarius* Day, *Fauna Brit. India*, Fish., 2, p. 104.



TEXT-FIG. 130.—Lateral view of *Polydactylus sextarius* (Schn.). (After Day).

Head 4 to 4.2, depth 4 to 4.5 in total length. Eyes 3 to 3.7 in head. Maxilla extends behind orbit. Teeth villiform. Pectoral with 6 free

rays, reaching to pelvics. Least height of caudal peduncle half of head length. Lateral line scales 48-50. Golden, upper half of first dorsal spotted black ; other fins also numerously dotted with grey ; a large black shoulder spot.

Distribution.—India : coasts of Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN : coast of Sind, E. Pakistan.—Burma, Ceylon, S. and E. coasts of Africa, Malaya, Malay Archipelago, Siam, Hongkong, China.

Remarks.—It attains upto 190 mm. ($7\frac{1}{2}$ inches) in length.

121. Genus *Polynemus* L.

1758. *Polynemus* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 317. (Type, *P. paradiseus* L., logotypic.)

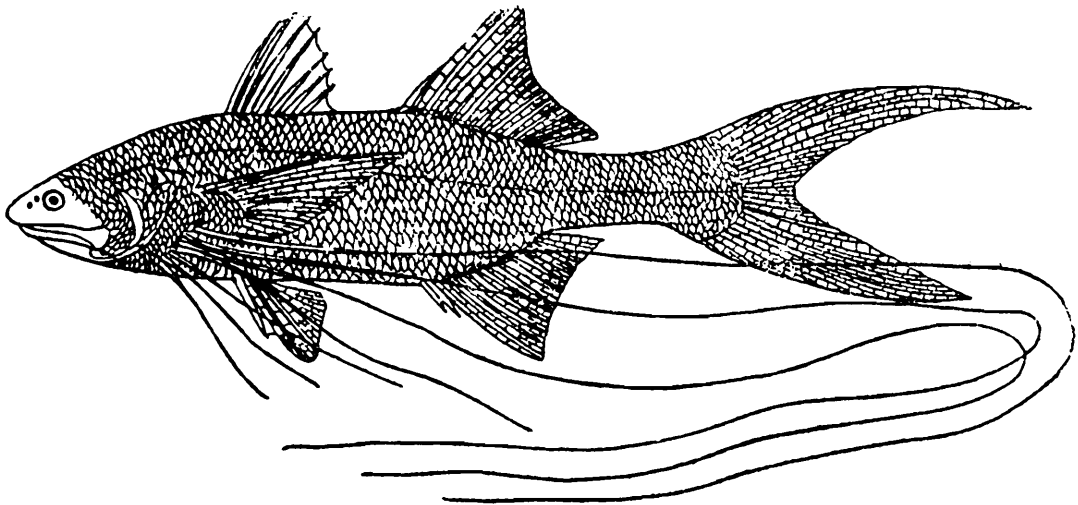
233. *Polynemus paradiseus* L.

(Text-fig. 131)

1758. *Polynemus paradiseus* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 317 (type-locality : India).

1889. *Polynemus paradiseus* Day, *Fauna Brit. India*, Fish., 2, p. 102.

Head 6 to 6.5, depth 6 to 6.5 in total length. Eyes 8 in head. Maxilla extends to below 2 eye diameters behind orbit. Teeth villiform. Pectoral with 7 free rays, the longest about twice the length of fish. Least height of caudal peduncle equals two-fifth of head length. Lateral line scales 70. Golden grey with fins tinged grey.



TEXT-FIG. 131.—Lateral view of *Polynemus paradiseus* L. (After Day).

Distribution.—INDIA : coast of Bombay, Bay of Bengal at least as low as Coconada ; Pakistan : coasts of Sind, E. Pakistan.—Burma, Malaya, Siam.

Remarks.—It attains 258 mm. (9 inches) in length and enters rivers for spawning purposes, generally during the South West monsoon and the cold months. It is considered a great luxury for the table.

Order OPHIOCEPHALIFORMES

XLVI. Family OPHIOCEPHALIDAE (Channidae)

122. Genus *Channa* Gronov

1763. *Channa* Gronov, *Zoophyl. Gronovius Animal.*, p. 155. (Type, *C. orientalis* Bl. Schn., inadmissible.)
 1777. *Channa* Scopoli, *Introd. Hist. Nat.*, p. 459. (Type, *C. orientalis* Bl. Schn.)
 1793. *Ophiocephalus* Bloch, *Naturg. Ausland. Fische*, 7, p. 137. (Type, *O. punctatus* Bl.)

234. *Channa gachua* (Ham.)

1822. *Ophiocephalus gachua* Hamilton, *Fish. Ganges*, pp. 68, 367, pl. 21, fig. 21 (type-locality : ponds and ditches of Bengal).
 1889. *Ophiocephalus gachua* Day, *Fauna Brit. India*, Fish., 2, p. 304.

Head 3.5 to 4.2, depth 6 in total length. Eyes 6 in head. Maxilla reaches to below hind border of eye. Teeth conical. Pelvics two-fifth of pectoral length. 4 or 5 rows of scales between orbit and angle of preopercle ; predorsal scales 12 ; lateral line scales 40-45. Cephalic pits simple. Colour varies with environment ; usually greenish becoming lighter beneath ; dorsal, anal and caudal slaty grey and orange tipped ; pectoral with a black base transversely barred.

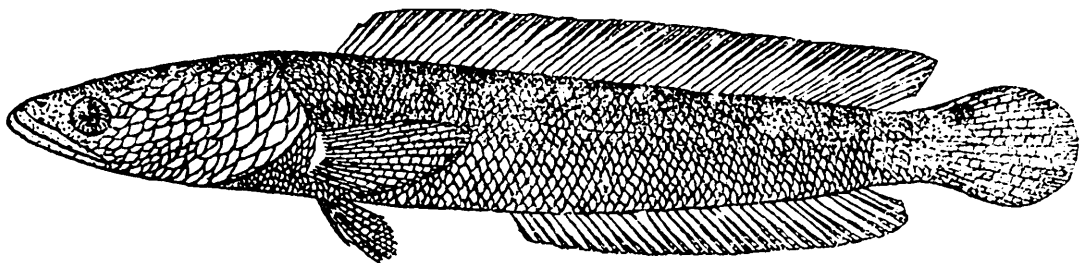
Distribution.—INDIA : freshwaters of E. Punjab, U. P., Western Himalayas, Bihar, Darjeeling Dt., W. Bengal, Assam, Eastern-Himalayas, Orissa, Madras, Deccan, M. P., Mysore, Travancore-Cochin, Poona, Bombay ; Andamans ; PAKISTAN : freshwaters of W. Pakistan, Baluchistan, E. Pakistan.—Burma, Ceylon, Afghanistan, Malaya, Malay Archipelago, Siam, Indo-China, Yunnan, Hainan.

Remarks.—It attains at least 203 mm. (8 inches) in length but according to Dr. F. Day grows upto 329 mm. (a foot and 1 inch).

235. *Channa marulius* (Ham.)

(Text-fig. 132)

1822. *Ophiocephalus marulius* Hamilton, *Fish. Ganges*, pp. 65, 367, pl. 17, fig. 19 (type-locality : the Ganges).
 1889. *Ophiocephalus marulius* Day, *Fauna Brit. India*, Fish., 2, p. 360.



TEXT-FIG. 132.—Lateral view of *Channa marulius* (Ham.). (After Day).

Head 4 to 5, depth 7 to 7.5 in total length. Eyes 5 to 7 in head. Maxilla extends half eye diameter behind orbit. Teeth villiform. Pelvics two-third as long as pectoral. 10 rows of scales between orbit and angle of preopercle ; predorsal scales 16 ; lateral line scales 60-70.

Cephalic pits multiple. Colour varies with environment ; generally greyish green becoming lighter below ; young with a brilliant, orange, lateral band and adult ones with 5-6 cloudy bands below lateral line ; a large black ocellus at upper part of the base of caudal.

Distribution.—INDIA : freshwaters of W. Bengal, Deccan, Mysore, Travancore-Cochin, Ahmedabad ; PAKISTAN : freshwaters of E. Pakistan.—Burma, Ceylon, Siam, China.

Remarks.—It attains as much as 1,219 mm. (4 feet) in length and takes a live bait pretty well.

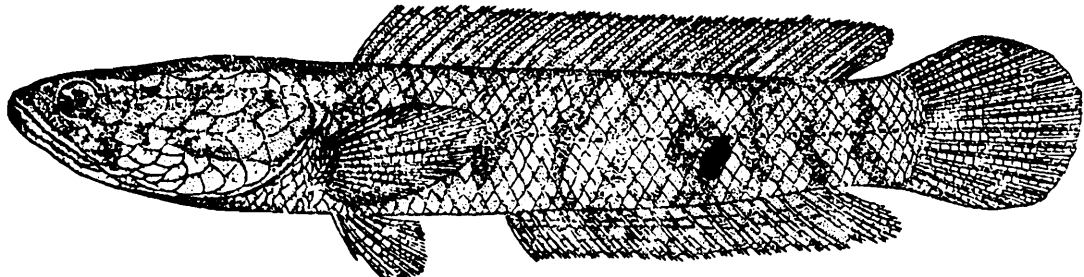
236. *Channa punctatus* (Bl.)

(Text-fig. 133)

1793. *Ophicephalus punctatus* Bloch, *Naturg. Ausland. Fische*, 7, p. 139, pl. 358 (type-locality : Malabar coast).

1889. *Ophiocephalus punctatus* Day, *Fanua Brit. India, Fish.*, 2, p. 364.

Head 3.3 to 3.6, depth 5.5 to 7 in total length. Eyes 7 to 8.5 in head. Lower jaw longer, maxillary reaching to below or behind hind border of eye. Teeth conical. Pelvics three-fourth as long as pectoral. 5 rows of scales between eye and angle of preopercle ; predorsal scales 12 ; lateral line scales 37-40. Cephalic pits simple. Colour varies with environment ; generally greenish grey becoming yellow below ; a dark stripe along side of head and several short cross bands from back to middle of body ; fins spotted.



TEXT-FIG. 133.—Lateral view of *Channa punctatus* (Bl.). (After Day).

Distribution.—INDIA : freshwaters of E. Punjab, U. P., Bihar, Darjeeling Dt., W. Bengal, Nepal, Assam, Eastern Himalayas, Orissa, Madras, Travancore-Cochin, Malabar, Ahmedabad ; PAKISTAN : freshwaters of Sind, and other parts of W. Pakistan, E. Pakistan.—Burma, Ceylon, Malaya, China, Tahiti, Polynesia.

Remarks.—It attains about 304 mm. (a foot) in length.

237. *Channa striatus* (Bl.)

1793. *Ophicephalus striatus* Bloch, *Naturg. Ausland. Fische*, 2, p. 141, pl. 359 (type-locality : Malabar).

1889. *Ophiocephalus striatus* Day, *Fauna Brit. India, Fish.*, 2, p. 363.

Head 3.3 to 4, depth 6 to 8 in total length. Eyes 6 to 7 in head. Lower jaw longer, maxillary reaching to below hind border of eye or even one eye diameter behind. Teeth conical in jaws, cardiform on palatines. 9 rows of scales between eye and angle of preopercle ; predorsal scales 18-20 ; lateral line scales 50-57. Cephalic pits multiple. Dark greyish to black above, dirty white below ; bands of grey or black

from sides to abdomen ; fins greyish ; young with a large black ocellus at the end of base of dorsal.

Distribution.—Freshwaters throughout the plains of INDIA and PAKISTAN.—Burma, Ceylon, Malaya, Malay Archipelago, Siam, Shanghai, China, Philippines, Honolulu (introduced).

Remarks.—It attains 914 mm. (3 feet) or more in length and takes a bait very readily, especially a frog.

Order SYMBRANCHIFORMES

Suborder Symbranchoidei

XLVII. Family SYMBRANCHIDAE

123. Genus *Synbranchus* Bl.

1795. *Synbranchus* Bloch, *Naturng. Ausland. Fische*, 9, p. 86. (Type, *S. marmoratus* Bl.)

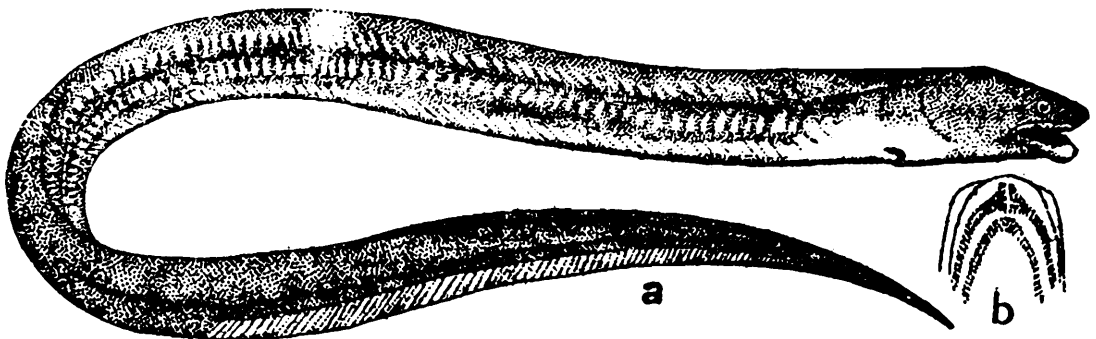
238. *Synbranchus bengalensis* (Mc Clell.)

(Text-fig. 134)

1845. *Ophisternon bengalensis* Mc Clelland, *Calcutta J. nat. Hist.*, 5, pp. 197, 200, pl. 11, fig. 1 (type-locality : Calcutta).

1889. *Synbranchus bengalensis* Day, *Fauna Brit. India*, Fish., 1, p. 71.

Head 9 to 12 in the distance between end of snout and anus. Eyes 20 in head. A single transverse, ventral gill opening. No accessory breathing apparatus. Snout anteriorly rounded. Lips fleshy. Upper jaw longer. Cleft of mouth reaches to some distance behind eyes.



TEXT-FIG. 134.—(a) Lateral view of *Synbranchus bengalensis*(Mc Clell.). (b) Dentition of same. (After Day).

Teeth in jaws fine, pointed, with an edentulous interspace at the symphysis ; palatine teeth in bands. Dorsal origin before anal origin. Anal in the last 4th or 5th of the total length. Caudal not distinct. All fins low. Scales absent. Lateral line conspicuous. Dirty brownish red becoming lighter below in estuaries ; greyish black in clear waters.

Distribution.—Estuaries and fresh waters within the tidal influence along the coasts of INDIA and PAKISTAN.—Burma, Ceylon, Malaya, Malay Archipelago, Siam, Indo-China, Philippines, Melanesia, Micronesia, N., S. and W. Australia.

Remarks.—It attains several feet in length and is more common in Bengal than in Malabar.

XLVIII. Family AMPHIPNOIDAE

124. Genus *Amphipnous* Muller

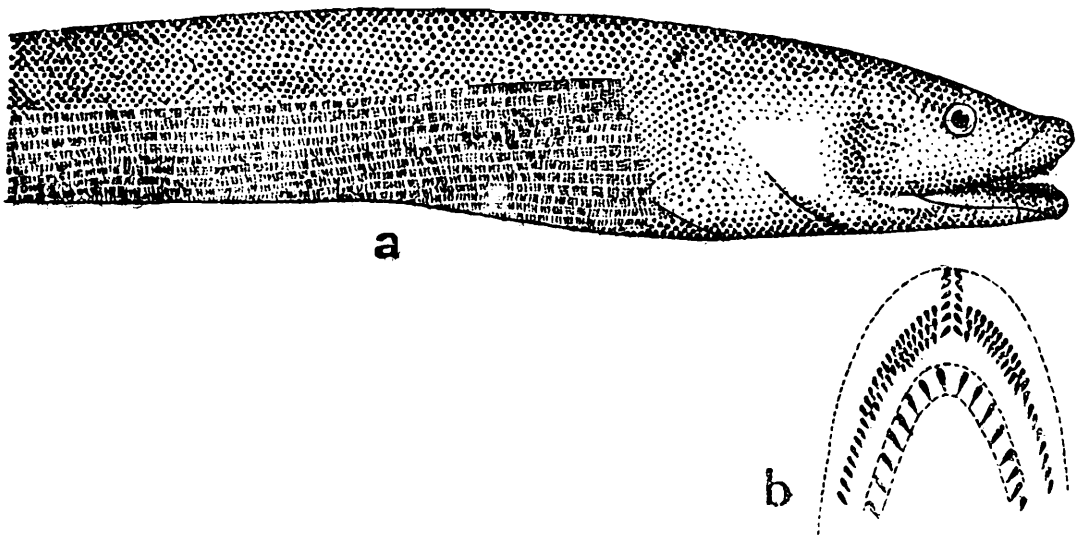
1839. *Amphipnous* Muller, *Abh. preuss. Acad. Wiss.*, p. 244. (Type, *Unibranchapertura cuchia* Ham., orthotypic.)

239. *Amphipnous cuchia* (Ham.)

(Text-fig. 135)

1822. *Unibranchapertura cuchia* Hamilton, *Fish. Ganges*, pp. 16, 363, pl. 16, fig. 4 (type-locality : rivers and ponds of S. E. parts of Bengal).
1889. *Amphipnous cuchia* Day, *Fauna Brit. India*, Fish., 1, p. 69,

Head 6 to 8 in the distance between snout and anus. Tail 4 to 4.5 in total length. A single, transverse, ventral gill opening. With accessory breathing apparatus. Eyes 2-3 diameters in snout, in the anterior one-fourth or one-fifth of head length. Upper jaw slightly longer, lips fleshy. Palatine teeth in single, well developed row. Rudimentary dorsal commences slightly before anus. Paired fins absent. Scales distinct, longitudinally arranged. Greenish or chestnut brown becoming lighter beneath, or often flesh coloured ; with numerous black spots over body,



TEXT-FIG. 135.—(a) Lateral view of *Amphipnous uchi* Ham. (b) Dentition of same. (After Day).

Distribution.—INDIA : fresh and brackish waters of E. Punjab, Orissa, Darjeeling Dt., W. Bengal, Assam ; PAKISTAN : freshwaters and brackish waters of W. Punjab, E. Pakistan.—Burma, Chusan, Ningpo.

Remarks.—It attains at least 609 mm. (2 feet) in length and is eaten in the Duars, N. Bengal.

Order PERCIFORMES (Acanthopterygii, Percomorphi)

Suborder Percoidei

XLIX. Family LATIDAE

125. Genus *Lates* C.

1828. *Lates* Cuvier, *Hist. nat. Poiss.*, 2, p. 88. (Type, *Perca nilotica* L.)

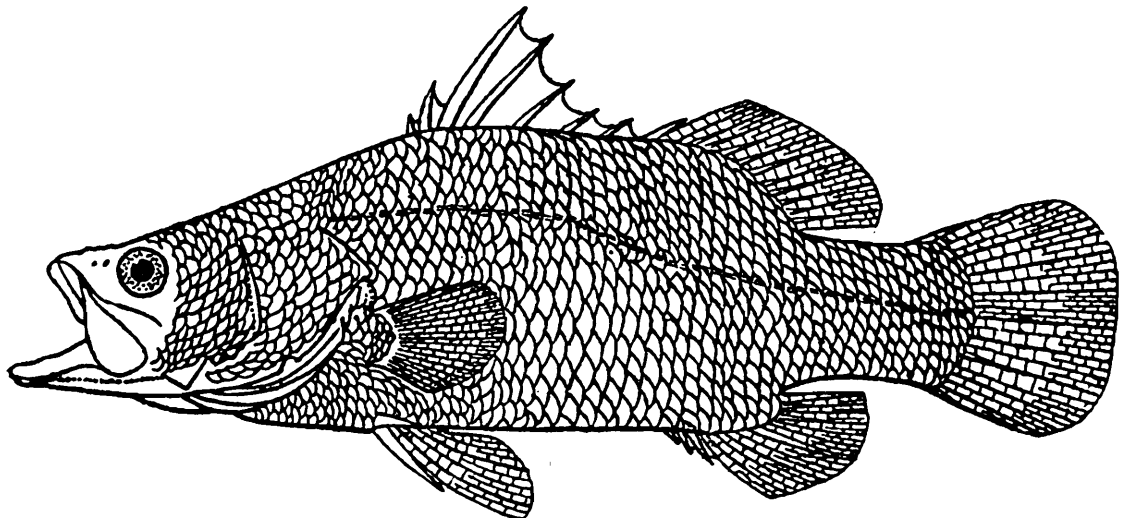
240. *Lates calcarifer* (Bl.)

(Text-fig. 136)

1790. *Holocentrus calcarifer* Block, *Naturg. Ausland. Fische*, 4, p. 100, pl. 244 (type-locality : Japan).

1889. *Lates calcarifer* Day, *Fauna Brit. India, Fish.*, 1, p. 440.

Head about 3.6 to 4, depth 3.5 to 3.6 in total length. Eye 5 to 6 in head. Maxilla extends to below hind border of eye. Preorbital and preopercle finely serrated, the latter denticulated at the angle. Villiform teeth on jaws, vomer and palate ; no canines. Two dorsals, united at their base, the first with 7-8 spines. Anal spines 3. Caudal rounded. Lateral line scales 52-60 ; lateral transverse scales 6-7/13. Grey shot with green on back, silvery below.



TEXT-FIG. 136.—Lateral view of *Lates calcarifer* (Bl.). (After Day).

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Vizagapatam, Orissa, W. Bengal, Andamans ; PAKISTAN : coasts of Karachi, Sind, Makran, E. Pakistan.—Burma, Ceylon, Persian Gulf, Malaya, Siam, Amoy, Hainan, Canton, Japan, Philippines, Melanesia, Queensland.

Remarks.—It attains 914 mm. (3 feet) in length and enters backwaters, estuaries and tidal rivers. It is excellent eating.

L. Family AMBASSIDAE

126. Genus *Ambassis* C.

1828. *Ambassis* Cuvier, *Hist. nat. Poiss.*, 2, p. 175. (Type, *Centropomus ambassis* Lac., tautotypic).

241. *Ambassis baculis* (Ham.)

1822. *Chanda baculis* Hamilton, *Fish. Ganges*, pp. 112, 371 (type-locality : N. E. parts of Bengal).

1889. *Ambassis baculis* Day, *Fauna Brit. India*, Fish., 1, p. 485.

Head 4, depth 3 in total length. Eyes 3 in head. Lower jaw a little shorter than upper, maxilla reaching to below first third of eye. Pre-orbital slightly serrated along its lower edge, with a sharp spine directed towards orbit. Upper edge of orbit serrated. Vertical limb of preopercle entire. Sub-and interopercles nonserrated. Villiform teeth in jaws, palate and vomer. Two dorsals united at their base, the first dorsal with 7 spines ; a recumbent spine present. Anal spines 3. Lateral line complete ; lateral line rays 80. Yellowish olive with a golden spot on opercle ; a black blotch on top of first dorsal ; second dorsal and anal black towards their margins ; caudal black tipped.

Distribution.—INDIA : freshwaters of E. Punjab, U. P., Bihar, Kalimpong, Duars and Siliguri Terai, W. Bengal, Orissa, M. P., Deolali, Bombay ; PAKISTAN : freshwaters of Sind, Lahore, W. Punjab, E. Pakistan.—Burma, Siam.

Remarks.—It grows to 63 mm. ($2\frac{1}{2}$ inches) in length.

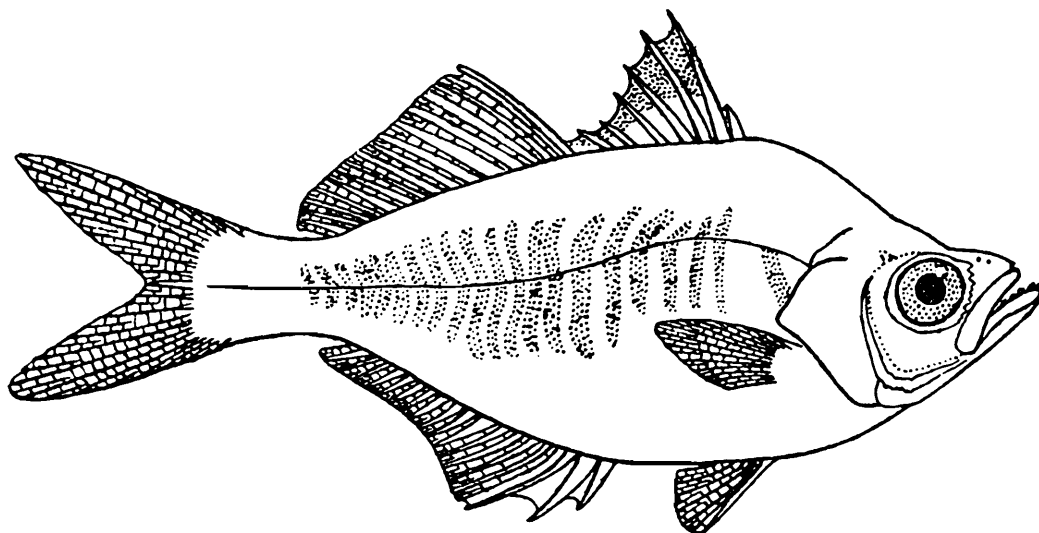
242. *Ambassis nama* (Ham.)

(Text-fig. 137)

1822. *Chanda nama* Hamilton, *Fish. Ganges*, pp. 109, 371 (type-locality : ponds throughout Bengal).

1889. *Ambassis nama* Day, *Fauna Brit. India*, Fish., 1, p. 484.

Head 4 to 4.5, depth 2.7 to 3 in total length. Eyes 3 in head. Dorsal and ventral profiles equal with a depression in the orbital region. Lower jaw longer than upper, maxilla reaching to below first third of eye. Preorbital slightly serrated. Vertical limb of preopercle entire except



TEXT-FIG. 137.—Lateral view of *Ambassis nama* (Ham.). (After Day.)

near angle. Sub-and interopercle entire. 2 or 3 large, crooked, canines in lower jaw. Two dorsals, united at their base ; first dorsal with 7 spines ; a recumbent spine present. Anal spine 3. Lateral line complete ; lateral line rays indistinct. Yellowish olive, covered with minute black dots ; fins orange.

Distribution.—INDIA: freshwaters of E. Punjab, U. P., Bihar, Darjeeling Dt., W. Bengal, Orissa, M. P., Deolali; PAKISTAN: freshwaters of E. Pakistan.—Burma.

Remarks.—It grows to about 76 mm. (3 inches) in length.

243. *Ambassis ranga* (Ham.)

1822. *Chanda ranga* Hamilton, *Fish. Ganges*, pp. 113, 371, pl. 16, fig. 38 (type-locality: freshwaters of all parts of the Gangetic Provinces).

1889. *Ambassis ranga* Day, *Fauna Brit. India*, Fish., 1, p. 485.

Head 3.2 to 4, depth 2.3 to 2.5 in total length. Eyes 2.5 in head. Maxilla reaches to below midorbit. Vertical limb of preopercle entire or finely serrated. Sub- and interopercles entire. Preorbital serrated. Teeth villiform in jaws, vomer and palate. 2 dorsal fins, united at their base; first dorsal with 7 spines; a recumbent dorsal spine present. Anal spines 3. Lateral line rays 60-70. Olive, with margins of the vertical fins grey.

Distribution.—Throughout the freshwaters of INDIA and PAKISTAN.—Burma, Malaya, Siam.

Remarks.—It attains 72-102 mm. (3 to 4 inches) in length.

244. *Ambassis thomassi* Day

1879. *Ambassis thomassi* Day, *Proc. zool. Soc. Lond.*, p. 369 (type-locality: coasts of Canara).

1889. *Ambassis thomassi* Day, *Fauna Brit. India*, Fish., 1, p. 486.

Head 3.2 to 4.5, depth 3 to 4 in total length. Eyes 3 to 3.3 in head. Lower jaw longer. A slight concavity over orbital region. Maxilla reaches to below midorbit. Vertical limb of preopercle finely serrated. Interopercle and preorbital serrated. An enlarged row of teeth in both jaws. Two dorsals, united at their base; first dorsal with 7 spines; a recumbent dorsal spine present. Anal spines 3. Lateral line complete; lateral line scales 35-41. Greyish silvery; scales on back with greenish basal spots.

Distribution.—INDIA: coasts of Travancore-Cochin, Bombay; PAKISTAN: coast of Sind.—Malaya, Siam.

Remarks.—It attains at least 165 mm. (6½ inches) in length and is found some distance inland even in elevated localities.

LI. Family APOGONIDAE

127. Genus *Apogon* Lac.

1763. *Amia* Gronow, *Zoophyl. Gronovius Animal.*, p. 80. (Type, *Apogon moluccensis* V., inadmissible.)

1802. *Apogon* Lacepede, *Hist. nat. Poiss.*, 3, p. 411. (Type, *Apogon ruber* Lac.)

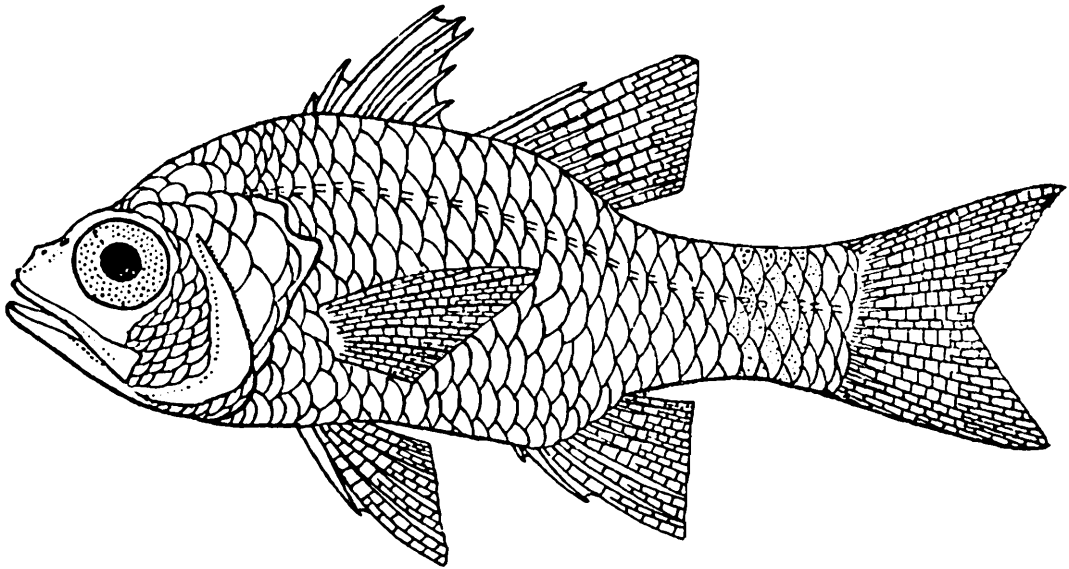
245. *Apogon aureus* (Lac.)

(Text-fig. 138)

1803. *Centropomus aureus* Lacepede, *Hist. nat. Poiss.*, 4, pp. 253, 273 (type-locality: Mauritius, Reunion).

1889. *Apogon aureus* Day, *Fauna Brit. India*, Fish., 1, p. 496.

Head 3.5, depth 3 to 3.3 in total length. Eyes 2.5 to 2.7 in head. Lower jaw slightly longer, maxilla reaching to midorbit. Vertical limb of preopercle serrated. Orbital edges serrated ; opercle with a spine. Teeth villiform, in a single row on vomer and palate ; no canines. Two separate dorsals ; first with 7 spines. Anal with 2 spines. Lateral line scales 25-26. Pinkish, dashed with gold ; a broad black band at caudal base ; fins reddish, tinted black.



TEXT-FIG. 138.—Lateral view of *Apogon aureus* (Lac.). (After Day.)

Distribution.—Seas of INDIA and PAKISTAN ; very common at Madras.—Ceylon, Red Sea, Natal, Madagascar, S. Africa, Malaya, Malay Archipelago, China, Philippines, Melanesia, Queensland.

Remarks.—It grows upto 127-152 mm. (5 or 6 inches) in length.

246. *Apogon lateralis* V

1852. *Apogon lateralis* Valenciennes, *Nouv. Ann. Mus. Hist. nat. Paris.*, 1, p. 58 (type-locality : Vanicolo).

1889. *Apogon ceramensis* Day, *Fauna Brit. India*, Fish., 1, p. 501.

Head 3.2, depth 3.3 in total length. Eyes 3.3 in head. Upper jaw a little longer, maxilla reaching to below last third of eye. Both limbs of preopercle serrated. Teeth villiform ; no canines. Two separate dorsals, first dorsal with 6 spines. Anal spines 2. Lateral line scales 23-25. Greenish brown above, lighter below ; a narrow blackish brown band from head to caudal base ending in a round blotch at base of caudal ; a brownish blotch on shoulder.

Distribution.—INDIA : W. Bengal, Nicobars ; PAKISTAN : E. Pakistan.—Malaya, Malay Archipelago, Philippines, Melanesia, Micronesia, Polynesia.

Remarks.—It attains 102 mm. (4 inches) in length.

247. *Apogon taeniatus* C.

1828. *Apogon taeniatus* Cuvier, *Hist. nat. Poiss.*, 3, p. 115 (type-locality : Djedda, Red Sea).

1889. *Apogon bifasciatus* Day, *Fauna Brit. India*, Fish., 1, p. 497.

Head 3·2 to 3·5, depth 2·7 in total length. Eyes 2·7 in head. Maxilla reaches to below posterior third of eye. Vertical limb of preopercle serrated. Opercle with a spine. Teeth villiform in jaws and in a band on vomer and palate; no canines. Two separate dorsals, first with 7 spines. Anal spines 2. Lateral line scales 25. Slaty grey with bronze reflections; a dark vertical band from the first half of dorsal fin down below to the pectorals and a shorter, similar one from the first half of second dorsal; a black blotch on caudal base; fins tinted black.

Distribution.—Seas of INDIA and PAKISTAN. Common at Madras and Karachi.—Persian Gulf, Red Sea, Zanzibar, Madagascar, S. Africa, Malaya, Malay Archipelago, Hongkong, China, Japan, Philippines.

Remarks.—It attains 152 mm. (6 inches) in length.

LII. Family SERRANIDAE

128. Genus *Epinephelus* Bl.

1793. *Epinephelus* Bloch, *Naturl. Ausland. Fische*, 6, p. 11. (Type, *E. marginalis* Bl.)
 1833. *Cerna* Bonaparte, *Introd. Faun. Italica*, 3, pt. 1, no pagination. (Type, *Perca gigas* Brunnich.)

248. *Epinephelus areolata* (Forsk.)

1775. *Perca summana areolata* Forskal, *Descript. Animal.*, p. 42 (type-locality: Djedda, Red Sea.)
 1889. *Serranus areolatus* Day, *Fauna Brit. India*, Fish., 1, p. 445.
 1889. *Serranus angularis* Day, *Fauna Brit. India*, Fish., 1, p. 454.

Head 3·3 to 3·5, depth 3·5 to 4 in total length. Eyes 4 to 5 in head. Lower jaw a little longer, maxilla extending to last third or hind border of eye. Preopercle serrated, angle a little produced, with 2 or 3 strong denticulations. Opercular spines 3, well developed, middle one the longest. Canines in both jaws; mandibular teeth in 2 series. Single dorsal fin, with 11 spines and 15-18 rays; spines not shorter than rays. Anal spines 3. Caudal truncate. Lateral rays 111/105; lateral line scale tubules without radiating ridges; predorsal scales 60-70; cheek scales 30-36; lateral transverse scales 19/47. Gill rakers 9+16. Brownish grey with hexagonal markings.

Distribution.—Seas of INDIA and PAKISTAN.—Ceylon, Red Sea, Madagascar, S. and E. coasts of Africa, Malaya, Malay Archipelago, Formosa, Japan, Philippines.

Remarks.—It grows to at least 533 mm. (a foot and nine inches) in length.

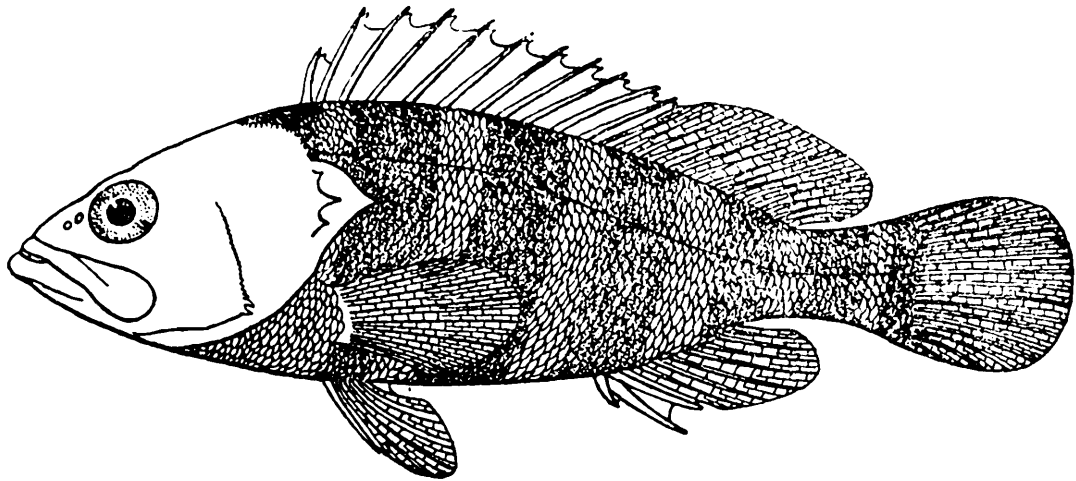
249. *Epinephelus diacanthus* (V.)

(Text-fig. 139)

1828. *Serranus diacanthus* Valenciennes, *Hist. nat. Poiss.*, 2, p. 319 (type-locality: Malabar).
 1889. *Serranus diacanthus* Day, *Fauna Brit. India*, Fish., 1, p. 449.

Head 3 to 3·3, depth 4 to 5 in total length. Eyes 4 to 4·2 in head. Lower jaw slightly longer, maxilla reaching to below hind border of

eye. Preopercle serrated. Of the 3 opercular spines, the centre one the largest. Canines in both jaws ; mandibular teeth in 2 series. Single dorsal fin, with 11-12 spines and 15-16 rays ; spines not shorter than rays. Anal spines 3. Caudal rounded. Lateral rays 100/95 ; lateral line scale tubules without radiating ridges ; predorsal scales 56-60 ;



TEXT-FIG. 139.—Lateral view of *Epinephelus diacanthus* (V.). (After Day).

cheek scales 21-25 ; lateral transverse scales 19-21/45. Gill rakers 8+16. Brownish pink above and lighter below ; 6 dark vertical bands, the first crossing head and the last crossing caudal peduncle ; a dark band from eye to angle of preopercle ; fins edged grey.

Distribution.—Seas of INDIA and PAKISTAN.—Ceylon, Persian Gulf, Red Sea, Natal, Madagascar, S. coast of Africa, Malaya, Malay Archipelago, Siam, Hongkong, Canton, Shanghai, Japan, Philippines.

Remarks.—Dr. F. Day collected a specimen measuring 457 mm. (a foot and 6 inches) in length at Karachi.

250. *Epinephelus lanceolatus* (Bl.)

1790. *Holocentrus lanceolatus* Bloch, *Naturg. Ausland. Fische*, 4, p. 92, pl. 242, fig. 1 (type-locality : East Indies).

1889. *Serranus lanceolatus* Day, *Fauna Brit. India*, Fish., 1, p. 450.

Head 3.2 to 3.5, depth 3.5 to 4 in total length. Eyes 6 to 8 in head. Maxilla reaches a little beyond hind border of eye. Preopercle serrated, with a shallow emargination above its angle. Opercle with the middle spine most distinct. Canines in both jaws ; small teeth in lower jaw in 2 series. Single dorsal fin, with 11 spines and 14-16 rays ; spinous part lower than rayed part. Anal spines 3. Lateral line scale tubules with 4-6 radiating ridges ; predorsal scales 50 ; cheek scales 30 ; lateral transverse scales 20/52. Gill rakers 10+(15-16). Sulphur yellow, with irregular markings and vertical bands in adult ; paired fins lemon yellow tinted with black.

Distribution.—Seas of INDIA and PAKISTAN.—Ceylon, Seychelles, Zanzibar, Mauritius, E. and S. coasts of Africa, Malaya, Malay Archipelago, Siam, Formosa, Philippines, Micronesia, New South Wales, Hawaii.

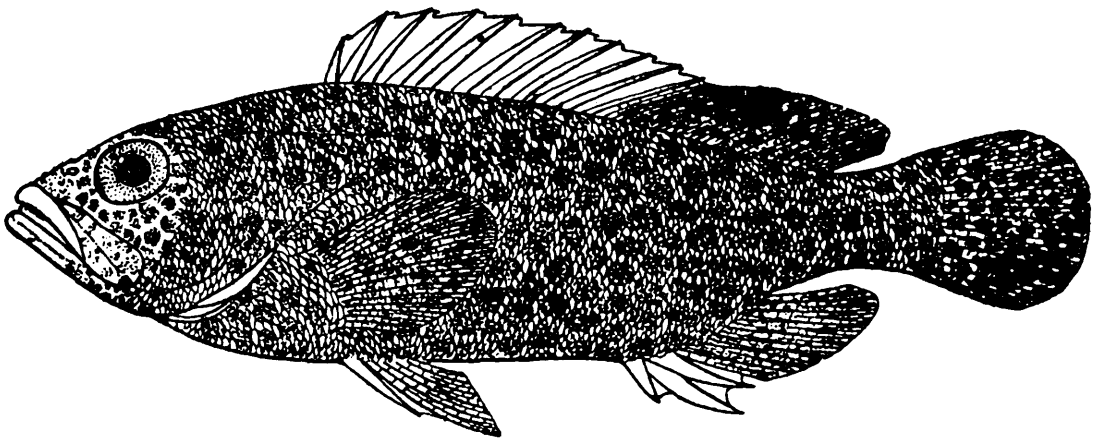
Remarks.—It grows to about 3,048 mm. (10 feet) in length.

251. *Epinephelus merra* Bl.

(Text-fig. 140)

1793. *Epinephelus merra* Bloch, *Naturl. Ausland. Fische*, 7, p. 17, pl. 329 (type-locality : Japan Sea).
 1889. *Serranus hexagonatus* Day, *Fauna Brit. India*, Fish., 1, p. 447.

Head 3·3 to 3·6, depth 3·6 to 4 in total length. Eyes 4 to 4·2 in head. Snout obtuse. Maxilla extends to below hind border of eye. Preopercle rounded, serrated. Middle opercular spine more prominent. Small canines in both jaws ; mandibular teeth in 3 series. Single dorsal fin, with 11 spines and 15-17 rays ; spinous part not lower than rayed part. Anal spines 3. Caudal fan-like. Lateral rays 110/90; lateral line scale tubules without radiating ridges ; predorsal scales 56-62; cheek scales 25-27; lateral transverse scales 16/32. Gill rakers 7+15. Reddish brown with large hexagonal, dark brown spots and intervening light reticulations, forming a honey-comb pattern.



TEXT-FIG. 140.—Lateral view of *Epinephelus merra* Bl. (After Day).

Distribution.—Seas of INDIA and PAKISTAN.—Ceylon, Madagascar, S. Africa, Malaya, Malay Archipelago, Siam, Formosa, China, Japan, Philippines, Melanesia, Micronesia, Polynesia, Queensland, New South Wales.

Remarks.—It attains over 203 mm. (8 inches) in length.

252. *Epinephelus sonnerati* (C.)

1828. *Serranus sonnerati* Cuvier, *Hist. nat. Poiss.*, 2, p. 229 (type-locality : Pondicherry, Ceylon).
 1889. *Serranus sonnerati* Day, *Fauna Brit. India*, Fish., 1, p. 457.

Head 3·3 to 3·5, depth 3·2 to 3·5 in total length. Eyes 5·5 to 6·5 in head. Interorbital rather concave. Maxilla reaches beyond hind edge of eye. Preopercle with its vertical limb often oblique, and serrated. The 2 upper opercular spines stronger than the lower. Canines in both jaws ; teeth in lower jaw in 2 series. Single dorsal fin, with 9 spines and 14-15 rays ; spinous part not lower than rayed part. Anal spines 3. Caudal rounded. Lateral rays 130-140/116-120 ; lateral line scale tubules without radiating ridges ; predorsal scales 62-68 ; cheek scales 33 ; lateral transverse scales 27/40. Gill rakers 9+13. Reddish to yellowish brown ; head and front part of body covered with a net work of pale bluish

lines forming spots or blotches; fins of darker tint than body, black edged.

