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VOLUME IX

THE FRESH-WATER FISHES OF CHINA

CENTRAL ASIATIC EXPEDITIONS
THE FRESH-WATER FISHES OF CHINA
The Fresh-Water Fishes of China

BY

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With 143 Figures in the Text, 10 Colored Plates, and 1 Map

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PREFACE

The Asiatic Expeditions of the American Museum of Natural History have brought together general collections of fresh-water fishes from representative localities in China. "These make up what is probably the most nearly adequate representation of such fishes that has been assembled to date, and with its aid it is possible to obtain a fair idea of the fauna as a whole, which in the last analysis will probably be found to comprise some 500 forms. This supposes that even in the best known areas a few undescribed species still await discovery, and that close study of large series of specimens of various variable and difficult groups, from different parts of China, will lead to the recognition of a number of new forms well in excess of the number of which will doubtless be found to be merely nominal" (Nichols, in Andrews, R. C., 1932, Natural History of Central Asia, I, p. 597).

This is primarily a general report on the American Museum collections of Chinese fresh-water fishes. It also aims to be a comprehensive review of the fresh-water fishes of China proper, outlying territories such as Manchuria and Mongolia not being included. No attempt has been made to include marine species, or brackish-water species with marine affinities, though such may at times occur in fresh water. In so far as possible, all recent literature has been studied and carefully considered to, and including, the year 1934 (see beyond).

The last few years before the present war witnessed much active interest in systematic ichthyology in China; in stimulating this interest the series of preliminary papers issued by the American Museum can presumably claim a share. We now aim to acquaint the several workers in this field more fully with the extent of our collections and the conclusions to which they lead. It is also hoped that the present volume will serve as a "handbook" to the subject.

To review briefly the sources of the principal material examined in preparing this report, the first small collections of Chinese fresh-water fishes to reach the American Museum were obtained from the Reverend John Graham in Yunnan, and by Doctor H. R. Caldwell in Fukien, and reported on in 1918. Doctor Caldwell later sent in more extensive collections from the neighborhood of Yenping.

In the winter of 1921-1922, Mr. Clifford H. Pope spent three months at Huping, Tungting Lake, Hunan, and nine months in 1922 and 1923 near Nodoa on
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Hainan Island, making comprehensive collections of the fish faunas of central and of southern China at these localities, respectively. This material is the most extensive that we have had for study. At other times Mr. Pope obtained lesser collections from various localities in Chihli, Suixian in Anhwei, Shansi, Shantung, and Fukien. To him belongs the credit for assembling a major part of our material. The material from Chihli and Anhwei was reported on by Mr. Henry W. Fowler of the Academy of Natural Sciences of Philadelphia in 1924, in a paper which was of great service to the writer when initiating his study of the collections as a whole.

Other members of the Asiatic Expeditions collected a few fishes incidentally, notably Doctor Walter Granger in western China; some from the vicinity of Canton were received through the courtesy of Doctor William E. Hoffmann of Lingnan University.

Preliminary papers based on these collections include a report on those from Chihli and Anhwei by Fowler (1924), on the fishes of Hainan by Nichols and Pope (1927), a provisional check-list of the fresh-water fishes of China (1928), and a series of American Museum Novitates articles describing new forms by Nichols (1925–1931, see bibliography).

Acknowledgment should be made of courtesies and assistance received by Mr. Pope from Mr. George Bachman and other members of the faculty of Huping College, near Yochow, Hunan; the late Reverend William J. Leverett and associates of the American Presbyterian Mission at Nodao, Hainan, as well as numerous other persons and institutions. The color plates are from sketches made under Mr. Pope’s direction in the field by Mr. Wang Hao-T’ing. With the exception of one taken from “The Fishes of Hainan” (Nichols and Pope, 1927), they are reproduced here for the first time. The text figures have been taken from preliminary papers; a few are reproduced with Mr. Fowler’s permission from his report. The outline drawings from “The Fishes of Hainan” were executed by Miss Olive Otis; most of the others, by Mrs. Louise Nash and Mrs. Helen Ziska.

The literature references, both in the text and the bibliography, have been painstakingly revised by Miss Ruth Tyler, the editor, and she should have credit for such completeness, uniformity, and freedom from error as they show.

A consistent usage in Chinese place names could not be attempted in this volume. The spelling of the authors cited has in many cases been retained. Hence the reader will find Chihli as well as the more recent equivalent, Hopei; Cochinchina as well as French Indo-China, Korea and Chosen, Manchuria and Manchukuo, Peiping and Peking. The map of China showing the location of places visited by members of the Asiatic Expeditions, 1921–1930 (Andrews, 1932, Natural History of Central Asia, I), and the map of later date inserted in this volume will prove useful for an orientation of Chinese provincial areas. Data on a number of the localities
mentioned and the collecting stations will be found in the reptile volume of this series (Pope, 1935, Natural History of Central Asia, X, pp. 491–503).

The main portion of the manuscript for this volume was closed in February, 1935. Delay in securing means for publication made it advisable to examine numerous papers which had appeared in 1935 and 1936, very active years in Chinese ichthyology, and to embody taxonomic changes and additions therefrom in a Supplement, the manuscript for which was closed in May, 1938. Further unexpected delays occurred, and now that the volume is finally in the hands of the printer it seems best to let it stand as of 1938, rather than to attempt to introduce the small amount of additional material possible, which, though of interest, would give a false impression of up-to-dateness. As of 1938, it closes the pre-war period of Chinese ichthyology, of which it is a part.

John Treadwell Nichols

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CHAPTER I
INTRODUCTION
FAUNAL DISCUSSION

Different writers approach the broad and indefinite subject of zoogeography from different angles. There are various sound basic concepts according to which one may orient the material of faunal discussion, and when these are poorly defined confusion frequently results. The faunal area is an area characterized by a certain fauna or association of animals. The writer places primary emphasis on the fauna rather than the area, bearing in mind that they are two different things, but at the same time defines the fauna in terms of its geographic limits or boundaries, that is, in terms of the faunal area.

Where two faunas come together, they may be sharply defined the one from the other, they may interdigitate, usually on some physiographic basis, or they may blend and mix over a relatively wide belt. It is possible, using one or another criterion, to draw a geographic line between the two, but at times it is preferable to recognize a transition belt belonging neither exclusively to one nor the other, but partly to both. By the first procedure it is possible to classify faunally every geographic point, but the last makes the unit fauna concept more definite and tangible. The writer uses the one or the other, depending on the aspect of the matter under discussion.

It is, of course, obvious that faunal areas will run right across political boundaries, except in cases where these may correspond with such natural boundaries as chance to be of faunal significance. Most faunal lists and studies are, however, made for a constituted national, state, or local area. Definite, tangible, arbitrary limits set in advance are a great advantage in such work, and an equal convenience for those who will later refer to it. At the same time it is most satisfactory to treat an area which is, as far as may be, faunally homogeneous, and it is with this in mind that the boundaries of the present work have been set as those of China proper. Westward of these boundaries one finds the unlike fishes of high central Asia; northward a different fauna lies across the deserts, and the American Mu-
seum of Natural History has also received very scant material from thence, whereas recent Russian ichthyologists have studied the fauna rather thoroughly and satisfactorily.

Every species of animal has a somewhat different range. Every group of animals has a different center of abundance, of dispersal, and is separable into faunas which do not correspond in detail with those of any other group. On the other hand, the factors of physiographic and climatic uniformity and divergence, past and present, primary causes in differentiating one fauna from another, have frequently acted on different groups in much the same way, leading to a sufficiently close approximation of the major faunas of one group to those of another so that the same faunal terminology may be approximately applied to each, or diverse groups make up the fauna in a broader sense. It is the somewhat parallel correspondence between the ranges of different species which makes of the fauna an entity anyway, not merely an abstract concept.

To emphasize this correspondence and make the fauna more tangible, we draw limits about the area which it dominates and in so doing define the faunal area. This puts us in a position to analyze the fauna, which is to a considerable extent a matter of studying the details which do not correspond. We find in Chinese fresh waters, for instance, a *Tetraodon* and other fishes with obvious marine affinities. They are an integral part of the fauna as defined, yet a foreign or marine element therein. Similarly species with high central Asiatic affinities are a foreign element, and the place we assign to the Chinese or any other fauna in a general classification of the fish faunas of the world depends on the balance between such different elements. Most taxonomic groups of fishes have geographic or physiographic centers of abundance, and the classification of faunas corresponds more or less with one which might be based on the dominance of the different groups.

The whole subject is an involved and somewhat complicated one. To some students it seems highly subjective and rather meaningless. But when one has worked out and determined faunal lines on the map on one basis or another, and later finds numerous unsuspected details wherein the animals on one side of the line differ from those on the other, as not infrequently occurs, it seems safe to conclude that they have a real meaning. This is also excellent verification for the correctness with which the lines have been drawn.

**ORIENTATION OF THE CHINESE FISH FAUNA**

The fishes of the world fall into three natural faunal groups: deep-sea, shore, and fresh-water fishes. The writer has elsewhere (1928, Amer. Mus. Novitates, No. 319, pp. 6–7) drawn up a faunal analysis of fresh-water fishes essentially as follows:
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FRESH-WATER FISHES

I. Peripheral
   1. Boreal
   2. Austral
   3. Insular and Australian
      A. Australian
      B. Insular
         a. Madagascan
         b. West Indian
         c. Oceanic
   2. Austral
      A. African
         a. East and South African
         b. Nile and West African
      B. Neotropical
         a. Middle American
         b. South American

   B. High Asiatic
   C. Indian and Oriental
      a. Indian
      b. Chinese
         x. Temperate
         y. Subtropical

The continental fauna is dominated by the Ostariophysii (carp-catfish-charac- cin group). It occupies continental Eurasia, Africa, and the Americas, with the exception of a rather vague northern circumpolar area, and the southern tips of South America and Africa. The peripheral fauna is made up of elements with better marked affinities to salt-water groups. It occupies a vague northern circumpolar area (trouts and pikes), the southern tips of South America and Africa (Galaxias), Australia and the islands of the world in general.