Distribution.—Seas of INDIA and PAKISTAN. It is common at Nicobars, Madras, Bombay and Karachi.—Ceylon, S. Arabia, Natal, S. Africa, Malay Archipelago, Philippines, Micronesia, Polynesia.

Remarks.—It attains at least 914 mm. (3 feet) in length.

253. *Epinephelus tauvina* (Forsk.)

1775. *Perca tauvina* Forskal, *Descript. Animal.*, p. 39 (type-locality : Djedda, Red Sea).

1889. *Serranus pantherinus* Day, *Fauna Brit. India*, Fish., 1, p. 451.

1889. *Serranus salmoides* Day, *Fauna Brit. India*, Fish., 1, p. 452.

1889. *Serranus semipunctatus* Day, *Fauna Brit. India*, Fish., 1, p. 452.

Head 3.3 to 3.5, depth 3.7 to 4 in total length. Eyes 6.5 in head. Interorbital slightly convex. Maxilla extends slightly beyond hind margin of eye. Preopercle rather emarginate, serrated. Opercular spines indistinct but for the central one. Small canines in both jaws; teeth in lower jaw in 3 series. Single dorsal fin, with 11 spines and 15-16 rays; spinous part not lower than rayed part. Anal spines 3. Caudal rounded. Lateral rays 105/90; lateral line scale tubules without radiating ridges; predorsal scales 66-70; cheek scales 36-38; lateral transverse scales 24/50. Gill rakers 10+15. Dark reddish brown, with round black spots which often form ill-defined bands on body in young.

Distribution.—Seas of INDIA and PAKISTAN.—Ceylon, Red Sea, Zanzibar, Natal, Madagascar, S. Africa, Malaya, Malay Archipelago, Siam, China, Japan, Philippines, Melanesia, Micronesia, Polynesia, Queensland, New South Wales, Hawaii.

Remarks.—It attains 2,133 mm. (7 feet) in length.

254. *Ephinephelus undulosus* (Q. G.)

1824. *Bodianus undulosus* Quoy & Gaimard, *Voy. " Uranie " Zool.*, p. 310 (type-locality : Waigiou).

1889. *Serranus undulosus* Day, *Fauna Brit. India*, Fish., 1, p. 446.

Head 3.5 to 3.6, depth 3.6 in total length. Eyes 5 to 6 in head. Maxilla extends to below last third or to hind border of eye. Preopercle serrated, rather produced at the angle. The middle opercular spine most conspicuous. Small canines in both jaws; mandibular teeth in 2 series. Single dorsal fin, with 11 spines and 17-19 rays; spinous part not lower than rayed part. Anal spines 3. Caudal rounded in young, cut square in adult. Lateral rays 135/130; lateral line scale tubules without radiating ridges; predorsal scales 57-67; cheek scales 30-32; lateral transverse scales 20/48. Gill rakers 14+20. Reddish gray above and lighter below; about 10-12 narrow, brownish blue, obliquely horizontal lines of varying length on body; dots and yellow lines on head; fins gray with darker edges.

Distribution.—Seas of INDIA and PAKISTAN. It is common at Madras where the young are numerous during the cold season.—Burma, Ceylon, Gulf of Oman, S. Africa, Malay Archipelago, China, Philippines, Melanesia.

Remarks.—It attains 304 mm. (a foot) in length.

LIII. Family THERAPONIDAE

120. Genus *Therapon* C.

1817. *Therapon* Cuvier, *Regne Animal.*, 2, ed. 1, p. 295. (Type, *Holocentrus serrus* Bl.)

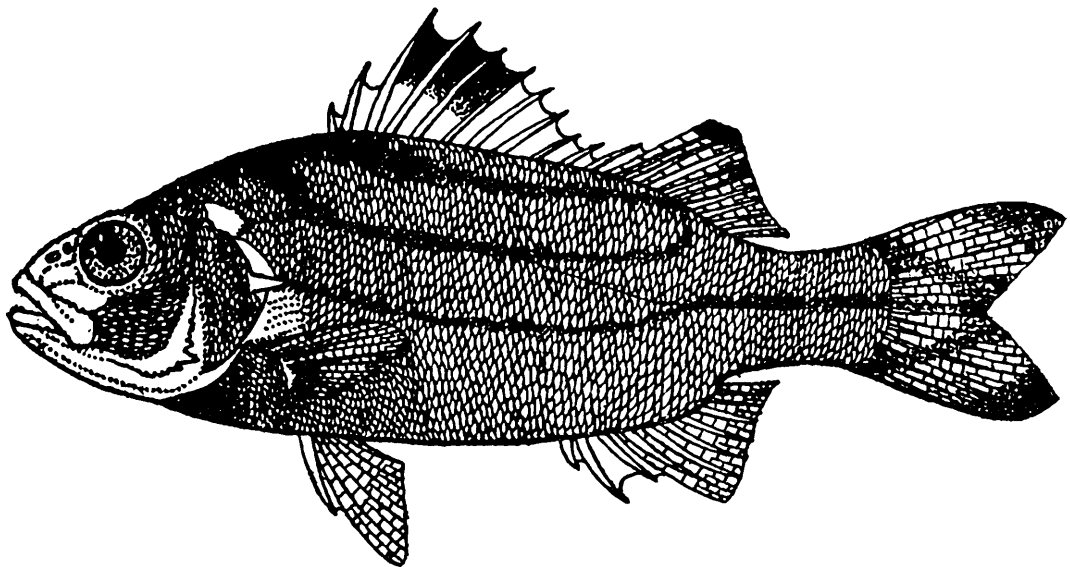
255. *Therapon jarbua* (Forsk.)

(Text-fig. 141)

1775. *Sciaena jarbua* Forskal, *Descript. Animal.*, p. 50 (type-locality : Djedda, Red Sea).

1889. *Therapon jarbua* Day, *Fauna Brit. India*, Fish., *v*, p. 505.

Head 3.6 to 4, depth 3.5 to 3.6 in total length. Eyes 3.5 to 4 in head. Cleft of mouth rather oblique, maxilla extending to first third of eye. Preorbital serrated in the last two-third of its lower edge ; vertical limb of preopercle with 12-14 serrations ; interopercles finely serrated. Opercle spinate ; upper opercular spine small, lower longer and strong. Teeth villiform in both jaws. Single dorsal, notched, with 10-12 spine. Anal with 3 spines. Gill rakers 6+13. Bluish gray on back and white below ; shot with gold on cheeks and snout ; 3 convex longitudinal reddish brown bands on body ; a dark blotch on the spinous dorsal and two oblique bands across either caudal lobes.



TEXT-FIG. 141.—Lateral view of *Therapon jarbua* (Forsk.). (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W Bengal, Andamans ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Muscat, Red Sea, Seychelles, Mauritius, Madagascar, E. & S. coasts of Africa, Malaya, Malay Archipelago, Siam, Formosa, China, Korea, Riu Kiu Is., Japan, Philippines, Melanesia, Polynesia, Queensland.

Remarks.—It is a common fish growing to 304-329 mm. (1 foot to 1 foot and an inch) and ascends estuaries and tidal rivers.

257. *Therapon puta* C.

1829. *Therapon puta* Cuvier, *Hist. nat. Poiss.*, 3, p. 131 (type-locality : Pondicherry).

1889. *Therapon puta* Day, *Fauna Brit. India*, Fish., 1, p. 505.

Head 4 to 4.3, depth 4 in total length. Eyes 3.3 to 3.6 in head. Maxilla reaches to below front edge of eye. Preopercle with 5-6 strong serrations on its vertical limb. Sub- and interopercles entire. Opercle spinate ; lower opercular spine, stronger and longer. Teeth villiform in jaws. Single dorsal, somewhat notched, with 11-12 spines. Anal spines 3. Caudal emarginate. Lateral line scales 90-100 ; cheek scales 6 ; predorsal scales 10-20. Gill rakers 9+20. Greyish olive with 3 or 4 straight, longitudinal blackish broad bands on body ; a dark blotch on spinous dorsal and two oblique bands across either caudal lobes.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal ; PAKISTAN ; coasts of Sind, E. Pakistan.—Ceylon, S. Arabia, Red Sea, Socotra, Zanzibar, Madagascar, Malaya, Malay Archipelago, Siam, Philippines, Melanesia, Queensland.

Remarks.—It grows upto 203 mm. (8 inches) in length.

257. *Therapon theraps* C.

1829. *Therapon theraps* Cuvier, *Hist. nat. Poiss.*, 3, p. 129, pl. 53 (type-locality : Java ; Mahe).

1889. *Therapon theraps* Day, *Fauna Brit. India*, Fish., 1, p. 506.

Head 4, depth 3.5 in total length. Eyes 3.2 to 3.5 in head. Maxilla extends to below first third of eye. Preorbital finely serrated on its lower edge. Preopercle evenly serrated but coarsely at its angle. Sub- and interopercles entire in adult. Opercle spinate ; lower opercular spine the longest. Teeth villiform in jaws. Single dorsal, more or less notched, with 10-12 spines. Anal spines 3. Caudal emarginate. Lateral line scales 50-55 ; cheek scales 5-6 ; predorsal scales 12-15. Gill rakers 8+16. Brownish grey above and silvery below ; 3 or 4 horizontal blackish brown bands on body ; a black blotch on dorsal and two oblique cross bars on each caudal lobe.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Burma, Ceylon, Red Sea, Zanzibar, Madagascar, S. Africa, Malaya, Malay Archipelago, Siam, Hongkong, China, Formosa, Korea, Philippines, Melanesia, Micronesia, Polynesia, Queensland.

Remarks.—It grows upto 177 mm. (7 inches) in length.

LIV Family SILLAGINIDAE

130. Genus *Sillaginopsis* Gill

1862. *Sillaginopsis* Gill, *Proc. Acad. nat. Sci. Philad.*, p. 505. (Type, *Sillago domina* C. V., orthotypic.)

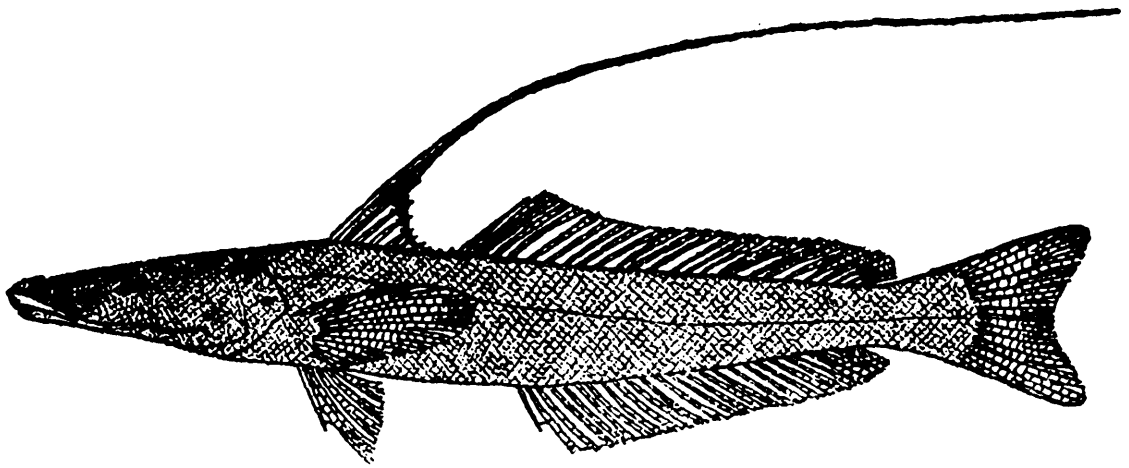
258. *Sillaginopsis panijus* (Ham.)

(Text-fig. 142)

1822. *Cheilodipterus panijus* Hamilton, *Fish. Ganges*, pp. 57, 367 (type-locality : estuaries of the Ganges).

1889. *Sillago panijus* Day, *Fauna Brit. India*, Fish., 2, p. 222.

Head 3·7 to 4, depth 7 to 8 in total length. Eyes 3·5 to 4 in snout. Head depressed, pyriform ; cheeks swollen. Opercle with a small spine. Preopercle entire. Largest teeth in the centre of upper jaw. Two dorsals ; first with 9 spines, commencing slightly behind pectorals ; the second dorsal spine extending to caudal base. Lateral line scales 90. Greenish yellow shot with purple.



TEXT-FIG. 142.—Lateral view of *Sillaginopsis panijus* (Ham.). (After Day).

Distribution.—INDIA : coasts of Coromandel, Orissa, and W. Bengal, Bay of Bengal as low as Pondicherry ; PAKISTAN : coasts of E. Pakistan.—Malaya.

Remarks.—It attains at least 254 mm. (10 inches) in length and ascends rivers and tidal estuaries and is found in the Ganges at Calcutta. It is esteemed as food.

131. Genus *Sillago* C.

1817. *Sillago* Cuvier, *Regne Animal.*, 2, ed. 1, p. 258. (Type, *S. acuta* C.)

259. *Sillago sihama* (Forsk.)

(Text-fig. 143.)

1775. *Atherina sihama* Forskal, *Descript. Animal.*, p. 70 (type-locality : Red Sea).

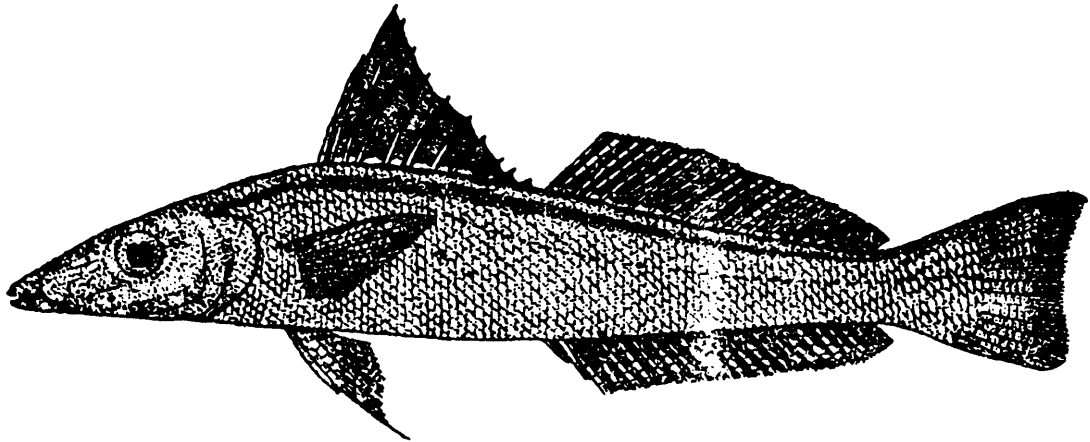
1889. *Sillago sihama* Day, *Fauna Brit. India*, Fish., 2, p. 224.

Head 4 to 4·5, depth 6 to 7·5 in total length. Eyes 1·3 to 2·2 in snout. Vertical limb of preopercle serrated in its lower half. Opercle with a well developed spine. Teeth villiform in band in jaws. Two dorsals ; first dorsal with 10-11 spines, the second dorsal spine not exceeding depth of body. Lateral line scales 70-74. Gill rakers 7-9 and rudimentary ones. Olive green along back becoming lighter on abdomen ; a silvery longitudinal band along body.

Distribution.—INDIA : coasts of Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal, Andamans, Nicobars ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Muscat, Iraq, Red Sea, Aden, Zanzibar, Seychelles, Mauritius,

S. Africa, Malaya, Malay Archipelago, Siam, Hongkong, Formosa, Canton, Korea, Japan, Philippines, Melanesia, Queensland.

Remarks.—It attains 304 mm. (a foot) in length and ascends tidal rivers. It is common at Madras and Karachi.



TEXT-FIG. 143.—Lateral view of *Sillago sihama* (Forsk.). (After Day).

LV Family Carangidae

132. Genus *Atropus* C.

1817. *Atropus* Cuvier, *Regne Animal.*, 2, ed. 1, p. 324. (Type, *Brama atropus* Schn., tautotypic.)

260. *Atropus atropus* (Schn.)

1801. *Brama atropus* Schneider, *Syst. Ichth. Bloch*, p. 98 (type-locality : Tranquebar).

1889. *Caranx atropus* Day, *Fauna Brit. India*, Fish., 2, p. 162.

Head 3.5 to 4, depth 2.5 in total length. Eyes 3.3 to 3.5 in head. Maxilla reaches to below middle of eye ; lower jaw longer. Teeth villiform, in two rows in upper jaw, single row in lower. Two dorsals ; the first with 8 spines, connected by a membrane, shorter than second dorsal. Some of the anterior dorsal and anal rays prolonged and filamentous. A deep median groove on abdomen. Two preanal spines. Lateral line armed with 32-35 scutes. Bluish green above, silvery below, shot with purple on sides ; pelvics deep black.

Distribution.—INDIA : coasts of Bombay, Malabar, Cutch, Baroda, Travancore-Cochin, Coromandel, Orissa, W Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, S. Africa, Malaya, Malay Archipelago, Siam, Formosa, Hongkong, Korea, Polynesia.

Remarks.—It attains 304 mm. (a foot) in length.

133. Genus *Alectis* Rafinesque

1815. *Alectis* Rafinesque, *Analyse de la Nat. Palermo*, p. 84. (Type, *Zeus ciliaris* Bl.)

261. *Alectis ciliaris* (Bl.)

1788. *Zeus ciliaris* Bloch, *Naturg. Ausland. Fische*, 6, p. 29, pl. 191 (type-locality : East Indies).

1889. *Caranx ciliaris* Day, *Fauna Brit. India*, Fish., 2, p. 166.

Head 3.5 to 3.6, depth 1.5 to 1.7 in total length. Eyes 3 in head. Lower jaw longer, maxilla reaching to below front edge or first third of eye. Depth of preorbital equalling 0.75-1.0 eye diameter. Teeth villiform. Two dorsals; the first reduced to 6 spines, vanishing with age, not connected by membrane; the second dorsal with anterior 5th or 6th rays prolonged into filaments. Two preanal spines, vanishing with age; anterior 4 or 5 anal rays prolonged into filaments. Pelvics with 2 or 3 outer rays filliform. Lateral line armed with 15 scutes. Gill rakers 14, long, slender. Silvery, with 5 or 6 vertical bands on body; soft dorsal and anal black.

Distribution.—INDIA: coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W Bengal, Andamans; PAKISTAN: coasts of Sind, E. Pakistan.—Ceylon, Muscat, Red Sea, Zanzibar, Natal, Madagascar, S. Africa, Malaya, Malay Archipelago, Siam, China, Formosa, Korea, Japan, Philippines, Melanesia, Micronesia, Polynesia, Hawaii.

Remarks.—It attains 304 mm. (a foot) in length.

262. *Alectis indicus* (Rupp.)

1828. *Scyris indicus* Ruppell, *Atl. Fische*, p. 128, pl. 33, fig. 1 (type-locality: Djedda, Red Sea).

1889. *Caranx gallus* Day, *Fauna Brit. India*, Fish., 2, p. 166.

Head 3.3 to 4.6, depth 1.7 to 3 in total length. Eyes 3.3 to 4 in head. Lower jaw longer, maxilla reaching to below front border of eye. Depth of preorbital nearly twice eye diameter. Teeth villiform in young, in adults with rounded crowns of 5 rows in upper jaw and 4 rows in lower, decreasing to 2 or 1 row behind. Two dorsals; the first reduced to 6 spines vanishing with age, not connected by membrane; second dorsal with anterior 7 or 8 rays elongated as filaments. Two preanal spines, vanishing with age; 2 or 3 anterior anal rays elongated. Pelvics with 2 or 3 outer rays filliform. Lateral line armed with 8-10 scutes. Silvery shot with purple and gold; filamentous prolongations of fins dark or black.

Distribution.—INDIA: coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W Bengal; PAKISTAN: coasts of Sind, E. Pakistan.—Burma, Ceylon, Muscat, Red Sea, Madagascar, S. and E. coasts of Africa, Malaya, Malay Archipelago, Siam, Formosa, Hongkong, China seas, Philippines, Melanesia, Polynesia, Australia.

Remarks.—It attains 609 mm. (2 feet) in length but is said to reach 5 feet.

134. Genus *Decapterus* Blkr.

1851. *Decapterus* Bleeker, *Nat. Tijdscher Ned.-Ind.*, 1, p. 352. (Type, *Caranx kurra* C., orthotypic.)

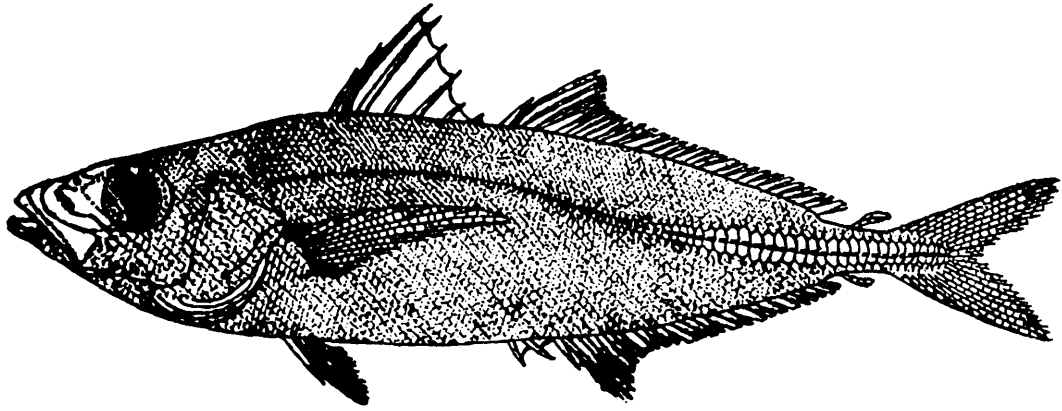
263. *Decapterus russelli* (Rupp.)

(Text-fig. 144)

1828. *Caranx russelli* Ruppell, *Atl. Reise Nordl. Afrika Fische*, p. 99 (type-locality: Red Sea at El Tos).

1889. *Caranx kurra* Day, *Fauna Brit. India*, Fish., 2, p. 151.

Head 3.7 to 4, depth 5 to 5.5 in total length. Eyes 4 in head, with well developed adipose lids. Lower jaw longer. Preorbital with 3 or 4 radiating raised ridges. Teeth in single row, villiform in both jaws. Two dorsals distantly placed ; the first with 8 weak spines ; second dorsal with a single detached finlet behind. Two preanal spines; anal with a single detached finlet behind. Lateral line armed with 40 scutes. Gill-rakers 30. Bluish green above, silvery below ; fins yellow, dark edged.



TEXT-FIG. 144.—Lateral view of *Dacapterus russelli* (Rüpp.). (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W Bengal; PAKISTAN : coasts, of Sind, E. Pakistan.—Ceylon, Muscat, Red Sea, Aden, Zanzibar, Natal, Madagascar, S. Africa, Malaya, Malay Archipelago, Siam, Japan, Philippines, Queensland.

Remarks.—It attains 152-177 mm. (6 to 7 inches) in length and arrives, in Madras and Trivandrum by about October.

135. Genus *Megalaspis* Blkr.

1852. *Megalaspis* Bleeker, *Verh. Bat. Gen.*, 24, p. 49. (Type, *Scomber cordyla* L., orthotypic : name *Megalaspis* used by Bleeker in 1851 in *Nat. Tijds. Ned.-Indie*, 2, p. 213, but no description of his new genus.)

264. *Megalaspis cordyla* (L.)

1758. *Scomber cordyla* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 298 (type-locality : America).
1889. *Caranx rottleri* Day, *Fauna Brit. India*, Fish., 2, p. 150.

Head 2.6 to 5.2, depth 4.2 to 4.6 in total length. Eyes 3.5 to 4 in head, with well developed adipose lids. Cleft of mouth a little oblique ; lower jaw the longer, maxilla reaching beyond midorbit. Depth of preorbital equals half eye. Teeth small, in single series in lower jaw and in bands in upper jaw. Two dorsals, the first with 6-8 spines ; second dorsal with 8-10 detached finlets. Two preanal spines ; anal with 7-8 detached finlets. Lateral line armed with 55-59 scutes. Gill rakers 28-32. Greenish blue above becoming yellowish silvery below ; fins yellowish, dorsal and anal tipped black.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W Bengal ; PAKISTAN : coasts of Sind, E Pakistan.—Burma, Ceylon, Muscat, S. Arabia, Red Sea, Zanzibar, Natal, Madagascar, S. Africa, Malaya, Malay Archipelago,

Siam, Hongkong, Seas of China, Japan, Philippines, Polynesia, Queensland, New South Wales, Hawaii.

Remarks.—It attains about 1,524 mm. (5 feet) in length.

136. Genus *Selar* Blkr.

1851. *Selar* Bleeker, *Nat. Tijdscher. Ned.-Ind.*, 1, p. 359. (Type, *Caranx hasselti* Blkr., orthotypic.)

265. *Selar boops* (C.)

1833. *Caranx boops* Cuvier, *Hist. nat. Poiss.*, 9, p. 46 (type-locality : Amboina : Vanicolo).

1889. *Caranx boops* Day, *Fauna Brit. India*, Fish., 2, p. 157.

Head 3.7 to 4, depth 4 in total length. Eyes with broad adipose lids, 2.7 to 3 in head. Lower jaw longer, maxilla extending to midorbit. Preorbital narrow, its depth two-fifth to 1 in eye. A groove in shoulder girdle under opercle. Teeth weak, uniseriate in both jaws, often pluriseriate anteriorly in upper jaw. Two dorsals; the first with 8 spines. Two preanal spines. Lateral line armed with 46 scutes. Chest and cheeks scaled. Lower gill rakers 23. Silvery grey along back becoming lighter shot with gold below.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Andamans; PAKISTAN : coast of Sind.—Burma, Malaya, Malay Archipelago, Siam, Hongkong, Philippines, Melanesia, Micronesia, Queensland.

Remarks.—Specimens measuring 304 mm. (a foot) in length have been obtained.

266. *Selar crumenophthalmus* (Bl.)

1793. *Scomber crumenophthalmus* Bloch, *Naturg. Ausland. Fische*, 7, p. 77, pl. 343 (type-locality : Acara Bay, Guinea, West Africa).

1889. *Caranx crumenophthalmus* Day, *Fauna Brit. India*, Fish., 2, p. 156.

Head 3.7 to 4, depth 4.5 to 4.6 in total length. Eyes with well developed adipose lids, 3 to 3.2 in head. Lower jaw longer, maxilla reaching to below first third of eye. Depth of preorbital less than eye diameter. A groove in shoulder girdle under operculum. Teeth small, in single series, in 2 or 3 series anteriorly in the upper jaw. Two dorsals; the first with 8 spines. Two preanal spines. Chest and cheeks scaled. Lateral line armed with 33-38 scales. Lower gill rakers 23-27. Bluish silvery becoming golden below; fins golden with black dots.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal, Andamans, Nicobars; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Muscat, S. Africa, Red Sea, Zanzibar, Natal, Madagascar, Mauritius, Seychelles, S. and W coasts of Africa, Malaya, Malay Archipelago, Siam, Formosa, China, Japan, Philippines, Melanesia, Micronesia, Polynesia, Hawaii; circumtropical.

Remarks.—It attains at least 304 mm. (a foot) in length.

267. *Selar djedaba* (Forsk.)

1775. *Scomber djedaba* Forskal, *Descript. Animal.*, p. 56 (type-locality : Djedda, Red Sea).

1889. *Caranx djedaba* Day, *Fauna Brit. India*, Fish., 2, p. 158.

Head 4·6, depth 3·5 in total length. Eyes with well developed adipose lids, 4 to 4·5 in head. Lower jaw a little longer, maxilla reaching to below first third of eye. Depth of preorbital two-third of eye. A groove in shoulder girdle under operculum. Teeth fine, in single row in jaws. Two dorsals, first with 8 spines. Two preanal spines. Chest and cheeks scaled. Lateral line armed with 58 scales. Lower gill rakers 26-28. Silvery blue on back and golden below, fins yellow.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal, Andamans ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Muscat, Red Sea, Zanzibar, Natal, Madagascar, S. Africa, Malaya, Malay Archipelago, Siam, Hongkong, Formosa, Riu Kiu Is., Philippines.

Remarks.—It attains at least 329 mm. (a foot and an inch) in length.

268. Selar kalla (C.)

1833. *Caranx kalla* Cuvier, *Hist. nat. Poiss.*, 9, p. 49 (type-locality : Malabar ; Mahé ; Red Sea).

1889. *Caranx kalla* Day, *Fauna Brit. India*, Fish., 2, p. 160.

Head 4·5 to 5, depth 3 to 3·5 in total length. Eyes with adipose eye lids, 4 in head. Lower jaw slightly prominent, maxilla reaching to below first third of eye. Ventral profile more convex than dorsal profile. Depth of preorbital half of eye. A groove in shoulder girdle under operculum. Teeth fine, in single row in jaws. Two dorsals, first with 8 spines. Two preanal spines. Chest and cheeks scaled. Lateral line armed with 44 scutes. Gill rakers 27. Bluish green above becoming silvery below ; tail and caudal brilliant yellow with upper lobe tinged green.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal, Andamans ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, S. Arabia, Red Sea, Seychelles, Natal, Madagascar, S. Africa, Malaya, Malay Archipelago, Siam, Hongkong, Amoy, Philippines, Melanesia, Queensland.

Remarks.—It attains at least 203 mm. (8 inches) in length.

269. Selar mate (C.)

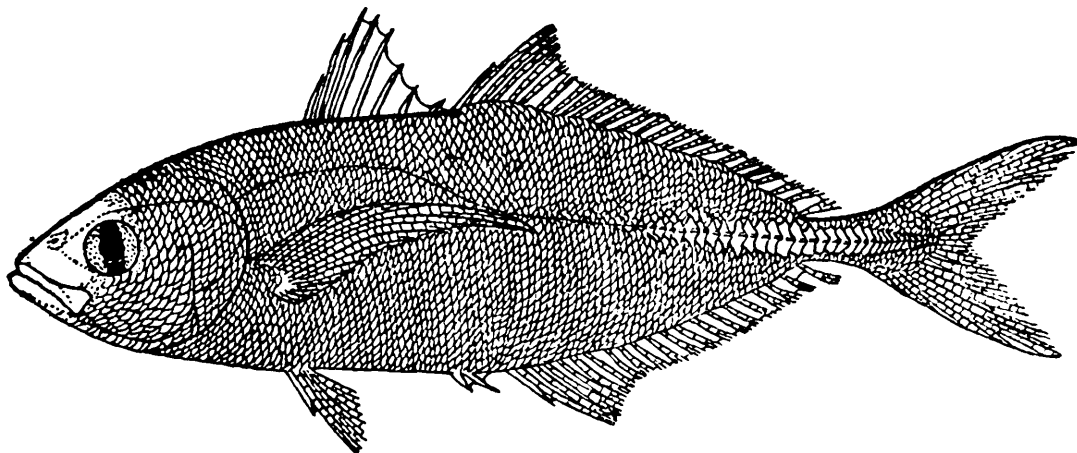
(Text-fig. 145)

1833. *Caranx mate* Cuvier, *Hist. nat. Poiss.*, 9, p. 54 (type-locality : Pondicherry ; New Guinea ; Anjer).

1889. *Caranx affinis* Day, *Fauna Brit. India*, Fish., 2, p. 158.

Head 4·5, depth 3·7 in total length. Eyes with broad adipose lids, 4 in head. Lower jaw longer, maxilla reaching to below front margin or first third of eye. Interorbital with raised ridges medially. Depth of preorbital equals to eye. A deep groove in shoulder girdle under operculum. Teeth villiform, uniseriate in jaws except at symphysis of upper jaw. Two dorsals ; first with 7-8 spines. Two preanal spines. Chest and cheeks scaled. Lateral line armed with 40-47 scutes. Greyish silvery above becoming golden below ; a series of light vertical bands on sides ; fins yellow, white edged.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal, Andamans ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—



TEXT-FIG. 145.—Lateral view of *Selar mate* (C.). (After Day).

Ceylon, Muscat, Red Sea, Natal, Madagascar, Seychelles, S. Africa, Malaya, Malay Archipelago, Siam, Formosa, Riu Kiu Is., Philippines, Melanesia, Polynesia, N. W. Australia, Hawaii.

Remarks.—It attains at least 304 mm. (a foot) in length.

137. Genus *Citula* C.

1817. *Citula* Cuvier, *Regne Animal.*, 2, ed. 1, p. 315. (Type, *Sciaena armata* Forskal.)

270. *Citula armata* (Forsk.)

1775. *Sciaena armata* Forskal, *Descript. Animal.*, p. 53 (type-locality : Red Sea).
1889. *Caranx armatus* Day, *Fauna Brit. India*, Fish., 2, p. 165.

Head 4.5 to 5, depth 2.5 to 2.7 in total length. Eyes with rudimentary adipose lid, 3.2 to 3.5 in head. Lower jaw longer, maxilla reaching to below one third of eye. Depth of preorbital two-third of eye. Teeth villiform, pluriserial in lower jaw. Two dorsals, the first with 6-8 spines; the first few rays of second dorsal prolonged and filamentous. Two preanal spines. Chest naked. Lateral line armed with 20 feeble scutes. Bluish green above becoming golden below.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal, Andamans ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, S. Arabia, Red Sea, Aden, Zanzibar, Madagascar, Seychelles, S. Africa, Malaya, Malay Archipelago, Siam, Formosa, China, Japan, Philippines, Melanesia, Polynesia, N. & W. Australia, Queensland.

Remarks.—It attains at least 508 mm. (1 foot and 8 inches) in length.

271. *Citula malabaricus* (Schn.)

1801. *Scomber malabaricus* Schneider, *Syst. Ichth. Bloch*, p. 31 (type-locality : Tranquebar).
1889. *Caranx malabaricus* Day, *Fauna Brit. India*, Fish., 9, p. 163.

Head 3.7 to 4, depth 2.5 to 2.6 in total length. Eyes with rudimentary adipose lids, 3 in head. Lower jaw slightly longer, maxilla reaching

to below first third of eye. Depth of preorbital equals eye diameter. Teeth in villiform bands on jaws. Two dorsals ; the first with 8 spines. Two preanal spines. Chest naked. Lateral line armed with 25-28 scutes. Lower gill rakers 23-25. Dusty above, silvery below ; soft dorsal, anal and caudal with dark margins.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal, Andamans ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Red Sea, S. and E. coasts of Africa, Malaya, Malay Archipelago, Siam, Hongkong, Canton, Japan, Philippines, Queensland.

Remarks.—It attains at least 304 mm. (a foot) in length.

272. *Citula oblongus* (C.)

1833. *Caranx oblongus* Cuvier, *Hist. nat. Poiss.*, 9, p. 128 (type-locality : Vanicolo).

1889. *Caranx oblongus* Day, *Fauna Brit. India*, Fish., 2, p. 163.

Head 4 to 4.5, depth 3.2 in total length. Eyes without distinct adipose lids, 3.2 to 4.3 in head. Lower jaw longer. Cleft of mouth oblique, maxilla reaching to below midorbit. Depth of interorbital 1 to 3 of eye diameter. Teeth in villiform bands in jaws, broadest anteriorly ; some of the outer irregularly enlarged, conical but no canines. Two dorsals ; first with 8 spines ; about 7 anterior rays of second dorsal produced into filament. Two preanal spines ; about 6 anterior anal rays form a falciform lobe, shorter than depth of body. Chest naked ; cheeks scaly. Lateral line armed with 34-40 scutes. Lower gill rakers 19. Brownish grey above, silvery below.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W Bengal, Andamans ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, S. Africa, Malaya, Malay Archipelago, Siam, Formosa, Riu Kiu Is., China, Japan, Philippines, Melanesia, Polynesia, Queensland.

Remarks.—It attains at least 329 mm. (a foot and an inch) in length.

138. Genus *Caranx* Lac.

1802. *Caranx* Lacepede, *Hist. nat. Poiss.*, 3, p. 57. (Type, *Scomber carangus* Bl.)

273. *Caranx carangus* (Bl.)

1793. *Scomber carangus* Bloch, *Naturg. Ausland. Fische*, 7, p. 69 (type-locality : Antilles).

1889. *Caranx carangus* Day, *Fauna Brit. India*, Fish., 2, p. 153.

Head 4.3, depth 3 in total length. Eyes with narrow posterior adipose lids, 3.5 in head. Dorsal and ventral profiles equally arched. Lower jaw slightly longer, maxilla extending to midorbit. Depth of preorbital equals two-third of eye. Outer series of teeth in upper jaw strong and prominent ; a single row in lower jaw. No groove in shoulder girdle under operculum. Two dorsals ; the first dorsal with 8 spines. Two preanal spines. Ventral portion of chest naked, a few scales laterally. Lateral line armed with 33-37 scales. Golden above, silvery below ; young with 4-5 dark cross bars ; margin of soft dorsal and upper lobe of caudal tipped black.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Malaya, Malay Archipelago, Siam, Philippines, China.

Remarks.—It grows to about 457 mm. (a foot and a half) in length.

274. *Caranx sexfasciatus* Q. G.

1824. *Caranx sexfasciatus* Quoy & Gaimard, *Voy. " Uranie "*, *Zool.*, p. 358, pl. 66, fig. 1 (type-locality : Papous Islands).

1889. *Caranx hippos* (nec Linnaeus) Day, *Fauna Brit. India*, *Fish.*, 2, p. 154.

Head 4, depth 3 to 3·3 in total length. Eyes with posterior adipose lids, 3·6 in head. Lower jaw slightly longer, maxilla reaching to below last third of orbit. Depth of preorbital equals half of eye. Outer series of teeth in upper jaw enlarged ; a single row in lower jaw. No groove in shoulder girdle under operculum. Two dorsals ; first with 7-8 spines. Two preanal spines. Chest and cheeks scaled. Lateral line armed with 30-36 scutes. Gill rakers 15. Golden with grey on back ; young with 4-5 transverse bands.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal, Andamans ; PAKISTAN : coasts of Sind, E. Pakistan.—Burma, Ceylon, Muscat, Red Sea, Aden, Zanzibar, Natal, Madagascar, Malaya, Malay Archipelago, Siam, Hongkong, China seas, Japan, Philippines, Melanesia, Micronesia, Polynesia, Hawaii, Queensland.

Remarks.—It attains a large size of 914 mm. (3 feet) or more in length.

275. *Caranx sansun* (Forsk.)

1775. *Scomber sansun* Forskal, *Descript. Animal.*, p. 55 (type-locality : Red Sea).

1889. *Caranx jarra* Day, *Fauna Brit. India*, *Fish.*, 2, p. 152.

1889. *Caranx sansun* Day, *Fauna Brit. India*, *Fish.*, 2, p. 155.

Head 4, depth 3 in total length. Eyes with adipose lids, 3·7 in head. Ventral profile less convex than dorsal profile. Lower jaw slightly longer, maxilla extending to below last third of eye. Depth of preorbital three-fourth to one and a half in eye. Outer series of teeth in upper jaw enlarged ; a single row in lower jaw with longer ones intermixed. No groove in shoulder girdle under operculum. Two dorsals ; the first with 8 spines. Two preanal spines. Chest sparsely scaly. Lateral line armed with 30-36 scutes. Greenish grey above becoming silvery shot with gold below.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Red Sea, Malay Archipelago, Formosa, Riu Kiu Is., Japan, Philippines.

Remarks.—It attains at least 304 mm. (a foot) in length.

139. Genus *Elagatis* Bennett

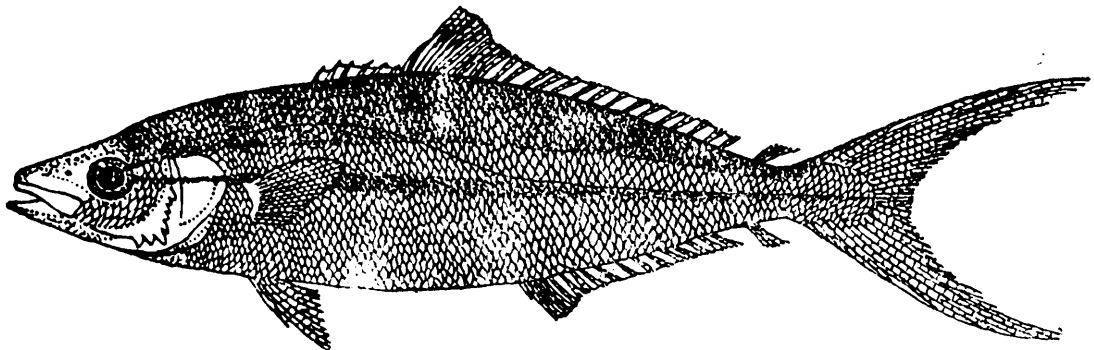
1835. *Elagatis* Bennett, *Narrative of whaling Voy. around Globe*, p. 283. (Type, *Seriola bipinnulata* Q. & G.)

276. *Elagatis bipinnulata* (Q.G.)

(Text-fig.146)

1824. *Seriola bipinnulata* Quoy & Gaimard, *Voy. " Uranie " Zool.*, 1, p. 363, pl. 63, fig. 3 (type-locality : Keeling Island).1889. *Seriolichthys bipinnulatus* Day, *Fauna Brit. India, Fish.*, 2, p. 171.

Head 5, depth 5 in total length. Eyes 4 in head. Lower jaw somewhat longer, maxilla extending to below front edge of eye. Gill openings wide extending forward till below eye. Teeth villiform in jaws. Two dorsals ; the first with 5-6 spines ; second dorsal long, with 25-27 rays. Anal shorter, with 15-17 rays. Second dorsal and anal with 1-2 detached finlets behind. Two small, preanal spines visible or covered with skin. Lateral line not armed. Greenish above and silvery below, with 2 longitudinal blue bands passing from eye, the upper to dorsal finlet and the lower to the middle of caudal base.

TEXT-FIG. 146.—Lateral view of *Elagatis bipinnulata* (Q.G.). (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal ; PAKISTAN: coasts of Sind, E. Pakistan.—Muscat, Red Sea, Zanzibar, Natal, Madagascar, Mauritius, Seychelles, Malay Archipelago, Japan, Riu Kiu Is., Philippines, Melanesia, Polynesia, Queensland, New South Wales, Hawaii.

Remarks.—It attains at least 1,219 mm. (4 feet) in length.

140. Genus *Seriola* C.1817. *Seriola* Cuvier, *Regne Animal.*, 2, ed. 1, p. 315. (Type, *Caranx dumerili* Risso.)277. *Seriola nigrofasciatus* (Rupp.)1828. *Nomeus nigrofasciatus* Ruppell, *Atl. Reise Nordl. Afrika Fische*, p. 92, pl. 24, fig. 2 (type-locality : Massaua, Red Sea).1889. *Seriola nigrofasciata* Day, *Fauna Brit. India, Fish.*, 2, p. 170.

Head 3.6 to 4.5, depth 3.5 to 4 in total length. Eyes 4 in head. Lower jaw a little longer, maxilla reaches to below middle or hind third of eye. Snout almost vertical. Gill openings reach to below mandibles. Teeth in villiform bands in jaws. Two dorsals ; the first with 5-6 spines, the second dorsal with 30-34 rays. Two preanal spines may be present. Anal much shorter than second dorsal, with 15-17 rays. No detached finlets behind second dorsal and anal. Lateral line unarmed. Gill rakers short, 8-9. Bluish grey becoming lighter below ; with 5 vertical

black bands from back to abdomen. Dorsals, anal and pelvics black and white tipped ; pectoral and caudal yellowish.

Distribution.—Seas of INDIA and PAKISTAN.—Ceylon, Red Sea, Zanzibar, Natal, Madagascar, E. and S. coasts of Africa, Malay Archipelago, Siam, China, Japan, Philippines, Melanesia, Australia.

Remarks.—It attains at least 711 mm. ($2\frac{1}{3}$) feet in length.

141. Genus *Scomberoides* Lac.

1802. *Scomberoides* Lacepede, *Hist. nat. Poiss.*, 3, p. 50. (Type, *S. commersonianus* Lac.=*Scomber lysan* Forsk.)
 1831. *Chorinemus* Cuvier, *Hist. nat. Poiss.*, 8, p. 367. (Type, *Scomberoides commersonianus* Lac.)

278. *Scomberoides lysan* (Forsk.)

1775. *Scomber lysan* Forskal, *Descript. Animal.*, p. 54. (type-locality : Djedda : Lohaja).
 1889. *Chorinemus lysan* Day, *Fauna Brit. India*, Fish., 2, p. 175.