The typically continental Chinese sub-fauna is widely separated from the southern or Austral division of the continental both by space and in kind. To the southwest through Indo-China it merges into the equivalent Indian sub-fauna. Just where to draw the line between the two and the nature of their contact would have to be determined by a study of extensive collections from intermediate areas. It is bounded on the west by the high Asiatic and on the north by the Holarctic, the two major divisions of the northern continental foreign to it. Coastwise, of course, it is bounded by the realm of shore fishes. A faunal study of the estuaries or transition zone between Chinese fresh-water and marine shore fishes would have a particular interest, due to the faunal strength and comparatively pure continental nature (freedom from peripheral elements) of the Chinese fresh-water fish fauna. Attention has been too much occupied with study and description of fresh-water fishes to approach this subject.

The fish fauna of high central Asia is very different from that of China, although carps and loaches dominate it to the same extent. Carps related to Schizothorax and loaches related to Barbatula are present in great variety; a few peculiar
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types and many minor variations occur, as compared with the multiplicity of types found in China. These highland fishes enter the western provinces more or less in the hills and are also found here and there farther into China, but seem to be comparatively few in species even in Szechwan, where the fishes, of the larger rivers at least, are very like those of central China. The high Asiatic and Chinese faunas presumably interdigitate on a basis of physiography and ecology, mostly west of the boundaries of China proper. Careful collecting correlated with altitude along the western borders may show peninsulas and islands of the former in China and substantiate casual Chinese records for high Asiatic or Indian species, which are now open to question.

Northward the Chinese fauna is separated from the Holarctic by a desert barrier or series of such barriers. Only in Manchuria is there any considerable mixture of the two.

From the above it will appear that China proper is more or less of a unit faunal area. As such it may doubtless be subdivided into smaller sub-areas. Collections made by the American Museum of Natural History Asiatic Expeditions show rather clearly that in the east there is a faunal line separating south from central China, a southern from a north-central Chinese sub-fauna. This line corresponds more or less to that between the temperate and subtropical zones. It would presumably be of greater importance than it is for fresh-water fishes, were it not that deserts to the north form a natural barrier, to the south of which the Chinese fauna as a whole has been able to expand freely, which has checked invasion by Palaeartic forms from the north. The north-central and south Chinese faunas are very much alike, but species or races in the one are frequently replaced by allied representative species or races in the other.

Fukien belongs rather with the southern than with the north-central faunal area and is to some extent a transition belt between the two, with peculiarities of such transition belts (Nichols, 1923, Science, LVIII, pp. 153-155). In spite of its variability, it may be best to list it as a unit sub-area, but collections examined from elsewhere in south China are too meager to determine this point. For that matter, our south Chinese sub-fauna quite certainly crosses political boundaries to the southwest, and adequate extralimital material may prove it to cover quite as large an area without as within such boundaries.

Fishes of the Yangtze Valley lowlands are sufficiently characteristic to suggest making of this a unit sub-area. Due to favorable conditions, fish life is here exceedingly varied and abundant, and it seems also to be something of an evolutionary center and to have given rise to various adaptive or specialized forms. Fishes in the distant Amur River (some of them at least) are, however, closely related to their representatives in the Yangtze, and the writer is inclined to look
on these lowlands as merely a very extensive ecological niche dominating central China. The ecological association is an unsatisfactory minor factor from which to build faunas or faunal areas (Nichols, 1928, Condor, XXX, pp. 315, 316).

The fishes of Yunnan again are quite unlike those of eastern China and raise the question of transition belt versus unit sub-area as do those of Fukien. The American Museum has very scanty collections from this western province.

To sum up, we are in a position to separate Chinese fresh-water fishes definitely into north-central and southern sub-faunas which have a standard climatic zonal basis, and to recommend further study of the faunal complexity of this interesting area.

**SPECULATION ON THE HISTORY OF THE OSTARIOPHYSI**

(Nichols, 1930, Copeia, No. 4, pp. 148–151)

Carp-like fishes dominate the fauna of China to such an extent that in a provisional check list drawn up in 1928 (Nichols, 1928, Bull. Amer. Mus. Nat. Hist., LVIII, pp. 1–62), 263 of the 374 species recognized (70 per cent) were carps and loaches (with one sucker), and 11 per cent of the remainder were catfishes, so that only 19 per cent belonged to non-ostariophysine groups. Comparison of Chinese carps with the familiar American ones has led to speculation as to the history and distribution of this branch of the Ostariophys, which correlates with similar consideration of the more tropical catfish and characin branches dating from 1917, when Ludlow Griscom and the writer reported on an extensive collection of African fishes (Nichols and Griscom, 1917, Bull. Amer. Mus. Nat. Hist., XXXVII, pp. 653–756).

Carps are fundamentally non-predaceous, feeding on small animals or even vegetable matter, and are without teeth in the mouth. To take the place of the missing oral dentition, they are provided with well-developed, variously specialized teeth on the pharyngeal bones (of the throat). In the carps proper these are few in number and definite in arrangement, differing in number, arrangement, and character in different genera, and to a lesser extent in different species. In the suckers the pharyngeal teeth are more numerous, and in a more or less comb-like series.

Loss of oral dentition would have been a rational adaptative change in the suckers, whereas various of the modern active free swimming carps could, it seems, make good use of such teeth did they possess them. This is particularly true of certain predaceous forms that have developed in China, probably correlated with the long-time protection of that area by a desert system (the Gobi) from invasion by such northern predators as pike and trout. There is, for instance, the genus *Opsariichthys* with crooked, interlocking edges to the strong, toothless jaws. It is,
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then, a reasonable assumption, and one generally held, that the suckers are more primitive than, and more or less ancestral to, the true carps.

The suckers are now North American, except that one northern species (*Catostomus catostomus*) also occurs in Siberia, and that there is a specialized sucker (*Myxocyprinus*) in the valleys of China. This interesting fish was formerly united generically with similar forms of the Mississippi Valley, but as the theoretical probability of any such specialized cyprinoid having crossed between Asia and America is small, the present-day view that the resemblance here is a parallelism seems most rational. One may suppose the suckers to have run their course in China, have left but this single peculiar representative behind, and have there been superseded more or less by the present-day gudgeons, a division of the true carps. In America the group is still relatively young, with various genera and many species (Nichols, 1925, Natural History, XXV, p. 349).

This view would make of China a recent center of differentiation and distribution for carp-like fishes. It probably is this modern center. The true carps are here not only very abundant but more varied than elsewhere, more advanced in evolution or radial differentiation, more deeply cleft. Thus the breams with a single primitive genus in North America, and a couple allied to it in Europe, here make a convenient subfamily with a number of genera, some of them rich in species. The gudgeons, which seem not to have reached Africa or America and are represented by a few species in Europe, make a similar convenient subfamily with unlike genera and many species. *Zacco* and *Opsariichthys* clearly differ genetically, whereas the closely allied and somewhat more primitive *Barilius* shows no comparable variation across southern Asia and Africa.

It is obvious that carps have recently entered Africa from the northeast. In that continent they are little varied and form a minor part of the fresh-water fish fauna. Few genera are represented, and these are related to numerous and more varied forms occurring in southern Asia. For instance, the genus *Barbus* is represented by a large number of species, particularly in east and south Africa, but these are comparatively undifferentiated, whereas their Asiatic and East Indian allies are separated into numerous well-marked subgenera, to which the modern tendency is to give full generic rank. Not so many species have invaded the strong West African or Congo fauna with its many specialized fishes of older groups.

Carp-like fishes do not enter the neotropical or Australian regions. They are the dominant fresh-water fishes of the Northern Hemisphere. Their present distribution is obviously recent, from the north, from an Asiatic center, apparently China. The differentiation and occurrence of the loaches parallel that of the carps but are more restricted. Southwestward they have reached Abyssinia. Fragmentary remains of a supposed loach are recorded by Cope from a fresh-water Upper
Tertiary formation in Idaho, but their identification was probably an error. The group does not occur in America, and evidence of its ever having crossed to the New World is inadequate. Because of their many barbels, minute scales, and other characters, it would be excusable to consider loaches archaic with relationship to both carps and catfishes, but they are probably a secondary offshoot of the true carps. Tangible evidence of this is furnished in China by a puzzling fish, *Gobio-botia*, which combines characters of a loach and of a gudgeon.

To turn to catfishes and characins, the latter group is confined to the southern continents (South and Middle America, and Africa), and the former is most dominant and diversified in the same areas, although with a general continental distribution. There can be little doubt that both these groups are older than the carps, and whereas tangible evidence bearing on their distribution may be lacking, it is most reasonable to suppose that each invaded its present range from the north, where both have since been more or less superseded by the carps (Nichols and Griscom, 1917, Bull. Amer. Mus. Nat. Hist., XXXVII, pp. 736–738). The presence of characins in Middle America is presumably a secondary and recent northward movement of South American forms.

As to which are the older, catfishes or characins, fossil evidence is quite negligible, as it is for this entire group of Ostariophysi, except as it shows them present only in the Tertiary, and much as they are today. Distributional evidence is confusing. Nichols and Griscom (1917, *op. cit.*) consider that the distribution of the catfishes was the earlier, basing this opinion on their greater diversification in Africa and South America. From the radial diversity of catfishes there, it would seem that they may well have been the first modern “Continental” fishes to reach South America. On the other hand, if gymnotids be considered a characin offshoot, the development of this peculiar group is evidence to the contrary. Boulenger's (1904, Cambridge Natural History, p. 574) opinion that the characins are the most primitive ostariophysine fishes seems sound. Structurally, catfishes are more specialized than characins, and ancestral Ostariophysi should have been characin-like pre-characins, even if modern catfishes are older, and their distribution preceded that of the characins of today. In any event some interesting and perhaps significant comparisons may be drawn between the development of these two groups in Africa and South America. There is nothing in Africa to compare with the whole series of South American armored catfish. In South America there are no other older armored fishes which might have competed with such a trend; in Africa we have the heavily scaled polypterids. In South America we find the ostariophysine gymnotids which parallel the more primitive and presumably older non-ostariophysine mormyrids of Africa. So catfishes in one direction and characins in another seem to have had their evolutionary potentialities blocked in Africa by older groups which are absent in South America. The ostariophysine potentiality
of producing an electric species gives us the electric gymnotid eel in South America, and could there have been gymnotids in Africa there might have been one there also; as it is, an African electric catfish has been evolved.