Head 5.5 to 6, depth 3.2 in total length. Eyes 4 in head. Cleft of mouth deep, maxilla reaching half eye diameter beyond orbit. Teeth in 2 rows anteriorly and in one row posteriorly in upper jaw : in 2 rows in lower jaw ; front teeth enlarged in both jaws. Two dorsals, the first with 7 overlapping spines ; the second dorsal with 8-10, semi-detached rays behind. Two preanal spines. Anal like second dorsal, with 8-10 semi-detached rays behind. Lateral line unarmed. Gill rakers 11-12. Silvery grey above becoming lighter below ; 6-8 large round grey spots on sides ; second dorsal tipped black.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W Bengal ; PAKISTAN : coast of Sind, E. Pakistan.—Ceylon, Muscat, Red Sea, Zanzibar, Natal, Madagascar, S. Africa, Malaya, Malay Archipelago, Siam, Canton, China sea, Japan, Philippines, Melanesia, Polynesia, Queensland.

Remarks.—It attains at least 1,016 mm. ($3\frac{1}{3}$ feet) in length.

279. *Scomberoides sanctipetri* (C.)

1831. *Chorinemus sanctipetri* Cuvier, *Hist. nat. Poiss.*, 8, p. 279, pl. 236 (type-locality : Malabar, India).
 1889. *Chorinemus sanctipetri* Day, *Fauna Brit. India*, Fish., 2, p. 174.

Head 5.2 to 5.7, depth 4.2 to 4.6 in total length. Eyes 4 to 4.5 in head. Maxilla reaches to below hind border of eye. No enlarged teeth in jaws ; in many rows in front and in a single row behind in upper jaws ; 2 rows in lower jaw. Two dorsals ; the first with 7 flattened spines which do not overlap in adult ; the second dorsal with 8-10 semi-detached rays behind. Two preanal spines. Anal similar to second dorsal with semi-detached rays behind. Lateral line unarmed. Gill rakers 16-17. Bluish grey above becoming lighter below, with a row of 6-8 dark blotches above lateral line and often with a second row of 3 or 5 fainter ones below ; soft dorsal tipped black.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Red Sea, Zanzibar, Mozambique, Natal, Madagascar, S. Africa Malaya, Siam, Formosa, China, Riu Kiu Is.,

Philippines, Melanesia, Micronesia, Polynesia, Hawaii, Queensland, New South Wales.

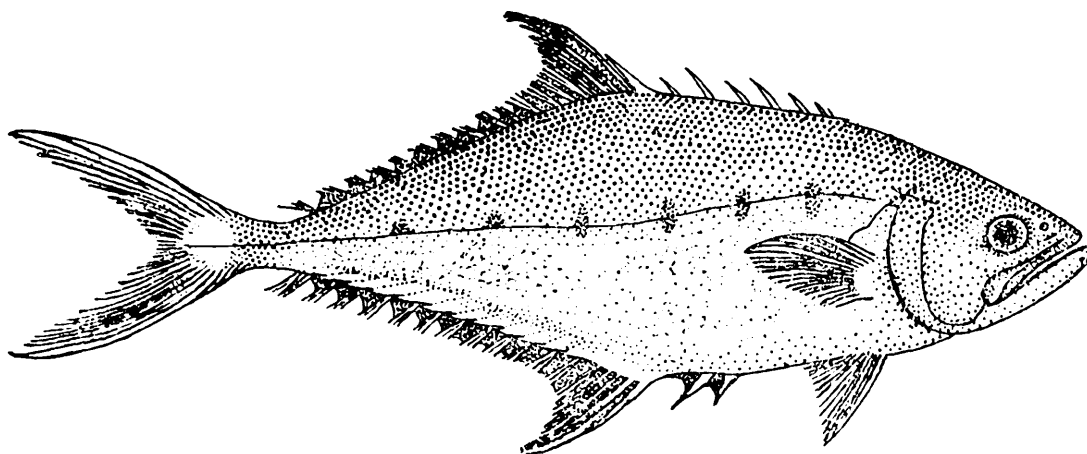
Remarks.—It attains at least 508 mm. (a foot and 8 inches) in length.

280. *Scomberoides tala* (C.)

(Text-fig. 147)

1831. *Chorinemus tala* Cuvier, *Hist. nat. Poiss.*, 8, p. 317 (type-locality ; Malabar).
 1889. *Chroinemus tala* Day, *Fauna Brit. India*, Fish., 2, p. 176.
 1889. *Chronemus toloo* Day, *Fauna Brit. India*, Fish., 2, p. 176.

Head 5·6 to 5·7, depth 3·5 to 3·6 in total length. Eyes 4 to 4·5 in head. Lower jaw prominent, maxilla extending to below hind margin of eye. Teeth in upper jaw in a single and in lower in 2 series, with canine-like teeth on either side of symphysis. Two dorsal fins, the first with 7 over-lapping spines, the second with 8-10 semi-detached rays behind. Two preanal spines. Anal equal to second dorsal and with similar semi-detached rays behind. Greenish silvery above becoming silvery white below ; a series of 7 oval vertical spots on sides.



TEXT-FIG. 147.—Lateral view of *Scomberoides tala* (C.). (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W Bengal, Andamans ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Red Sea, Seychelles, Malay Archipelago, Siam, China, Phillipines, Melanesia, Queensland.

Remarks.—It attains at least 457 mm. (a foot and a half) in length.

142. Genus *Trachinotus* Lac.

1802. *Trachinotus* Lacepede, *Hist. nat. Poiss.*, 3, p. 79. (Type, *Scomber falcatus* Forsk.)

281. *Trachinotus bailloni* (Lac.)

1802. *Caesiomorus bailloni*, Lacepede, *Hist. nat. Poiss.*, 3, pp. 92, 93, pl. 3, fig. 1 (type-locality : not given).
 1889. *Trachynotus baillonii* Day, *Fauna Brit. India*, Fish., 2, p. 178.

Head 5·5, depth 3 to 3·5 in total length. Eyes 3·5 to 4 in head. Snout obtuse, swollen. Cleft of mouth small, maxilla reaching to midorbit. Teeth card-like in both jaws. Two dorsals, first with 6-7 spines. Two preanal spines ; anal equal to second dorsal, similarly produced and

falcate anteriorly. No detached finlets. Pelvics very small, equalling 1.5 eye diameters. Lateral line unarmed. Gill rakers 13. Yellowish green shot with silvery above and silvery white below ; a row of 3-5 black spots on lateral line.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Burma, Ceylon, Muscat, S. Arabia, Red Sea, Aden, Socotra, Zanzibar, Madagascar, Mauritius, S. and E. coasts of Africa, Malaya, Malay Archipelago, Siam, Formosa, Riu Kiu, Japan, Philippines, Melanesia, Polynesia, Queensland, New South Wales.

Remarks.—It attains at least 508 mm. (a foot and 8 inches) in length.

282. *Trachinotus blochii* (Lac.)

1802. *Caesiomorus blochii* Lacepede, *Hist. nat. Poiss.*, 3, pp. 92, 95, pl. 3, fig. 2 (type-locality : not given).

1889. *Trachynotus ovatus* Day, *Fauna Brit. India*, Fish., 2, p. 179.

Head 4.5, depth 2 to 2.3 in total length. Eyes 3 to 4.5 in head, middle of head length. Cleft of mouth oblique, maxilla reaching to midorbit, Teeth card-like in both jaws, but disappearing with age. Two dorsals, the first with 6-7 spines. Two preanal spines. Anal equal to second dorsal and similarly produced and falcate anteriorly. No detached finlets. Pelvics not very small, more than 1.5 eye diameters. Lateral line armed. Gill rakers 9-12. Golden shot with silvery ; body without lateral spots.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal, Andamans ; PAKISTAN : coasts of Sind, E. Pakistan.—Burma, Ceylon, S. Arabia, Red Sea, Zanzibar, Seychelles, Madagascar, S. Africa, Malaya, Malay Archipelago, Formosa, Canton, Japan, Philippines, Melanesia, Micronesia, Polynesia, Queensland, New South Wales.

Remarks.—It attains at least 508 mm. (a foot and 8 inches) in length.

283. *Trachinotus russellii* C.

1831. *Trachinotus russellii* Cuvier, *Hist. nat. Poiss.*, 8, p. 436 (type-locality : Vizagapatam).

1889. *Trachynotus russellii* Day, *Fauna Brit. India*, Fish., 2, p. 178.

Head 5 to 5.7, depth 3.2 to 3.6 in total length. Eyes 3.5 to 3.7 in head. Cleft of mouth extends to middle or lower third or front edge of orbit ; maxilla reaches midorbit. Teeth fine in jaws. Two dorsals, the first with 6 spines. Two preanal spines. Anal equal to second dorsal and similarly produced and falcate anteriorly. No detached finlets. Pelvics more than 1.5 eye diameters. Lateral line unarmed. Gill rakers 12. Greenish shot with yellow above becoming golden on sides and silvery below ; 3-6 large indistinct blotches above lateral line.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Muscat, Natal, Madagascar, S. Africa, Malay Archipelago, Melanesia, Polynesia, Queensland, New South Wales.

Remarks.—It attains at least 558 mm. (a foot and 10 inches) in length, and is good eating.

LVI. Family LACTARIIDAE

143. Genus *Lactarius* V

1833. *Lactarius* Valenciennes, *Hist. nat. Poiss.*, 9, p. 237. (Type, *Scomber lactarius* L., haplotypic).

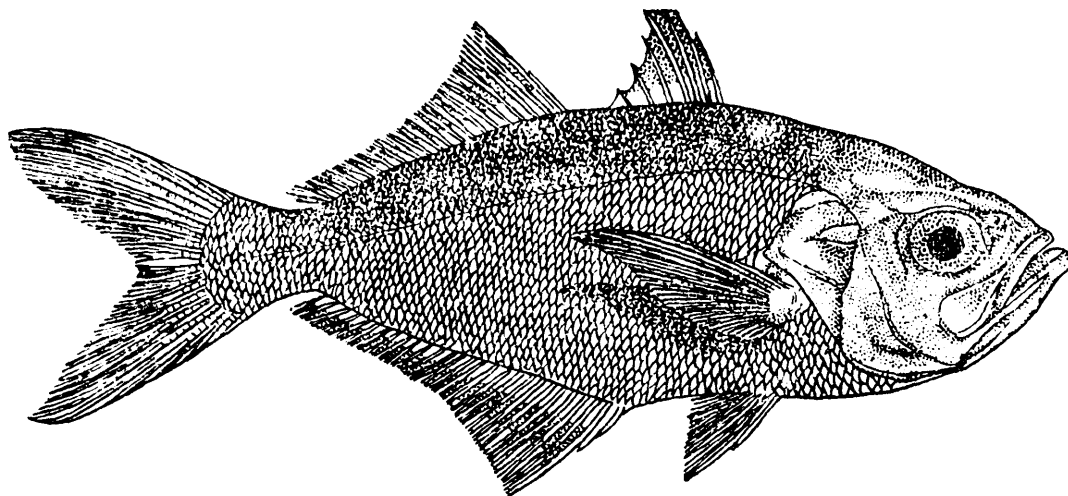
284. *Lactarius lactarius* (Schn.)

(Text-fig. 148)

1801. *Scomber lactarius* Schneider, *Syst. Ichth. Bloch*, p. 31 (type-locality : Tranquebar).

1889. *Lactarius delicatulus* Day, *Fauna Brit. India*, Fish., 2, p. 196.

Head 4, depth 3.5 in total length. Eyes 3 in head, in the anterior half of head. Cleft of mouth oblique, large, maxilla extending to mid-orbit. Lower jaw prominent. Teeth small in jaws, with one or 2 pairs of strong canines anteriorly. Two dorsals, the first with 7-8 spines ; soft dorsal long. Anal spines 3. Anal somewhat longer than second



TEXT-FIG. 148.—Lateral view of *Lactarius lactarius* (Schn.). (After Day).

dorsal. No detached finlets. Lateral line unarmed. Lateral line scales 74-80. Leaden grey above becoming silvery shot with purple below.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Muscat, Malaya, Malaya Archipelago, Siam, China sea, Philippines, Melanesia, Queensland.

Remarks.—It attains at least 254 mm. (10 inches) in length and appears in Travancore and Malabar in shoals during the months of February and March.

LVII. Family RACHYCENTRIDAS

144. Genus *Rachycentron* Kaup

1826. *Rachycentron* Kaup, *Isis*, 19, p. 89. (Type, *R. typus* Kaup).
1831. *Elacate* Cuvier, *Hist. nat. Poiss.*, 8, p. 328. (Type, *E. malabaricus* C.)

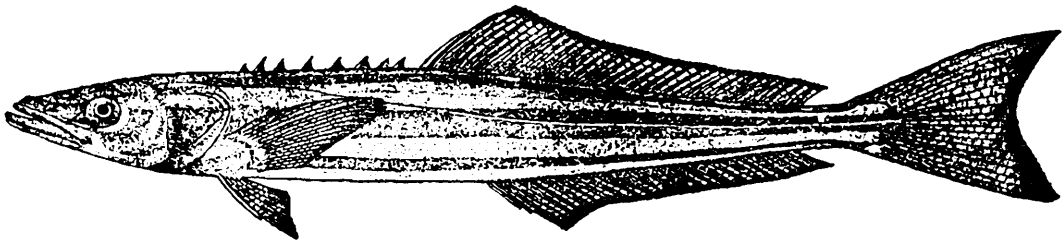
285. *Rachycentron canadus* (L.)

(Text-fig. 149)

1766. *Gasterosteus canadus* Linnaeus, *Syst. Nat.*, 1, ed. 12, p. 213 (type-locality : Carolina).

1889. *Elacate nigra* Day, *Fauna Brit. India*, Fish., 1, p. 213.

Head 4·7 to 5, depth 7·2 to 8 in total length. Eyes 4·5 to 5 in head. Mouth wide, maxilla reaching to below front border or first third of eye. Head depressed, stellately rugose on upper surface. Teeth villiform in jaws. Two dorsals, the first reduced to 8 spines ; the second dorsal a little longer than anal. Anal with 2-3 feeble spines, similar to second dorsal, with its origin behind second dorsal origin. Olive brown with a dark band along back before dorsal ; another along middle of side ; fins brownish, caudal lobes white edged.



TEXT-FIG. 149.—Lateral view of *Rachycentron canadus* (L.). (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Muscat, Red Sea, Zanzibar, Madagascar, S. Africa, Malaya, Malay Archipelago, Siam, Formosa, Japan, Philippines, Queensland, New South Wales.

Remarks.—It grows upto 1,473 mm. (4 feet and 10 inches) in length.

LVIII. Family MENIDAE

145. Genus *Mene* Lac.

1803. *Mene* Lacepede, *Hist. nat. Poiss.*, 5, p. 479. (Type, *M. annacarolina* Lac. = *Zeus maculatus* Bl.)

286. *Mene maculatus* (Schn.)

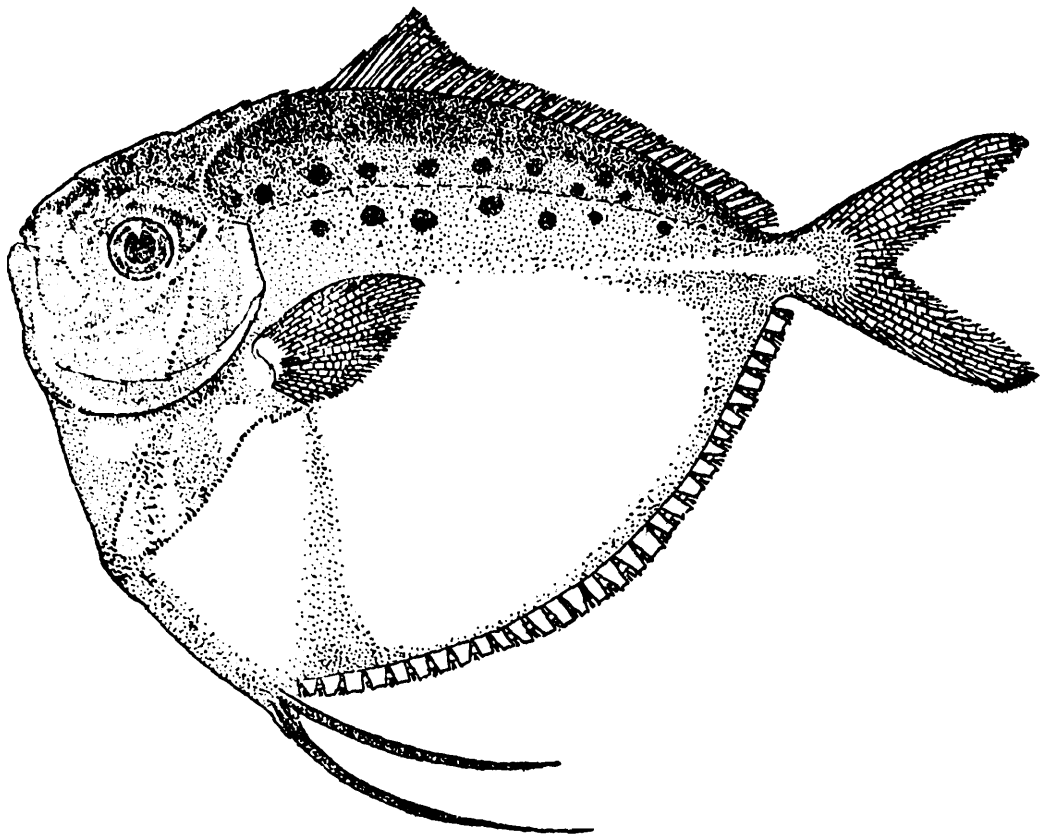
(Text-fig. 150)

1801. *Zeus maculatus* Schneider, *Syst. Ichth.*, Bloch, p. 95. (type-locality : Tranquebar).

1889. *Mene maculata* Day, *Fauna Brit. India*, Fish., 2, p. 201.

Head 4, depth 1·7 to 2 in total length. Eyes 3 to 3·5 in head. Body ovoid, strongly compressed with prominent sharp-edged abdomen. Mouth very protractile, oblique. Villiform teeth in jaws. A single, long dorsal without any distinct spines in adult. Anal long, rudimentary, spineless in adult, with many rays enveloped in skin forming broad free extremities. Pelvics thoracic with the first ray very much elongated. Scales very minute. Deep blue along back and silvery white below with 2-3 rows of large spots in the superior half of body above pectoral ; dorsal, caudal and pelvics dusky, other fins hyaline.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Burma, Ceylon, Aden, Zanzibar, Madagascar,



TEXT-FIG. 150.—Lateral view of *Mene maculatus* (Schn.). (After Day).

S. Africa, Malaya, Malay Archipelago, Siam, Formosa, seas of China, Korea, Japan, Philippines, Queensland.

Remarks.—It attains at least 203 mm. (8 inches) in length.

LIX. Family CORYPHAENIDAE

146. Genus *Coryphaena* L.

1758. *Coryphaena* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 261. (Type, *C. hippurus* L.)

287. *Coryphaena hippurus* L.

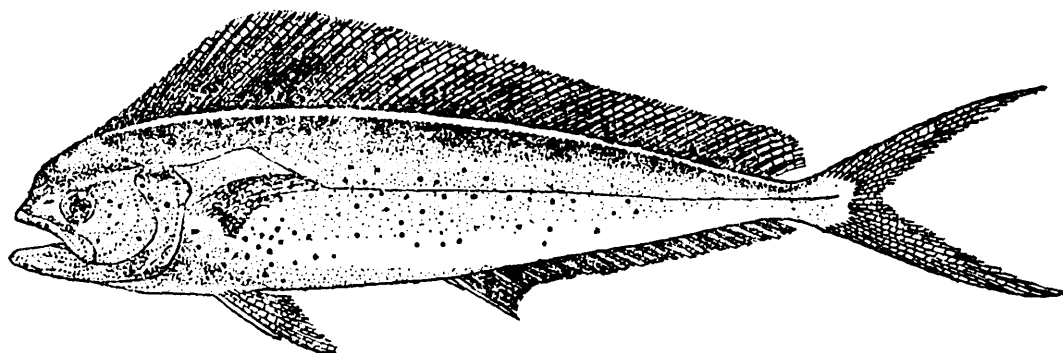
(Text-fig. 151)

1758. *Coryphaena hippurus* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 261 (type-locality : open sea).

1889. *Coryphaena hippurus* Day, *Fauna Brit. India*, Fish., 2, p. 201.

Head 5·1, depth 5·5 to 6·5 in total length. Eyes 4 to 6 in head. Body elongate and compressed, with a well developed occipital crest. Teeth villiform, in many rows. A single, long dorsal commencing on occiput or middle of eye and extending to caudal ; without any distinct spines. Anal about half dorsal ; origin between front border of eye and caudal base. Pelvics thoracic. Scales small. Back greyish shot with gold abdomen and sides lighter with many blue spots, which become black after death.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal, Andamans ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Muscat,



TEXT-FIG. 151.—Lateral view of *Coryphaena hippurus* L. (After Day).

S. Africa, Malay Archipelago, Korea, Hawaii, New South Wales ; all warm or tropical seas.

Remarks.—It attains 1,524 mm. (5 feet) or more in length.

LX. Family LUTIANIDAE

147. Genus *Lutianus* Bl.

1790. *Lutianus* Bloch, *Naturg. Ausland., Fische*, 4, p. 105. (Type, *L. lutianus* Bl., tautotypic.)
 1790. *Lutjanus* Bloch, *Naturg. Ausland. Fische*, 4, p. 108 : Change of spelling.

288. *Lutianus argentimaculata* (Forsk.)

1775. *Sciaena argentimaculata* Forskal, *Descript. Animal.*, p. 47 (type-locality : Arabia).
 1889. *Lutjanus argentimaculatus* Day, *Fauna Brit. India*, Fish., 1, p. 472.
 1889. *Lutjanus roseus* Day, *Fauna Brit. India*, Fish., 1, p. 472

Head 3.2 to 3.5, depth 3 to 3.5 in total length. Eyes 3 to 5 in head. Maxilla reaches to front border of eye. A slight swelling on interopercle. Villiform teeth in jaws ; larger canines in upper jaw and smaller ones in lower jaw. A single dorsal with 10 spines. Three anal spines. Caudal emarginate or rather deeply lunate. Scales in horizontal rows above lateral line in the anterior part and slightly oblique in the posterior part ; in horizontal series below lateral line. Lateral line scales 45. Predorsal scales do not extend forward to interorbital space. Gill rakers 9-12. Cherry red, young with 6-9 vertical, silvery white bands disappearing with age.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal, Andamans ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Arabia, Red Sea, S. Africa, Malaya, Malay Archipelago, Siam, Philippines, Melanesia, Micronesia, Polynesia, Queensland.

Remarks.—It grows upwards to 609 mm. (2 feet) and is good eating.

289. *Lutianus bohar* (Forsk.)

1775. *Sciaena bohar* Forskal, *Descript. Animal.*, p. 46 (type-locality : Arabia).
 1889. *Lutjanus bohar* Day, *Fauna Brit. India*, Fish., 1, p. 477.

Head 3·5, depth 3 in total length. Eyes 3·5 in head. Maxilla reaches to below midorbit. Interopercle with a small knob ; preopercle feebly notched. Villiform teeth in jaws ; upper jaw with large and lower with smaller canines. A single dorsal with 10 spines. Three anal spines. Caudal somewhat deeply emarginate. Scales in oblique rows throughout above lateral line and in horizontal series below it. Lateral line scales 50-55. Predorsal scales do not extend forward to interorbital space. Gill rakers 14. Brownish above and silvery white below ; 2 milk white spots in the upper part of body below spinous and soft parts of dorsal ; pelvics black, white edged.

Distribution.—Seas of INDIA and PAKISTAN.—Ceylon, Arabia, Red Sea, Seychelles, Mauritius, S. Africa, Malaya, Malay Archipelago, Siam, Philippines, Melanesia, Polynesia.

Remarks.—It has been recorded upto 914 mm. (3 feet) in length.

290. *Lutianus johnii* (Bl.)

1692. *Anthias johnii* Bloch, *Naturg. Ausland. Fische*, 6, p. 113, pl. 318 (type-locality : Surat, India).

1889. *Lutjanus johnii* Day, *Fauna Brit. India*, Fish., 1, p. 476.

Head 3·2 to 3·5, depth 3·5 in total length. Eyes 4 to 6 in head. Dorsal profile more arched than ventral profile. Maxilla extends to below first third or middle of eye. An indistinct knob in interopercle. Villiform teeth in jaws ; larger canines in upper jaw and smaller ones in lower. A single dorsal with 10 spines. Three anal spines. Caudal slightly emarginate. Scales above lateral line in series parallel with dorsal profile, those below it in horizontal series. Lateral line scales 48-50. Gill rakers 9-12. Yellowish becoming lighter below with a large black spot on lateral line below end of spinous dorsal.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Natal, Madagascar, S. Africa, Malaya, Malay Archipelago, Siam, Hongkong, China seas, Philippines, Melanesia, Polynesia, Queensland.

Remarks.—It attains 304 mm. (a foot) in length.

291. *Lutianus kasmira* (Forsk.)

(Text-fig. 152)

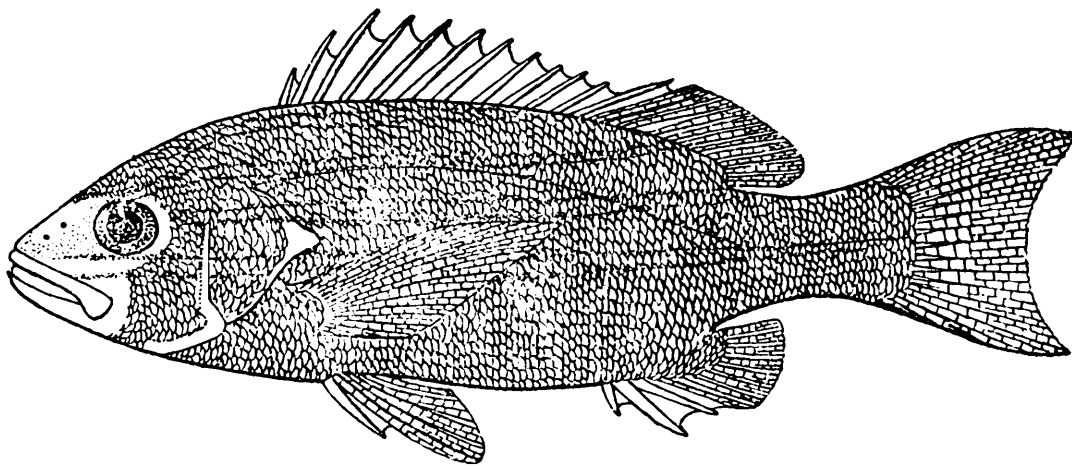
1775. *Sciaena kasmira* Forskal, *Descript. Animal.*, p. 46 (type-locality : Arabia).

1889. *Lutjanus kasmira* Day, *Fauna Brit. India*, Fish., 1, p. 468.

1889. *Latjanus quinquelinearis* Day, *Fauna Brit. India*, Fish., 1, p. 479.

Head 3·5 to 3·7, depth 3·3 to 3·5 in head. Eyes 3·3 to 4·5 in head. Maxilla reaches to below first third or middle of orbit. Interopercular knob present ; preopercle deeply notched. Villiform teeth in jaws ; larger canines in upper and smaller ones in lower. A single dorsal with 10-11 spines. Three anal spines. Caudal emarginate to lunate. Scales above lateral line in oblique series throughout and those below horizontal. Lateral line scales 50-56. Predorsal scales extend forward to interorbital or to front of eye. Gill rakers 15. Canary yellow becoming lighter below with 4 or 5 blue lines edged with brown on sides.

Distribution.—INDIA: coasts of Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal; PAKISTAN: coasts of E. Pakistan.—Ceylon, Muscat, Red Sea, Aden, Natal, Madagascar, Seychelles, E. and S. coasts



TEXT-FIG. 152.—Lateral view of *Lutianus kasmira* (Forsk). (After Day) of Africa, Malay Archipelago, Siam, Hongkong, Japan, Philippines, Melanesia, Micronesia, Polynesia, Queensland, New South Wales.

Remarks.—It attains at least 254 mm. (10 inches) in length.

292. *Lutianus lineolatus* (Rupp.)

1828. *Lutjanus lineolatus* Ruppell, *Atl. Riese Nordl. Afrika Fische*, p. 76, pl. 19, fig. 3 (type-locality: Massaua, Red Sea).

1889. *Lutjanus lineolatus* Day, *Fauna Brit. India, Fish.*, 1, p. 469.

Head 3.5 to 3.6, depth 3.5 to 3.7 in total length. Eyes 3 to 3.5 in total length. Maxilla reaches to below middle of orbit. No interopercular knob. Villiform teeth in jaws, larger canines in upper jaw and smaller ones in lower jaw. A single dorsal with 11 spines. Three anal spines. Caudal emarginate to lunate. Scales above lateral line in oblique rows in the anterior part of body and in horizontal series in the posterior part and below lateral line. Predorsal scales extend forward to interorbital or to front edge of eye. Gill rakers 16-18. Purplish red becoming yellowish silvery below; oblique gold lines along scale rows in upper part and pinkish longitudinal stripes below lateral line.

Distribution.—Seas of INDIA and PAKISTAN.—Burma, Ceylon, Gulf of Oman, Arabia, Red Sea, Madagascar, Zanzibar, S. Africa, Malaya, Malay Archipelago, Siam, Philippines, Micronesia.

Remarks.—It attains at least 228 mm. (9 inches) in length and is very common off Madras.

293. *Lutianus lutjanus* (Bl.)

1790. *Lutjanus lutjanus* Bloch, *Naturg. Ausland. Fische*, 4, p. 107 (type-locality: Japan).

1889. *Lutjanus madras* Day, *Fauna Brit. India, Fish.*, 1, p. 480.

Head 3.5, depth 3 to 3.5 in total length. Eyes 3 to 3.5 in head. Maxilla reaches to below anterior third of eye. No interopercular knob. Larger canines in upper and smaller ones in lower jaw. A single dorsal with 10 spines. Three anal spines. Caudal emarginate. Scales in oblique rows throughout above, and in horizontal series below lateral

line. Lateral line scales 48-52. Predorsal scales extend forward to interorbital or to front of eye. Gill rakers 6+15. Pinkish olive above, silvery yellow below, with oblique lines above lateral line and narrow red horizontal bands below it.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Seychelles, S. Africa, Malaya, Malay Archipelago, Indo-China, Japan, Philippines, Melanesia, Micronesia.

Remarks.—It attains about 304 mm. (a foot) in length.

294. *Lutianus rivulata* (C.)

1828. *Diacope rivulata* Cuvier, *Hist. nat. Poiss.*, 1, p. 414, pl. 38 (type-locality : Coromandel : Malabar and Pondicherry coasts : Java : Red Sea).

1889. *Lutjanus rivulatus* Day, *Fauna Brit. India*, Fish., 1, p. 471.

Head 3.3 to 3.5, depth 3 in total length. Eyes 4.5 in head. Maxilla extends only to front border of eye. Well developed interopercular knob. Larger canines in upper jaw and smaller ones in lower jaw. A single dorsal with 10 spines. Three anal spines. Caudal slightly emarginate. Scales in oblique rows throughout above lateral line and in horizontal series below it. Lateral line scales 45-50. Predorsal scales do not extend forward to interorbital space. Gill rakers 13. Olive brown becoming pale silvery below ; with a large white blotch on lateral line behind spinous dorsal ; several bright blue lines across cheeks.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Coromandel, Madras, Orissa, W Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Red Sea, Zanzibar, Natal, Madagascar, Mauritius, Malay Archipelago, China, Formosa, Japan, Philippines, Melanesia, Polynesia.

Remarks.—It attains at least 304 mm. (a foot) in length.

295. *Lutianus sanguinea* (C.)

1828. *Diacope sanguinea* Cuvier, *Hist. nat. Poiss.*, 2, p. 437, (type-locality : Massaua).

1889. *Lutjanus annularis* Day, *Fauna Brit. India*, Fish., 1, p. 466.

Head 3.5 to 3.7, depth 2.7 to 3.2 in total length. Eyes 5 to 6 in head. Maxilla does not extend to below front border of eye. A small interopercular knob. Larger canines in upper jaw and smaller ones in lower jaw. A single dorsal with 11 spines. Three anal spines. Caudal emarginate or cut square in young. Scales in oblique rows both above and below lateral line. Predorsal scales extend to interorbital space. Lateral line scales 52-55. Gill rakers 12-13. Blood red with orange reflections, a broad dark band from eye to the dorsal ; 8-12 narrow, horizontal black stripes on sides ; black transverse band across free portion of tail with a white one before it and a narrow pink one behind it ; pelvics partly or wholly black.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Coromandel, Madras, Orissa, W Bengal ; PAKISTAN : coasts of Sind,

E. Pakistan.—Ceylon, Red Sea, E. and S. coasts of Africa, Malaya, Malay Archipelago, Siam, China, Japan, Philippines, Queensland.

Remarks.—It attains a little over 304 mm. (a foot) in length.

296. *Lutianus vaigiensis* (Q. G.)

1824. *Diacope vaigiensis* Quoy & Gaimard, *Voy. "Uranie", Zool.*, p. 307 (type-locality : Waigiu).

1889. *Lutjanus marginatus* Day, *Fauna Brit. India*, Fish., 1, p. 478.

Head 3.5 to 4, depth 3 to 3.5 in total length. Eyes 3.5 in head. Maxilla extends beyond anterior margin of eye. A well developed interopercular knob. Large canines in upper and smaller ones in lower jaw. A single dorsal with 10 spines. Three anal spines. Caudal emarginate. Scales in oblique rows above lateral line anteriorly and horizontal series below it. Predorsal scales do not extend into inter-orbital space. Lateral line scales 47-50. Gill rakers 10-11. Purplish yellow above lateral line and golden below it ; 7 yellow horizontal stripes on sides.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal : PAKISTAN: coasts of Sind, E. Pakistan.—Ceylon, S. Arabia, Natal, Mozambique, E. and S. coasts of Africa, Malaya, Malay Archipelago, Siam, Japan, Philippines, Melanesia, Micronesia, Polynesia, North Australia.

Remarks.—It has been recorded upto about 508 mm. (a foot and 8 inches) in length.

LXI. Family NEMIPTERIDAE

148. Genus *Nemipterus* Swainson.

1839. *Nemipterus* Swainson, *Nat. Hist. Fish. Animals*, 2, p. 223. (Type, *Dentex filamentosus* C., haplotypic.)

1859. *Synagris* (nec Klein) Gunther, *Cat. Fish. Brit., Mus.*, 1, p. 373. (Type, *Dentex furcosus* V.)

297 *Nemipterus bleekeri* (Day)

1875. *Synagris bleekeri* Day, *Fish. India*, p. 92, pl. 24, fig. 1 (type-locality : Madras).

1889. *Synagris bleekeri* Day, *Fauna Brit. India*, Fish., 1, p. 528.

Head 4 to 4.5, depth 4.3 in total length. Eyes 3.5 in head. Opercle with a small flat spine. Preopercle entire. Outer conical row of teeth in upper jaw absent ; a single conical lateral row in lower jaw. A single dorsal with 10 spines, slightly notched ; dorsal spines shorter than rays. Three anal spines. Upper caudal ray non-filamentous. Lateral line scales 48. Reddish above becoming silvery below with yellow lateral stripes ; a bluish spot on opercle.

Distribution.—Seas of INDIA and PAKISTAN.—Ceylon, Malaya.

Remarks.—It grows to 203 mm. (8 inches) in length.

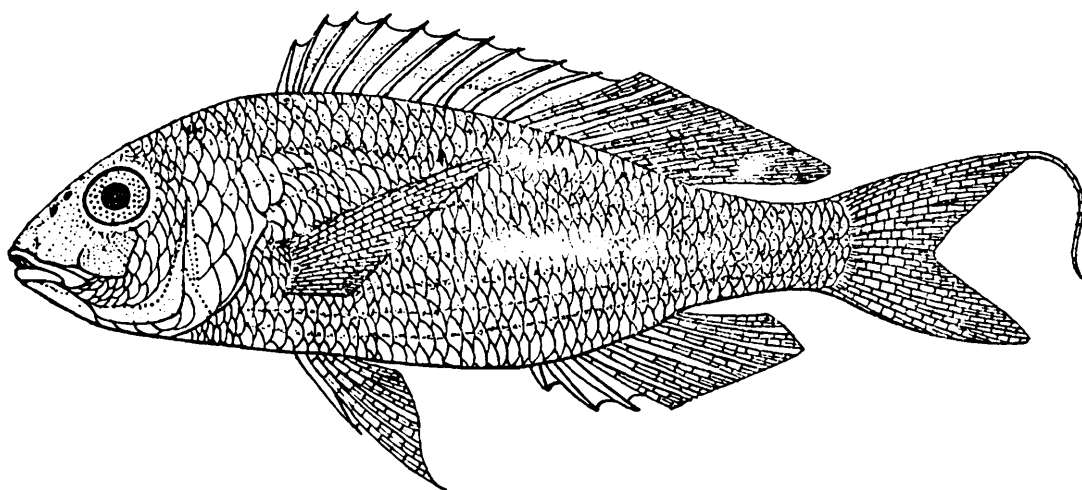
298. *Nemipterus japonicus* (Bl.)

(Text-fig. 153)

1791. *Sparus japonicus* Bloch, *Naturg. Ausland. Fische*, 5, p. 110 (type-locality : not given ("Japan")).

1889. *Synagris japonicus* Day, *Fauna Brit. India, Fish.*, 1, p. 527.

Head 4, depth 4 in total length (without filamentous prolongation of caudal fin). Eyes 3·2 to 3·3 in head. Opercle without any distinct spine. Preopercle finely serrated. A lateral outer row of conical teeth in upper jaw only. A single slightly notched, dorsal with 10 spines. Three anal spines. Upper caudal ray filamentous. Lateral line scales 48. Yellowish red with longitudinal reddish lines along each row of scales ; dorsal and anal with yellow streaks in the middle.



TEXT-FIG. 153.—Lateral view of *Nemipterus japonicus* (Bl.). (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Red Sea, Aden, Zanzibar, Mauritius, Malaya, Malay Archipelago, Siam, China, Formosa, Japan, Philippines.

Remarks.—It grows to about 304 mm. (a foot) in length.

299. *Nemipterus tolu* (V.)

1830. *Dentex tolu* Valenciennes, *Hist. nat. Poiss.*, 6, p. 248 (type locality : Pondicherry : New Guinea).

1889. *Synagris tolu* Day, *Fauna Brit. India, Fish.*, 1, p. 528.

Head 4·5, depth 4 to 4·5 in total length. Eyes 3 in head. Opercle with a small flattened spine. Preopercle entire. Lateral conical teeth in both jaws. A single deeply notched dorsal with 10 spines ; dorsal spines longer than rays. Three anal spines. Upper caudal ray non-filamentous. Lateral line scales 48. Rosy with 4 or 5 yellowish, horizontal, lateral stripes between rows of scales.

Distribution.—INDIA : coasts of Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Arabia, Malaya, Malay Archipelago, Siam, Formosa, Philippines, Melanesia.

Remarks.—It grows to about 263 mm. (8 inches) in length ; it is most common in Madras from October and March.

LXII. Family LOBOTIDAE

149. Genus *Lobotes* C.

1829. *Lobotes* Cuvier, *Regne Animal.*, 2, ed. 2, p. 177. (Type, *Holocentrus surinamensis* Bl.)

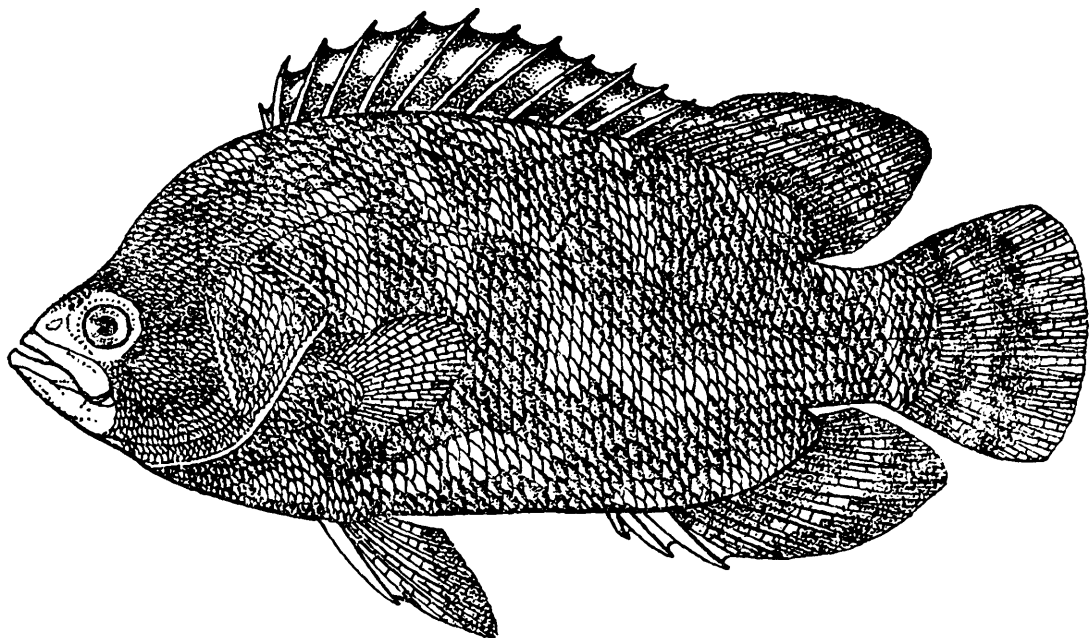
300. *Lobotes surinamensis* (Bl.)

(Text-fig. 154)

1790. *Holocentrus surinamensis* Bloch, *Naturl. Ausland. Fische*, 4, p. 98, pl. 243 (type-locality : Surinam).

1889. *Lobotes surinamensis* Day, *Fauna Brit. India*, Fish., 1, p. 519.

Head 3·5 to 3·6, depth 2·5 to 3 in total length. Eyes 6 to 7 in head, in the anterior third of head. Upper profile of head concave. Cleft of mouth oblique, lower jaw the longer. Preopercle coarsely serrated. Teeth in jaws villiform. A single dorsal with 12 stout spines ; rays higher than spines. Three strong anal spines. Caudal rounded. Lateral line scales 42-44. Brassy brown becoming lighter below ; sometimes with dusky lines and faint spots on body.



TEXT-FIG. 154.—Lateral view of *Lobotes surinamensis* (Bl.). (After Day).

Distribution.—Seas of INDIA and PAKISTAN.—Ceylon, Natal, Madagascar, Seychelles, S. Africa, Malaya, Malay Archipelago, Siam, China, Cochin China, S. Japan, Philippines, Melanesia, Micronesia, Queensland, New South Wales ; tropical Atlantic, coast of America, occasionally in Mediterranean.

Remarks.—It attains at least 762 mm. ($2\frac{1}{2}$ feet) in length and is excellent as food.

150. Genus **Datnioides** Blkr.

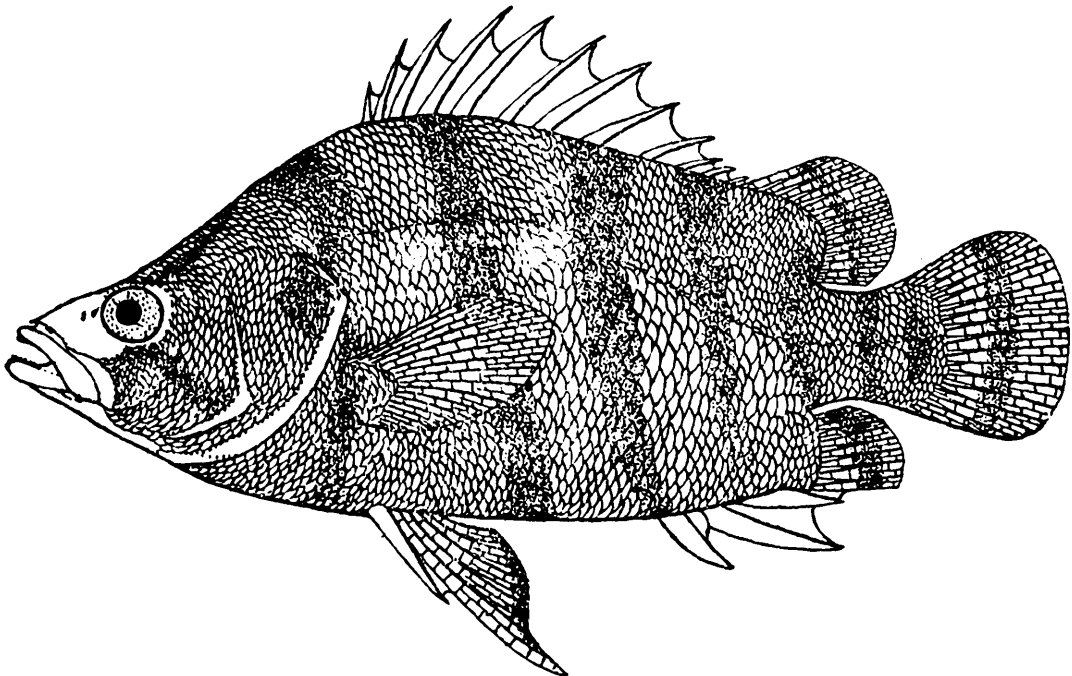
1853. *Datnioides* Bleeker, *Nat. Tijdscher Ned.-Ind.*, 5, p. 440. (Type, *Coius polota* Ham.)