At a superficial glance, the systematic ichthyologist sees certain resemblances between catfishes and characins in Africa and in South America, which fade on closer study, and he gets the impression that the evolutionary diversification of both groups in the respective continents has been entirely independent, as it would have been with an invasion of primitive forms from the north prior to such diversification. These fishes seem to the writer to furnish evidence against any land bridge or other connection between the two continents in Tertiary times.

The fossil evidence on the Ostariophysi is too scant to tell us much of their history or distribution, and none of it is pre-Tertiary. The group seems to have been present pretty much throughout the Tertiary, and the opening of that period very likely found it essentially as today with its three main sub-groups already differentiated. The writer's concept of evolutionary dynamics favors the view that it is not in changes correlated with environmental change that significant new adaptations arise, but as evolutionary experiments in one direction or another in a wide, favorable, and stable environment where a given form is sufficiently numerous and well established for competition to be keen and of long duration between the individuals which comprise it, not merely between one form and another, or a form and the environment as a whole. A given species quickly expands numerically to its saturation point in a given environment, but by splitting into different species, each with somewhat different habits and adaptations, it may continue to expand. This would seem to be at least one important factor in the origin of species. It is not unreasonable to suppose that between Mesozoic and Cenozoic life there was a long period of stable conditions with few uplifts or depressions, a period of which the fossil record is essentially lacking, a true epi-Mesozoic interval. Such a period would have been characterized by mature drainage systems where a group of fresh-water fishes, the Ostariophysi, might well have been evolved, and the carps arisen as toothless suckers.

The ancestors of the Ostariophysi are unknown, and the writer has made no special study to justify speculation as to the relationships of the group to more primitive fishes. It was probably always a fresh-water group. Largely on the basis of its membership in modern fresh-water fish faunas, these may be separated into Continental (Ostariophysi dominant) and Peripheral (whose members have marine affinities) (Nichols, 1928, Amer. Mus. Novitates, No. 319, pp. 6–7).

It is interesting to note that the carps, although abundant in the Indies, do not reach the Australian region. Fresh-water forms of catfish do occur there, but these are related to the exceptional marine catfish genera, *Plotosus* and *Arius*, hence to be expected.
The family Cyprinidae (carps) are conveniently divided into several series, sometimes given subfamily rank. At the suggestion of Doctor William K. Gregory, the characters, adaptations, and habitats of these series, and of carp-like fishes in general, have been arranged in tabular form.

<table>
<thead>
<tr>
<th>Group</th>
<th>Characters</th>
<th>Adaptations</th>
<th>Preference</th>
<th>Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carp-like fishes</td>
<td>Pharyngeal teeth, none in mouth</td>
<td>Bottom</td>
<td>Fresh water</td>
<td>Continental fresh waters except Australia and South America</td>
</tr>
<tr>
<td>Suckers</td>
<td>Sucking mouth</td>
<td>Bottom</td>
<td>Mature rivers</td>
<td>North America, Siberia, one in China</td>
</tr>
<tr>
<td>Carps</td>
<td>Standardized teeth, normal mouth</td>
<td>Free swimming</td>
<td>Lakes and swift water</td>
<td>Continental fresh waters except Australia and South America</td>
</tr>
<tr>
<td>Cyprininae (barbs)</td>
<td>Standardized; barbels; full set of teeth</td>
<td>Comparative inactivity</td>
<td>Sluggish water</td>
<td>Eurasia and Africa</td>
</tr>
<tr>
<td>Xenocyprininae</td>
<td>Cross-mouth</td>
<td>Bottom, and secondarily free swimming</td>
<td>Various</td>
<td>Fully represented in Asia, and bottom forms in Africa</td>
</tr>
<tr>
<td>Leuciscinae (minnows)</td>
<td>Slender, no barbels</td>
<td>Free swimming</td>
<td>Clear lakes and streams</td>
<td>Northern continents (especially Europe and North America)</td>
</tr>
<tr>
<td>Abramidinae (breams)</td>
<td>As above, compressed, sometimes deep-bodied, belly keeled</td>
<td>Mid-water</td>
<td>Lakes</td>
<td>Northern continents (especially Eurasia)</td>
</tr>
<tr>
<td>Rhodeinae</td>
<td>Teeth reduced, deep body, small size, spawning habits</td>
<td>Specialized</td>
<td>Narrow waters</td>
<td>Eurasia (especially China)</td>
</tr>
<tr>
<td>Gobioinae (gudgeons)</td>
<td>More or less elongate, with inferior mouth</td>
<td>Bottom</td>
<td>Mature rivers</td>
<td>Temperate Asia and Europe</td>
</tr>
<tr>
<td>Loaches</td>
<td>Numerous barbels; reduced scales; encapsuled air bladder</td>
<td>Primarily bottom</td>
<td>Various adaptations to various speeds and loads of running water</td>
<td>Eurasia (especially China)</td>
</tr>
</tbody>
</table>
INTRODUCTION

PLAN OF THE PRESENT WORK

In listing the fresh-water fishes of China, brief comparative descriptions have been given of the genera and species, with keys to the species when several occur in a genus. Wherever possible the species descriptions are based on specimens actually examined, and as fishes vary considerably with size, the range of lengths of those on which the descriptions are based is given.

In addition to the original reference to each species, other names clearly referable to it have been included in the synonymy. It should be noted that where the author’s name is separated from the species name by a comma, the reference is not an original reference and implies merely that the citation is a synonym, not that the name he uses is, as it may be a misidentification.

DOUBTFUL SPECIES REFERENCES

In the past, various fresh-water fishes have been imperfectly described from China (sometimes from Chinese pictures) which it is not possible to identify with any degree of certainty, though doubtless all or almost all were based on species here recognized. There are also numerous more or less recent Chinese references to species which occur in other regions, for the most part based on misidentification of Chinese material with related extralimital forms. Very likely a good many Indian species actually do occur in the western borders of China, but the status as Chinese of various of those so listed requires confirmation. From these and other sources of error, an alphabetical list of names, which will be met with in the literature of Chinese fresh-water fishes but which the writer considers are not entitled to further consideration here in our present state of knowledge of that subject, has been drawn up, as follows:

-Acehara hakonensis
-Acrossochilus formosanus
-Ameiurus (Pimelodus) guttatus
-Aoria cavasius
-cornula
-Aspidobagrus gulio
-Aspiolucius merzbacheri
-Bagrus (Pimelodus) bouderius
-Barbus apogon
-chola
-huguenini

melanopterus
-mosal
-sarana
-stigma
-tor
-Capoeta fundulus
-Chaca hamiltoni
-Channa formosana
-Cobitichthys dichachrous
-polynema
-Cobitis poecilopleura
THE FRESH-WATER FISHES OF CHINA

Coilia ectenes
  grayii
  mystus
  rendahli
Cottus pollux
Crossostoma lacustre
Cyprinus chola
  catio
  tor
Diplophysa kungessana
Exostoma labiatum
Gasterosteus aculeatus
Gnathopogon biwae
  gracilis
  iiijmae
  tsuchigae
Gobio gobio
Gymnocypris dobula
Gymnostomus moliterella
Hemibagrus limbatus
Hemibarbus barbus
Hemiculter akoensis
Lampetra fluviatilis
  planeri
Leiocassis adiposalis
  brashnokowi
  brevianalis
Lepisosteus sinensis
Leuciscus stigma
Misgurnus dichacrous
  maculatus
  polynema
  spilurus
Moroco chuanchicus
Nemachilus mongolicus
  sternurus
  zaidamensis
Odontolabrax typus
Ompok bimaculatus
  canio
Oncorhynchus leptosomus
Ophicephalus iris
  jovis
  lucius
  miliaris
  ocellatus
  tadianus
Oreinus richardsonii
Pimelodus cavasius
  cornula
  gulio
Pseudolaubuca sinensis
Rasbora daniconius
Rhodeus atremius
  kurumeus
Rita manillensis
  sacerdatum
Rohita macrochir
Rohitee belangeri
  catio
  microlepis
Schizopygopsis malacanthus
  microcephalus
  przewalskii
  stoliczkae
Schizothorax dolichonema
  kessleri
  richardsonii
INTRODUCTION

Silurus attu
   bimaculatus
   canio
Systomus microlepis
Trichogaster leeri

Wallago attu
   Xenocypris homospilotus
   plena
   sungariensis

Too much confusion still exists between various related species of Chinese fishes to map their respective ranges accurately, and this has not been attempted. The localities of material examined have been listed throughout, the locality from most of the references in the synonymy has been given, and some locality references courteously furnished by Doctor N. Gist Gee of Peking are included.

Not a great deal of data on the habits and manner of occurrence of Chinese fresh-water fishes is available. Some has been quoted from the literature, and wherever Mr. Pope has made interesting field observations these have been inserted over his name.

Several fresh-water fishes are extensively cultivated by the Chinese. We may mention Cyprinus carpio (the carp), the genus Hypophthalmichthys, and Labeo jordani. This doubtless complicates the ranges of various species and sometimes causes confusion between artificial forms and natural races. A much more detailed knowledge of this fish culture than is available, would be advantageous (Nichols, in Andrews, R. C., 1932, Natural History of Central Asia, I, pp. 596–598).

Writing of the fresh-water fish industry of South China Professor William E. Hoffmann says (1929, Lingnan Sci. Jour., Canton, VIII, pp. 167–168):

“Pond-fish culture seems to have originated in China, apparently about 2000 B.C. From China pond-fish culture has been introduced into other countries and, in recent times, greatly improved. In China the present-day methods are much the same as those in use hundreds of years ago. The five kinds of fish commonly cultured, frequently in the same pond, are Cyprinus carpio L., Ctenopharyngodon idellus, Hypophthalmichthys nobilis, H. molitrix, and a fifth species not yet identified [presumably Labeo jordani].