301. **Datnioides quadrifasciatus** (Sevastianov)

(Text-fig. 155)

1809. *Chaetodon quadrifasciatus* Sevastianov, *Mém. Acad. Sci. St. Petersb.*, 1, p. 448, pl. 18.
1889. *Datnioides quadrifasciatus* Day, *Fauna Brit. India*, Fish., 1, p. 534, fig. 162.

Head 3 to 3.5, depth 2.5 to 3 in total length. Eyes 5 in head, in anterior half of head. Jaws nearly equal. Preopercle finely serrated. Villiform teeth in jaws. A single dorsal with 12 strong spines. Spines as long as rays. Three strong anal spines. Lateral line scales 48. Caudal rounded. Brownish with coppery reflections ; 6 or 7 narrow vertical bands on body.



TEXT-FIG. 155.—Lateral view of *Datnioides quadrifasciatus* (Sevastianov). (After Day).

Distribution.—INDIA : estuaries and within tidal influence of the Ganges in W Bengal ; PAKISTAN : estuaries and within tidal influence of the Ganges of E. Pakistan.—Burma, Ceylon, Sumatra, Borneo, Melanesia, Siam, Cochin China.

Remarks.—It attains at least 304 mm. (a foot) in length ; though not esteemed as food it is eaten by the poorer class.

LXIII. Family LEIOGNATHIDAE

151. Genus **Leiognathus** Lac.

1803. *Leiognathus* Lacepede, *Hist. nat. Poiss.*, 4, p. 448. (Type, *L. argenteus* Lac.)

302. **Leiognathus blochii** (V.)

1835. *Equula blochii* Valenciennes, *Hist. nat. Poiss.*, 10, p. 84 (type-locality : coast of Malabar).
1889. *Equula blochii* Day, *Fauna Brit. India*, Fish., 2, p. 189.

Head 4·3, depth 2·2 to 3·2 in total length. Eyes 2 in head. Dorsal profile more arched or equal to ventral profile. Interorbital cavity twice as long as wide. Mouth protractile, horizontal. Supraorbital edge serrated. Teeth minute, in single row in jaws. A single dorsal with 8 spines; longest spine not exceeding half depth of body. Three anal spines. No finlets. Pelvics extend more than half way to anal. Lateral line scales 60. Chest scaly. Silvery with a dark brown blotch over nape; spinous dorsal with a blotch; vertical zig-zag yellow lines on body.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, Chilka Lake, W. Bengal; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Malaya, Borneo, Siam, Philippines.

Remarks.—It attains at least 76 mm. (3 inches) in length and ascends tidal rivers and has been found at Calcutta.

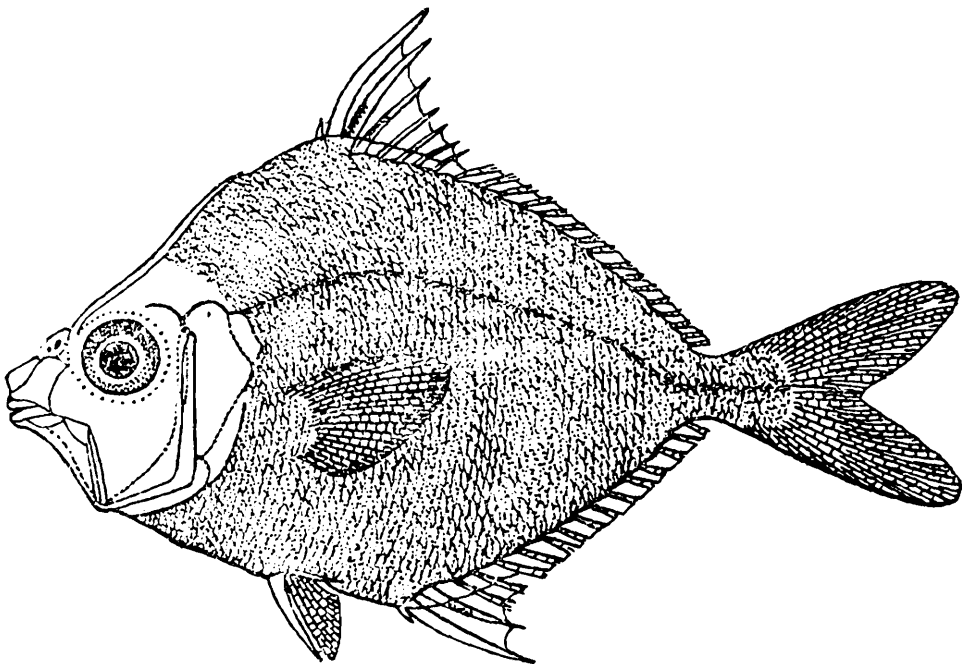
303. *Leiognathus equula* (Forsk.)

(Text-fig. 156)

1775. *Scomber equula* Forskal, *Descript. Animal.*, p. 75 (type-locality : Red Sea).

1889. *Equula edentula* Day, *Fauna Brit. India*, Fish., 2, p. 186.

Head 4, depth 2 to 2·5 in total length. Eyes 3 in head. Dorsal profile more convex than that of abdomen. Snout obtuse, maxilla reaching to front border of eye. Supraoccipital edge serrated. Interorbital cavity not twice as long as wide. Mouth protractile, horizontal.



TEXT-FIG. 156.—Lateral view of *Leiognathus equulus* (Forsk.). (After Day).

Teeth fine in both jaws, in a single row. A single dorsal with 8 spines, longest spine not exceeding half depth of body. Three anal spines. No finlets. Pelvics almost reach anal. Lateral line scales 60. Chest with rudimentary scales. Silvery becoming greyish along lateral line with fine transverse lines from back down the sides.

Distribution—INDIA : coasts of Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN : coasts of E. Pakistan.—Burma, Ceylon, Muscat, Red Sea, Zanzibar, Madagascar, Mauritius, S. Africa, Malaya, Malay Archipelago, Siam, China, Japan, Philippines, Melanesia, Micronesia, Polynesia, Queensland.

Remarks.—It attains 254 mm. (10 inches) in length and ascends rivers far above tidal reach.

304. *Leiognathus fasciata* Lac.

1803. *Clupea fasciata* Lacepede, *Hist. nat. Poiss.*, 5, pp. 460; 463 (type-locality : Mauritius).

1889. *Equula fasciata* Day, *Fauna Brit. India*, Fish., 2, p. 192.

Head 4 to 4.5, depth 2.5 in total length. Eyes 3 in head. Dorsal profile more convex than ventral. Mouth protractile, horizontal, maxilla reaching to below first third of eye. Supraorbital edge entire. Interorbital cavity nearly twice as long as wide. Teeth minute, in a single row in both jaws. A single dorsal with 8 spines, the longest spine more than half depth of body. Three anal spines. No finlets. Pelvics reach three-fourth of the distance to anal. Lateral line stops just before caudal base ; lateral line scales 65. Chest scaleless or with indistinct minute scales. Silvery with irregular transverse streaks on body.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin Coromandel, Madras, Orissa, W. Bengal, Andamans ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Muscat, Red Sea, Zanzibar, Madagascar, Mauritius, Seychelles, Malaya, Malay Archipelago, Philippines, Melanesia, Polynesia, Queensland.

Remarks.—It attains 152 mm. (6 inches) in length.

305. *Leiognathus lineolata* (V.)

1835. *Equula lineolata* Valenciennes, *Hist. nat. Poiss.*, 10, p. 86 (type-locality : Java).

1889. *Equula lineolata* Day, *Fauna Brit. India*, Fish., 2, p. 190.

Head 4.5, depth 2.7 in total length. Eyes 3 in head. Dorsal and ventral profiles equal. Mouth protractile, horizontal, maxilla reaching to below first third of eye. Supraorbital edge entire. Interorbital cavity at least twice as long as broad. Teeth minute, in single row in jaws. A single dorsal with 8 spines ; the longest spine more than half depth of body. Three anal spines. No finlets. Pelvics do not reach anal. Lateral line reaches to free portion of tail lateral line scales 60. Chest scaly. Silvery with vertical zig-zag streaks on body ; spinous dorsal edged with dark.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN: coasts of Sind, East Pakistan.—Ceylon, Madagascar, Malaya, Malay Archipelago, Nagasaki, Japan, Queensland.

Remarks.—It attains 102 mm. (4 inches) in length.

306. *Leiognathus ruconius* (Ham.)

1822. *Chanda ruconius* Hamilton, *Fish. Ganges*, pp. 106, 371, pl. 12, fig. 35 (type-locality : estuaries of the Ganges).

1889. *Equula ruconius* Day, *Fauna Brit. India*, Fish., 2, p. 192.

Head 4.3, depth 2 (1.5 to 1.6 in young) in total length. Eyes 3 in head. Ventral profile more convex than dorsal profile. Mouth protractile, oblique, maxilla reaching to front border of eye. Supraorbital edge minutely serrated. Teeth minute, deciduous, in single row in jaws. A single dorsal with 8 spines, the longest spine less than half depth of body. Three anal spines. No finlets. Pelvics reach half way to anal. Lateral line ceases below middle of soft dorsal or often continued on to its last third. Scales deciduous. Bluish silvery above, whitish silvery below ; transverse lines of black spot with bronze reflections in the upper third of body ; a well marked black streak from front edge of orbit to throat.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN: coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, S. Arabia, S. Africa, Malaya, Malay Archipelago, Siam, Hongkong, Formosa, Philippines, Australia.

Remarks.—It attains 89 mm. ($3\frac{1}{2}$ inches) in length and ascends estuaries and tidal rivers. It is common in the Hooghly at Calcutta.

307. *Leiognathus splendens* (C.)

1829. *Equula splendens* Cuvier, *Regne Animal.*, 2, ed. 2, p. 212 (type-locality : India).

1889. *Equula splendens* Day, *Fauna Brit. India*, Fish., 2, p. 188.

Head 4, depth 2.2 to 2.3 in total length. Eyes 3 in head. Dorsal profile more arched than ventral profile. Snout obtuse. Mouth protractile, horizontal, maxilla reaching to below midorbit. Supraorbital edge serrated. Interorbital cavity nearly twice as long as broad. Teeth minute, in single row in jaws. A single dorsal with 8 spines, the longest spine less than half depth of body. Three anal spines. No finlets. Pelvics almost reach anal. Lateral line does not reach caudal base ; lateral line scales 55-60. Chest scaly. Silvery with a deep black blotch in the upper half of spinous dorsal.

Distribution.—Seas of INDIA and PAKISTAN.—Ceylon, Red Sea, Madagascar, Mauritius, Malaya, Malay Archipelago, Siam, Formosa, China, Philippines, Polynesia, Queensland.

Remarks.—It attains at least 127 mm. (5 inches) in length.

152. Genus *Gazza* Ruppell

1835. *Gazza* Ruppell, *Neue Wirebelth. Fische*, p. 3. (Type, *G. equalaeformis* Rupp.)

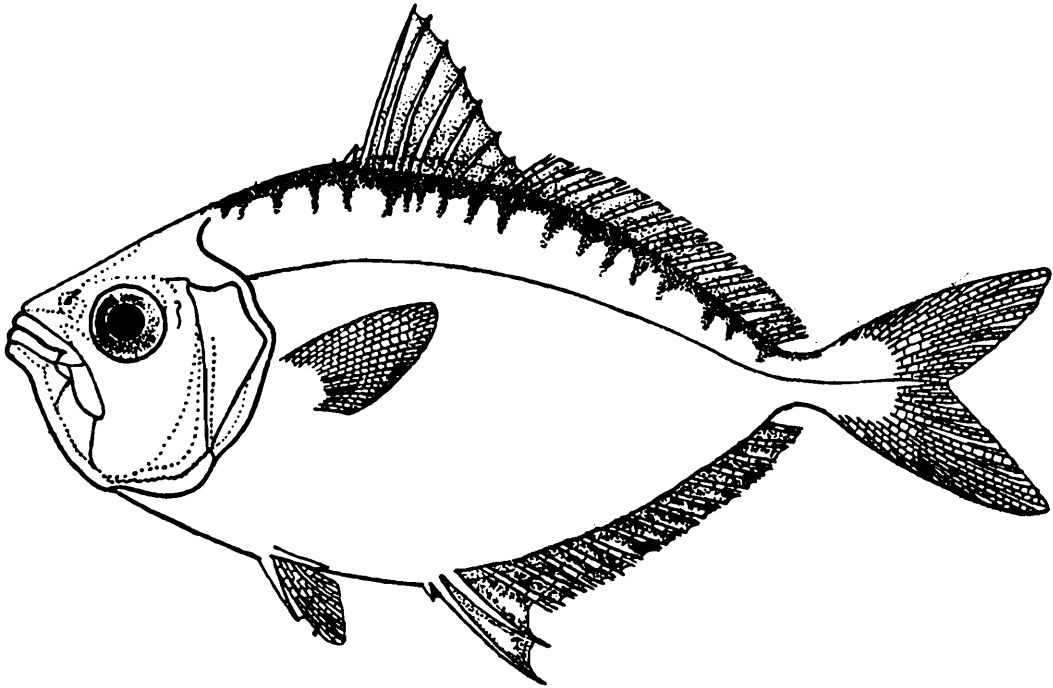
308. *Gazza minutus* (Bl.)

(Text-fig. 157)

1797. *Scomber minutus* Bloch, *Syst. Ichth.*, p. 110, pl. 429, fig. 2. (type-locality : Malabar).

1889. *Gazza minuta* Day, *Fauna Brit. India*, Fish., 2, p. 194.

Head 3.5 to 4, depth 2.2 to 3 in total length. Eyes 2.3 to 2.7 in head. Dorsal and abdominal profiles about equally convex. Mouth protractile, horizontal, maxilla reaching to below first third of eye. Supraorbital serrated, 2 spines above front third of eye. A pair of canines in upper jaw and a conical row in lower jaw. A single dorsal with 8 spines. Three anal spines. No finlets. Scales minute, about 60 in lateral line series. Scales indistinct on chest. Grayish silvery above becoming lighter below, with irregular zig-zag transverse bands on body.



TEXT-FIG. 157.—Lateral view of *Gazza minutus* (Bl.). (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal, Andamans; Chilka Lake ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Red Sea, Zanzibar, Natal, Madagascar, S. and E. coasts of Africa, Malaya, Malay Archipelago, Siam, Formosa, Philippines, Melanesia, Polynesia, Queensland.

Remarks.—It attains at least 152 mm. (6 inches) in length.

LXIV Family GERRIDAE

153. Genus *Gerres* C.

1824. *Gerres* Cuvier, in *Quoy & Gaimard, Voy. "Uranic Zool.*, p. 293 (Type, *G. vaigiensis* Q. G.).

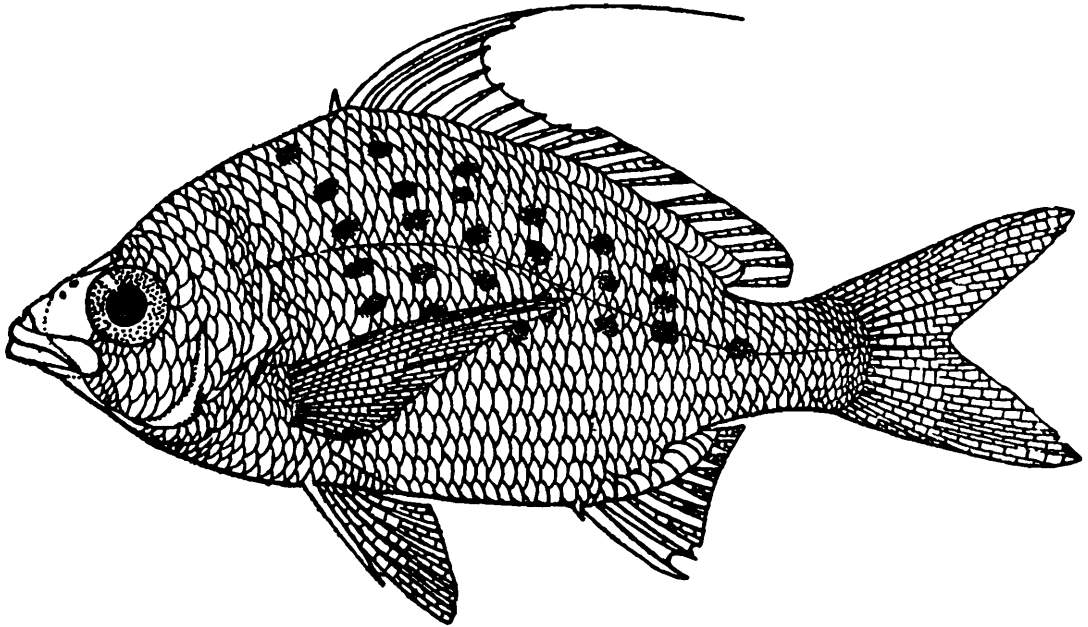
309. *Gerres filamentosus* C.

(Text-fig. 158)

1829. *Gerres filamentosus* Cuvier, *Regne Animal.*, 2, ed. 2. p. 188 (type locality : Vizagapatam).
1889. *Gerres filamentosus* Day, *Fauna Brit. India, Fish.*, 1, p. 537, fig. 163.

Head 4 to 4.2, depth 3 in total length. Eyes 3 in head. Mouth protractile, maxilla extending to below first fourth of eye. Preopercle entire. Villiform teeth in jaws ; no canines. A single dorsal with 9

spines ; spinous and soft parts equal ; longest spine prolonged into a filament, exceeding depth of body and often reaching caudal. Three anal spines. Dorsal and anal with scaly sheath. Lateral line scales 45-48. Silvery with rows of short oblong horizontal bluish spots along upper half of body.



TEXT-FIG. 158.—Lateral view of *Gerres filamentosus* C. (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal, Andamans; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Red Sea, Socotra, Natal, Mauritius, Madagascar, S. Africa, Malaya, Malay Archipelago, Siam, China, Formosa, Hongkong, Japan, Philippines, Melanesia, Queensland.

Remarks.—It attains at least 203 mm. (8 inches) in length.

310. *Gerres limbatus* C.

1830. *Gerres limbatus* Cuvier, *Hist. nat. Poiss.*, 6, p. 476 (type-locality : Malabar).

1889. *Gerres limbatus* Day, *Fauna Brit. India*, Fish., 1, p. 539.

Head 4, depth 3·2 in total length. Eyes 3 in head. Mouth protractile, maxilla extending to below first third of eye. Villiform teeth in jaws ; no canines. A single dorsal with 9 spines ; spinous and soft parts equal, the largest spine not longer than longest anal spine. Three anal spines. Moderately developed sheath for dorsal and anal. Lateral line scales 45. Silvery with a dark margin to dorsal and anal.

Distribution.—INDIA : coasts of Malabar, Travancore-Cochin, Coromandel, Madras.—Burma, Malaya, Hainan.

Remarks.—It attains 114 mm. (4½ inches) in length.

311. *Gerres oblongus* C.

1830. *Gerres oblongus* Cuvier, *Hist. nat. Poiss.*, 6, p. 479 (type-locality : Ceylon).

1889. *Gerres oblongus* Day, *Fauna Brit. India*, Fish., 1 p. 536.

Head 4.3, depth 4 in total length. Eyes 3 in head. Snout rather elevated. Mouth protractile, maxilla extending to below front border of eye. Preopercle entire. Villiform teeth in jaws, no canines. A single dorsal with spinous and soft parts equal ; 9 spines, the longest three-fourth the depth of body. Three anal spines. Dorsal and anal with scaly sheath. Lateral line scales 48-50. Silvery, with eyes golden.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal, Andamans; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Delagoa Bay, S. Africa, Malaya, Malay Archipelago, Philippines, Melanesia, Polynesia.

Remarks.—It attains at least 228 mm. (9 inches) in length.

312. *Gerres oyena* (Forsk.)

1775. *Labrus oyena* Forskal, *Descript. Animal.*, p. 35 (type-locality : Suez, Djedda).

1889. *Gerres oyena* Day, *Fauna Brit. India.*, Fish., 1, p. 538.

Head 4, depth 2.7 in total length. Eyes 3.5 in head. Mouth protractile, maxilla reaching to below first third of eye. Preopercle roughened but not serrated. Villiform teeth in jaws ; no canines. A single dorsal with spinous and soft parts equal , 9 strong spines, the longest less than depth of body, longer than the longest anal spine and as long as head, without snout. Three anal spines. Dorsal and anal with scaly sheath. Lateral line scales 38-40. Silvery, with dorsal edged black ; a dark spot often on the free portion of tail.

Distribution.—Seas of INDIA and PAKISTAN. It has been recorded from the coasts of Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, Andamans and Chilka Lake.—Ceylon, Red Sea, Aden, Zanzibar, Mauritius, Madagascar, S. Africa, Malaya, Malay Archipelago, Tonkin, Korea, Japan, Philippines, Melanesia, Micronesia, Polynesia, Queensland.

Remarks.—It attains at least 190 mm. (7½ inches) in length.

313. *Gerres poeti* C.

1829. *Gerres poeti* Cuvier, *Regne Animal.*, 2, ed. 2, p. 188 (type-locality : Moluccas).

1889. *Gerres poeti* Day, *Fauna Brit. India*, Fish., 1, p. 538.

Head 4.5, depth 3 in total length. Eyes 2.5 in head. Mouth protractile, maxilla reaching to below first third of eye. Villiform teeth in jaws ; no canines. A single dorsal with spinous and soft parts equal ; 9 spines, the longest less than depth of body, longer than the longest anal spine and as long as head without snout. Three anal spines. Dorsal and anal with scaly sheath. Lateral line scales 40. Silvery, with a dark edged dorsal ; somewhat distinct lines along rows of scales and body.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal, Andamans; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Red Sea, E. and S. coasts of Africa, Malaya, Malay Archipelago, Hainan, Philippines, Melanesia.

Remarks.—It attains 177 mm. (7 inches) in length.

314. *Gerres setifer* (Ham.)

1822. *Chanda setifer* Hamilton, *Fish. Ganges*, pp. 105, 370 (type-locality : estuaries).
 1889. *Gerres setifer* Day, *Fauna Brit. India*, Fish., 1, p. 536.
 1889. *Gerres lucidus* Day, *Fauna Brit. India*, Fish., 1 p. 539.

Head 4 to 4.2, depth 3 in total length. Eyes 3 in head. Mouth protractile, maxilla extending to below front border of eye. Preopercle, serrated. Villiform teeth in jaws ; no canines. A single dorsal with spinous and soft parts equal ; 10 spines, the longest about two-fifth the depth of body. Three anal spines, Dorsal and anal with sheath. Lateral line scales 38. Silvery, dorsal dark edged.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal, Chilka Lake ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Malaya, Siam, Hongkong.

Remarks.—It attains 102 mm. (4 inches) in length, ascends tidal rivers and is common in the Hoogly river at Calcutta. It is also the most common Indian species visiting the coasts in enormous numbers.

LXV Family POMADASYIDAE

154. Genus *Pomadasys* Lac.

1803. *Pomadasys* Lacepede, *Hist. nat. Poiss.*, 4, p. 517. (Type, *Sciaena argentea* Forsk.)

315. *Pomadasys argyreus* (V.)

1833. *Pristipoma argyreus* Valenciennes, *Hist. nat. Poiss.*, 9, p. 385 (type-locality : Coromandel Coast).
 1889. *Pristipoma guoraca* Day, *Fauna Brit. India*, Fish., 1, p. 512.

Head 3.5, depth 3 in total length. Eyes 3.3 to 3.6 in head. Gape of mouth not wide, maxilla hardly reaching to below front border of eye. A deep longitudinal groove below symphysis of lower jaw ; 2 small open pores under chin, no barbels. Preopercle serrated. Teeth in jaws villiform, without canines. A single dorsal with 12-13 spines ; spinous part longer than soft part. Three anal spines, 2nd the longest and stoutest, much longer than 3rd. Caudal cut square or slightly emarginate. Lateral line scales 45-47. Gill rakers 7+14. Silvery, without lateral bands and spots in adult ; an olive spot on opercle.

Distribution.—Seas of INDIA and PAKISTAN.—Ceylon, Mauritius, E. and S. coasts of Africa, Malay Archipelago, Siam, Melanesia, Philippines.

Remarks.—It grows to about 304 mm. (a foot) in length and has been captured in brackish waters.

316. *Pomadasys furcatus* (Schn.)

1801. *Grammistes furcatus* Schneider, *Syst. Ichth.*, Bloch, p. 187, pl. 43 (type-locality : " Mari Orientali ").
 1889. *Pristipoma furcatum* Day, *Fauna Brit. India*, Fish., 1, p. 510.

Head 4 to 4.2, depth 3 in total length. Eyes 3.3 to 4.2 in head. Gape of mouth small, reaching to below anterior nostril. A median groove under lower jaw ; 2 small open pores under chin ; no barbels. Preopercle serrated. Teeth in jaws villiform with an outer enlarged one in upper and a slightly enlarged one in lower jaw ; no canines. A single dorsal with 12-13 spines ; spinous part longer than soft part. Three anal spines, 2nd anal spine the longest being half as high as body and much longer than 3rd anal spine. Caudal notched. Lateral line scales 55-60. Gill rakers 7+10. Silvery, with 6 horizontal black bands on body, 3 above lateral line and 3 below it ; spinous dorsal with 3 rows of brown spots and with dark edge ; soft dorsal dark edged ; anal banded dark.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal ; PAKISTAN: coasts of Sind, E. Pakistan.—Ceylon, S. Arabia, Red Sea, Natal, Madagascar, Malaya, Malay Archipelago.

Remarks.—It attains at least 279 mm. (11 inches) in length.

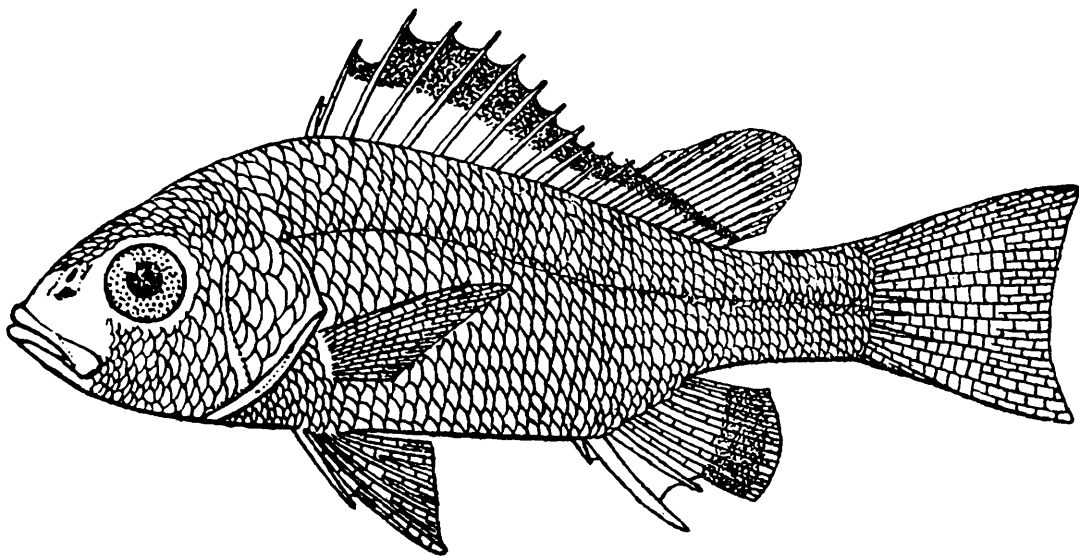
317. *Pomadasys hasta* (Bl.)

(Text-fig. 159)

1790. *Lutjanus hasta* Bloch, *Naturg. Ausland. Fische*, 4, p. 109 (type-locality : Japan).

1889. *Pristipoma hasta* Day, *Fauna Brit. India*, Fish., 1, p. 510.

Head 3 to 3.5, depth 3 to 3.3 in total length. Eyes 3 to 5 in head. Cleft of mouth moderate, maxilla extending to below front border or first third of eye. A median groove under lower jaw ; 2 small pores under chin ; no barbels. Preopercle serrated. Teeth in jaws villiform,



TEXT-FIG. 159.—Lateral view of *Pomadasys hasta* (Bl.). (After Day).

outer row somewhat enlarged ; no canines. A single dorsal with 12 spines ; spinous part longer than soft part. Three anal spines ; 2nd the longest equalling half depth of body, much longer than 3rd. Caudal emarginate. Lateral line scales 45-50. Gill rakers 12-13. Silvery grey with 4-5 dark interrupted lines along sides, 3 or 4 above lateral line often coalescing.

Distribution.—Seas of INDIA ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Oman, Red Sea, Natal, E. and S. coasts of Africa, Madagascar, Malaya, Malay Archipelago, Siam, Formosa, Hongkong, Korea, Japan, Philippines, Melanesia, Queensland.

Remarks.—It attains about 457 mm. ($1\frac{1}{2}$ feet) in length.

318. *Pomadasys maculatus* (Bl.)

1797. *Anthias maculatus* Bloch, *Naturg. Ausland. Fische*, 7, pl. 326, fig. 2 (type-locality : East Indies).

1889. *Pristipoma maculatum* Day, *Fauna Brit. India*, Fish., 1, p. 510.

Head 3.5, depth 3 to 3.2 in total length. Eyes 3.5 to 4 in head. Gape of mouth not wide, maxilla reaching to below front border of eye. A median groove under lower jaw ; open pores under chin ; no barbels. Preopercle serrated. Teeth in jaws villiform, outer row slightly the longest ; no canines. A single dorsal with 12 spines ; spinous part longer than soft part. Three anal spines, 2nd spine not longer or as long as the 3rd. Caudal emarginate. Lateral line scales 52-56 ; scales in oblique rows above lateral line and in horizontal series below it. Gill rakers 13-14. Silvery shot with purple on head ; nape and back with series of incomplete cross bars often forming blotches ; spinous dorsal with a black blotch.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal, Andamans ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Red Sea, Aden, Natal, E. and S. coasts of Africa, Malaya, Malay Archipelago, Siam, Formosa, China, Philippines, Melanesia, Queensland.

Remarks.—It attains at least 406 mm. ($1\frac{3}{4}$ feet) in length.

155. Genus *Plectorhynchus* Lac.

1802. *Plectorhynchus* Lacepede, *Hist. nat. Poiss.*, 3, p. 134. (Type, *P. chaetodontoides* Lac.)

319. *Plectorhynchus niger* (C.)

1830. *Pristipoma niger* Cuvier, *Hist. nat. Poiss.*, 5, p. 258 (type-locality : Manila).

1889. *Diagramma crassispinum* Day, *Fauna Brit. India*, Fish., 1, p. 514.

Head 3.5, depth 3 in total length. Eyes 4.5 in head. Mouth small, maxilla not reaching to below front border of eye. No median groove below lower jaw ; 6 pores under chin ; no barbels. Preopercle serrated. Teeth in jaws villiform ; no canines. A single dorsal with 14 spines ; spinous part longer than soft part. Three anal spines. Caudal broadly rounded. Lateral line scales 50-60. Gill rakers 18-20. Greyish to slaty grey, shot with violet over head, brassy tinged on body ; fins dark, a few irregular coppery spots on body.

Distribution —INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Burma, Ceylon, Red Sea, Natal, Madagascar, S. and E. coasts of Africa, Malaya, Malay Archipelago, Siam, China, Philippines, Melanesia, Polynesia, Queensland.

Remarks.—It attains 609 mm. (2 feet) or more in length and is good eating..

320. *Plectorhynchus picta* (Thunberg)

1792. *Perca picta* Thunberg, *Kon. Vet. Akad. Naya. Handl. Stockholm*, 13, p. 143 (type-locality : Japan).
 1889. *Diagramma pictum* Day, *Fauna Brit. India*, Fish., 1, p. 518.
 1889. *Diagramma punctatum* Day, *Fauna Brit. India*, Fish., 1, p. 518.

Head 4·2 to 4·5, depth 3·5 to 3·7 in total length. Eyes 3·5 to 4·5 in head. Mouth small, maxilla reaching to below posterior nostril or front border of eye. No median groove below lower jaws ; 6 pores under chin, no barbels. Preopercle serrated. Villiform teeth in jaws ; no canines. A single dorsal with 9-10 spines ; spinous part more or less equal to soft part. Three anal spines. Caudal rounded in young and emarginate in adult. Lateral line scales 90-110. Gill rakers 11-14. Greyish with darker spots and grey fins ; young yellowish orange with brown or black horizontal markings or bands on body ; fins yellow streaked and blotched with black.

Distribution.—Seas of INDIA and PAKISTAN. Mostly found along the coasts of Bombay, Malabar, Travancore-Cochin, Andamans and Sind.—Ceylon, Persian Gulf, Red Sea, Aden, Zanzibar, Seychelles, Madagascar, Natal, S. and E. coasts of Africa, Malaya, Malay Archipelago, Siam, Hongkong, Formosa, Korea, Japan, Philippines, Melanesia, Micronesia, Polynesia, New South Wales, Queensland.

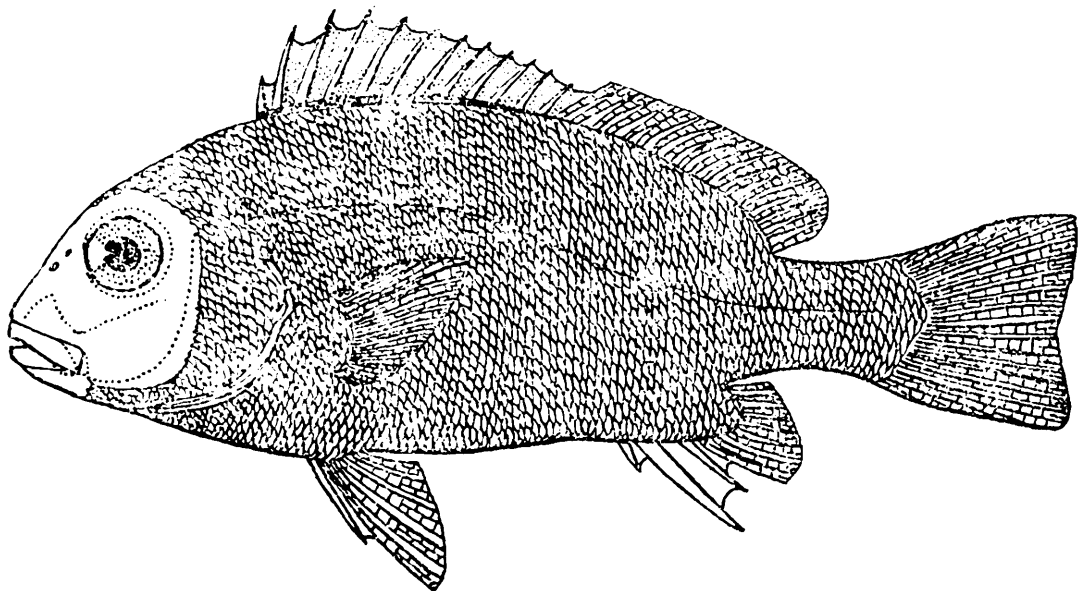
Remarks.—It attains at least 609 mm. (2 feet) in length.

321. *Plectorhynchus schotaf* (Forsk.)

(Text-fig. 160)

1775. *Sciaena schotaf* Forskal, *Descript. Animal.*, p. 51 (type-locality : Arabia).
 1889. *Diagramma griseum* Day, *Fauna Brit. India*, Fish., 1, p. 517, fig. 156.

Head 3·6 to 4, depth 3 in total length. Eyes 3·5 in head. Mouth small, maxilla reaching to below posterior nostril. No median groove



TEXT-FIG. 160.—Lateral view of *Plectorhynchus schotaf* (Forsk) (After D

under surface of lower jaw ; 6 pores under chin ; no barbels. Preopercle serrated. Teeth in jaws villiform ; no canines. A single dorsal with

11-12 spines ; spinous part somewhat equal to soft part. Three anal spines ; caudal cut square or faintly emarginate. Lateral line scales 63 ; scales in oblique rows above lateral line. Uniform gray or olive grey, fins black ; young with narrow blue lines over snout and cheeks and on sides.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel ; PAKISTAN : coasts of Sind, Karachi, Makran, Baluchistan.—Arabia, Red Sea, Aden, Seychelles, Melanesia, Polynesia.

Remarks.—It attains at least 457 mm. (1½ feet) in length.

LXVI. Family SCIAENIDAE

156. Genus *Sciaena* L.

1758. *Sciaena* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 288. (Type, *S. cirrosa* L.)
 1817. *Umbrina* Cuvier, *Regne Animal.*, 2, ed. 1, p. 297. (Type, *Scieena cirrosa* L.)

322. *Sciaena dussumieri* (V.)

1833. *Umbrina dussumieri* Valenciennes, *Hist. nat. Poiss.*, 9, p.481 (type-locality : Coromandel, India).
 1889. *Sciaena dussumieri* Day, *Fauna Brit. India*, Fish., 2, p. 110.

Head 4 to 4.2, depth 4.2 to 4.5 in total length. Eyes 3.5 to 3.7 in head. Dorsal profile convex, ventral profile more or less horizontal upto anal. Upper jaw overhanging lower jaw. Mouth inferior ; snout obtuse, inflated, with pores. Cleft of mouth nearly horizontal. A barbel about half of eye ; mandibular symphysis with a basal and 2 lateral pores. Teeth in villiform bands in both jaws without any true canines. Two dorsals, the first with 10 spines ; second much longer than first and connected with it. Two anal spines. Caudal wedge-shaped in young and somewhat obtuse and rounded in adult. Lateral line scales 50-52. Gill rakers 4+8-9. Deep brown with coppery reflections, becoming lighter below ; fins reddish brown, first dorsal tinted with black ; pelvics yellow.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal ; PAKISTAN: coasts Sind, East Pakistan.—Ceylon, Madagascar, S. AFRICA, Malaya, Malay Archipelago, Indo-China, Formosa, Canton, Philippines.

Remarks.—It attains at least 203-228 mm. (8 or 9 inches) in length.

323. *Sciaena russellii* (C.)

1830. *Umbrina russellii* Cuvier, *Hist. nat. Poiss.*, 5, p. 178 (type-locality : Coromandel).
 1889. *Sciaena russellii* Day, *Fauna Brit. India*, 2, Fish., 2, p. 110.

Head 4 to 4.3, depth 3.7 to 4 in total length. Eyes 3.5 to 4 in head. Dorsal profile convex, ventral profile more or less horizontal upto anal. Upper jaw overhanging lower jaw. Mouth inferior ; snout blunt, prominent, with pores. Cleft of mouth nearly horizontal. A barbel about three-fourth or equal to eye at mandibular symphysis with basal and lateral pores. Teeth in villiform band in both jaws, without any true

canines. Two dorsals, the first with 10 spines ; second much longer than first and connected with it. Two anal spines. Caudal wedge-shaped. Lateral line scales 44. Gill rakers 6+10. Grey above and silvery white below ; a steel blue opercular spot ; first dorsal with its upper $\frac{2}{3}$ tinted black ; other fins yellow.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal, Chilka Lake ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Malaya, Malay Archipelago, S. China, Philippines.

Remarks.—It attains at least 254 mm. (10 inches) in length.

157. Genus *Pseudosciaena* Blkr.

1863. *Pseudosciaena* Bleeker, *Nat. Tijds. Dierk.*, 1, p. 142. (Type, *Corvina amblyiceps* Blkr., orthotypic.)

324. *Pseudosciaena axillaris* (C.)

1830. *Corvina axillaris* Cuvier, *Hist. nat. Poiss.*, 5, p. 112 (type-locality : Malabar).
1889. *Sciaena axillaris* Day, *Fauna Brit. India*, Fish., 2, p. 116.

Head 4.2 to 4.5, depth 3.3 to 3.6 in total length. Eyes 4 in head. Dorsal profile more convex than ventral profile. Upper jaw not overhanging lower jaw. Mouth terminal ; snout more or less pointed, not prominent, not inflated, without pores. Cleft of mouth wide, oblique, maxilla reaching to below hind edge of eye. No mental barbel. A knob below symphysis of lower jaw ; with a median and 2 lateral pores. Teeth in villiform bands in both jaws ; two canines. Two dorsals, the first with 10 spines ; second much longer than first and connected with it. Two anal spines ; 2nd anal spine 2.3 in head. Caudal wedge-shaped. Lateral line scales 50. Silvery shot with purple, with a black spot on axilla ; upper two-third of first dorsal black, fins greyish.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Malay Archipelago, Siam, S. China, Philippines, Melanesia, Queensland.

Remarks.—It attains 254 mm. (10 inches) in length.

325. *Pseudosciaena coibor* (Ham.)

1822. *Bola coibor* Hamilton, *Fish. Ganges*, pp. 78, 362 (type-locality : larger estuaries of the Ganges).
1889. *Sciaena albida* Day, *Fauna Brit. India*, Fish., 2, p. 117.

Head 3.7 to 5, depth 4 in total length. Eyes 4 (in young) 7 (in adult) in head. Dorsal and ventral profiles more or less equal in (adult). Upper jaw not overhanging lower jaw. Mouth terminal ; snout somewhat blunt, not overhanging mouth, with 3 small pores. Cleft of mouth slightly oblique, maxilla extending to below last third or hind border of eye. No mental barbel. A blunt knob below symphysis of lower jaw ; with a median and 2 pairs of lateral pores. Teeth in villiform bands in both jaws with true canines. Two dorsals, the first with 9-10 spines ; second much longer than first and connected with it. Two anal spines, 2nd anal spine half in head. Caudal wedge-shaped

in young, rounded in adult. Lateral line scales 52. Silvery, with a light streak along each row of scales ; pelvics, anal and caudal yellowish ; dorsals stained black.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, Baluchistan, E. Pakistan.—Burma, Ceylon, Malaya, Malay Archipelago, Australia (Norman River).

Remarks.—It attains at least 914 mm. (3 feet) in length.

326. *Pseudosciaena diacanthus* (Lac.)

1802. *Lutjanus diacanthus* Lacepede, *Hist. nat. Poiss.*, 4, pp. 195, 240 (type-locality : not given).

1889. *Sciaena diacanthus* Day, *Fauna Brit. India, Fish.*, 2, p. 118.

Head 4 to 4.2, depth 4.2 to 5 in total length. Eyes 4.5 to 6 in head. Dorsal profile more or less convex, ventral profile, straight upto anal. Upper jaw slightly longer than lower. Mouth oblique, maxilla reaching to hind border or beyond eye. Snout bluntly pointed, with pores. No mental barbel. Five pores under lower jaw. A median tubercle below symphysis of lower jaw. Teeth in villiform bands in both jaws, with true canines. Two dorsals, the first with 10 spines ; the second much longer than first and connected with it. Two anal spines, 2nd anal spine 2.7 in head. Caudal wedge-shaped. Lateral line scales 52. Gill rakers 6+9. Brownish grey with silvery reflections on back, becoming silvery grey beneath ; fins yellowish with black dots.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Malaya, Malay Archipelago, Siam, S. China, Philippines.

Remarks.—It attains 1,524 mm. (5 feet) in length and ascends tidal rivers and estuaries and is found in the Hooghly as high as Calcutta.

327. *Pseudosciaena sina* (C.)

1830. *Corvina sina* Cuvier, *Hist. nat. Poiss.*, 5, p. 122 (type-locality : Pondicherry).

1889. *Sciaena vogleri* Day, *Fauna Brit. India, Fish.*, 2, p. 113.

1889. *Sciaena sina* Day, *Fauna Brit. India, Fish.*, 2, p. 114.

Head 4 to 4.5, depth 3.5 to 4 in total length. Eyes 4 in head. Dorsal profile more or less convex, ventral profile rather straight upto anal. Jaws subequal. Mouth terminal, maxilla extending to last third or hind border of eye. Snout a little inflated, not overhanging mouth. No mental barbel. Five pores under lower jaw. Teeth in villiform bands in both jaws, with true canines. Two dorsals, the first with 10 spines ; the second much longer than first and connected with it. Two anal spines, 2nd anal spine 3.5 in head. Caudal wedge-shaped. Lateral line scales 52. Gill rakers 4-8+9-18. Silvery brown above becoming lighter and shot with gold below ; first dorsal blackish in outer half, other fins grey.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN : coasts of Gwadur, Sind, Karachi, Makran, E. Pakistan.—Ceylon, Arabia,

Zanzibar, Natal, Madagascar, E. and S. coasts of Africa, Malay Archipelago, S. China, Japan, Phillipines.

Remarks.—It attains 1,524-1,828 mm. (5 or 6 feet) in length and is much valued as food ; its air bladder is extensively collected for isinglass.

328. *Pseudosciaena soldado* (Lac.)

1802. *Holocentrus soldado* Lacepede, *Hist. nat. Poiss.*, 4, pp. 344, 389 (type-locality : "Cayenne" East Indies).

1889. *Sciaena miles* Day, *Fauna Brit. India*, Fish. 2, p. 113.

Head 3.2 to 4.5, depth 3.2 to 4 in total length. Eyes 4.5 to 5 in head. Dorsal profile convex, ventral rather straight upto anal. Jaws subequal. Mouth terminal ; cleft of mouth oblique, maxilla reaching to below hind border of eye. Snout pointed, not prominent, with 5 pores. No mental barbel. Five pores under lower jaw. Villiform teeth, in lower jaw with the inner row distantly placed and enlarged. Two dorsals, the first with 9-10 spines ; the second much longer than first and connected with it. Two anal spines, 2nd anal spine about half head. Caudal wedge-shaped. Lateral line scales 50. Gill rakers 13. Greyish green above becoming white below.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Mozambique, Madagascar, S. Africa, Malaya, Malay Archipelago, Siam, Indo-China, Hongkong, Phillipines, Queensland.

Remarks.—It attains at least 609 mm. (2 feet) in length.

158. Genus *Johnius* Bloch

1793. *Johnius* Bloch, *Naturg. Ausland. Fische*, 7, p. 132. (Type, *J. carutta* Bl., logotypic.)

329. *Johnius belengerii* (C.)

1830. *Corvina belengerii* Cuvier, *Hist. Nat. Poiss.*, 5, p. 120 (type-locality : Malabar).

1889. *Sciaena belengeri* Day, *Fauna Brit. India*, Fish., 2, p. 120.

Head 4.3 to 4.5, depth 4 to 4.5 in total length. Eyes 3.5 to 3.7 in head, in anterior half of head. Snout rounded with 5 pores across its base, a central pore along its quadrilobate free border. Cleft of mouth inferior, almost horizontal, maxilla reaching to below midorbit. No mental barbel ; 5 mental pores. Teeth in jaws in villiform bands, subequal ; no enlarged row in lower jaw ; no canines. Two dorsals, the first dorsal with 9 spines ; spinous dorsal shorter than soft dorsal. Two anal spines, second anal spine 2.2-2.5 in depth of body. Outer pelvic ray prolonged. Caudal wedge-shaped. Lateral line scales 52. Dark grey becoming lighter below ; dorsals, anal and caudal nearly black.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Malaya, Malay Archipelago, Cochin China, S. China.

Remarks.—It attains 304 mm. (a foot) in length and is much more common on the Western coasts of India than in the Bay of Bengal.

330. *Johnius carutta* Bl.

1793. *Johnius carutta* Bloch, *Nat. Ausl. Fische*, 7, p. 133, pl. 356 (type-locality : Tranquebar).

1889. *Sciaena carutta* Day, *Fauna Brit. India*, Fish., 2, p. 122.

Head 4 to 4.3, depth 4 in total length. Eyes 4 in head. Snout swollen, with a row of pores at its base and 5 along its free lobate border. Upper jaw longer, overhanging lower. Cleft of mouth inferior, horizontal, maxilla reaching to midorbit. No mental barbel ; 5 mental pores. Teeth in jaws in villiform bands ; no enlarged row in lower jaw ; no canines. Two dorsals, the first with 10 spines. Two anal spines ; second anal spine, one third depth of body. Outer pelvic ray prolonged. Caudal wedge-shaped. Lateral line scales 50. Gill rakers 4+9. Purplish brown becoming golden at sides and lighter below ; first dorsal, dark, other fins grey edged.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, W. Pakistan.—Ceylon, Malaya, Malay Archipelago, Siam, S. China.

Remarks.—It attains 304 mm. (a foot) in length.

331. *Johnius dussumieri* (C.)

1830. *Corvina dussumieri* Cuvier, *Hist. nat. Poiss.*, 5, p. 119 (type-locality : Malabar).

1889. *Sciaena glauca* Day, *Fauna Brit. India*, Fish., 2, p. 122.

Head 4.3 to 4.5, depth 4.2 in total length. Eyes 3.7 to 4.2 in head. Snout rounded, with 3 pores across its base and 5 along its quadrilobate free border. Upper jaw longer, overhanging the lower. Cleft of mouth inferior, almost horizontal, maxilla reaching to midorbit. No mental barbel ; 5 mental pores. Teeth in jaws in villiform bands ; no enlarged row in lower jaw ; no canines. Two dorsals, the first with 10 spines, shorter than soft dorsal. Two anal spines, second anal spine about 2.2-2.5 in depth of body. Outer pelvic ray prolonged. Caudal rounded or wedge-shaped. Lateral line scales 50. Greyish green above and silvery below ; first dorsal nearly black.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal, Andamans ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Natal, Malaya, Malay Archipelago, Siam, S. China, Korea, Philippines, Melanesia.

Remarks.—It has been collected upto 203 mm. (8 inches) in length, but according to Dr. F. Day attains a larger size.

332. *Johnius osseus* (Day)

1876. *Sciaena osseus* Day, *Fish. India*, p. 193, pl. 46, fig. 3 (type-locality : Malabar).

1889. *Sciaena osseus* Day, *Fauna Brit. India*, Fish., 2, p. 123.

Head 4.2, depth 4.2 in total length. Eyes 5 in head. Snout obtuse, not swollen, with 3 pores across its base and 5 along its non-lobate free border. Upper jaw longer, overhanging lower. Cleft of mouth slightly oblique, maxilla reaching to hind border of eye. No mental barbel ;

6 mental pores. Teeth in jaws in villiform bands ; no enlarged teeth in lower jaw ; no canines. Two dorsals ; first with 10 spines ; spinous dorsal shorter than soft dorsal. Two anal spines ; second anal spine about one-third the depth of body. Outer pelvic ray not produced. Caudal wedge-shaped. Lateral line scales 50. Gill rakers 2+7. Brownish grey above becoming dull white below.

Distribution.—INDIA : coasts of Cutch, Bombay, Baroda, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal; PAKISTAN: coasts of Sind, E. Pakistan.—Ceylon, Malaya.

Remarks.—It attains at least 177 mm. (7 inches) in length.

333. *Johnius semiluctuosus* (C.)

1830. *Corvina semiluctuosus* Cuvier, *Hist. nat. Poiss.*, 5, p. 106 (type-locality: Malabar).

1889. *Sciaena semiluctuosa* Day, *Fauna Brit. India*, Fish., 2, p. 121.

Head 3.5 to 4, depth 3.5 to 4 in total length. Eyes 4.5 to 6 in head. Snout a little swollen, with 3 pores across its base and 5 along its lobate free border. Upper jaw longer, overhanging lower. Cleft of mouth inferior, somewhat horizontal, maxilla extending to midorbit. No mental barbel ; 5 mental pores. Teeth in jaws in villiform bands ; no enlarged teeth in lower jaw ; no canines. Two dorsals, the first with 10 spines ; spinous dorsal shorter than soft dorsal. Two anal spines, second anal spine about three-seventh the depth of body. Outer pelvic ray prolonged. Caudal wedge-shaped or rounded. Lateral line scales 55-60. Deep grey becoming lighter below, with a blackish band along centre of each row of scales ; fins deep black.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal; PAKISTAN : coasts of Baluchistan, Sind, E. Pakistan.—Malaya, Malay Archipelago, Philippines, China.

Remarks.—It attains 457 mm. (1½ feet) in length.

159. Genus *Pama* Fowler

1933. *Pama* Fowler, *Bull. U. S. nat. Mus.*, 12, p. 360. (Type, *Bola pama* Ham.)

334. *Pama pama* (Ham.)

1822. *Bola pama* Hamilton, *Fish. Ganges*, pp. 79, 368 (type-locality : Calcutta).

1889. *Sciaenoides pama* Day, *Fauna Brit. India*, Fish., 2, p. 124.

Head 4.3 to 4.6, depth 5 to 6 in total length. Eyes 7 to 8 in head. Snout more or less pointed, with 2 pores on its anterior surface and 2 more on the free border. Jaws subequal, upper not overhanging lower. Cleft of mouth oblique, maxilla reaching to behind orbit. No mental barbel, 2 small mental pores. Teeth in jaws in villiform bands ; enlarged row in lower jaw with canines. Two dorsals, the first with 10 spines ; the spinous dorsal shorter than soft dorsal. Two anal spines, second anal spine equal to eye diameter. Caudal wedge-shaped with central rays a little prolonged. Lateral line scales 55. Light brownish above becoming white below ; fins yellowish, upper half of dorsal and last half of dorsal and last half of caudal grey.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal; PAKISTAN: coasts of Sind, E. Pakistan.—Burma, Malaya, Malay Archipelago, Siam.

Remarks.—It attains at least 1,524 mm. (5 feet) in length and ascends tidal rivers and estuaries.

160. Genus *Otolithoides* Fowler

1860. *Sciaenoides* (nec Richardson, 1843) Blyth. *J. Asiat. Soc. Beng.*, **29**, p. 139. (Type, *S. biauritus* Blyth, inadmissible.)
 1933. *Otolithoides* Fowler, *Bull. U. S. nat. Mus.*, **12**, p. 364. (Type, *Sciaenoides biauritus* Blyth, orthotypic.)

335. *Otolithoides biauritus* (Cantor)

- 1849 (1850). *Otolithus biauritus* Cantor, *J. Asiat. Soc. Beng.*, **18**, p. 1039 (type-locality : Sea of Penang).
 1889. *Sciaenoides biauritus* Day, *Fauna Brit. India*, Fish., **2**, p. 126.

Head 4 to 4.3, depth 5 to 6 in total length. Eyes 7 to 8 in head. Mouth terminal, snout more or less pointed, non-lobate, with 5 pores. Cleft of mouth oblique, maxilla reaching to below last third or hind border of eye. No mental barbel ; 4 small mental pores. Teeth in jaws in villiform bands ; enlarged row in lower jaw ; canines present. Two dorsals, the first with 9 spines ; spinous dorsal shorter than soft dorsal. Two anal spines, 2nd anal spine one-fourth in head. Caudal wedge-shaped. Lateral line scales 60-70. Light brown above becoming paler below.

Distribution.—Seas and estuaries of INDIA and PAKISTAN.—Malaya, Malay Archipelago, Siam.

Remarks.—A specimen in the Indian Museum at Calcutta is 1,066 mm. (3½ feet) in length.

161. Genus *Otolithes* Oken

1817. *Otolithes* (Cuvier) Oken, *Isis*, p. 1182. (Type, *Johnius ruber* Bl.)

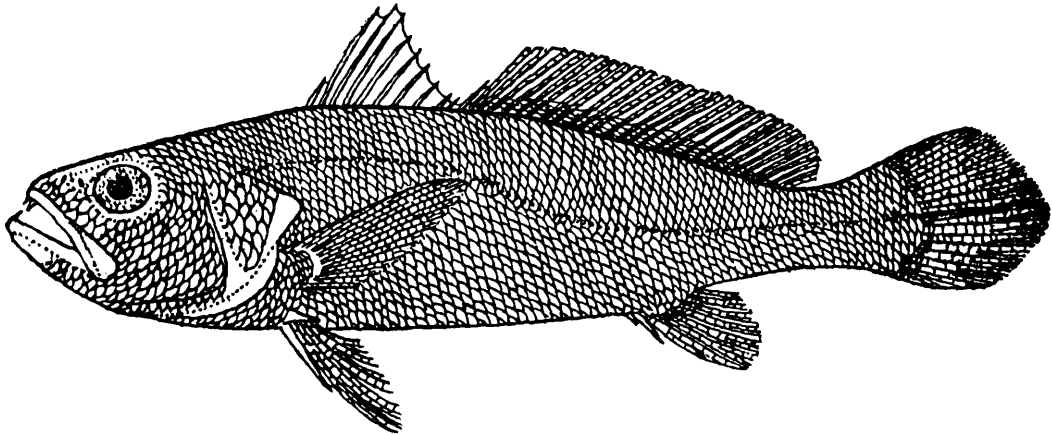
336. *Otolithes argenteus* C.

(Text-fig. 161)

1830. *Otolithes argenteus* Cuvier, *Hist. nat. Poiss.*, **5**, p. 62 (type-locality : Batavia Malabar).
 1889. *Otolithes argenteus* Day, *Fauna Brit. India*, Fish., **2**, p. 129.

Head 3.7 to 4.3, depth 4.5 to 5 in total length. Eyes 4 to 4.5 in head. Mouth terminal ; snout more or less pointed, non-lobate with an open pore. Cleft of mouth oblique, lower jaw prominent, maxilla reaching to midorbit. No mental barbel ; no mental pores. Teeth in jaws in villiform bands, with large canines. Two dorsals, the first with 10 spines ; spinous dorsal shorter than soft dorsal. Two anal spines ; anal base equals one-fifth of soft dorsal base. Caudal wedge-shaped. Lateral line scales 54. Gill rakers 5+8. Silvery grey above and lighter below, with 4 dark longitudinal bands on sides.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Aden,



TEXT-FIG. 161.—Lateral view of *Otolithes argenteus* C. (After Day.)

Madagascar, Africa, Malaya, Malay Archipelago, Siam, China, Philippines, Queensland.

Remarks.—It attains 762 mm. ($2\frac{1}{2}$ feet) and upwards in length.

337. *Otolithes maculatus* C.

1830. *Otolithes maculatus* Cuvier, *Hist. nat. Poiss.*, 5, p. 64 (type-locality: Batavia).

1889. *Otolithes maculatus* Day, *Fauna Brit. India*, Fish., 2, p. 127.

Head 3.5 to 4.2, depth 5.5 to 6 in total length. Eyes 6 to 7 in head. Mouth terminal ; snout more or less pointed, non-lobate, with 3 small open pores. Cleft of mouth oblique, lower jaw prominent, maxilla reaching to last third or hind border of eye. No mental barbel ; no mental pores. Teeth in jaws in villiform bands, with large canines. Two dorsals, the first with 9-10 spines, spinous dorsal shorter than soft dorsal. Two anal spines ; anal base equals one-third the soft dorsal base. Caudal wedge-shaped or rounded. Lateral line scales 80-85. Gill rakers 5+8. Greyish above, golden below with 5-6 rows of black spots on body and caudal fin.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Orissa, W Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Burma, Ceylon, Malaya, Malay Archipelago, Siam.

Remarks.—It attains at least 406 mm. ($1\frac{1}{3}$ feet) in length and is very common in the seas and estuaries of Orissa and lower Bengal.

LXVII. Family LETHRINIDAE

162. Genus *Lethrinus* C.

1829. *Lethrinus* Cuvier, *Regne Animal.*, 2, ed. 2, p. 182. (Type, *Sparus choerorhynchus* Bl. Schn.)

338. *Lethrinus nebulosa* (Forsk.)

1775. *Sciaena nebulosa* Forkal, *Descript. Animal.*, p. 52 (type-locality : Arabia).

1889. *Lethrinus nebulosus* Day, *Fauna Brit. India*, Fish., 2, p. 39.

1889. *Lethrinus karwa* Day, *Fauna Brit. India*, Fish., 2, p. 38.

Head 3·6, depth 4 in total length. Eyes 5 in head. Snout pointed, compressed, maxilla reaching to below front nostril. Villiform teeth in anterior part of jaws ; with canines ; lateral teeth conical, pointed. A single dorsal with 10 spines. Pelvics reach anal spine. Caudal emarginate. Lateral line scales 48-50. Cheeks scaleless. Gill rakers 4+5-8. Olive brown becoming paler below ; a dark blotch behind posterior upper angle of eye ; narrow oblique dark bands from eye and opercle to upper jaw ; a large blotch on the opercle ; 8 faint cross bands from back to middle of body.

Distribution.—Seas of INDIA and PAKISTAN.—Burma, Ceylon, Arabia, Red Sea, Suez, Seychelles, S. Africa, Malaya, Malay Archipelago, Siam, Hongkong, China, Philippines, Micronesia, Polynesia, Queensland.

Remarks.—It attains 304 mm. (a foot) in length.

LXVIII. Family MULLIDAE

163. Genus *Upeneus* C.

1829. *Upeneus* Cuvier, *Regne Animal.*, 2, ed. 2, p. 160. (Type, *Mullus vittatus* Forsk.)
 1849. *Upeneoides* Bleeker, *Verh. Bat. Gen.*, 22, p. 64. (Type, *Mullus vittatus* Forsk.)

339. *Upeneus sulphureus* C.

1829. *Upeneus sulphureus* Cuvier, *Hist. nat. Poiss.*, 3, p. 333 (450) (type-locality : Anjer, Straits of Sunda).
 1889. *Upeneoides sulphureus* Day, *Fauna Brit. India.*, Fish., 2, p. 25.

Head 4 to 4·3, depth 4·2 to 4·5 in total length. Eyes 3·5 to 3·7 in head. Two stiff barbels below chin. Teeth in an uninterrupted, semi-lunar band on vomer. Two dorsals distantly placed, the first with 8 spines. No anal spines. Lateral line scales 35. Gill rakers 19-22. Reddish chestnut above and yellowish silvery below ; a bright yellow stripe from eye to caudal and 2-3 below and parallel to it ; a purplish blotch on opercle and subopercle ; caudal reddish, without bars.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal, Andamans ; PAKISTAN: coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, S. Africa, Malaya, Malay Archipelago, Siam, Hongkong, China, Japan, Philippines, Melanesia, Polynesia.

Remarks.—It attains at least 127 mm. (5 inches) in length.

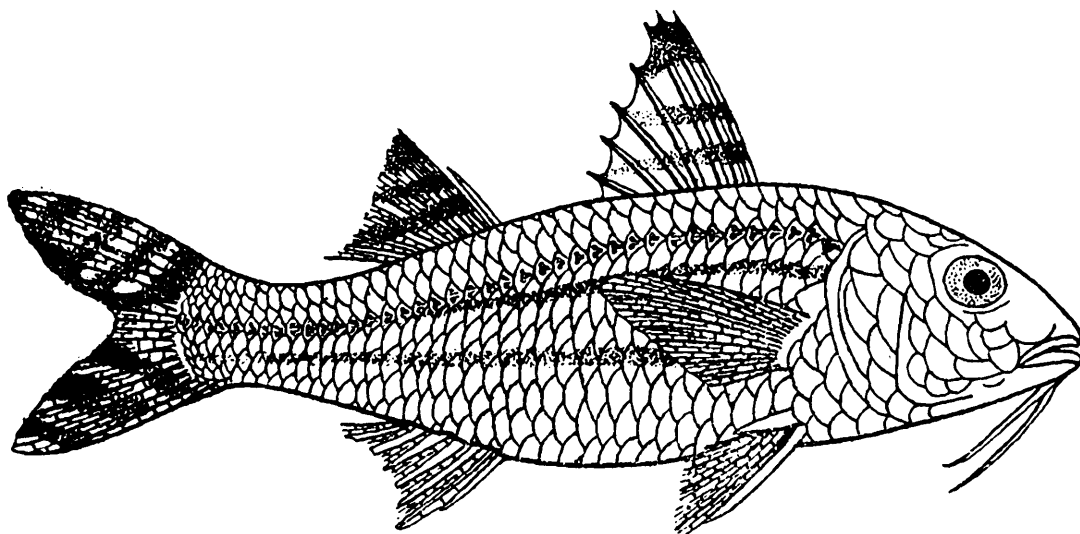
340. *Upeneus vittatus* (Forsk.)

(Text-fig. 162)

1775. *Mullus vittatus* Forskal, *Descript. Animal.*, pp. 10, 31 (type-locality : Djedda, Red Sea).
 1889. *Upeneoides vittatus* Day, *Fauna Brit. India*, Fish., 2, p. 25.

Head 4·2, depth 4·2 to 4·7 in total length. Eyes 3·2 to 3·7 in head. Two stiff barbels below chin. Teeth in single row on vomer. Two dorsals distantly placed, the first with 8 spines. No anal spines. Lateral line scales 38-39. Gill rakers 16-20. Chestnut on back, golden below ;

2-3 bright yellow longitudinal stripes on side ; upper caudal lobe tipped black with 6 yellowish brown cross bars and lower tipped white with 3 such bars.



TEXT-FIG. 162.—Lateral view of *Upeneus vittatus* (Forsk.). (After Day).

Distribution.—INDIA ; coasts of Cutch, Baroda. Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN ; coasts of Sind, E. Pakistan.—Burma, Ceylon, Arabia, Red Sea, Aden, Zanzibar, Natal, Madagascar, S. Africa, Malaya, Malay Archipelago, Siam, Hongkong, Japan, Philippines, Melanesia, Micronesia, Polynesia, Queensland.

Remarks.—It attains 127 mm. (5 inches) in length.

LXIX. Family PSETTIDAE

164. Genus *Monodactylus* Lac.

1802. *Monodactylus* Lacepede, *Hist. nat. Poiss.*, 3, p. 131. (Type, *M. falciformis* Lac.)
 1829. *Psettus* Cuvier, *Regne Animal.*, 2, ed. 2, p. 193. (Type, *Chaetodon rhombeus* Bl. Schn.)

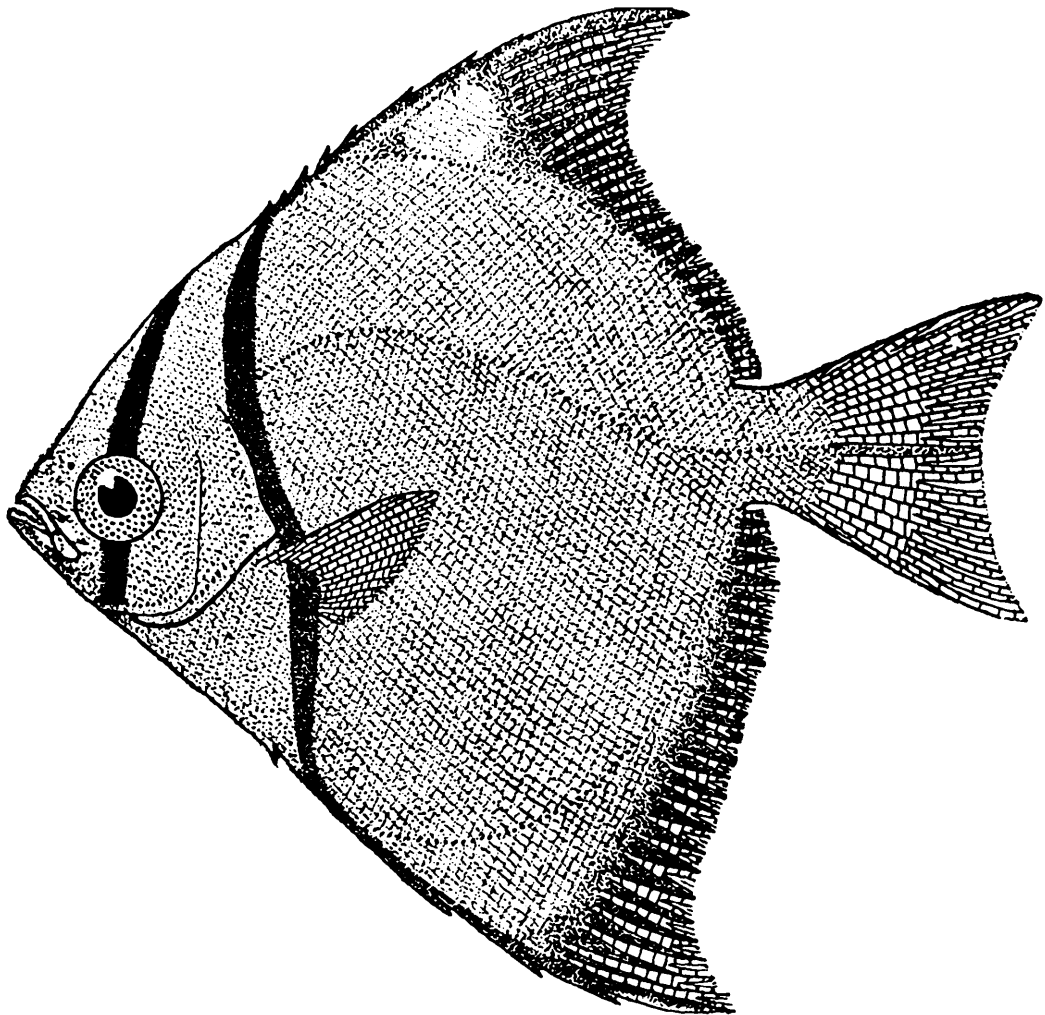
341. *Monodactylus argenteus* (L.)

(Text-fig. 163)

1758. *Chaetodon argenteus* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 272 (type-locality : Indies).
 1889. *Psettus argenteus* Day, *Fauna Brit. India, Fish.*, 2, p. 180.

Head 4 to 4.3, depth 1.5 in total length. Eyes 2.3 in head. Body much compressed, elevated. Cleft of mouth small, oblique. Teeth in villiform bands in both jaws. A single dorsal, with 8 spines ; anterior dorsal rays elongated, falciform. Pelvics close together like 2 spines, the rays rudimentary. Three anal spines, anterior anal rays elongated, falciform. Lateral line scales 75. Gill rakers 16-19. Silvery with 2 black bands, the first across eye, the second across opercle, disappearing with age.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal, Andamans ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Muscat, Red



TEXT-FIG. 163.—Lateral view of *Monodactylus argenteus* (L.). (After Day).

Sea, Aden, Zanzibar, Natal, Madagascar, Seychelles, S. Africa, Malaya, Malay Archipelago, Siam, Canton, Philippines, Melanesia, Micronesia, Polynesia, New South Wales, Queensland.

Remarks.—It attains at least 177 mm. (7 inches) in length ; most common in Malabar during the monsoon months.

342. *Monodactylus falciformis* Lac.

1800. *Monodactylus falciformis* Lacepede, *Hist. nat. Poiss.* 2, pl. 5, fig. 4 (type-locality : not given).

1889. *Psettus falciformis* Day, *Fauna Brit. India*, Fish., 2, p. 180.

Head 4 to 4.3, depth 2 to 2.1 in total length. Eyes 2.5 in head. Body much compressed, elevated. Cleft of mouth small, oblique. Teeth in villiform bands in both jaws. A single dorsal, with 8 spines almost concealed ; anterior dorsal rays elongated, falciform. Pelvics close together like 2 spines, the rays rudimentary. Three anal spines ; anterior anal rays elongated, falciform. Lateral line scales 100. Silvery with no bands.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Red Sea, S. Africa, Madagascar, Malaya, Malay Archipelago, Siam, China, Polynesia.

Remarks.—It attains at least 228 mm. (9 inches) in length.

LXX. Family SPARIDAE

165. Genus *Argyrops* Swainson

1839. *Argyrops* Swainson, *Nat. Hist. Fish. Animal.*, 2, p. 221. (Type, *Sparus spinifer* Forsk.)

343. *Argyrops spinifer* (Forsk.)

1775. *Sparus spinifer* Forskal, *Descript. Animal.*, p. 32 (type-locality : Djedda, Red Sea).
1889. *Pagrus spinifer* Day, *Fauna Brit. India*, Fish., 2, p. 42.

Head 3·6 to 3·7, depth 2·3 to 2·5 in total length. Eyes 3·3 to 4 in head. Dorsal profile more convex than ventral profile. Two rows of well developed molars in jaws. A single dorsal, with 11-12 flexible, often elongated, spines (2nd to 5th) ; spinous part longer than soft part. Three anal spines, 2nd the longest. Pectorals much longer than head. Pelvics reaching anus. Caudal emarginate. Lateral line scales 53. Scales on interorbital. Gill rakers 9-10. Rosy or whitish with pink bars passing along centre of scale rows becoming indistinct below middle of body.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal ; PAKISTAN: coasts of Sind, Makran, E. Pakistan.—Ceylon, Persian Gulf, Arabia, Red Sea, Zanzibar, Madagascar, Natal, S. Africa, Portuguese E. Africa, Malay Archipelago, Formosa, Philippines, Queensland.

Remarks.—It attains at least 279 mm. (11 inches) in length.

166. Genus *Sparus* L.

1758. *Sparus* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 277. (Type, *S. aurata* L.)

344. *Sparus berda* Forsk.

1775. *Sparus berda* Forskal, *Descript. Animal.*, p. 32 (type-locality : Arabia).
1889. *Chrysophrys berda* Day, *Fauna Brit. India*, Fish., 2, p. 44.

Head 4, depth 2·5 to 2·6 in total length. Eyes 3·5 to 4 in head. Dorsal profile more convex than ventral. Snout pointed. Four or five rows of molars in upper and 3-4 in lower jaw. A single dorsal, with 11-12 rigid, normal spines ; spinous part longer than soft part. Three anal spines, 2nd the longest. Pectorals a little longer than head. Pelvics not reaching anus. Caudal emarginate. Lateral line scales 44-46. Interorbital scaleless. Gill rakers 5-8+9-11. Silvery grey ; fins dark edged ; a dark, band along anal.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal, Andamans ; PAKISTAN : coasts of Karachi, Sind, Makran, E. Pakistan.—Ceylon, Arabia, Red Sea, Socotra, Natal, E. and S. coasts of Africa, Malaya, Malay Archipelago, Siam, China, Formosa, Hongkong, Japan, Philippines, Melanesia, Queensland.

Remarks.—It attains 762 mm. (2½ feet) in length and is excellent eating.

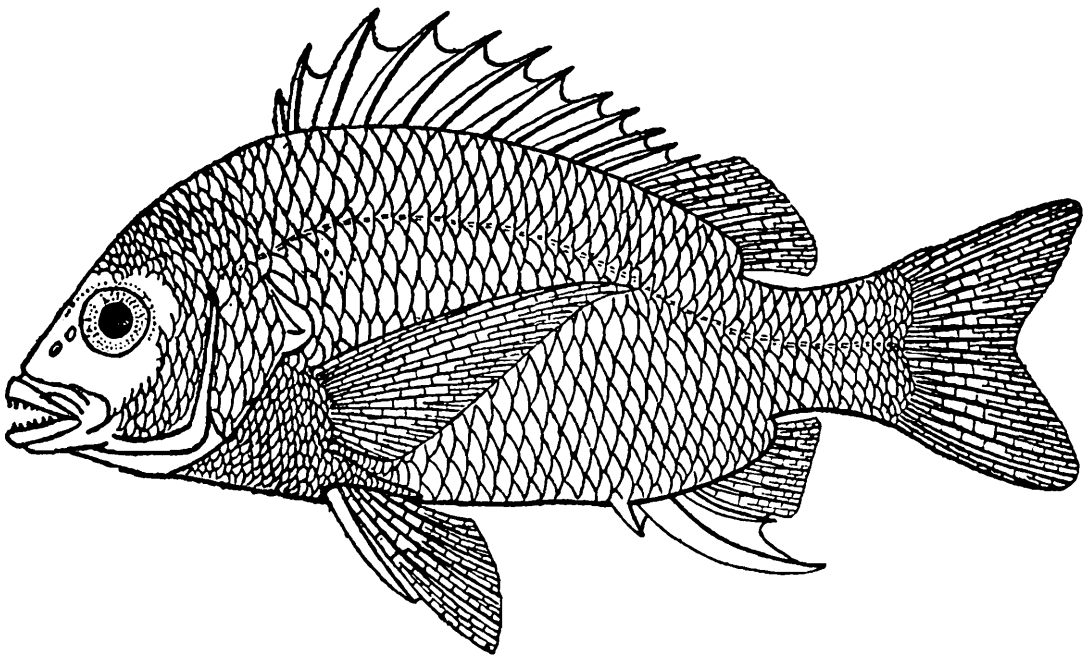
345. *Sparus datnia* (Ham.)

(Text-fig. 164)

1822. *Coius datnia* Hamilton, *Fish. Ganges*, pp. 88, 369, pl. 9, fig. 29 (type-locality : Mouth of the Ganges).

1889. *Chrysophrys datnia* Day, *Fauna Brit. India*, Fish., 2, p. 44.

Head 4 to 4.2, depth 2.7 in total length. Eyes 4 to 5 in head. Dorsal profile much elevated. Snout pointed. Four or five rows of molars in upper and 3-4 in lower jaw. A single dorsal, with 11-13 rigid normal spines ; spinous part longer than soft part. Three anal spines, 2nd the longest. Pelvics not reaching anus. Pectorals longer than head. Caudal emarginate. Lateral line scales 46-48. Gill rakers 5-7+8-9. Silvery grey with golden longitudinal lines along scale rows ; dorsal and caudal dark edged ; a dark band on soft dorsal and anal.



TEXT-FIG. 164.—Lateral view of *Sparus datnia* (Ham.). (After Day.)

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar ; Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal ; PAKISTAN : coasts of Sind, Karachi, E. Pakistan.—Burma, Ceylon, Indo-China, Hongkong, Japan, Philippines.

Remarks.—It attains at least 457 mm. (1½ feet) in length and ascends tidal rivers and estuaries.

LXXI. Family TOXOTIDAE

167. Genus *Toxotes* C.

1817. *Toxotes* Cuvier, *Regne Animal.*, 2, ed. 1, p. 338. (Type, *Labrus jaculator*, Bl. Schn.).

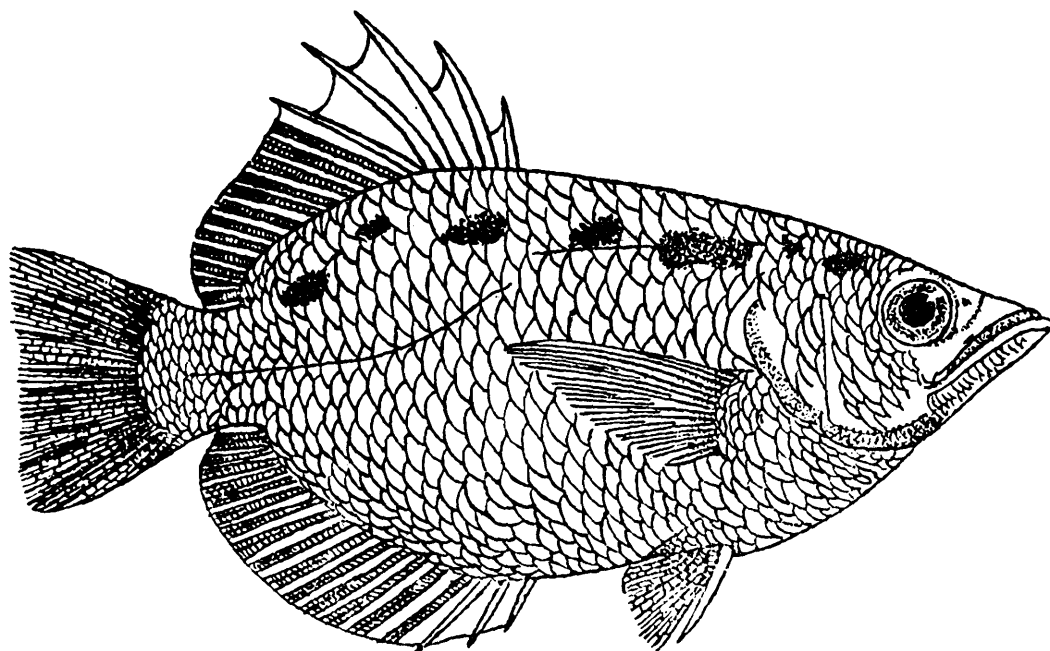
346. *Toxotes chatareus* (Ham.)

(Text-fig. 165)

1822. *Colus chatareus* Hamilton, *Fish. Ganges*, pp. 101, 370, pl. 14, fig. 3 (type-locality : mouth of the Ganges).

1889. *Toxotes chatareus* Day, *Fauna Brit. India*, Fish., 2, p. 23.

Head 3·2 to 3·3, depth 3·5 in total length. Eyes 3·2 to 4 in head. Body oblong, compressed, back depressed. Snout pointed, lower jaw longer, Cleft of mouth oblique, maxilla extending beyond midorbit. Viliform teeth in jaws. A single dorsal in the posterior half of body, opposite anal, with 4-5 strong spines ; spinous part shorter than soft part. Three anal spines. Caudal cut square. Lateral line scales 31 ; predorsal scales 26-28. Silvery dashed with gold, back greenish brown ; 6-7 oblong spots between eye and end of dorsal base ; soft dorsal blotched, anal black edged.



TEXT-FIG. 165.—Lateral view of *Toxotes chatareus* (Ham.). (After Day).

Distribution.—Rivers and estuaries of INDIA and PAKISTAN.—Burma, Ceylon, Malaya, Malay Archipelago, Siam, Cochin China, Philippines, Melanesia, Queensland.

Remarks.—It attains upwards of 304 mm. (a foot) in length.

LXXII. Family EPHIPPIDAE

168. Genus *Ehippus* C.

1817. *Ehippus* Cuvier, *Regne Animal.*, 2, ed. 1, p. 335. (Type, *Chaetodon macrolepidotus* Bl.)

347. *Ehippus orbis* (Bl).

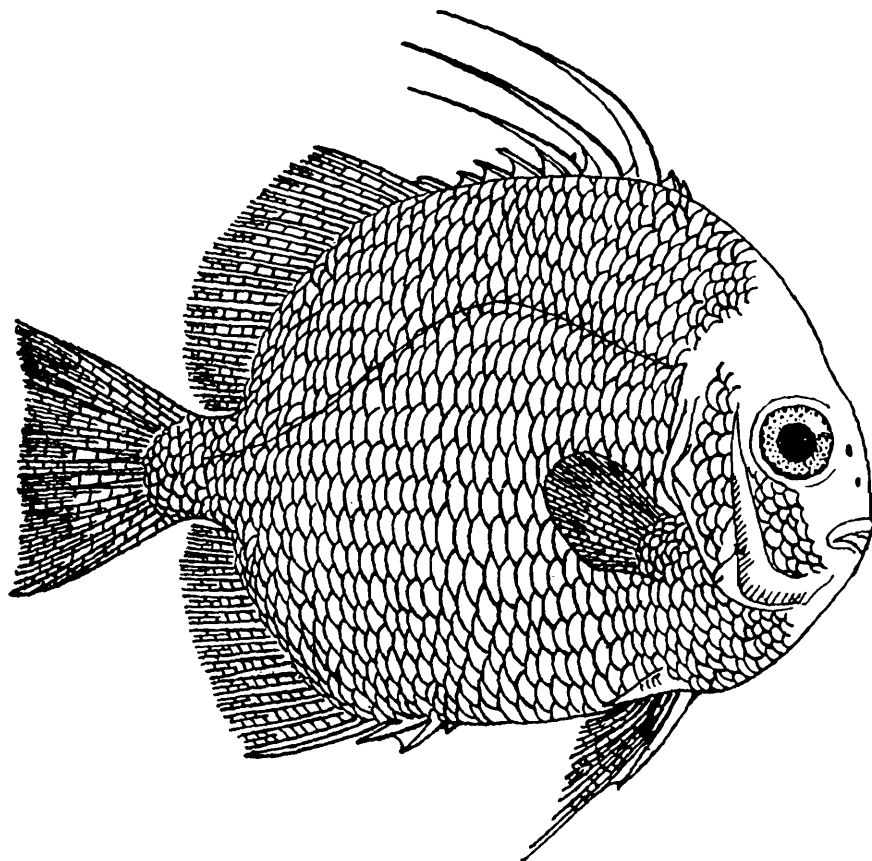
(Text-fig. 166)

1787. *Chaetodon orbis* Bloch, *Naturg. Ausland. Fische*, 3, p. 81, pl. 202, fig 4 (type-locality : East Indies).

1889. *Ehippus orbis* Day, *Fauna Brit. India, Fish.*, 2, p. 20.

Head 4 to 4·5, depth 1·5 in total length. Eyes 2·3 in head. Body much compressed, elevated. Snout short, dorsal, profile parabolic. Mouth short, maxilla not reaching to front border of eye. A single notched dorsal with 8-9 spines ; 3-5 spines elongated and filiform. First pelvic ray elongated. Three anal spines. Caudal shortly produced in the centre or emarginate. Pectorals short, less than head. Lateral

line scales 42. Gill rakers 2+8. Greyish green above and silvery dashed with pink below ; young with a dark grey orbital band, another over nape and 2 over body.



TEXT-FIG. 166.—Lateral view of *Ehippus orbis* (Bl.). (After Day).

Distribution.—INDIA ; coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal, Andamans ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Natal, Malaya, Malay Archipelago, Siam, China, Formosa, Philippines.

Remarks.—It attains at least 152 mm. (6 inches) in length.

LXXIII. Family PLATACIDAE

169. Genus *Platax* C.

1817. *Platax* Cuvier, *Regne Animal.*, 2, ed. 1, p. 334. (Type, *Chaetodon teira* Bl.)

348. *Platax pinnatus* (L.).

1758. *Chaetodon pinnatus* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 272 (type locality : East Indies).

1889. *Platax teira* Day, *Fauna Brit. India, Fish.*, 2, p. 182.

1889. *Platax vespertilio* Day, *Fauna Brit. India, Fish.*, 2, p. 183.

Depth (excluding vertical fins) equal to or more than standard length. Eyes 3 in head. Body compressed, much elevated. Mouth small, snout short. A single dorsal with 3-7, almost hidden spines ; anterior soft rays very much prolonged and falcate. Three anal spines ; anterior anal rays prolonged and falcate. Pectorals small, about equal to head. Pelvics well developed, with elongated rays. Caudal cut square, slightly emarginate or with central rays produced, Lateral line scales 55-56.

Brownish grey with 3 broad cross bars passing through eye, pectoral and across soft part of dorsal and anal ; fins black exclusive of pectoral and caudal.

Distribution.—INDIA ; coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W Bengal, Andamans ; PAKISTAN coasts of Sind, E. Pakistan, Burma, Ceylon, Red Sea, Aden, Zanzibar, Madagascar, E. and S. coasts of Africa, Malaya, Malay Archipelago, Siam, China, Japan, Korea, Philippines, Melanesia, Micronesia, Polynesia, Queensland.

Remarks.—It grows to about 457 mm. (1½ feet) in length.

LXXIV Family DREPANIDAE

170. Genus *Drepane* C.

1831. *Drepane* Cuvier, *Hist. nat. Poiss.*, 7, p. 132.

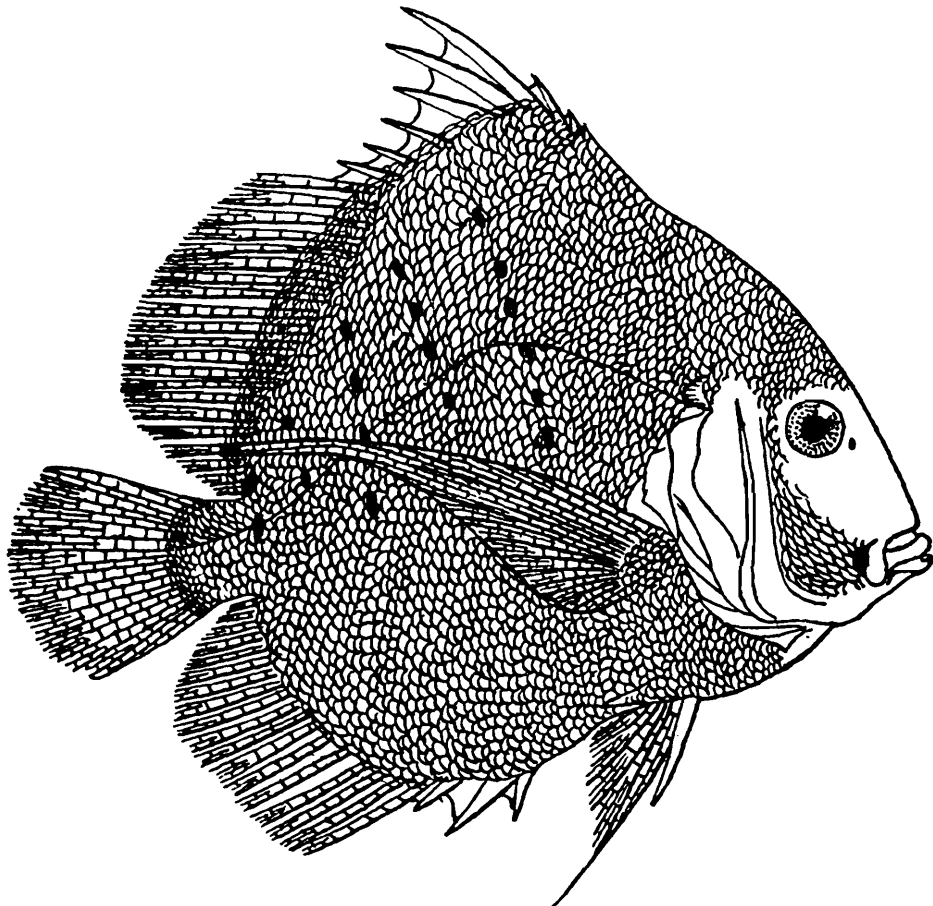
349. *Drepane punctata* (L.).