“The type of pond as well as the management of the same is variable and depends upon the source of the water supply, whether or not plant crops are alternated with fish crops, and other factors. The fry, except of Cyprinus carpio L., are secured from the rivers, kept for a time in special rearing ponds, and then sold as ‘stock fish’ to the fish farmers who raise large fish for the market. The number and size of fish used in stocking a pond depend upon the size of the pond, the food supply, and the size of market fish desired. . . . Feeding methods are also variable. The food used is determined usually by availability and cheapness and in the silk
district, for instance, consists chiefly of the by-products of silkworm rearing. Night-soil, various animal manures, grass, by-products of the silk industry, and materials coming from peanut oil making, bean oil manufacture, wine making, and from the rice mills, are the chief foods.

"Water crops commonly grown in fish ponds are water chestnuts, Caladium, and lotus. The fish are commonly harvested once each year, but in certain places some fish are taken out each day, while under certain conditions the fish are harvested but once in two years. The fish are usually caught and marketed by the fish farmers themselves but there are also certain people who make a business of catching and marketing fish for others. Fish markets consist of one or more commission houses depending upon the size of the market. The largest fish market in Canton is very interesting. It opens about 2:00 A.M. and closes about 8:00 or 9:00 A.M. when all fish have been sold. As much as $24,000 worth of fish may change hands in one morning during the height of the season. The annual pond-fish production of Kwangtung Province is very great but it is impossible to get accurate figures on the same. With more scientific methods, based on experimental studies, the production could undoubtedly be very much increased."

Almost every fresh-water fish, large or small, is utilized for food by the Chinese. According to Mr. Pope, a simple fish conservation custom or belief is quite prevalent among them. When a given piece of water has become seriously depleted, it is rumored that the reason the fishing there has fallen off is that the spirits of that particular water have in some manner been offended. It is considered bad luck and becomes bad form to fish there any more, and no one does so for a while. Later, with the passage of time, now and then a hardy individual may try his luck, but says nothing about it for fear of public disapprobation. When, however, such a one chances to make a good catch, it is a sign that the spirits are again friendly; he spreads the glad tidings and fishing is resumed.
CHAPTER II
SYSTEMATIC ACCOUNT OF THE FRESH-WATER
FISHES OF CHINA

Family ACIPENSERIDAE
STURGEONS

The sturgeons are large fresh-water or anadromous fishes of north temperate regions. They are shark-like in various ways, such as having the mouth on the under side of the head, and a heterocercal caudal fin, with attenuated tail bent upward and extending into its long upper lobe. They are without true scales. Primitive fishes related to the sturgeons were dominant during Palaeozoic times, held on during the Mesozoic era, and are represented today by a few scattered remnants. Sturgeons are excellent food fish and have a very large number of small eggs from which caviar is made. Two species, both of the genus *Acipenser*, are known from China. Chinese records of *Huso dauricus* (Georgi) are questionable.

Genus Acipenser Linnaeus


Fresh-water and anadromous sturgeons, with gill membranes attached to the isthmus, not forming a fold across it. Barbels round in cross section. Mouth comparatively small, transverse. Snout and peduncle not notably depressed. Snout more or less elongate, extending beyond the inferior mouth which is surrounded with barbels. Body without scales, armed with series of bony scutes, and smaller nodules between.

**Key to Chinese Acipenser**

Seventeen dorsal and 36 to 41 lateral shields; skin entirely naked; snout decidedly longer than $\frac{1}{2}$ head (in examples of 12 to 15 inches) ........................................... *sinensis*

Nine to 12 dorsal and 33 to 35 lateral shields; snout about equal to $\frac{1}{2}$ head (in examples of 12 to 15 inches) ................................................................. *dabryanus*
Acipenser sinensis Gray


Locality of Material:—Specimen examined from near Canton.

Description:—Head in length to base of caudal, about 3; depth in head, 2.4; snout, 1.7; eye in snout, 8 (specimen 390 mm. total length). Dorsal rays, 45 or 50; anal, about 40; scutes, 37 to 41.

Acipenser dabryanus Duméril

Figure 1


Locality of Material:—Shanghai (fide Gee).

Specimen examined from Tungting Lake, Hunan.

Description:—Head in length to base of caudal, 3.1; depth (greatest at shoulder) in head, 2.5; snout, about 2; eye in snout, 6.5. Dorsal rays, about 60; anal, about 40; scutes (lateral row), 35 (specimen 318 mm. to base of caudal).

Remarks:—We obtained only one small sturgeon [Acipenser dabryanus] at Tungting Lake, called “sung-huang-yü.” As it was the only one we got word of at either Pien-Shan or Yochow, these fish appear to be uncommon in the immediate vicinity. A big one was reported seen at the Port, 4 miles beyond Yochow. There are said to be two kinds here, and both to attain a great size, some 1500 lbs., and that the one we got has the longer nose of the two (C. H. Pope, field notes).