(Text-fig. 167)

1758. *Chaetodon punctata* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 273 (type-locality : Asia).

1889. *Drepane punctata* Day, *Fauna. Brit. India*, Fish., 2, p. 21.

Head 3.2 to 4, depth 1.3 to 1.5 in total length. Eyes 2.5 to 3 in head. Body compressed, much elevated. Mouth small protractile ;



TEXT-FIG. 167.—Lateral view of *Drepane punctata* (L.). (After Day).

snout short. A single notched dorsal with 8-9 strong spines ; spinous part a little shorter than soft part. Three anal spines. Pectoral much larger than head, reaching caudal base. Caudal with central rays slightly

produced. Lateral line scales 50-55. Gill rakers 10-11. Silvery shot with gold and purple ; with or without 4-6 vertical rows of black spots on upper part of body and soft part of dorsal.

Distribution.—INDIA : coasts of Cutch. Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal, Andamans; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Persian Gulf, Muscat, S. Arabia, Red Sea, E. and S. coasts of Africa, West coast of tropical Africa, Madagascar, Malaya, Malay Archipelago, Siam, Hongkong, China, Formosa, Philippines, Melanesia, Polynesia, Queensland.

Remarks.—It attains at least 381 mm. (a foot and 3 inches) in length.

LXXV Family SCATOPHAGIDAE

171. Genus *Scatophagus* C.

1831. *Scatophagus* Cuvier, *Hist. nat. Poiss.*, 7, p. 136. (Type, *Chaetodon argus* L.).

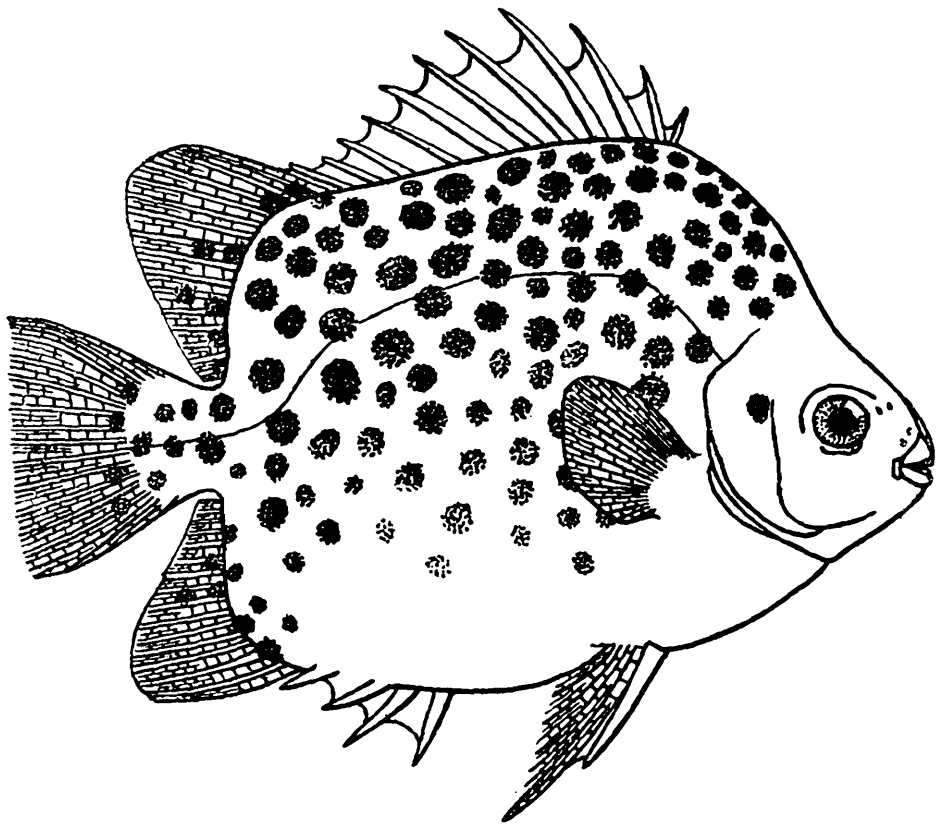
350. *Scatophagus argus* (L.)

(Text-fig. 168)

1766. *Chaetodon argus* Linnaeus, *Syst. Nat.*, 1, ed. 12, pl. 464 (type-locality : India).

1889. *Scatophagus argus* Day, *Fauna Brit. India*, Fish., 2, p. 18.

Head 4, depth 2 in total length. Eyes 3.5 in head. Body much compressed, elevated, roughly quadrangular. Mouth small. Two



TEXT-FIG. 168.—Lateral view of *Scatophagus argus* (L.). (After Day.)

borsals united at their base, the first with 10 spines and longer than soft dorsal. Four anal spines. Pectorals shorter than head. Caudal cut

square or with central rays slightly prolonged. Scales minute ; lateral rays 110-120 in the longitudinal series. Purplish becoming white below ; large round blackish or greenish spots on body, numerous along back.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Malaya, Malay Archipelago, Siam, China, Formosa, Philippines, Melanesia, Polynesia, Queensland.

Remarks.—It attains 304 mm. (a foot) in length and enters backwaters and rivers.

LXXVI. Family CHAETODONTIDAE

172. Genus *Heniochus* C.

1817. *Heniochus* Cuvier, *Regne Animal.*, 2, ed. 1, p. 335. (Type, *Chaetodon macrolepidotus* Bl.)

351. *Heniochus acuminatus* (L.)

1758. *Chaetodon acuminatus* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 272 (type-locality : Indies).

1889. *Heniochus macrolepidotus* Day, *Fauna Brit. India*, Fish., 2, p. 12.

Head 4, depth 1.5 in total length. Eyes 3 to 3.2 in head. Body elevated, strongly compressed. Mouth short, maxilla reaching to half way between snout and front border of eye. A single dorsal with 11-12 spines ; the fourth spine having a filamentous prolongation reaching to caudal or even beyond ; the 5th also a little elongated. Three anal spines. Pelvics reach anal. Caudal almost cut square. Lateral line scales 52. Gill rakers 11. Pearly white with a dark purplish band over snout, another over eyes, a third broad one from first three dorsal spines across side down to pelvics and anal, and a fourth from 5th to 7th dorsal spine extending to the posterior two-third of anal ; pectorals, soft dorsal, anal and caudal bright yellow.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal, Andamans, PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Persian Gulf, Muscat, Red Sea, Zanzibar, Natal, Madagascar, Seychelles, S. Africa, Malaya, Malay Archipelago, Korea, Japan, Philippines, Melanesia, Micronesia, Polynesia, Hawaii, N. Australia.

Remarks.—It attains 457 mm. (1½ feet) in length and is of aquarium interest.

173. Genus *Chaetodon* L.

1758. *Chaetodon* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 272. (Type, *C. capistratus* L.)

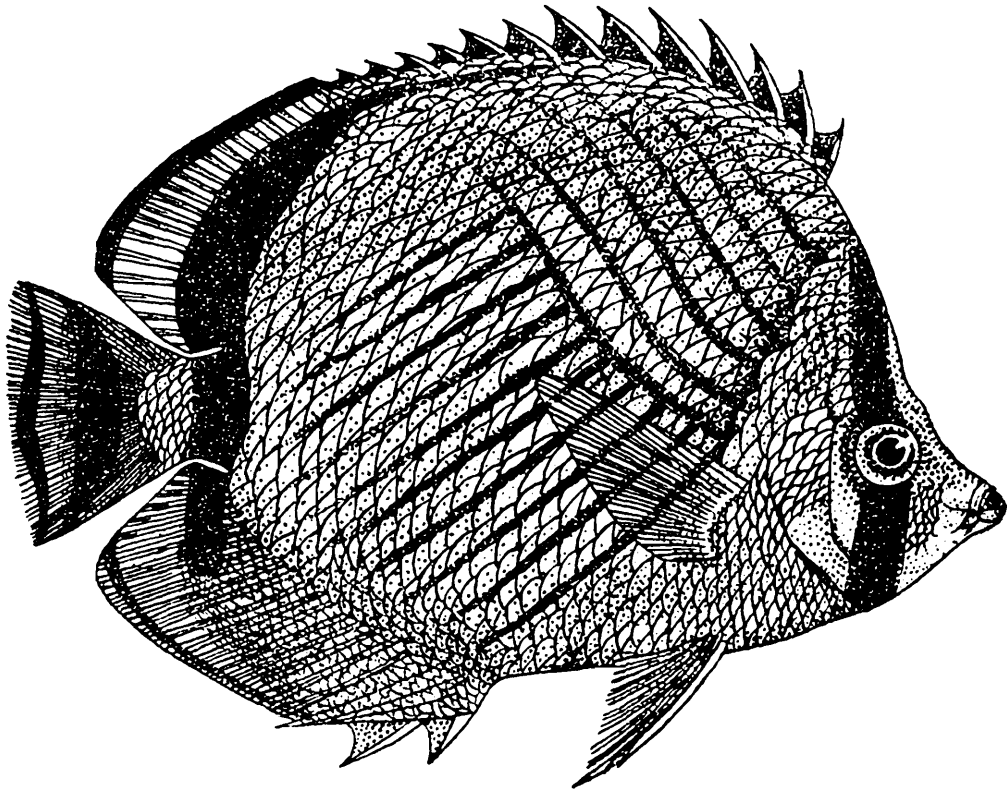
352. *Chaetodon vagabundus* L.

(Text-fig. 169)

1785. *Chaetodon vagabundus* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 465 (type-locality : East Indies).

1889. *Chaetodon vagabundus* Day, *Fauna Brit. India*, Fish., 2, p. 4.

Head 3.5 to 4, depth 1.7 in total length. Eyes 3.3 in head. Body elevated, strongly compressed. Snout rather produced, maxilla reaching to below front nostril. Teeth brush-like. A single notched dorsal with 12-13 spines, none elongated. Three anal spines. Caudal cut square or rounded. Lateral rays 43/33. Gill rakers 11. Pearly white with a black ocular band and numerous dark bands passing downwards and forwards to the middle of side of body where others pass backwards ; a black broad band from the posterior dorsal spines and soft rays of dorsal down across body on to the anal fin ; two vertical bands on caudal, the anterior one concave.



TEXT-FIG. 169.—Lateral view of *Chaetodon vagabundus* L. (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal, Andamans, Nicobars ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, S. Arabia, Red Sea, Aden, Zanzibar, Natal, Mauritius, Madagascar, S. Africa, Malaya, Malay Archipelago, S. China, Japan, Riu Kiu Is., Philippines, Melanesia, Polynesia, Queensland.

Remarks.—It attains at least 190 mm. ($7\frac{1}{2}$ inches) in length and is of aquarium interest.

174. Genus *Holacanthus* Lac.

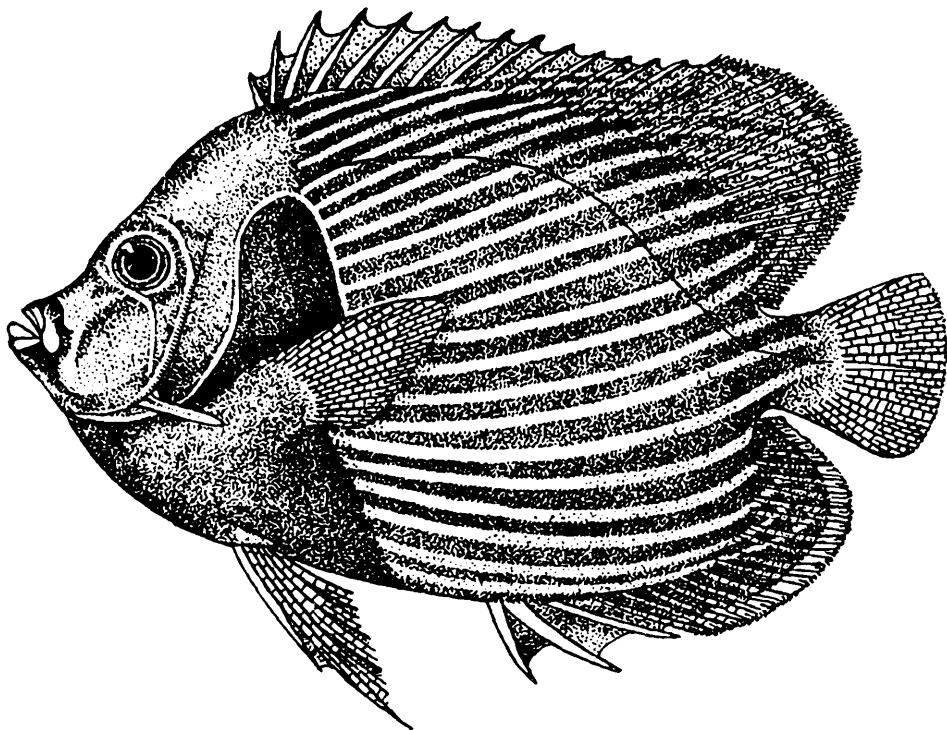
1803. *Holacanthus* Lacepede, *Hist. nat. Poiss.*, 4, p. 525. (Type, *Chaetodon tricolor* L.)

353. *Holacanthus imperator* (Bl.)

(Text-fig. 170)

1787. *Chaetodon imperator* Bloch, *Naturlg. Ausland. Fische*, 3, p. 51, pl. 194 (type-locality : Moluccas : Japan).
1889. *Holacanthus imperator* Day, *Fauna Brit. India, Fish.*, 2, p. 15.

Head 4 to 4.3, depth 1.8 to 2 in total length. Eyes 3 to 4 in head. Body oval, strongly compressed. Snout elevated, maxilla reaching half way below front border of eye. A single notched dorsal with 14 spines, none elongated. Three anal spines. Caudal rounded. Scales minute. Bluish with a greenish tinge on back ; about 19 canary yellow lines passing upwards to dorsal, horizontally to shoulder ; chest chestnut ; a light blue stripe across snout round cheeks to peropercular spine ; a brown band edged superiorly with blue passes the eye to preopercle ; pectorals blackish and caudal dark edged.



TEXT-FIG. 170.—Lateral view of *Holacanthus imperator* (Bl.). (After Day).

Distribution.—Seas of INDIA and PAKISTAN.—Ceylon, Muscat, Red Sea, Zanzibar, Mauritius, Seychelles, Madagascar, S. Africa, Malaya, Malay Archipelago, China, Japan, Philippines, Melanesia, Micronesia, Polynesia, Queensland.

Remarks—It grows to at least 203 mm. (8 inches) in length.

LXXVII. Family PRISTOLEPIDAE

175. Genus *Pristolepis* Jerdon

1848. *Pristolepis* Jerdon, *Madras J. Lit. Sci.*, 15, p. 141. (Type, *P. marginatus* Jerdon, orthotypic.)

354. *Pristolepis fasciata* (Blkr.)

1857. *Catopra fasciata* Bleeker, *Nat. Tijdschr. Ned.-India*, 2, p. 65 (type-locality : Bandjermassing, Borneo, in rivers).

1889. *Pristolepis fasciata* Day, *Fauna Brit. India*, Fish., 2, p. 85.

Head 3.3 to 3.7, depth 3.7 in total length. Eyes 3.5 to 3.6 in head. Body compressed. Mouth moderately protractile, maxilla reaching to below first third of eye. Two sharp, flat, bifid opercular spines. Vomerine teeth globular. A single, notched dorsal with 12-13 spines ; spinous

portion much longer than soft portion. Three anal spines. Caudal rounded. Lateral line interrupted, 26-28 scales. Dull greenish with a deep black spot on shoulder and over upper part of pectoral base ; pectorals yellow, other fins slaty grey.

Distribution.—INDIA freshwaters of Travancore-Cochin.—Burma, Malaya, Malay Archipelago, Siam, Cochin China.

Remarks.—It attains about 203 mm. (8 inches) in length.

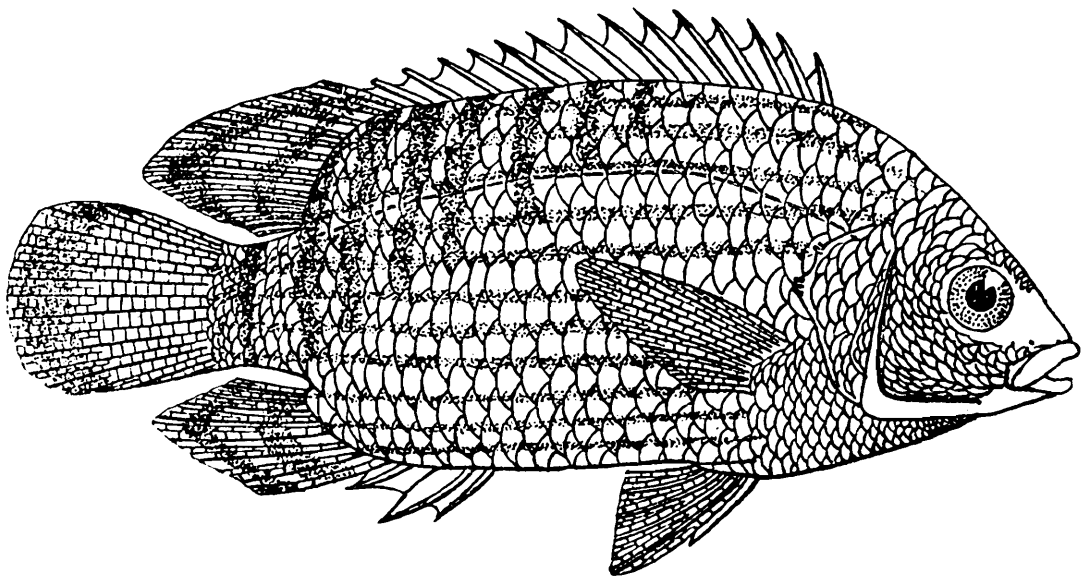
355. *Pristolepis malabarica* (Gthr.)

(Text-fig. 171)

1864. *Catopra malabarica* Gunther, *Ann. Mag. nat. Hist.*, (3) 14, p. 375 (type-locality : hill ranges of Travancore on the Malabar Coast).

1889. *Pristolepis malabarica* Day, *Fauna Brit. India*, Fish., 2, p. 84.

Head 4 to 4·2, depth 2·2 to 2·5 in total length. Eyes 3·5 in head. Body compressed. Mouth moderately protractile, maxilla reaching a little beyond front border of eye. Two sharp, flat, bifid opercular spines. Villiform teeth on vomer. A single notched dorsal with 14 spines ; spinous part much longer than soft part. Caudal rounded. Lateral



TEXT-FIG. 171.—Lateral view of *Pristolepis malabarica* (Gthr.). (After Day).

line interrupted, 25-27 scales. Rifle green shot with purple, often vertically banded.

Distribution.—INDIA : freshwaters of Western Ghats.

Remarks.—It attains at least 152 mm. (6 inches) in length.

LXXVIII. Family NANDIDAE

176. Genus *Nandus* C.

1831. *Nandus Valenciennes* *Hist. nat. Poiss.*, 7, p. 481. (Type, *N. marmoratus* C.)

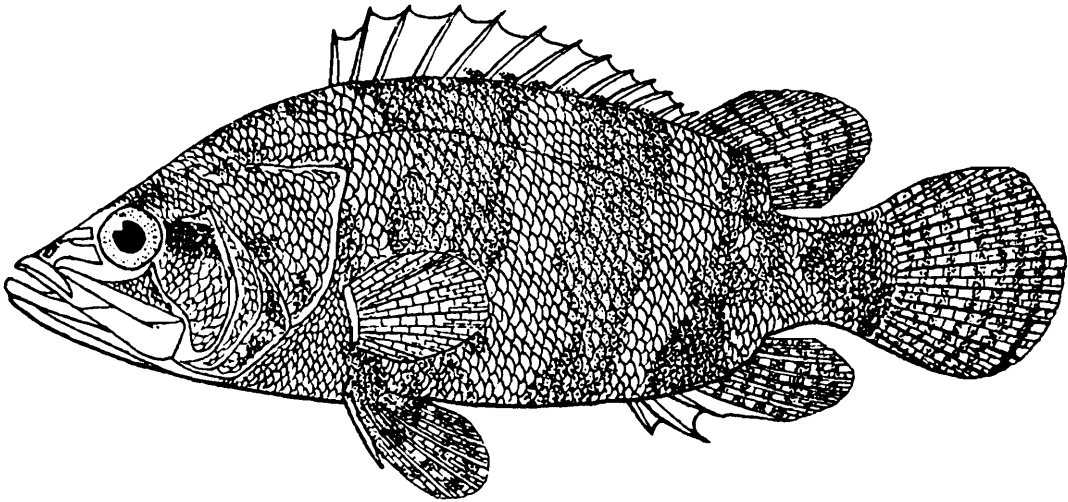
356. *Nandus nandus* (Ham.)

(Text-fig. 172)

1822. *Coius nandus* Hamilton, *Fish. Ganges*, p. 96, pl. 30, fig. 32 (type-locality : ponds of Gangetic provinces).

1889. *Nandus marmoratus* Day, *Fauna Brit. India*, Fish., 2, p. 82.

Head 3, depth 3 to 3·3 in total length. Eyes 5 to 6 in head. Body compressed. Mouth highly protractile, cleft deep, maxilla reaching beyond postorbit. One opercular spine. Teeth villiform. A single, notched dorsal with 12-14 spines ; spinous part longer than soft part.



TEXT-FIG. 172.—Lateral view of *Nandus nandus* (Ham.). (After Day).

Three anal spines. Caudal rounded or cut square. Lateral line interrupted, 46-57 scales. Greenish brown with brassy reflections ; 3 broad patchy marbled bands over body and a fourth one across free portion of tail ; narrow bands of spots across soft parts of dorsal, anal and caudal.

Distribution.—Fresh and brackish waters of INDIA and PAKISTAN.—Burma, Malaya, Siam.

Remarks.—It attains at least 177 mm. (7 inches) in length.

LXXIX. Family CICHLIDAE

177. Genus *Eetroplus* C.

1830. *Eetroplus* Cuvier, *Hist. Nat. Poiss.*, 5, p. 486. (Type, *E. meleagris* C.)

357. *Eetroplus canarensis* Day

1777. *Eetroplus canarensis* Day, *Fish. India*, p. 414, pl. 89, fig. 5 (type-locality : S. Canara).

1889. *Eetroplus canarensis* Day, *Fauna Brit. India*, Fish., 2, p. 429.

Head 3·4 to 3·5, depth 2·2 to 2·5 in total length. Eyes 3 to 3·3 in head. Body elevated, compressed. Cleft of mouth small. Teeth in 2 to 3 rows, compressed, lobate. A single dorsal with 21-22 spines ; spinous part much longer than soft part. Fourteen to 16 anal spines. Caudal emarginate. Lateral line with 30-31 scales, often ceasing after 15-25 scales. Yellowish buff with nearly 8 vertical blackish bands ; each scale darkest at its base with a light yellow central spot ; pelvics and anal black, pectorals yellow with a black base.

Distribution.—INDIA : S. Canara, in freshwaters.

Remarks.—It attains at least 114 mm. ($4\frac{1}{2}$ inches) in length.

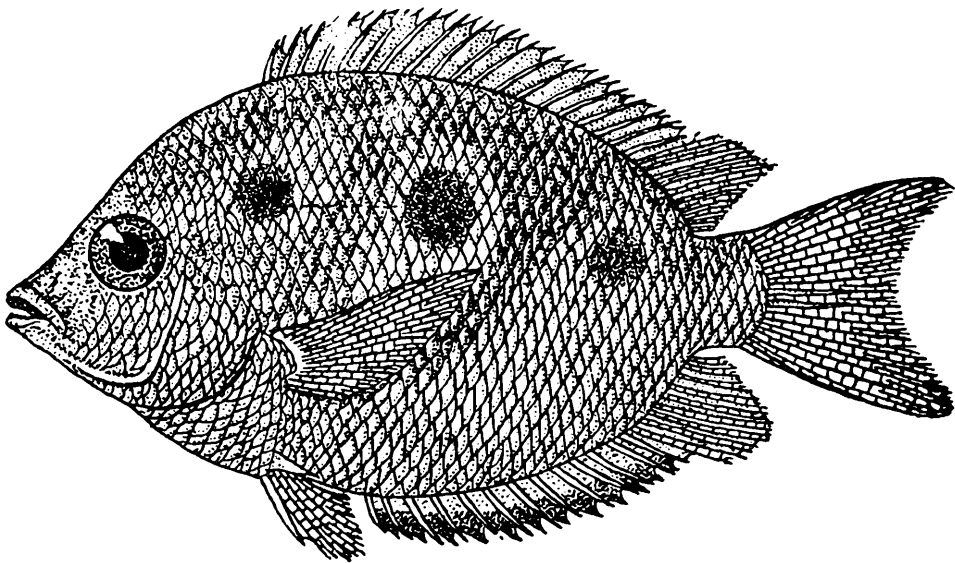
358. *Etroplus maculatus* (Bl.)

(Text-fig. 173)

1785. *Chaetodon maculatus* Bloch, *Syst. Ichth.*, pl. 427, fig. 2 (type-locality : not given).

1889. *Etroplus maculatus* Day, *Fauna Brit. India*, Fish., 2, p. 429.

Head 3.5 to 3.6, depth 2.2 to 2.5 in total length. Eyes 3 in head. Body elevated, compressed. Cleft of mouth small. Teeth trilobate, not touching each other. A single dorsal with 17-22 spines ; spinous part much longer than soft part. Twelve to 15 anal spines. Caudal lunate. Lateral line scales 35. Yellowish with greenish back ; about 17



TEXT-FIG. 173.—Lateral view of *Etroplus maculatus* (Bl.). (After Day).

horizontal lines of deep golden spots and a few others on dorsal, anal and abdomen ; three dark blotches along lateral line, middle the largest.

Distribution.—INDIA : fresh and brackish waters along the coasts of Madras, S. Canara, Malabar and Travancore-Cochin.—Ceylon.

Remarks.—It attains at least 76 mm. (3 inches) in length.

359. *Etroplus suratensis* (Bl.)

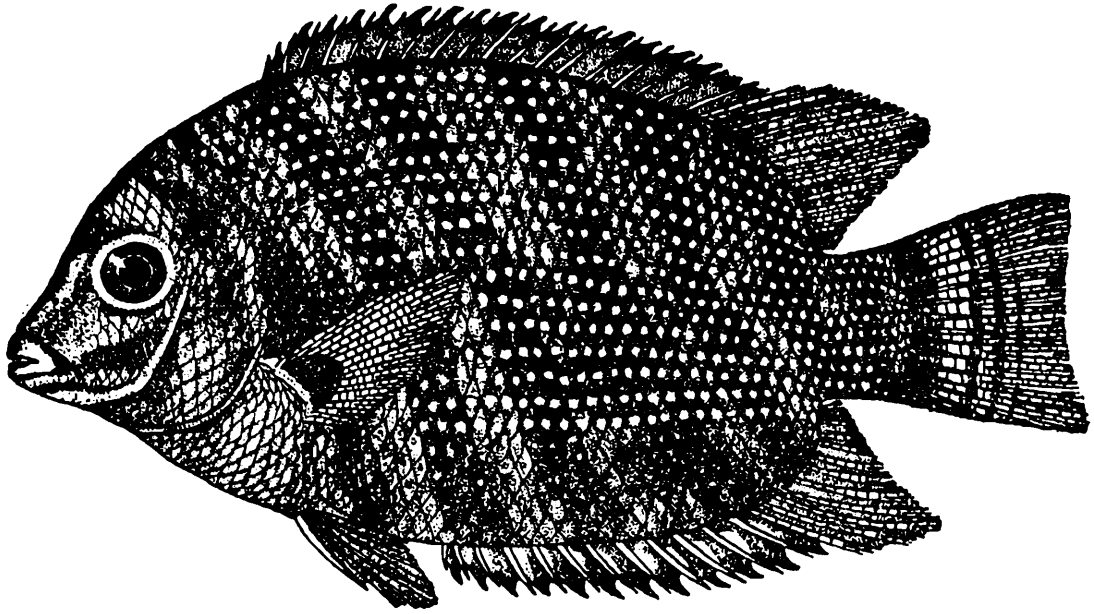
(Text-fig. 174)

1785. *Chaetodon suratensis* Bloch, *Syst. Ichth.*, pl. 217 (type-locality : Surat).

1889. *Etroplus suratensis* Day, *Fauna Brit. India*, Fish., 2, p. 430.

Head 4, depth 2.2 in total length. Eyes 3 to 4 in head. Body elevated, compressed. Cleft of mouth small. Teeth in single row in each jaw, compressed, lobate. A single dorsal with 18-19 spines ; spinous part much longer than soft part. Twelve to 13 anal spines. Caudal

slightly emarginate. Lateral line scales 35-40. Light green with 8 vertical bands ; scales above lateral line with a central pearly spot.



TEXT-FIG. 174.—Lateral view of *Etroplus suratensis* (Bl.). (After Day).

Distribution.—INDIA : fresh and brackish waters of Orissa, Madras, Malabar, Travancore-Cochin.—Ceylon.

Remarks.—It attains at least 190 mm. ($7\frac{1}{2}$ inches) in length.

LXXX. Family CEPOLIDAE

178. Genus *Cepola* L.

1766. *Cepola* Linnaeus, *Syst. Nat.*, 1, ed. 12, p. 445. (Type, *C. taenia* L. = *C. rubescens* L.)

360. *Cepola abbreviata* V

(Text-fig. 175)

1835. *Cepola abbreviata* Valenciennes, *Hist. nat. Poiss.*, 10. p. 403 (type-locality : Anjer Strait near Java).

1889. *Cepola abbreviata* Day, *Fauna Brit. India, Fish.*, 2, p. 330.

Head 6 to 7, depth 10.5 in total length. Eyes 3 in head. Body elongated, compressed. Cleft of mouth oblique, gape wide, maxilla reaching to below midorbit. Teeth in single row in both jaws. A single, long dorsal, united with caudal and equally long anal ; origin above hind edge of opercle. No dorsal and anal spines. Scales small, present on cheeks and opercles. Lateral line runs along dorsal base. Reddish, with 12 pairs of red or golden spots on body.

Distribution.—INDIA : coasts of W. Bengal and Madras ; PAKISTAN : coasts of E. Pakistan.—Malaya, Malay Archipelago, China, Philippines.



TEXT-FIG. 175.—Lateral view of *Cepola abbreviata* V. (After Day).

Remarks.—It attains at least 304 mm. (a foot) in length.

Suborder Siganoidei

LXXXI. Family SIGANIDAE

179. Genus *Siganus* Forsk.

1766. *Teuthis* Linnaeus, *Syst. Nat.*, 1, ed. 12, p. 507. (Type, *Chaetodon caeruleus* Bl., inadmissible.)
 1775. *Siganus* Forskal, *Descript. Animal.*, pp. 10, 25. (Type, *Scarus rivulatus* Forsk.)

361. *Siganus javus* (L.)

1766. *Teuthis javus* Linnaeus, *Syst. Nat.*, 1, ed. 12, p. 507 (type-locality : Java).
 1889. *Teuthis java* Day, *Fauna Brit. India*, Fish., 2, p. 88.

Head 5·2, depth 2·6 to 2·7 in total length. Eyes 3 to 3·5 in head. Interorbital elevated, grooved medianly. A single dorsal with 13 spines. Seven anal spines. Each pelvic with an inner and outer spine and three intermediate rays. Caudal emarginate. Scales minute. Lateral line scales nearly 200. Brownish above lighter below, with many pale grey rounded spots on back and head forming wavy lines on sides and abdomen.

Distribution.—INDIA ; coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Andamans ; PAKISTAN : coasts of Sind.—Burma, Ceylon, Muscat, Malaya, Malay Archipelago, Siam, Indo-China, Philippines, Melanesia, Polynesia, Queensland, New South Wales.

Remarks.—It attains at least 177 mm. (7 inches) in length.

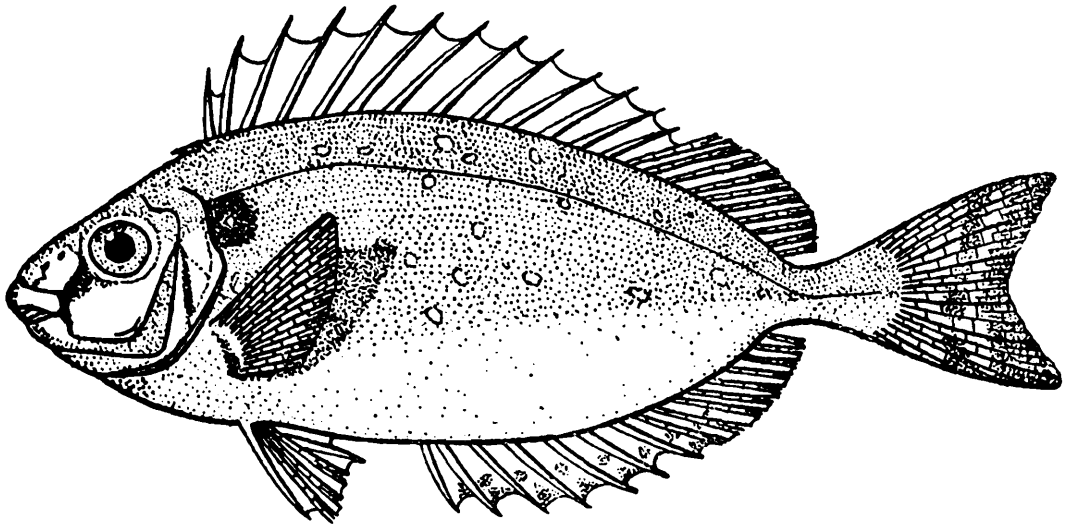
362. *Siganus oramin* (Schn.)

(Text-fig. 176)

1801. *Amphacanthus oramin* Schneider, *Syst. Ichth.*, Bloch, p. 207, pl. 48 (type-locality : Tranquebar).
 1889. *Teuthis ormain* Day, *Fauna Brit. India*, Fish., 2, p. 91.

Head 4·7 to 5·2, depth 3 to 3·2 in total length. Eyes 2·2 in head. Interorbital flat, not grooved medianly. A single dorsal with 13 spines. Seven anal spines. Each pelvic with an inner and outer spine and three intermediate rays. Caudal with pointed lobes. Scales minute ; lateral

line scales about 180-200. Olive with indistinct longitudinal stripes above, silvery below ; numerous pearly spots ; a round black spot on shoulder and another above eye.



TEXT-FIG. 176.—Lateral view of *Siganus oramin* Schn. (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel ; PAKISTAN : coast of Sind.—Burma, Ceylon, S. Arabia, Red Sea, Zanzibar, Seychelles, Madagascar, Natal, S. Africa, Malaya, Malay Archipelago, Siam, Indo-China, Hongkong, China, Japan, Riu Kiu Is., Formosa, Philippines, Melanesia, Micronesia, Polynesia, Queensland.

Remarks.—It attains at least 228 mm. (9 inches) in length.

Suborder Acanthuroidei

LXXXII. Family ACANTHURIDAE

180. Genus *Acanthurus* Forskal

1775. *Acanthurus* Forskal, *Descript. Animal.*, p. 59. (Type, *Chaetodon sohal* Forsk.)

363. *Acanthurus triostegus* (L.)

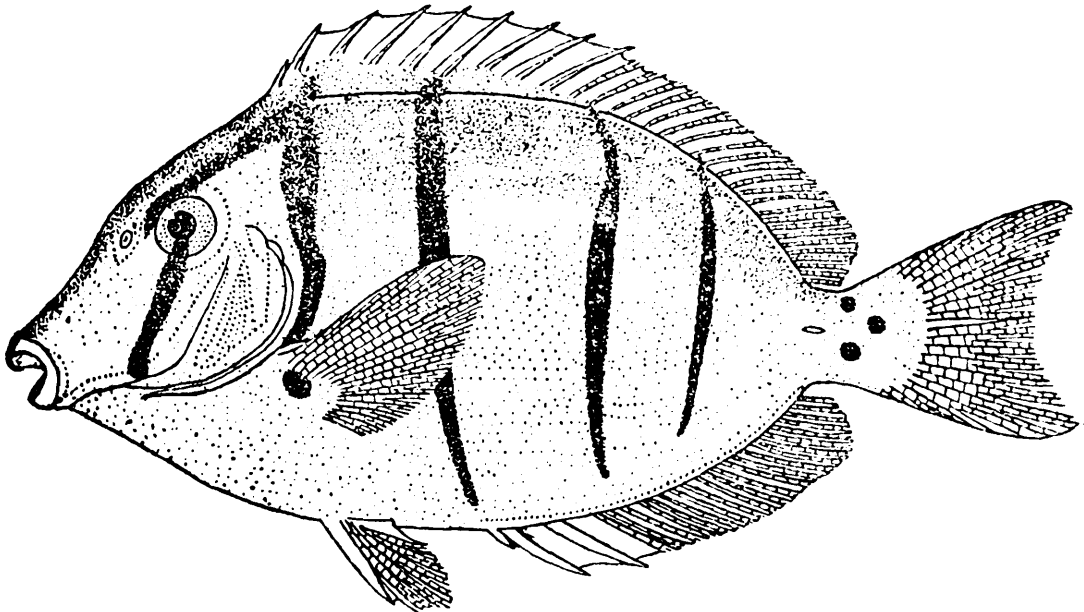
(Text-fig. 177)

1758. *Chaetodon triostegus* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 274 (type-locality : East Indies).

1889. *Acanthurus triostegus* Day, *Fauna Brit. India*, Fish., 2, p. 139.

Head 3.3 to 4, depth 2.3 to 2.4 in total length. Eyes high up, 3.5 in head. Body and head elevated, compressed. Teeth in single row, lobate, incisor-like. A single dorsal with 9 spines. Caudal lunate. A moveable spine in a groove on either side of caudal peduncle just below lateral line. Three anal spines. Scales small, about 150-160 on lateral line. Greenish brown above white below ; six vertical cross bars, the first obliquely through eye and the last across caudal peduncle in the form of two rounded blotches.

Distribution.—INDIA : coasts of Malabar, Travancore-Cochin, Coromandel, Andamans, Maldives.—Ceylon, Zanzibar, Seychelles, Mauritius, S. Africa, Madagascar, Malaya, Malay Archipelago, Formosa, Riu Kiu Is., Japan, Philippines, Melanesia, Micronesia, Polynesia, Hawaii, W. and E. coasts of Australia.



TEXT-FIG. 177.—Lateral view of *Acanthurus triostegus* (L.). (After Day).

Remarks.—It grows to about 203 mm. (8 inches) in length and is of aquarium interest.

Suborder Trichiuroidei

LXXXIII. Family TRICHIURIDAE

181. Genus *Trichiurus* L.

1758. *Trichiurus* Linnaeus, *Syst. Nat.*, 1, ed. 10. p. 246. (Type, *T. lepturus* L.)

364. *Trichiurus haumela* (Forsk.)

1775. *Clupea haumela* Forskal, *Descript. Animal.*, p. 72 (type-locality : Mochha, Red Sea).

1889. *Trichiurus haumela* Day, *Fauna Brit. India*, Fish., 2, p. 134.

Head 6.5 to 8, depth 12 to 15 in total length. Eyes 4.7 to 6.5 in head. Body scaleless, elongate, compressed, ribbon-shaped, tapering to a point. Cleft of mouth deep, lower jaw longer, maxilla reaching to midorbit. Teeth in jaws strong, conical. A single, long spineless dorsal; highest dorsal ray equals depth of body. Anal fin in the form of short spines behind anus, often concealed. Pelvics absent. Greyish above and silvery below ; fins yellow.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal, Andamans ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan,—Ceylon, Red Sea, E. and S. coasts of Africa, Malaya, Malay Archipelago, Siam, China, Riu Kiu Is., Japan, Formosa, Philippines, Melanesia, Polynesia, Queensland.

Remarks.—It attains 914 mm. (3 feet) in length and ascends estuaries.

365. *Trichiurus muticus* Gray

1831. *Trichiurus muticus* Gray, *Zool. Misc.*, p. 10 (type-locality : India).

1889. *Trichiurus muticus* Day, *Fauna Brit. India*, Fish., 2, p. 134.

Head 10.5 to 11.5, depth 16 to 16.5 in total length. Eyes 6.5 in head. Body scaleless, elongate, compressed, ribbon-like tapering to a point. Cleft of mouth deep, lower jaw longer, maxilla reaching to midorbit. Interorbital keeled. Teeth in jaws strong, conical. A single, long spineless dorsal; highest dorsal rays half the depth of body. Anal fin in the form of short spines, entirely concealed. Pelvics rudimentary in the form of 2 scales. Burnished silvery; fins yellow.

Distribution.—INDIA : coast of Orissa.—Persian Gulf, Malay Archipelago, Siam, China.

Remarks.—It grows to about 609 mm. (2 feet) in length.

366. *Trichiurus savala* C.

(Text-fig. 178)

1829. *Trichiurus savala* Cuvier, *Regne Animal.*, 2, ed. 2, p. 219 (type-locality : Sea of the Indies).

1889. *Trichiurus savala* Day, *Fauna Brit. India*, Fish., 2, p. 135.

Head 7.5, depth 16 in total length. Eyes 6.5 to 7 in head. Body scaleless, elongate, compressed, ribbon-like tapering to a point. Cleft of mouth deep, lower jaw longer, maxilla reaching to midorbit. Interorbital flat. Teeth in jaws strong, conical. A single, long spineless dorsal; highest dorsal ray equals depth of body. Pelvics absent. Anal in the form of spines not concealed in skin. Silvery, fins yellowish.



TEXT-FIG. 178.—Lateral view of *Trichiurus savala* C. (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel; PAKISTAN : coasts of Sind, Karachi, Makran.—Burma, Ceylon, Reunion, Malaya, Malay Archipelago, Siam, China, Japan, Philippines, Queensland.

Remarks.—It attains at least 304 mm. (a foot) in length.

Suborder Scombroidei

LXXXIV. Family Scombridae

182. Genus *Rastrelliger* Jordan and Starks

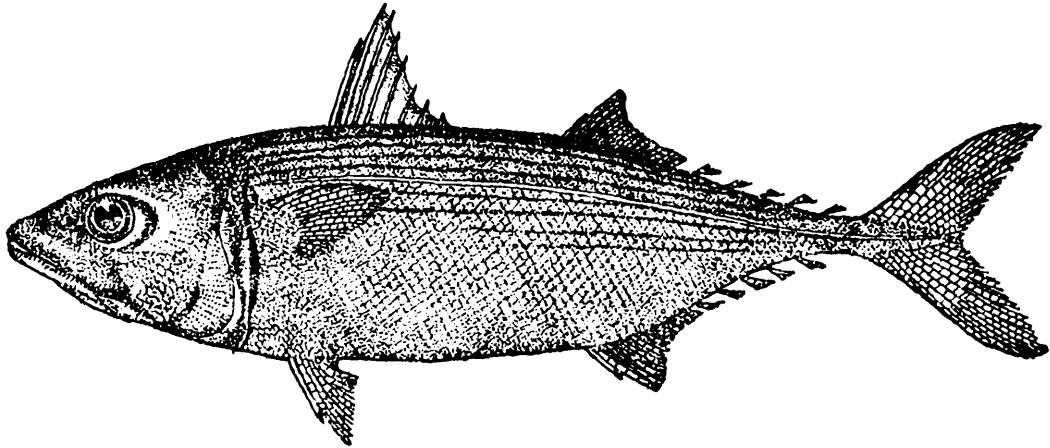
1908, *Rastrelliger* Jordan & Starks, *Proc. U. S. nat. Mus.*, 34, p. 60.
(Type, *Scomber brachysomus* Blkr.)

367. *Rastrelliger kanagurta* (C.)

(Text-fig. 179)

1817. *Scomber kanagurta* Cuvier, *Regne Animal.*, 2, p. 313 (foot note).1889. *Scomber microlepidotus* Day, *Fauna Brit. India, Fish.*, 2, p. 203.

Head 3·7 to 4·5, depth 4 to 4·6 in total length. Eyes with broad adipose lid, 4 to 4·5 in head. Lower jaw slightly longer, cleft of mouth deep, maxilla extending to hind border of eye. Teeth minute, deciduous in jaws. Two dorsals widely separated, first with 8-10 spines and second with 5-6 finlets behind. A single, weak anal spine; 5-6 finlets behind anal. Caudal peduncle keeled. Scales small, about 130-150 in the lateral line. Lower gill rakers 35-38. Greenish above, silvery below; a row of sixteen spots along back near dorsal base; fins yellow; large specimens often with longitudinal lines along upper part of body.

TEXT-FIG. 179.—Lateral view of *Rastrelliger kanagurta* (C.). (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal, Andamans, Nicobars; PAKISTAN : coasts of Sind, E. Pakistan.—Burma, Ceylon, Persian Gulf, coast of Arabia, Red Sea, Seychelles, E. and S. coasts of Africa, Malaya, Malay Archipelago, Melanesia, Micronesia, Polynesia, Queensland.

Remarks.—It attains at least 304 mm. (a foot) in length and forms an important item of the fishery of the Malabar coast.

368. *Rastrelliger neglectus* (van Kampen)1907. *Scomber neglectus* van Kampen, *Bull. Dept. Agric. Ind. Neerl.*, 8, (Zool., 2), p. 7.1889. *Scomber brachysoma* Day, *Fauna Brit. India, Fish.*, 2, p. 204.

Head 3·7, depth 3·6 in total length. Eyes with broad adipose lid, 4·3 in head. Lower jaw slightly longer, cleft of mouth deep, maxilla extending to hind border of eye. Teeth minute, deciduous in jaws. Two widely separated dorsals, first with 10 weak spines; 5 finlets behind second dorsal. A single, weak anal spine; 5 finlets behind anal. Caudal peduncle keeled. Scales small, about 135 in the lateral line. Greenish above, silvery below; 2 shining light spots above and behind eye; spinous dorsal edged black posteriorly.

Distribution.—INDIA: Coromandel coast, Andamans.—Malaya, Malay Archipelago, Philippines.

Remarks.—It attains at least about 254 mm. (10 inches) in length.

LXXXV Family CYBIIDAE

183. Genus *Scomberomorus* Lac.

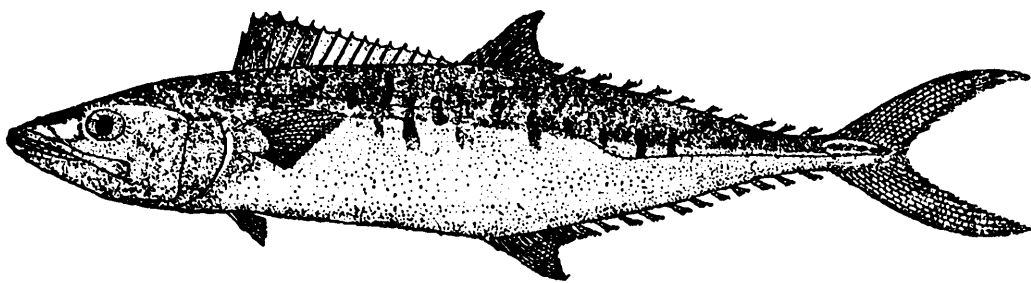
1802. *Scomberomorus* Lacepede, *Hist. nat. Poiss.*, 3, p. 292. (Type. *S. plumieri* Lac.).

369. *Scomberomorus commerson* Lac.

(Text-fig. 180)

1800. *Scomber commerson* Lacepede, *Hist. nat. Poiss.*, 2, pp. 598, 600, pl. 20, fig. 1 (type-locality : not given).
1889. *Cybium commersonii* Day, *Fauna Brit. India*, Fish., 2, p

Head 4 to 5, depth 5.5 to 7 in total length. Eyes 4.5 to 5 in head. Cleft of mouth deep, maxilla reaching to hind border of eye. Teeth strong, conical, compressed in jaws. Two dorsals, the first with 16-17 weak spines. Three weak anal spines ; 9-10 finlets behind anal. Pelvies small. Caudal peduncle slightly keeled. Scales rudimentary. Gill rakers rudimentary, about 3 in lower limb of first gill arch. Bluish above, silvery below with numerous wavy, narrow, greyish vertical bars on body ; first dorsal black anteriorly in young, other fins bluish grey



TEXT-FIG. 180.—Lateral view of *Scomberomorus commerson* (Lac.). (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Red Sea, Zanzibar, Mauritius, Madagascar, Cape of Good Hope, S. and E. coasts of Africa, Malaya, Malay Archipelago, Siam, China, Japan, Formosa, Philippines, Melanesia, Polynesia, Queensland.

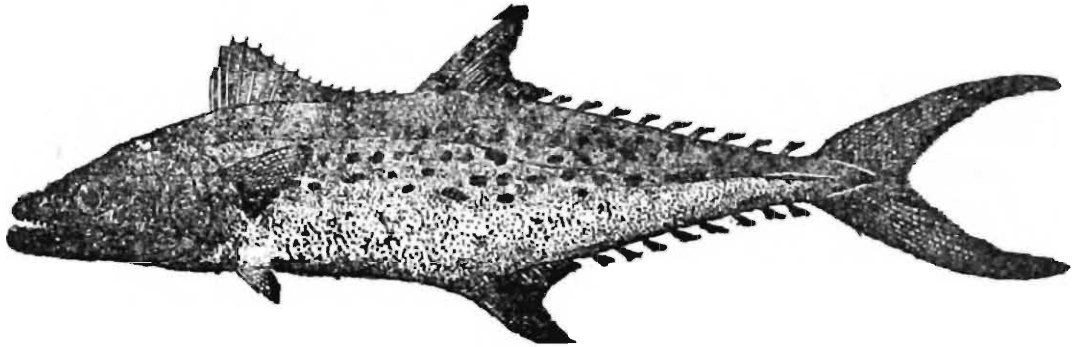
Remarks.—It attains at least 1,219 mm. (4 feet) in length.

370. *Scomberomorus guttatus* (Schn.)

(Text-fig. 181)

1801. *Scomber guttatus* Schneider, *Syst. Ichth. Bloch.*, p. 23, pl. 5 (type-locality : Tranquebar).
1889. *Cybium guttatum* Day, *Fauna Brit. India*, Fish. 2, p. 210.

Head 5 to 5.3, depth 5 in total length. Eyes 5.2 to 5.5 in head. Cleft of mouth deep, maxilla reaching to hind border of eye. Teeth strong, lancet-shaped, compressed in jaws. Two dorsals, the first with 16-17 weak spines; 8-9 finlets behind second dorsal. Three weak anal spines; 7-9 finlets behind anal. Pelvics small. Caudal peduncle keeled. Scales rudimentary. Gill rakers 1-2+8-10. Dark above and silvery below, with 3 horizontal rows of elongated spots; spinous dorsal black anteriorly, other fins dark.



TEXT-FIG. 181.—Lateral view of *Scomberomorus guttatus* (Schn.). (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Malabar, Travancore-Cochin, Coromandel, Madras; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Persian Gulf, Malaya, Malay Archipelago, Siam, China, Formosa, Philippines, Queensland.

Remarks.—It grows upto 1,828 mm. (6 feet) in length.

LXXXVI. Family HISTIOPHORIDAE

184. Genus *Tetrapturus* Rafinesque

1810. *Tetrapturus* Rafinesque, *Caratt. Animal Piante, Sicilia*, p. 54. (Type, *T. belone* Raf.)

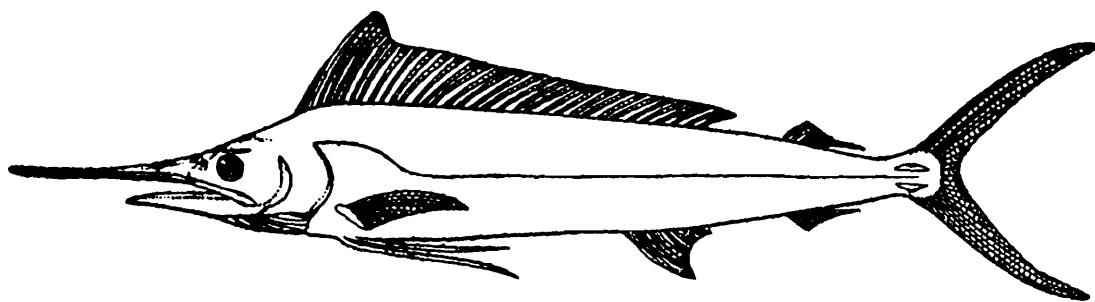
371. *Tetrapturus brevirostris* (Playfair)

(Text-fig. 182)

1866. *Histiophorus brevirostris* Playfair, *Fish. Zanz.*, pp. 53, 145, fig. 100 (type-locality : Zanzibar).

1889. *Histiophorus brevirostris* Day, *Fauna Brit. India, Fish.*, 2, p. 132.

Head (including snout) 3.3, depth 8 in total length. Eyes 3 in head (without snout). Snout produced, upper jaw longer. Teeth in jaws minute. Two dorsals, the first with 4 unbranched and 32-35 branched rays, much longer than second; the second with 1 unbranched and 6 branched rays; dorsals lower than depth of body. Two anals, the first with 3 unbranched and 10 branched rays and the second with 1 unbranched and 6 branched rays. Pelvics with only 2 elongated rays. Two keels on either side of caudal peduncle. Scales minute, lancet-like, embedded in skin. Bluish grey above and silvery below; dorsal and pectoral tipped black.



TEXT-FIG. 182.—Lateral view of *Tertrapturus brevirostris* (Playfair). (After Day).

Distribution.—INDIA : off the coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Madras, Orissa, W. Bengal ; PAKISTAN off the coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Muscat, Zanzibar, Seychelles, S. Africa, Malay Archipelago, New South Wales, Hawaii.

Remarks.—It attains 3,572 mm. (11 ft.) in length.

185. Genus *Istiophorus* Lac.

1802. *Istiophorus* Lacepede, *Hist. nat. Poiss.*, 3, p. 374. (Type, *Scomber gladius* Broussonet.)

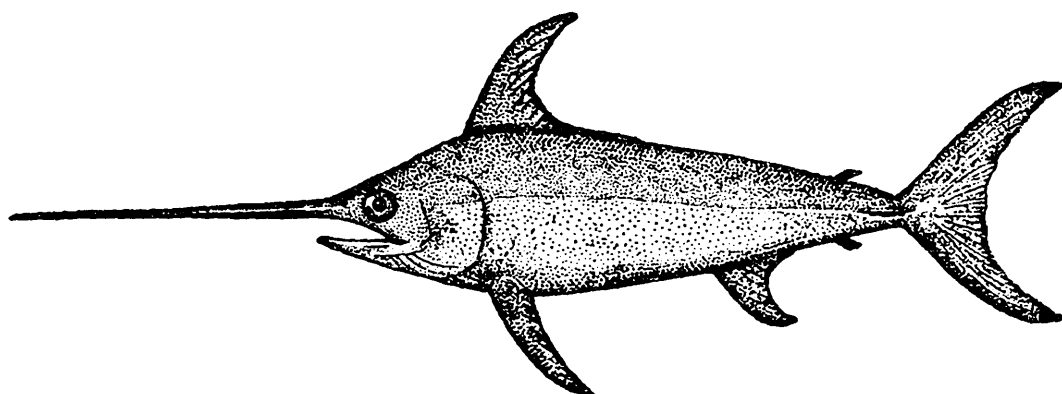
372. *Istiophorus gladius* (Bl.)

(Text-fig. 183)

1793. *Scomber gladius* Bloch, *Naturl. Ausland. Fische.*, 7, p. 81, pl. 345 (type-locality : Surat ; Madagascar).

1889. *Histiophorus gladius* Day, *Fauna Brit. India, Fish.*, 2, p. 131.

Head (including snout) 4, depth 7 to 8 in total length. Snout produced, upper jaw much longer than lower. Teeth in jaws minute. Two dorsals, the first with 40-50 spines, much higher than depth of body, sail-like ; the second with 6-7 short spines. Two anals, the first with 10-11 spines ; the second with 6-7 rays. Pelvics with 3 elongated rays. Two keels on either side of caudal peduncle. Scales minute, lancet-like, embedded in skin. Bluish grey becoming dull white below ; first dorsal bright Prussian blue with numerous black spots.



TEXT-FIG. 183.—Lateral view of *Istiophorus gladius* (Bl.). (After Gudger).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Red Sea, Seychelles, Mauritius,

E. and S. coasts of Africa, Malaya, Malay Archipelago, Siam, Cochin China, China, New South Wales, Polynesia, Hawaii.

Remarks.—It attains at least 2,743 mm. (9 feet) in length.

LXXXVII. Family XIPHIIDAE

186. Genus *Xiphias* L.

1758. *Xiphias* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 248 (type, *X. gladius* L.)

373. *Xiphias gladius* L.

1758. *Xiphias gladius* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 248 (type-locality : Europe).

Head (including snout) 1.3 to 1.5, depth 6 to 7 in total length. Snout very much produced in the form of a sword. Teeth in jaws minute. Two dorsals, the first with 40 rays, not higher than depth of body, not sail-like ; the second with 4 rays. Two anals, the first with 18 rays, the second with 4 rays. Pelvics absent. A single keel on either side of caudal peduncle. Scales absent. Grey or bronze to purplish above, lighter below.

Distribution.—INDIA : coasts of Travancore-Cochin, Tranquebar, Bay of Bengal ; PAKISTAN : Bay of Bengal.—Indian, Pacific and Atlantic oceans : circumtropical—in all tropical and temperature seas.

Remarks.—It is known to be a very dangerous and pugnacious fish growing over 2,743 mm. 9 feet) in length.

Suborder Stromatoidei

LXXXVIII. Family STROMATOIDEI

187. Genus *Pampus* Bonaparte

1837. *Pampus* Bonaparte, *Iconogr. Faun. Ital.*, 3, pt. 9. (Type, not named but plainly *Stromateus candidus* C., orthotypic.)

1862. *Chondroplites* Gill, *Proc. Acad. nat. Sci. Philad.*, p. 216. (Type, *Stromateus atous* C.)

374. *Pampus argenteus* (Euphr.)

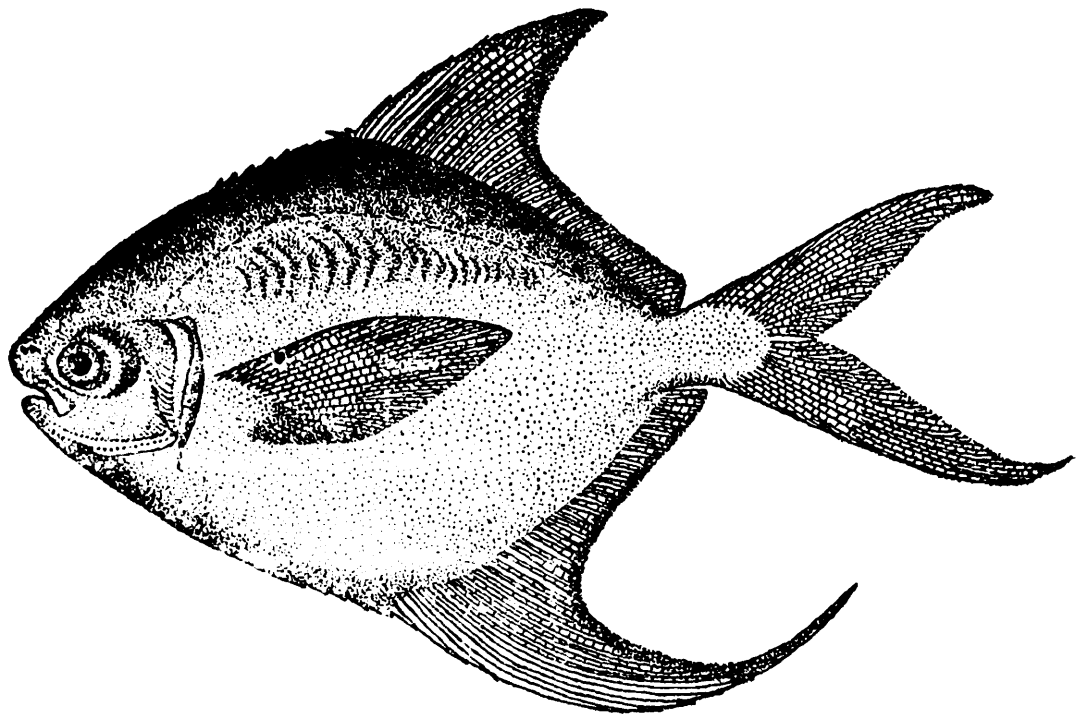
(Text-fig. 184)

1788. *Stromateus argenteus* Euphrasen, *Kon. Vet. Akad. Nya. Handl. Stockholm*, 9, p. 49 (type-locality : Sea of China) (“Castellum Chinese Bocca Tigris dictum”).

1889. *Stromateus cinereus* Day, *Fauna Brit. India, Fish.*, 1, p. 198.

Head 4 to 4.5, depth 1.3 to 1.6 in standard length. Eyes with feeble adipose lid, 4 to 5 in head. Snout overhanging mouth ; cleft of mouth narrow. Teeth small, in single row in jaws, deciduous. Two dorsals ; the first with 5-6 spines often embedded in skin and truncated ; anterior and rays much elevated and falciform. Pelvics absent in adult. Caudal deeply forked. Lateral line not keeled. Scales small, deciduous.

Greyish silvery above fading to white below ; minute black dots over body, dorsal and anal ; other fins yellowish.



TEXT-FIG. 184.—Lateral view of *Pampus argenteus* (Euphrasen). (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W Bengal ; PAKISTAN : coasts of Sind and E. Pakistan.—Ceylon, Malaya, Malay Archipelago, Siam, Cochin China, Indo-China, China, Korea, Japan, Riu Kiu Is., Philippines, Hawaii (introduced).

Remarks.—It attains at least 304 mm. (a foot) in length.

375. *Pampus chinensis* (Euphrasen)

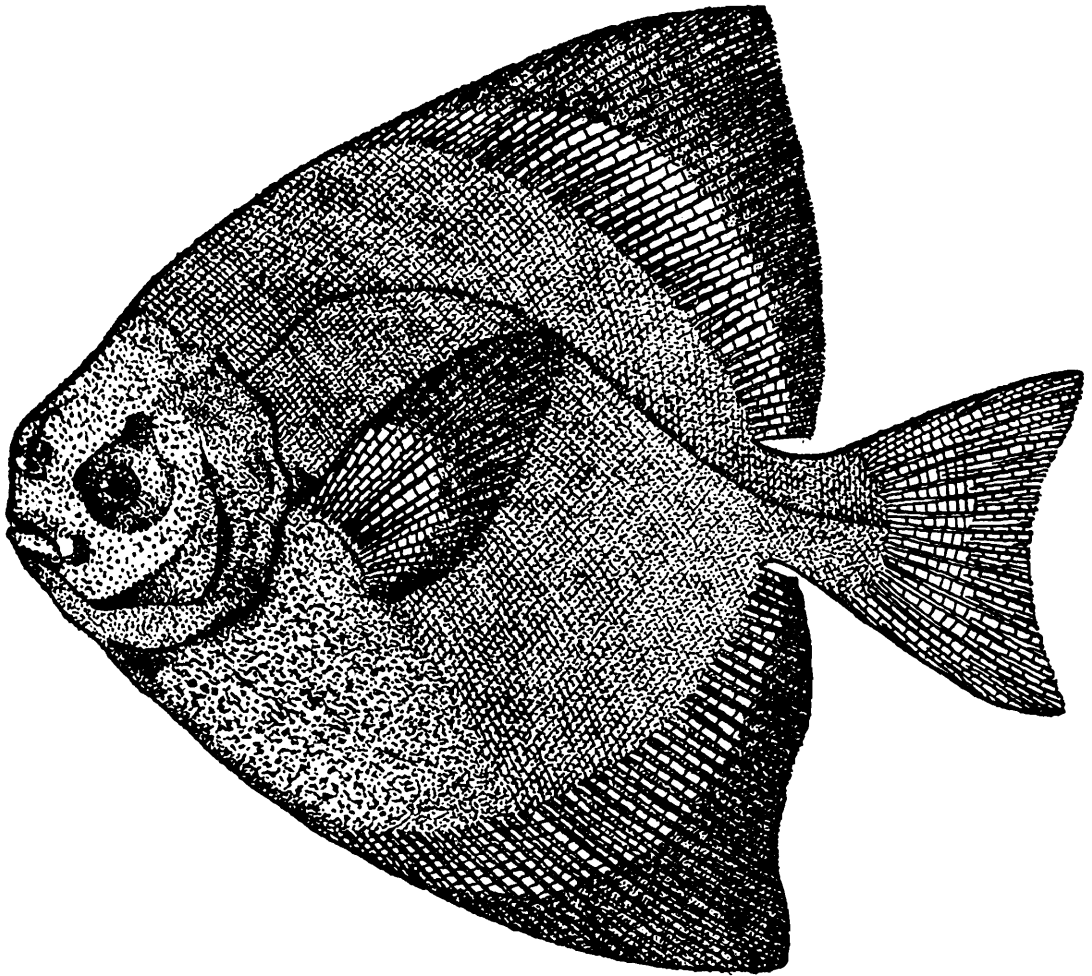
(Text-fig. 185)

1788. *Stromateus chinensis* Euphrasen, *Kon. Vet. Akad. Nya. Handl. Stockholm*, 9, p. 49, pl. 9 (lower left figure) (type-locality : "Castellum Chinese Bocca Tigris dictum").

1889. *Stromateus sinensis* Day, *Fauna Brit. India*, Fish., 5, p. 197.

Head 4.3 to 5, depth 1.6 to 1.5 in total length. Eyes with narrow adipose lid, 3.5 to 4.3 in head. Lower jaw a little longer, cleft of mouth moderate. Teeth small, in a single row in jaws, deciduous. Two dorsals, but 4 or 5 rudimentary spines of the first dorsal very short and not appearing above skin ; anterior rays of second dorsal elongated and falciform. Five to 6 rudimentary anal spines hidden under skin ; anterior anal rays elongated, and falciform. Pelvics absent. Caudal emarginate in young, forked in adult. Lateral line not keeled. Scales small, deciduous. Brownish grey above with metallic reflections, becoming lighter and silvery below ; body dotted all over brown ; fins silvery grey.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Malaya, Malay Archipelago, Siam, Indo-China, China.



TEXT-FIG. 185.—Lateral view of *Pampus chinensis* (Euphrasen). (After Day).

Remarks.—It grows upto 304 mm. (a foot) in length and ascends estuaries.

188. Genus *Parastromateus* Blkr.

1832. *Apolectus* Cuvier, *Hist. nat. Poiss.*, 8, "1831", Jan. 1832, p. 438. (Type, *A. stromateus* C. V.=*Stromateus niger* Bl., orthotypic.) Preoccupied by *Apolectus* Bennett; *Proc. zool. Soc. Lond.*, Dec., 1831, p. 146, a genus of Scombroid fishes: in admissible.
1865. *Parastromateus* Bleeker, *Ned. Tijds. Dierk.*, 4, p. 174 (type, *Stromateus niger*, orthotypic).

376. *Parastromateus niger* (Bl.)

1795. *Stromateus niger* Bloch., *Naturl. Ausland. Fische*, 9, p. 93, pl. 422. (type-locality: "Malaisch" (Malaya).)
1889. *Stromateus niger* Day, *Fauna Brit. India, Fish.*, 2, p. 199.

Head 4.5, depth 2.3 to 3 in total length. Eyes with narrow adipose lid, 4.3 to 5 in head. Lower jaw longer, cleft of mouth moderate. Teeth small, in a single row in jaws, deciduous. Two dorsals, the first with 5 spines embedded in skin; anterior rays of second dorsal elevated and

falciform. Two to 3 rudimentary anal spines ; anterior rays of anal elongated and falciform. Pelvics rudimentary in young, absent in adult. Caudal deeply forked. Lateral line keeled. Scales small. Deep brown or greyish brown with bluish reflexions ; dorsal and anal black, caudal yellow with brown cross bands.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal, Andamans ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Persian Gulf, Zanzibar, Natal, Malaya, Malay Archipelago, Siam, Indo-China, China, Japan, Riu Kiu Is., Formosa, Philippines, Queensland.

Remarks.—It grows upto about 609 mm. (2 feet) in length.

Suborder Anabantoidei

LXXXIX. Family ANABANTIDAE

189. Genus *Anabas* C.

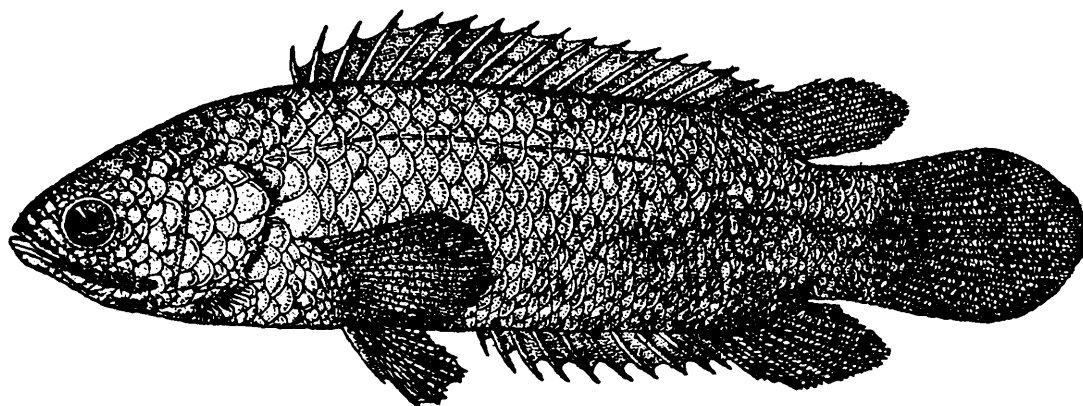
1817. *Anabas* Cuvier, *Regne Animal.*, 2, ed. 1, p. 339. (Type, *Perca scandens* Daldorf.)

377. *Anabas testudineus* (Bl.)

(Text-fig. 186)

1792. *Anthias testudineus* Bloch, *Naturg. Ausland. Fische*, 6, p. 121, pl. 322 (type-locality : Japan ("East Indies")).
1889. *Anabas scandens* Day, *Fauna Brit. India*, Fish., 2, p. 367.

Head 3.5 to 3.6, depth 3 to 4 in total length. Eyes 4.5 to 5 in head. Lower jaw slightly longer, opercle and preorbital serrated, the former spinate. Teeth in jaws villiform ; teeth on palate. A single dorsal longer than anal, with 17-18 spines ; spinous part much longer than soft part. Nine to 10 anal spines. Lateral line interrupted, 28-32 scales. Light to dark green above, greenish yellow to orange below ; 4 wide cross bands on body ; a black spot on caudal peduncle.



TEXT-FIG. 186.—Lateral view of *Anabas testudineus* (Bl.). (After Day).

Distribution.—Fresh and brackish waters of INDIA and PAKISTAN.—Burma, Ceylon, Malaya, Malay Archipelago, Siam, Indo-China, China, Philippines, Polynesia.

Remarks.—It attains at least 203 mm. (8 inches) in length.

XC. Family OSPHRONEMIDAE

190. Genus *Osphronemus* Lac.

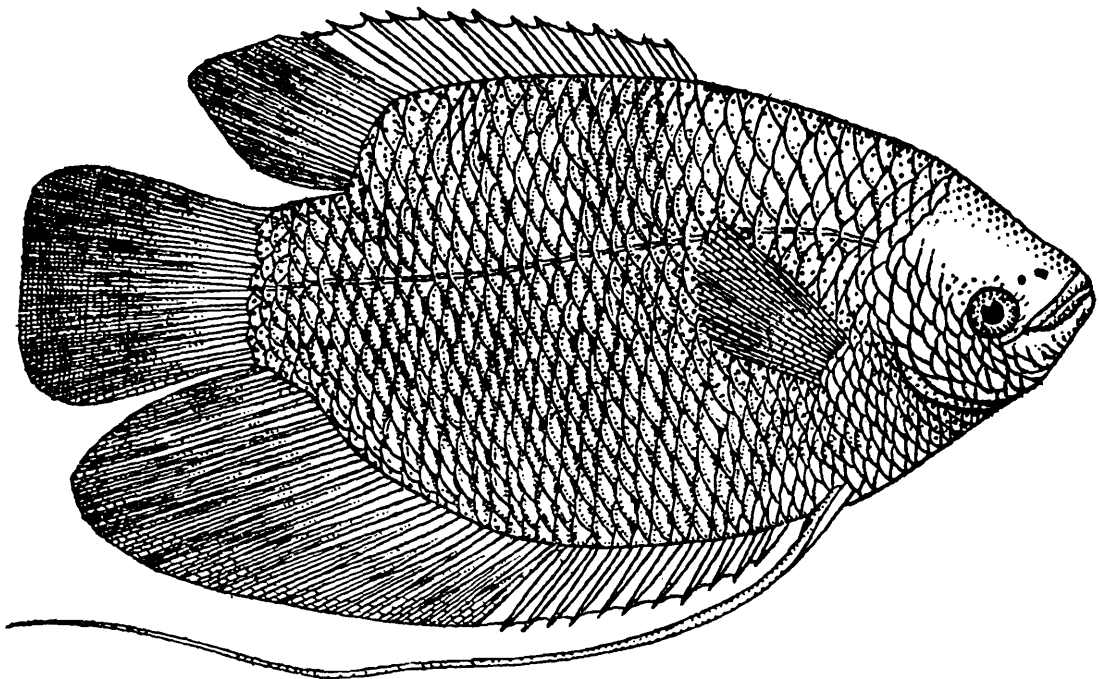
1802. *Osphronemus* Lacepede, *Hist. nat. Poiss.*, 3, p. 116 (type, *O. gouramy* Lac.).

378. *Osphronemus goramy* Lac.

(Text-fig. 187)

1802. *Osphronemus goramy* Lacepede, *Hist. nat. Poiss.*, 3, pp. 116, 117, pl. 8, fig. 2 (type-locality : Mauritius).
 1889. *Osphromenus olfax* Day, *Fauna Brit. India*, Fish., 2, p. 369.

Head 4, depth 3 in total length. Eyes 4 in head. Opercle non-spinate, preorbital serrated. Bands of small conical teeth in jaws, none on palate. A single dorsal, shorter than anal ; spinous part longer than soft part. Nine to 12 anal spines. Outer ray of pelvics much elongated, reaching beyond caudal. Lateral line complete and straight, 30-33 scales. Greenish brown becoming lighter below ; 8 cross bands on body in young.



TEXT-FIG. 187.—Lateral view of *Osphronemus goramy* Lac. (After Day).

Distribution.—It is an exotic species introduced into different parts of INDIA and PAKISTAN.—Ceylon, Mauritius, Seychelles, Malaya, Malay Archipelago, Siam, China, Philippines (introduced), Australia (introduced).

Remarks.—It attains at least 609 mm. (2 feet) in length.

191. Genus *Macropodus* Lac.

1802. *Macropodus* Lacepede, *Hist. nat. Poiss.*, 3, p. 416. (Type, *M. viridiauratus* Lac.)
 1829. *Polycanthus* (Kuhl) Cuvier, *Regne Animal.*, 2, ed. 2, p. 221 (Type, *Trichopodus colisa* Ham.)

379. **Macropodus cupanus C.**

1831. *Macropodus cupanus* Valenciennes, *Hist. nat. Poiss.*, 7, p. 35 (type-locality : Arian Coupang river, Pondicherry).

1889. *Polycanthus cupanus* Day, *Fauna, Brit. India*, Fish., 2, p. 367.

Head 4 to 5, depth 4 in total length. Eyes 4 to 5 in head. Opercle non-spinate, serrated ; preorbital serrated. Conical teeth in jaws, none on palate. A single dorsal shorter than anal ; spinous part longer than soft part. Sixteen to 19 anal spines. Outer ray of pelvics slightly produced. Lateral line incomplete, 29-32 scales. Greenish with the prolonged pelvic ray scarlet.

Distribution.—Ditches, paddy fields and shallow waters along the coasts of INDIA and PAKISTAN.—Ceylon, Malaya, Malay Archipelago.

Remarks.—It attains at least 76 mm. (3 inches) in length and is known to be a larvicidal fish.

Suborder Gobioidae

XCI. Family GOBIIDAE

192. Genus **Glossogobius Gill**

1859. *Glossogobius* Gill, *Proc. Acad. nat. Sci. Philad.*, p. 146. (Type, *Gobius platycephalus* Rich.)

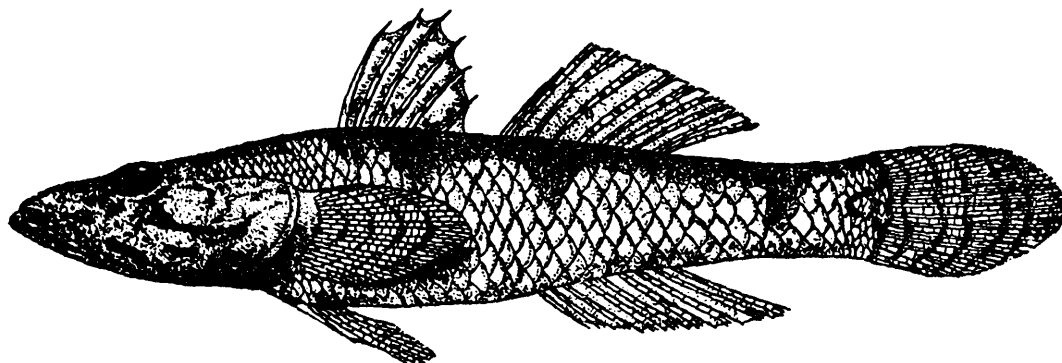
380. **Glossogobius giuris (Ham.)**

(Text-fig. 188)

1822. *Gobius giuris* Hamilton, *Fish. Ganges*, pp. 51, 366, pl. 33, fig. 15 (type-locality : ponds and freshwater rivers of the Gangetic provinces).

1889. *Gobius giuris* Day, *Fauna Brit. India*, Fish., 2, p. 266.

Head pointed, depressed, 3·7 to 4·2 depth, 5 to 6·5 in total length. Eyes 4 to 8 in head. Lower jaw prominent, snout pointed. Tongue bilobate. Two dorsals, placed close together ; first dorsal lower than depth of body, with 6 weak spines. One weak anal spine. Pelvics united forming a disc. Lateral line scales 21-30. Olive to dusky green above, lighter below ; 2 alternating rows of 4 to 6 blotches on body ; a dark blotch on first dorsal may be present.



TEXT-FIG. 188.—Lateral view of *Glossogobius giuris* (Ham.). (After Day).

Distribution.—Fresh and brackish waters of INDIA and PAKISTAN.—Burma, Ceylon, E. and S. coasts of Africa, Mauritius, Malaya, Malay Archipelago, Siam, China, Japan, Philippines, Melanesia, Polynesia, Australia.

Remarks.—It grows upto 304 mm. (a foot) in length.

Suborder Cottoidei

XCII. Family PLATYCEPHALIDAE

193. Genus *Platycephalus* Bl.

1795. *Platycephalus* Bloch, *Naturg, Ausland. Fische*, 9, p. 96. (Type, *P. spathula* Bl.=*Cottus insidiator* Forsk.).

381. *Platycephalus indicus* (L.)

1758. *Callionymus indicus* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 250 (type-locality : Asia)).
1889. *Platycephalus insidiator* Day, *Fauna Brit. India, Fish.*, 2, p. 238.

Head broad, depressed, spinate, 3·6, depth, 7 in total length. Eyes superior, 6·7 to 7 in head. Lower jaw slightly longer. Mouth large. Teeth in jaws villiform. Two dorsals the first with 8 spines. One anal spine. Pelvics below pectorals. Lateral line smooth, without spines, 125 scales. Brownish above and dirty white below ; fins spotted.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Red Sea, Natal, Madagascar, S. Africa, Malaya, Malay Archipelago, Siam, China, Korea, Japan, Philippines, Melanesia, Queensland.

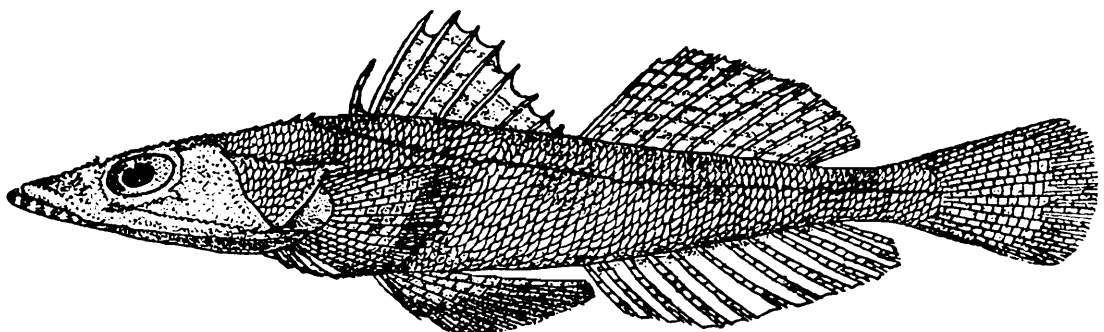
Remarks.—It grows to 304 mm. (a foot) in length and ascends estuaries.

382. *Platycephalus tuberculatus* C.

(Text-fig. 189)

1829. *Platycephalus tuberculatus* Cuvier, *Hist. nat. Poiss.*, 4, p. 258 (type-locality : Trincomale, Ceylon).
1889. *Platycephalus tuberculatus* Day, *Fauna Brit. India, Fish.*, 2, p. 238.

Head, broad, depressed, spinate, 3 to 3·2, depth 6 in total length. Eyes, superior, 3·6 to 4 in head. Mouth large. Teeth in jaws villiform. Two dorsals, the first with 8-9 spines. One anal spine. Pelvics below pectorals, reaching nearly anal. Lateral line spinate anteriorly, 55 scales. Brownish above, white below with some cross bands on body ; spinous dorsal blackish brown, second dorsal spotted ; outer half of pelvics grey.



TEXT-FIG. 189.—Lateral view of *Platycephalus tuberculatus* C. (After Day).

Distribution.—Seas of INDIA and PAKISTAN.—Ceylon, S. Africa, Malaya, Aru Is., Queensland.

Remarks. It grows upto 254 mm. (10 inches) in length.

Order THUNNIFORMES

XCIII. Family THUNNIDAE

194. Genus *Euthynnus* Jordan & Gilbert

1882. *Euthynnus* (Lutken) Jordan and Gilbert, *Bull. U. S. nat. Mus.*, p. 429.
(Type, *Thynnus pelamis* L., orthotypic.)

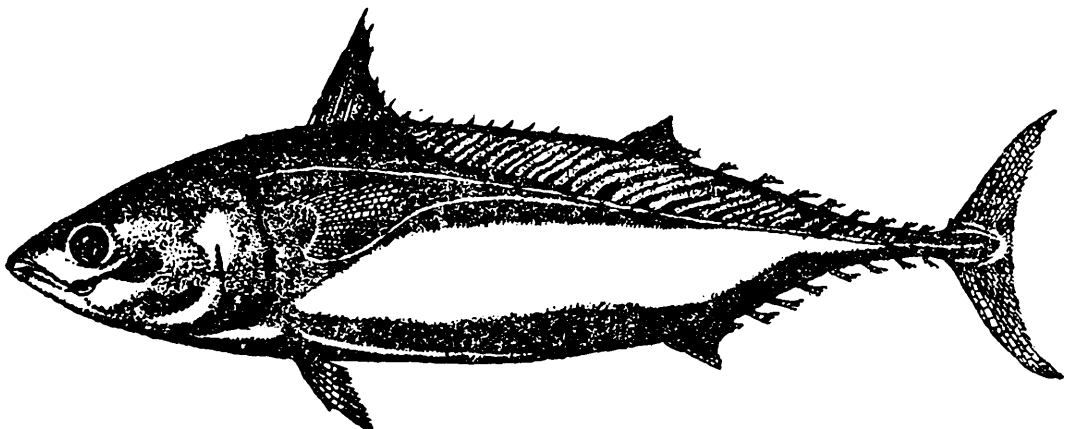
383. *Euthynnus alletteratus affinis* (Cantor)

(Text-fig. 190)

1850. *Thynnus affinis* Cantor, *J. Asiat. Soc. Beng.*, 18, p. 1088 (type-locality : Penang).

1889. *Thynnus thunnina* Day, *Fauna Brit. India.*, Fish., 2, p. 205.

Head 3.5 to 3.7, depth 4.3 in length from snout to middle of posterior edge of caudal fin. Eyes 6.5 in head. Cleft of mouth deep, maxilla reaching to post-orbit. Vomerine and palatine teeth present. Two dorsals close together, the first with 15 weak spines ; the second with 8 detached finlets. Pectorals short, less than head. Two to three concealed anal spines ; anal with 6-8 detached finlets, similar to second dorsal. Caudal broad, pointed. Caudal peduncle with a keel on either side. Scales absent except in pectoral region, small, forming a corselet in 3 portions. Lateral line straight to below soft dorsal. Lower gill-rakers 25-30. Bluish grey above and silvery below ; a large number of undulating oblique dark bends above lateral line ; sometimes black spots on chest.



TEXT-FIG. 190.—Lateral view of *Euthynnus alletteratus affinis* (Cantor). (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin ; PAKISTAN : coasts of Sind, Karachi, Makran.—Ceylon, Red Sea, Natal, Seychelles, Reunion Is., S. Africa, Malaya, Malay Archipelago, Siam, Formosa, Japan, Riu Kiu Is., Philippines, Polynesia, Hawaii, New South Wales.

Remarks.—It attains 609 mm. (2 feet) in length.

384. *Euthynnus pelamis* (L.)

1758. *Scomber pelamis* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 297 (type-locality : pelagic between tropics).

1889. *Thynnus pelamys* Day, *Fauna Brit. India.*, Fish., 2, p. 206.

Head 3.5, depth 3.2 to 3.5 in length from snout to middle of posterior edge of caudal fin. Eyes 5 to 6 in head. Cleft to mouth oblique, maxilla

extending to beyond midorbit. Vomerine and platine teeth absent. Two dorsals close together, the first with 15 weak spines ; the second with 8 detached finlets. Pectorals less than head. One to three, concealed anal spines ; anal with 7-8 detached finlets, similar to second dorsal. Caudal broad, pointed. Caudal peduncle with a keel on either side. Scales absent except in the anterior part of body, small, forming a corselet. Lateral line curved below soft dorsal. Lower gill rakers 36-40. Dark blue above and silvery below ; 4-6 longitudinal dark bands in the lower half of abdomen posteriorly, below lateral line ; transverse indistinct marks on back.

Distribution.—Seas of INDIA and PAKISTAN.—Ceylon, S. Africa, Malaya, Malay Archipelago, Formosa, Japan, Riu Kiu Is., Philippines, Micronesia, Polynesia, Hawaii, New Zealand, New South Wales ; warm parts of Atlantic, Indian and Pacific oceans : in temperate and tropical waters.

Remarks.—It attains at least 609 mm. (2 feet) in length.

195. Genus *Thunnus* South

1817. *Thynnus* (*nec* Browne, 1789) Cuvier, *Regne Animal.*, 2, ed. 1, p. 313. (Type, *Scomber thynnus* L., inadmissible.)
1845. *Thunnus* South, *Encyclopaedia Metropolitana*, 5, p. 620. (Type, *Scomber thynnus* L., tautotypic.)
1863. *Orycnus* Cooper, *Proc. Calif. Acad. nat. Sci.*, 5, p. 77. (Type, *Scomber thynnus* L.)

385. *Thunnus macropterus* Schgl.

1842. *Thynnus macropterus* Schlegel, *Faun. Japonica, Pisc.*, 98, pl. 51 (type-locality : Japan).
1889. *Thynnus macropterus* Day, *Fauna Brit. India, Fish.*, 2, p. 207.

Head 3.6, depth 3.6 in length from snout to middle of posterior edge of caudal fin. Eyes 5 in head. Cleft of mouth oblique, maxilla reaching to below first third of eye ; lower jaw a little longer. Vomer and palatine teeth present. Two dorsals, the first with 13-15 feeble spines ; the second with 8-9 detached finlets, falciform, with its anterior rays elongated. Pectorals nearly or as long as head. Two to 3 concealed anal spines ; anal with 7-8 detached finlets, falciform, similar to second dorsal. Caudal broad, pointed. Caudal peduncle with a well developed keel on either side. Scales throughout body, those in the front of pectoral region larger forming a corselet with three distinct posterior prolongations. Bluish grey becoming silvery below ; small, silvery, dark-edged, elongated spots on sides and abdomen ; fins mostly bright yellow.

Distribution.—Seas of INDIA and PAKISTAN.—Ceylon, Red Sea, S. Africa, Malay Archipelago, Japan, Riu Kiu Is., Philippines, Micronesia, Polynesia, Hawaii, Galapagos, S. California, Queensland, New South Wales.

Remarks.—It attains at least 762 mm. (2½ feet in length.)

Order PLEURONECTIFORMES

Suborder Psettoidoidei

XCIV. Family PSETTODIDAE

196. Genus *Psettodes* Bennett

1831. *Psettodes* Bennett, *Proc. zool. Soc. Lond.*, p. 147. (Type, *P. belcheri* Bennett, orthotypic.)

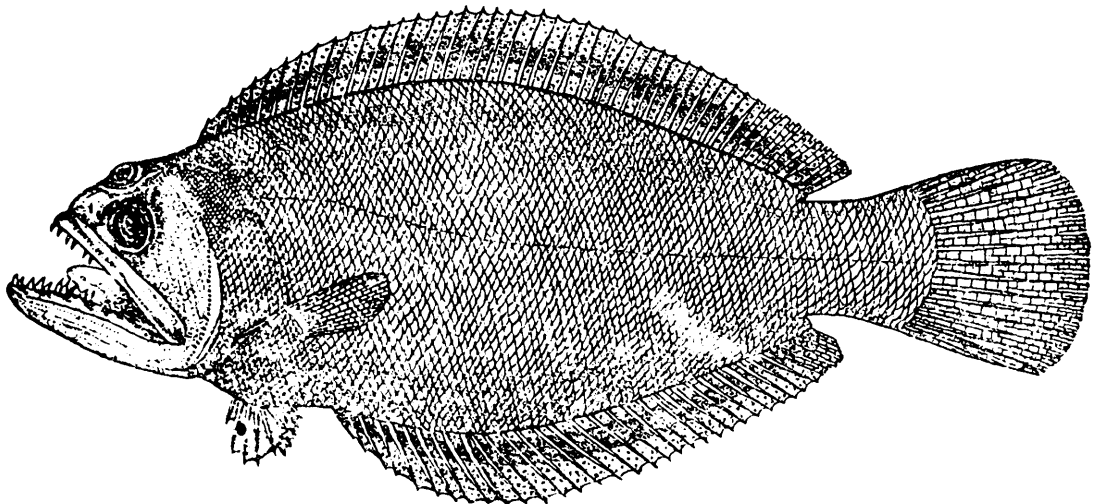
386. *Psettodes erumei* (Schn.)

(Text-fig. 191)

1801. *Pleuronectes erumei* Schneider, *Syst. Ichth. Bloch.*, p. 150 (type-locality : not given).

1889. *Psettodes erumei* Day, *Fauna Brit. India, Fish.*, 2, p. 439.

Head 4.1, depth 2.6 in total length. Eyes 6 in head, distantly placed on right or left side. Cleft of mouth deep; maxilla 0.8 of head length. Preopercular margin free, not almost covered by skin. Jaws and dentition equally developed on both sides. Teeth strong, barbed. A single long dorsal not extending on to head; anterior rays spinous. Anal long, commencing behind pectoral base. Caudal truncate or middle rays a little longer. A single lateral line with 70-75 scales. Gill rakers in the form of groups of minute spines. Uniform brown or purplish black, often with 4 cross bands in young; vertical fins white-edged.



TEXT-FIG. 191.—Lateral view of *Psettodes erumeri* (Schn.). (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Madras, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Gulf of Oman, Muscat, Persian Gulf, Red Sea, E. and S. coasts of Africa, Malaya, Malay Archipelago, Siam, China, Hongkong, Formosa, Japan, Philippines, Queensland.

Remarks.—It grows upto 304 mm. (a foot) in length.

Suborder Pleuronectoidei

XCV. Family BOTHIDAE

197. Genus *Pseudorhombus* Blkr.

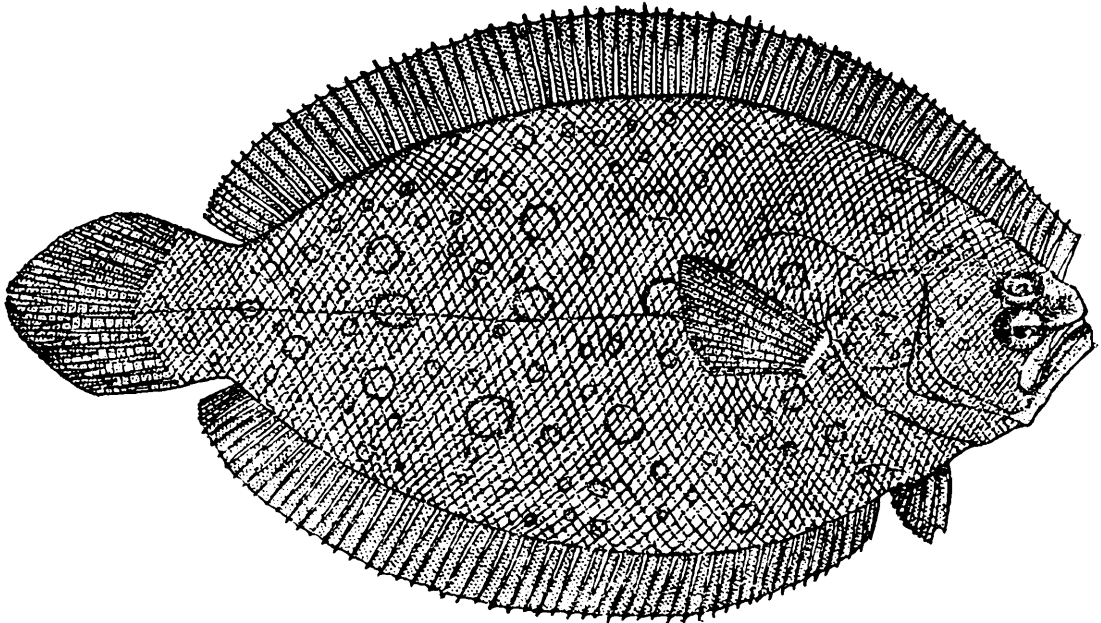
1862. *Pseudorhombus* Bleeker, *Versl. Akad. Amsterdam*, 13, p. 426. (Type, *Rhombus polyspilos* Blkr., orthotypic.)

387. *Pseudorhombus arsius* (Ham.)

(Text-fig. 192)

1822. *Pleuronectes arsius* Hamilton, *Fish. Ganges*, p. 125 (type-locality : estuaries below Calcutta).
 1889. *Pseudorhombus arsius* Day, *Fauna Brit. India, Fish.*, 2, p. 441.

Head 3.3 to 3.7, depth 1.7 to 2.2 in total length. Eyes 4.6 to 7 in head, on left side, close together, without a preorbital edge. Preopercular margin free, not covered by skin. Cleft of mouth rather deep, lower jaw longer; maxilla more than one-third of head. A single, long dorsal commencing before eyes; none of the rays produced. Anal commencing before pectoral base. Caudal double truncate, not united with anal and dorsal. A single lateral line on each side with dorsal branch on head; 67 to 78 scales. Lower gill rakers 9-13. Brownish with variously sized rings; often with two dark ocelli on straight portion of lateral line; vertical fins with brown spots and rings.



TEXT-FIG. 192.—Lateral view of *Pseudorhombus arsius* (Ham.). (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal, Andamans; PAKISTAN : coasts of Sind, E. Pakistan.—Burma, Ceylon, Gulf of Oman, Muscat, Madagascar, E. and S. coasts of Africa, Malaya, Malay Archipelago, Siam, Cochin China, China, Hongkong, Japan, Philippines, Melanesia, Queensland, New South Wales.

Remarks.—It grows upto 228 mm. (9 inches) in length and ascends estuaries.

388. *Pseudorhombus javanicus* (Blkr.)

1853. *Rhombus javanicus* Bleeker, *Nat. Tijdschr. Ned.-Ind.*, 4; p. 50 (type-locality : Batavia, Java).

1889. *Pseudorhombus javanicus* Day, *Fauna Brit. India*, Fish., 2, p. 442.

Head 3.6 to 4, depth 2.1 to 2.2 in total length. Eyes 5 in head, on left side, close together, without preorbital edge. Preopercular margin free. Cleft of mouth deep, lower jaw longer, maxilla reaching to mid-orbit. A single, long dorsal commencing in front of nostrils of blind side ; none of the rays produced. Anal commencing before pectoral base. Caudal double truncate, not united with anal and dorsal. A single lateral line on each side with dorsal branch at head, 68-72 scales. Lower gill rakers 12-14. Purplish brown often with 3 black spots on lateral line surrounded by a row of white dots or light blotches each surrounded by a dark ring.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Malaya, Malay Archipelago, Siam, Indo-China, Hainan, Hongkong, Philippines.

Remarks.—It grows to at least 203 mm. (8 inches) in length.

389. *Pseudorhombus triocellatus* (Schn.)

1801. *Pleuronectes triocellatus* Schneider, *Syst. Ichth. Bloch*, p. 145 (type-locality : East Indian Seas).

1889. *Pseudorhombus triocellatus* Day, *Fauna Brit. India*, Fish., 2, p. 442.

Head 3.3 to 3.5, depth 1.5 to 1.7 in total length. Eyes 4 in head, on left side, close together. Preopercular margin free. Cleft of mouth deep, lower jaw not longer, maxilla extending to midorbit. A single dorsal commencing above or a little in front of anterior nostril of blind side ; anterior rays non-spinous, free, prolonged. Anal commencing before pectoral base. Caudal double truncate or rounded, not united with anal and dorsal. A single lateral line on each side with dorsal branch at head ; 63 to 68 scales. Lower gill rakers 23. Brownish with 3 large, heart-shaped, purplish ocelli, each having a light centre and yellowish circumference, arranged in the form of a triangle ; indistinct dark spots or markings ; vertical fins with dots and patches, yellowish grey.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Malay Archipelago, Tahiti.

Remarks.—It grows at least upto 177 mm. (7 inches) in length.

XCVI. Family SOLEIDAE

198. Genus *Solea* Quensel

1806. *Solea* Quensel, *Kong. Vet. Akad. Nya Handling*, 27, pp. 44, 203. (Type, *Pleuronectes solea* L.)

390. *Solea ovata* Richardson

1846. *Solea ovata* Richardson, *Ichth. China, Japan*, p. 279 (type-locality : China).

1889. *Solea ovata* Day, *Fauna Brit. India*, Fish., 2, p. 445.

Head 3.5 to 4.1, depth 2 to 2.2 in total length. Eyes 4 to 5 in head, on right side, upper one in advance of lower, close together. Preopercular margin not free. Cleft of mouth narrow twisted round to left side ; upper jaw longer. A single, long dorsal commencing on snout, with anterior and posterior rays short. Caudal rounded, not united with dorsal and anal. A single, lateral line on each side with no dorsal branch on head ; 100-108 scales. Left pectoral present. Olive brown with black spots and blotches on coloured side of body and vertical fins ; pectorals deep black on outer two-third.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Malaya, Malay Archipelago, China, Philippines.

Remarks.—It attains at least 102 mm. (4 inches) in length.

199. Genus *Brachirus* Swainson

1839. *Brachirus* Swainson, *Nat. Hist. Fish. Animal.*, 2, p. 203. (Type, *Pleuronectes orientalis* Bl. Schn.)

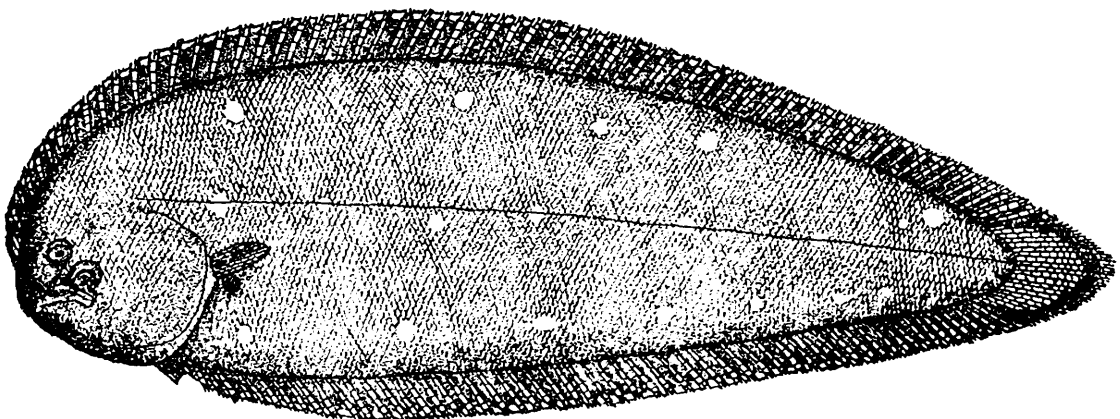
391. *Brachirus albomaculata* (Kaup)

(Text-fig. 193)

1858. *Synaptura albomaculata* Kaup, *Arch. Naturgesch.*, 24, pl. 1, p. 96 (type-locality : Coromandel).

1889. *Synaptura albomaculata* Day, *Fauna Brit. India, Fish.*, 2, p. 448.

Head 5.2 to 6, depth 3.3 to 3.6 in total length. Eyes 6 in head, on right side, upper in advance of lower, separated by a narrow scaly interspace. Preopercular margin not free. Cleft of mouth narrow, twisted round to left side, extending a little beyond midorbit ; lower lip distinctly fringed. A bony prominence on the anterior part of snout. A barbel between nostrils on ocular side. A single long dorsal, commencing on snout with anterior rays not produced. Anal long, origin before pectoral base. Both pectorals more or less of equal size. A lateral line on each side with 155 scales. Brownish on ocular side with 3-5 rows of widely separated white dots ; fins slaty grey, edged white.



TEXT-FIG. 193.—Lateral view of *Brachirus albomaculata* (Kaup). (After Day).

Distribution.—INDIA: coasts of Malabar, Travancore-Cochin, Madras, Coromandel, Orissa, W. Bengal ; PAKISTAN : coasts of E. Pakistan.—Burma, Malaya.

Remarks.—It grows upto 304 mm. (a foot) in length.

392. *Brachirus orientalis* (Schn.)

1801. *Pleuronectes orientalis* Schneider, *Syst. Ichth. Bloch*, p. 157 (type-locality : Tranquebar).

1889. *Synaptura orientalis* Day, *Fauna Brit. India, Fish.*, 2, p. 449.

Head 4.2 to 5.3, depth 2 to 2.2 in total length. Eyes 5 to 8 in head, on right side, upper in advance of lower, separated by a wide scaly interspace. Cleft of mouth small, extending to midorbit or a little less ; lower lip feebly fringed. No bony prominence on the anterior part of snout. A single, long dorsal commencing on snout with the anterior rays not produced. Anal long, origin before pectoral base. Caudal united with dorsal and anal. Both pectorals present, right longer. A lateral line on each side with 63-74 scales on blind side of head produced into barbel-like processes. A number of filamentous processes forming irregular groups on ocular side. Bluish slaty on ocular side with sharp narrow black cross bands ; or greyish or brownish, blotched or irregularly spotted with dark grey.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, Karachi, Makran, E. Pakistan.—Ceylon, Persian Gulf, Malaya, Malay Archipelago, Indo-China, Formosa, China, E. Australia.

Remarks.—It grows to 165 mm. (6 inches) in length.

393. *Brachirus pan* (Ham.)

1822. *Pleuronectes pan* Hamilton, *Fish. Ganges*, pp. 130, 373, pl. 24, fig. 42 (type-locality : Eastern estuaries of the Ganges from Dhapa downwards).

1889. *Synaptura pan* Day, *Fauna Brit. India, Fish.*, 2, p. 449.

Head 4.2 to 5, depth 2 to 2.2 in total length. Eyes 5 to 6 in head, upper in advance of lower, separated by a scaly interspace. Preopercular margin not free. Cleft of mouth narrow, reaching front edge of eye ; lower lip feebly fringed. No bony prominence in the anterior part of snout. A single, long dorsal commencing on snout with anterior rays not produced. Anal long, origin before pectoral base. Both pectorals present, the right a little longer. Caudal united with dorsal and anal. A lateral line on each side with 66-70 scales ; some of scales on blind side produced into barbel-like processes ; a few dermal filaments on ocular side. Dull red to muddy brown or gray with vertical black blotches and bands.

Distribution.—INDIA : estuaries and tidal rivers of Orissa and W. Bengal ; PAKISTAN : estuaries and tidal rivers of E. Pakistan.—Burma, Malaya, Malay Archipelago, Siam, S. China.

Remarks.—It attains at least 139 mm. (5 inches) in length.

XCVII. Family CYNOGLOSSIDAE

200. Genus *Cynoglossus* Ham.

1822. *Cynoglossus* Hamilton, *Fish. Ganges*, p. 32. (Type, *C. lingua* Ham.)

394. *Cynoglossus bilineatus* (Lac.)

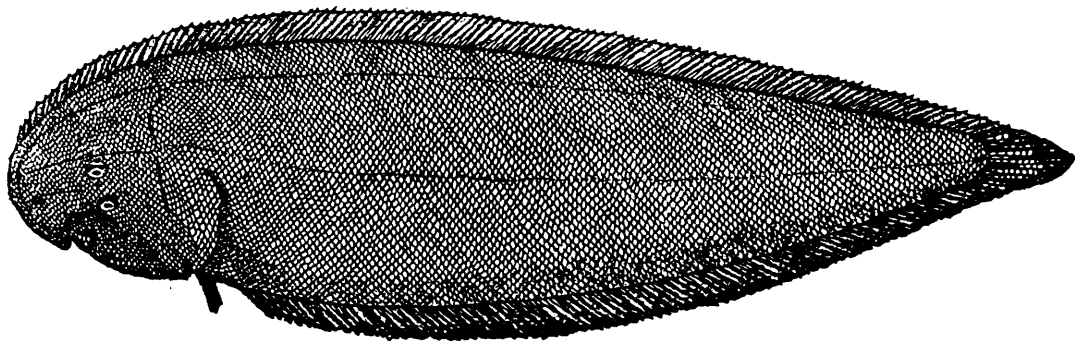
(Text-fig. 194)

1802. *Achirus bilineatus* Lacepede, *Hist. nat. Poise.*, 4, pp. 659, 662 (type-locality : China).

1889. *Cynoglossus sindensis* Day, *Fauna Brit. India, Fish.*, 2, p. 455

1889. *Cynoglossus quadrilineatus* Day, *Fauna Brit. India, Fish.*, 2, p. 457.

Head 4.4 to 5, depth 3.7 to 4.3 in total length. Eyes 8.5 to 11 in head, on left side, upper a little in advance of lower. Preopercular margin not free. Cleft of mouth narrow. Lips not fringed. Snout round, rostral hook short, extending a little beyond mandibular symphysis. Two nostrils on ocular side, one simple between eyes, another tubular in front of lower eye. A single, long dorsal commencing from anterior part of snout. Anal long, origin close behind gill opening. Caudal united with dorsal and anal. Pectorals absent. Two lateral lines on ocular side and two on blind side. Fourteen to 19 scales between lateral lines on ocular side and 15-18 on blind side. Brownish with irregular dark patch on opercular region.



TEXT-FIG. 194.—Lateral view of *Cynoglossus bilineatus* (Lac.). (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal; PAKISTAN: coasts of Sind, Karachi, Makran, E. Pakistan.—Burma, Ceylon, Red Sea, Zanzibar, Seychelles, Malaya, Malay Archipelago, China, Japan, Philippines, Queensland.

Remarks.—It grows to about 304 mm. (a foot) in length.

395. *Cynoglossus lingua* Ham.

1822. *Cynoglossus lingua* Hamilton, *Fish. Ganges*, pp. 32, 365 (type-locality : estuaries of the Ganges with greater salinity).

1889. *Cynoglossus lingua* Day, *Fauna Brit. India*, Fish., 2, p. 454.

Head 4.5 to 5, depth 5.6 to 6.5 in total length. Eyes 11 to 14 in head, on left side, upper in advance of lower. Preopercular margin not free. Cleft of mouth narrow. Lips not fringed. Snout obtusely pointed, rostral hook short, extending a little beyond mandibular symphysis. Two nostrils on ocular side, a simple one between eyes and a tubular one in front of snout. Anal long, origin close behind gill opening. Caudal united with dorsal and anal. Pectorals absent. Two lateral lines on ocular side separated by 12 to 14 scales ; no distinct lateral line on blind side. Brownish or greyish with or without indistinct darker patches.

Distribution.—INDIA: coasts of Madras, Orissa, W. Bengal; PAKISTAN: coasts of E. Pakistan.—Burma, Ceylon, Malaya, Malay Archipelago, Siam.

Remarks.—It grows to about 355 mm. (a foot and 2 inches) in length and ascends estuaries.

396. *Cynoglossus macrolepidotus* (Blkr.)

1850. *Plagusia macrolepidotus* Bleeker, *Nat. Tijdschr. Ned.-Ind.*, 1, p. 415.
(type-locality : Batavia, Java).

1889. *Cynoglossus macrolepidotus* Day, *Fauna Brit. India, Fish.*, 2, p. 455.

Head 4 to 4.4, depth 3.8 to 4.6 in total length. Eyes 8.2 to 12 in head, on left side, upper in advance of lower. Preopercular margin not free. Cleft of mouth narrow. Lips not fringed. Snout rounded, obtusely pointed, rostral hook short extending a little beyond mandibular symphysis. Two nostrils on ocular side, a simple one between eyes, a tubular one in front of lower eye. A single, long dorsal commencing from the anterior part of snout. Anal long, origin close behind gill opening. Caudal united with dorsal and anal. Pectorals absent. Two lateral lines on ocular side separated by 7-9 scales ; no distinct lateral line on blind side. Uniform brown, fins often darker posteriorly.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal; PAKISTAN: coasts of Sind, E. Pakistan.—Burma, Ceylon, Persian Gulf, Malaya, Malay Archipelago, Indo-China, China, Philippines.

Remarks.—It grows to about 304 mm. (a foot) in length.

ORDER MASTOCEMBELIFORMES

XCVIII. Family MASTOCEMBELIDAE

201. Genus *Mastocembelus* Scopoli

1763. *Mastacembelus* (*nec* Klein, 1744) Gronow, *Zoophyl. Gronovius Animal.*, p. 132. (Type, *Ophidium simack* Walbaum = *Rhyncobdella halepensis* Bl., inadmissible.)

1777. *Mastocembelus* Scopoli, *Introd. Hist. Nat.*, p. 458. (Type, *M. unicolor* C. V.)

397. *Mastocembelus armatus* (Lac.)

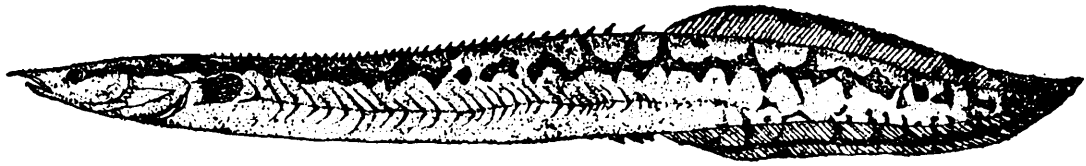
(Test-fig. 195)

1800. *Macrognathus armatus* Lacepede, *Hist. nat. Poiss.*, 2, pp. 283, 286
(type-locality : not given).

1889. *Mastacembelus armatus* Day, *Fauna Brit. India, Fish.*, 2, p. 334.

Head 6.5 to 7.5, depth 11 to 12 in total length. Eyes one diameter apart. Body elongate, cylindrical, eel-like. Cleft of mouth narrow ; a long fleshy appendage to snout, not transversely striated inferiorly ; snout trilobed. A preorbital spine. Teeth in jaws minute. A single, long dorsal with 32-39 stumpy free spines ; origin of soft part behind anal origin. Three anal spines. Caudal united with dorsal and anal. Thirty rows of scales between the base of first dorsal ray and

lateral line. Head and body scales similar. Brownish on back and lighter below, with a row of black spots along base of soft dorsal.



TEXT-FIG. 195.—Lateral view of *Mastocembelus armatus* (Lac.). (After Day).

Distribution.—Fresh and brackish waters of INDIA and PAKISTAN.—Burma, Ceylon, Malaya, Siam, Hainan.

Remarks.—It attains at least 609 mm. (2 feet) or more in length.

398. *Mastocembelus pancalus* (Ham.)

1822. *Macrogathus pancalus* Hamilton, *Fish. Ganges*, pp. 30, 364, (type-locality : tanks of the Gangetic provinces).
1889. *Mastacembelus pancalus* Day, *Fauna Brit. India, Fish.*, 2, p. 333.

Head 5 to 5.5, depth 6.5 to 7 in total length. Eyes one diameter apart. Body elongate, cylindrical eel-like. Cleft of mouth narrow ; a long fleshy appendage to snout ; snout without transverse striations inferiorly, trilobed. A preorbital spine. Teeth in jaws minute. A single, long dorsal with 24-26 stumpy free spines ; origin of soft dorsal behind anal origin. Three anal spines. Caudal not united with dorsal and anal. Eighteen rows of scales between lateral line and base of first dorsal ray. Greenish olive above yellowish below, with yellowish white spots on scales ; posterior part of body often vertically striped.

Distribution.—Fresh and brackish waters of INDIA and PAKISTAN.

Remarks.—It attains at least 177 mm. (7 inches) in length.

202. Genus *Macrogathus* Lac.

1800. *Macrogathus* Lacepede, *Hist. nat. Poiss.*, 2, p. 283. (Type, *Ophidium aculeatum* B1.)
1801. *Rhynchobdella* Schneider, *Syst. Ichth. Bloch*, p. 479. (Type, *R. orientalis* Schn.=*Ophidium aculeatum* B1.)

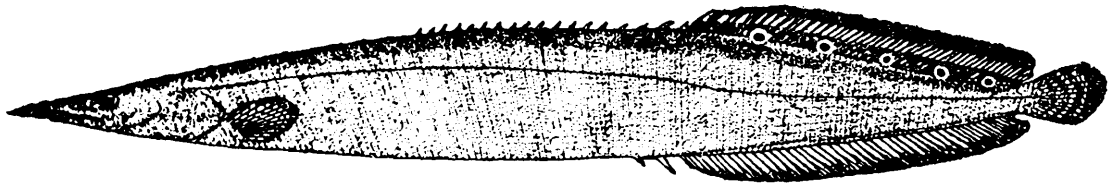
399. *Macrogathus aculeatum* (B1.)

(Text-fig. 196)

1795. *Ophidium aculeatum* Bloch, *Naturg. Ausland. Fische*, pl. 159, fig. 2 (type-locality : not given).
1889. *Rhynchobdella aculeata* Day, *Fauna Brit. India, Fish.*, 2, p. 331.

Head 5 to 6, depth 8 to 10 in total length. Eyes one diameter apart. Body elongate, cylindrical, eel-like. Cleft of mouth narrow ; snout long, fleshy, trilobed, with transverse striations inferiorly. No preorbital

spine. Teeth in jaws minute. A single, long dorsal with 13-20 stumpy free spines. Two to three anal spines. Caudal not united with dorsal and anal. Nineteen to 23 scales between lateral line and first ray of soft dorsal. Scales on head larger than those on body. Brownish or olive, marbled along back and yellowish below ; a light band above lateral line ; 3 to 9 large white or buff-edged ocelli along base of soft dorsal ; caudal vertically barred.



TEXT-FIG. 196.—Lateral view of *Macrogathus aculeatum* (Bl.). (After Day).

Distribution.—Fresh and brackish waters of INDIA and PAKISTAN.—Burma, Ceylon, Malaya, Malay Archipelago, Siam, Indo-China, China.

ORDER ECHENEIFORMES XCIX. Family ECHENEIDAE

203. Genus *Echeneis* L.

1758. *Echeneis* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 260. (Type, *E. naucrates* L.)

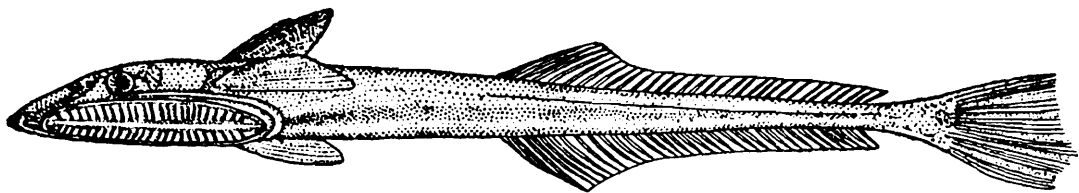
400. *Echeneis naucrates* L.

(Text-fig. 197)

1758. *Echeneis naucrates* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 261 (type-locality : "Pelago Indico").

1889. *Echeneis naucrates* Day, *Fauna Brit. India*, Fish., 2, p. 214.

Head 5.3 to 6, disk 4.2 to 5, depth 11.5 to 12.5 in total length. Eyes 2-3 diameters from snout end, 3.5 to 4.5 apart superiorly. Head depressed, body slender. Cleft of mouth deep. Teeth villiform in jaws. Two dorsals, the first modified into an adhesive disc on the summit of head, with 21-28 pairs of transverse laminae ; disc more than twice as long as broad ; second dorsal long, origin in front of anal.



TEXT-FIG. 197.—Lateral view of *Echeneis naucrates* L. (After Day).

Anal nearly as long as and similar to second dorsal. Pelvics pointed, placed almost horizontal ; origin below hind end of disc. Caudal cut square, with four short notches at its extremity. Scales minute. Gill-rakers 9. Brownish gray above, lighter below ; often a black band along middle of side ; pectorals deep brown ; caudal dorsal and anal white edged.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, E. Pakisthan.—Ceylon, Muscat, Natal, S. Africa, Malaya, Malay Archipelago, Siam, Hongkong, Chefoo, Korea, Philippines, Melanesia, Polynesia, New South Wales, Queensland, Atlantic ocean between the tropics ; circumtropical in all warm seas.

Remarks.—It grows to 914 mm. (3 feet) in length.

204. Genus *Remora* Forster

1771. *Remora* Forster, *Cat. Animal. N. America*, p. 20. (Type, *Echeneis remora* L.)

401. *Remora remora* (L.)

1758. *Echeneis remora* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 260 (type-locality : "Pelago Indico").

1889. *Echeneis remora* Day, *Fauna Brit. India, Fish.*, 2, p. 215.

Head 4.3, disk 3.2, depth 9 in total length. Eyes 3.5 diameters from snout end and 5 apart superiorly. Head depressed, body robust. Cleft of mouth deep. Teeth in jaws villiform, outer lateral row in lower jaw enlarged. Two dorsals, the first modified into an adhesive disk on the summit of head, with 16-20 pairs of transverse laminae ; disk about as wide as long ; second dorsal long, origin midway between pectoral base and caudal base. Anal opposite and similar to second dorsal. Caudal often forked in young. Scales small. Gill rakers 12. Brownish or dusky.

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal ; PAKISTAN : coasts of Sind, E. Pakistan.—Ceylon, Cape of Good Hope, Natal, S. Africa, Malaya, Malay Archipelago, Hongkong, China Sea, Korea, Philippines, Melanesia, Micronesia, Polynesia, Hawaii, New South Wales, Queensland, Atlantic ocean between the tropics ; circumtropical in all warm seas.

Remarks.—It grows to about 254 mm. (10 inches) in length.

Order TETRODONTIFORMES

Suborder Balistoidei

C. Family BALISTIDAE

205. Genus *Abalistis* Jordan & Seale

1906. *Abalistes* Jordan & Seale, *Bull. U. S. Bur. Fish.*, 25, p. 364. (Type, *Balistes stellaris* Bl. Schn., orthotypic.)

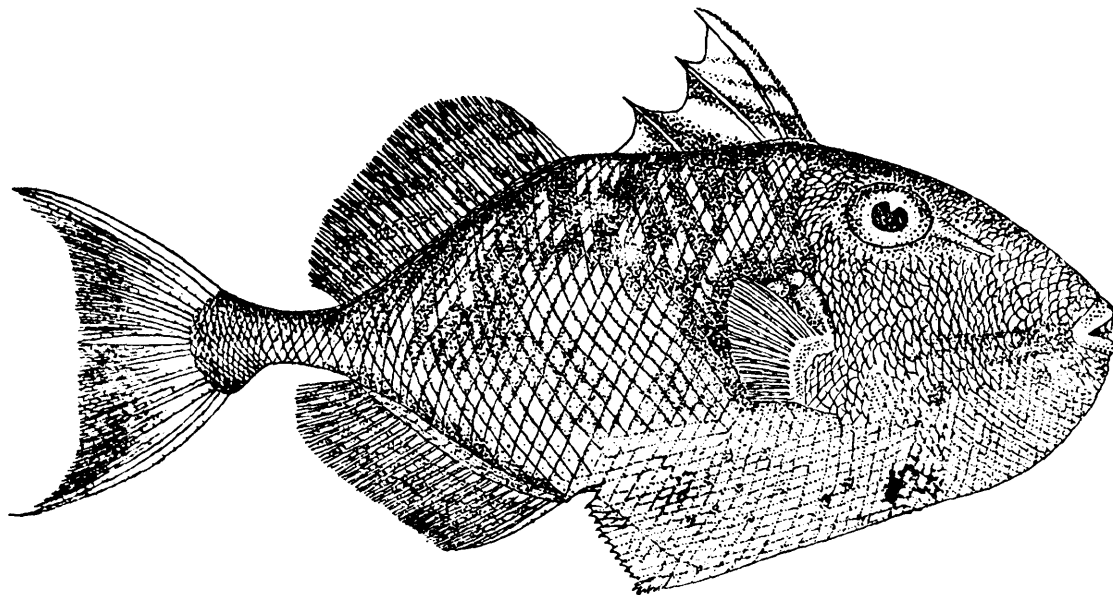
402. *Abalistis stellaris* (Schn.)

(Text-fig. 198)

1801. *Balistes stellaris* Schneider, *Syst. Ichth. Bloch*, p. 476 (type-locality : "Mauritius").

1889. *Balistes stellaris* Day, *Fauna Brit. India, Fish.*, 2, p. 473.

Head 3·7 to 4·5, depth 2·6 to 3 in total length. Eyes 2·2 to 2·7 from snout end, a groove in front of eye. Body compressed. Mouth small. Teeth uneven notched. Two dorsals, the first commencing slightly behind orbit ; with 3 spines, the first one stout and strong ; the second dorsal long, widely separate from first dorsal. Pelvics as an osseous appendage, spines moveable. Anal, long opposite and similar to second dorsal. Caudal concave, ends of lobe often produced in adult ; two ridges on either side of the depressed caudal peduncle in adults, in young formed of spines on scales. Scales on cheeks ; some enlarged scutes behind gill opening ; lateral line with 42-46 scales. Grey shot with olive green above, whitish below ; 3 large white blotches on back together with numerous small bluish spots ; 3-4 yellow streaks from mouth to pectoral base ; pectorals yellow with dark base ; fins banded with black, yellow and olive.



TEXT-FIG. 198.—Lateral view of *Abalistis stellaris* (Schn.). (After Day).

Distribution.—INDIA : coasts of Cutch, Baroda, Bombay, Malabar, Travancore-Cochin, Coromandel, Madras, Orissa, W. Bengal; PAKISTAN: coasts of Sind, E. Pakistan.—Ceylon, Red Sea, Zanzibar, Mauritius, E. and S. coasts of Africa, Malay, Malaya Archipelago, Siam, China; Philippines, Melanesia, Polynesia, W. Australia, Queensland.

Remarks.—It attains at least 609 mm. (2 feet) in length and yields a kind of oil used by some fishermen for painting their boats.

VI—SUMMARY

1. This work is an aid for the easy identification of some of the common fishes of commercial importance in India and Pakistan.
2. The marine, brackish and freshwater fishes dealt with here comprise 402 species belonging to 205 genera, 100 families, 8 orders and 2 classes. Of these 46 species, 24 genera and 12 families are of the class Elasmobranchii and 356 species, 181 genera, 88 families and 6 orders are of the class Teleostomi.
3. The classification adopted in this work is mainly after L. S. Berg.
4. The limits of the area of which the marine species are listed here are as shown by dotted line in the accompanying map, but excluding the coastal and territorial waters of Burma and Ceylon. For the fresh and brackish water species the limits of the area are the political boundaries of India and Pakistan.
5. This work consists of 4 main parts : the first providing the key to the classes, orders, suborders and families ; the second of a running field key for all the 100 families of the common commercial fishes ; the third providing the key to the different genera and species ; and the fourth dealing with the systematic account of the species.
6. In the systematic account of the species, relevant generic and specific synonymies have been given and the scientific names of the species standardised and stabilised according to the rules of the International Commission of Zoological Nomenclature.
7. In order to facilitate easy reference, names of fishes as found in Day's *Fauna of British India*, Fish series, are given in the specific synonymies.
8. Short descriptions of the species are followed by "Distribution" and "Remarks" Under "Distribution" the range of the species in India, Pakistan and the rest of the world is shown. Under "Remarks" the maximum size to which the species grows is also given in the metric system.
9. The illustrations of 198 species have been provided.
10. A new genus *Schizothoraichthys* (Cyprinidae : Cypriniformes) has been proposed with *Schizothorax esocinus* Heckel as the generitype. Under this new genus the following species are included :—*Schizothorax esocinus* Heckel, *S. curvifrons* Heckel, *S. longipinnis* Heckel, *S. niger* Heckel, *S. nasus* Heckel, *S. hugelii* Heckel, *S. micropogon* Heckel, *S. planifrons* Heckel, *S. pelzami* Kessler, *S. intermedius* Mc Clell., *S. argentatus* Kessler, *S. pseudaksaiensis* Herzenstein and *S. progastus* Mc Clell.

VII—REFERENCES

- ANONYMOUS. 1955. *Marine Fishes of Karachi and the Coasts of Sind and Makran*.—Karachi, pp. i-xii, 1-80, 113 figs.
- CHU, Y. Y. 1931. *Index Piscium Sinensium*.—*Biol. Bull. St. John's Univ.*, Shanghai, No. 1, pp. 1-290.
- DAY, F. 1878-88. *The Fishes of India : a natural history of the fishes of India, Burma and Ceylon, text including supplement*.—London, 1, pp. i-xx, 1-816 ; 2, 197 pls.
- DAY, F. 1889. *The Fauna of British India, including Ceylon and Burma Fishes*.—London, 1, pp. i-xviii, 1-548, 164 figs. ; 2, pp. i-xiv, 1-509, 177 figs.
- FOWLER, H. W. 1928. *The Fishes of Oceania*.—*Mem. B. P. Bishop Mus.*, Honolulu, 10, pp. 1-540, 49 pls., 82 figs.
- FOWLER, H. W. 1938. A list of the Fishes known from Malaya.—*Fisheries Bull.*, Singapore, No. 1, pp. 1-268, i-lvi.
- GUDGER, E. W. 1940. The alleged pugnacity of the swordfish and the spearfishes as shown by their attacks on vessels.—*Mem. roy. Asiat. Soc. Beng.*, Calcutta, 12, pp. 216-315.
- HERRE, A. W. 1953. Check list of Philippine Fishes.—*Fish and Wild life Service*, Washington, Res. rep., 20, pp. 1-977.
- HORA, S. L. and MUKERJI, D. D. 1938. Table of Identification of Indian freshwater fishes, with descriptions of certain families and observations on the relative utility of the probable larvivoracious fishes of India.—*Health Bull.*, No. 12, Malaria Bureau, Delhi, No. 4, 2nd ed., pp. 1-47, 7 pls.
- KOUMANS, F. P. 1953. *The Fishes of the Indo-Australian Archipelago*, Leiden, 10, pp. i-xiii, 1-423, 95 figs.
- MC CULLOCH, A. R. 1929-30. A check list of the Fishes recorded from Australia.—*Mem. Austral. Mus.*, Sydney, 5, pp. i-x, 1-534.
- MISRA, K. S. 1949. A check list of the Fishes of India, Burma and Ceylon. I. Elasmobranchii and Holocephali.—*Rec. Indian Mus.*, Delhi, 45 [1947], pp. 1-46.
- MISRA, K. S. 1949. A check list of the Fishes of India, Burma and Ceylon. II. Clupeiformes, Bathyclupeiformes, Galaxiiformes, Scopeliformes and Ateleopiformes.—*Rec. Indian Mus.*, Delhi, 45 [1947], pp. 377-431.
- MISRA, K. S. 1952. An Aid to the Identification of the Fishes of India, Burma and Ceylon. I. Elasmobranchii and Holocephali.—*Rec. Indian Mus.*, Delhi, 49 [1951], pp. 89-137, 25 text-figs.
- MISRA, K. S. 1953. An Aid to the Identification of the Fishes of India, Burma and Ceylon. II. Clupeiformes, Bathyclupeiformes, Scopeliformes and Ateleopiformes.—*Rec. Indian Mus.*, Delhi, 50 [1952], pp. 367-422, 30 text-figs.
- MORI, T. 1936. *Studies on the geographical distribution of freshwater Fishes in eastern Asia*.—Chosen, Japan, pp. 1-88.
- MORI, T. 1952. Check list of the Fishes of Korea.—*Mem. Hyogo Univ. Agric.*, Sasayama, Japan, 1, pp. 1-228.
- MUNRO, IAN S. R. 1955. *The Marine and Freshwater Fishes of Ceylon*, Canberra, pp. i-xvi, 1-349, 56 pls., 19 figs.
- NORMAN, J. R. 1927. The Flat fishes (Heterosomata) of India, with a list of the specimens in the Indian Museum. Part I.—*Rec. Indian Mus.*, Calcutta, 29, pp. 7-47, 7 pls., 12 text-figs.
- NORMAN, J. R. 1928. The Flat fishes (Heterosomata) of India, with a list of the specimens in the Indian Museum. Part II.—*Rec. Indian Mus.*, Calcutta, 30, pp. 173-215, 4 pls., 30 text-figs.
- PRASHAD, B. and MUKERJI, D. D. 1929. The Fish of the Indawgyi lake and the streams of the Myitkyina District (Upper Burma).—*Rec. Indian Mus.*, Calcutta, 31, pp. 161-223, 4 pls., 8 text-figs.
- SHAW, G. E. and SHEBBEARE, E. O. 1938. The Fishes of Northern Bengal.—*J. roy. Asiat. Soc. Beng., Sci.*, Calcutta, 3, pp. 1-317, 6 pls., 130 text-figs.
- SMITH, J. L. B. 1953. *The Sea Fishes of Southern Africa*.—Grahamstown, Revised and Enlarged ed., pp. i-xii, 1-564, 107 pls., 1232 figs.

- SMITH, H. M. 1945. The Freshwater Fishes of Siam, or Thailand.—*Bull. U.S. nat. Mus.*, Washington, No. 188, pp. i-xi, 1-622, 107 figs.
- SUVATTI, C. 1936. *Index to the Fishes of Siam, Bureau of Fisheries*, Bangkok, pp. A-F., 1-226.
- TANAKA, S. 1931. On the distribution of Fishes in Japanese waters.—*J. Facul. Sci., imp. Univ.*, Tokyo, 3, pp. 1-99, 3 pls.
- TOMIYAMA, I. 1936. Gobiidae of Japan.—*Jap. J. Zool.*, 7, pp. 37-112, 44 figs.
- WEBER, M. and DE BEAUFORT, L. F. 1913. *The Fishes of the Indo-Australian Archipelago*, Leiden, 2, pp. i-xiii, 1-404, 151 figs.
- WEBER, M. and DE BEAUFORT, L. F. 1916. *The Fishes of the Indo-Australian Archipelago*, Leiden, 3, pp. i-xv, 1-455, 214 figs.
- WEBER, M. and DE BEAUFORT, L. F. 1922. *The Fishes of the Indo-Australian Archipelago*, Leiden, 4, pp. i-xiii, 1-410, 103 figs.
- WEBER, M. and DE BEAUFORT, L. F. 1929. *The Fishes of the Indo-Australian Archipelago*, Leiden, 5, pp. i-xiv, 1-458, 98 figs.
- WEBER, M. and DE BEAUFORT, L. F. 1931. *The Fishes of the Indo-Australian Archipelago*, Leiden, 6, pp. i-xii, 1-448, 81 figs.
- WEBER, M. and DE BEAUFORT, L. F. 1936. *The Fishes of the Indo-Australian Archipelago*, Leiden, 7, pp. i-xvi, 1-607, 106 figs.
- WEBER, M. and DE BEAUFORT, L. F. 1940. *The Fishes of the Indo-Australian Archipelago*, Leiden, 8, pp. i-xv, 1-508, 56 figs.
- WEBER, M. and CHAPMAN, W. M. 1951. *The Fishes of the Indo-Australian Archipelago*, Leiden, 9, pp. i-xi, 1-484, 89 figs.

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