This may be a misidentification, as a specimen from near Canton, here called Acipenser sinensis, has a longer snout; or there may be a third species in Tungting Lake.

Genus Huso Brandt and Ratzeburg

Huso Brandt and Ratzeburg, 1833, Medizinische Zoologie, II, p. 3. Type: Acipenser huso Linnaeus.

Large Eurasian sturgeons, differing from Acipenser in having the gill membranes united in a free fold across the isthmus, the barbels more or less flattened, and a larger mouth.

Huso dauricus (Georgi)

Acipenser dauricus Georgi, 1775, Reise im Russischen Reich, I, p. 352. Amur River, etc.


SYSTEMATIC ACCOUNT


**Description:**—Head in length to base of caudal, 3.3; depth in head, 2; snout, 2.4; eye in snout, 6.5 (from figure of a young fish). Dorsal rays, 46 to 54; anal, 28 to 36; scutes (lateral row), 36 to 46.

**Remarks:**—This sturgeon has occasionally been recorded from China and the records later discredited. Assuming there has been no misidentification in Shaw's recent record, it is at least potentially Chinese.

**Family POLYODONTIDAE**

**PADDLE FISHES**

There are two living representatives of this peculiar family of primitive fishes related to the sturgeons, one found in the valley of the Yangtze, the other of the lower Mississippi.

**Genus Psephurus Günther**


Large, smooth-skinned, scaleless ganoids, with the upper jaw prolonged into a peculiar horizontally flattened paddle. Caudal strongly heterocercal. A single species, Chinese, differs from the related American *Polyodon* by comparatively short gill rakers in moderate number.

**Psephurus gladius** (Martens)


**Locality of Material:**—Shanghai (*fide* Gee).

**Description:**—Depth in length to base of caudal, 10.3; head, 1.6; snout in head, 1.5; eye in snout, 3.0 (small specimen 175 mm. long to base of caudal). Dorsal rays, about 70; anal, about 65; no scutes or scales.

**Remarks:**—"This fish is valued for food, like the sturgeon, and may reach a length of about 7,000 mm." (Ping, 1931, p. 190).

**Family ELOPIDAE**

**TARPONS**

**Genus Megalops Lacépède**


Compressed, large-eyed, herring-like fishes of moderate size, with a bony plate between the arms of the lower jaw; the last ray of the dorsal fin produced in
a filament; scales large, firm, silvery, and lateral line present. A widely distributed species on the shores of the Indian and adjacent Pacific oceans, entering fresh water.

Mouth large, opening more or less obliquely upward, the lower jaw projecting. Gill membranes entirely separate; pseudobranchiae absent.

**Megalops cyprinoides** (Broussonet)


**Locality of Material:**—Hainan (Oshima, 1926, p. 2).

**Description:**—Depth in length to base of caudal, about 3.5; head, about 3.5; eye in head, 3.2 to 3.5. Dorsal rays, 19 to 21; anal, 24 to 27; scales, 37 to 42.

**Family CLUPEIDAE**

**HERRINGS**

Herrings are small or moderate-sized, silvery, mostly marine fishes with a single soft-rayed dorsal fin placed in the middle of the back, and a forked caudal fin. Their mouths are large, teeth almost or quite absent, and gill rakers long and fine, forming a sieve which enables them to feed on relatively small plankton. Their bodies are usually compressed, and ventral line keeled. They commonly swim in schools at or near the surface.

Various herrings occasionally enter rivers from the sea, but the fortuitous occurrence of such species in fresh waters along the Chinese coast does not entitle them to consideration here. Other species are anadromous, that is, regularly enter fresh water to spawn. As far as available data go, there is only one Chinese herring, perhaps belonging to this latter category, which must be placed in our list of fresh-water fishes.

**Genus Hilsa Regan**


Herrings of the shores of the Indian Ocean, entering rivers. With the normal herring series of keeled scutes on the belly; gill rakers normal; ventral fin 8-rayed; last dorsal ray not prolonged; scales moderately large. No teeth on jaws or inside mouth, minute, deciduous or otherwise.

**Hilsa reevesii** (Richardson)


**Description:**—Depth in length to base of caudal, 2.9 to 3.3; head, 3 to 3.6;
eye in head, 5 to 9 (specimens 150 to 550 mm. long). Dorsal rays, 17 or 18; anal, 18 or 19; scales, 42 to 45.

Remarks:—“This fish appears in the rivers during late spring and early summer for laying eggs. It is quite abundant in the Yangtze River at those times, even in Chungking, Szechuan, a thousand miles or farther from the sea. The flesh of this fish is excellent and very famous in China” (Wang, K. F., 1935, p. 2).

Family ENGRAULIDAE
ANCHOVIES

Genus Coilia Gray


Small, anchovy-like, typically estuarine fishes of southern Asia, the Indies, and the Orient, with the posterior portion of the body long and tapering; the anal very long, confluent with a small, pointed caudal. Variable, a number of rather ill-defined species recognized.


This genus is found in both salt and fresh water. We assume that only one or two Chinese species belong in fresh water.

Key to Chinese Fresh-Water Coilia

Maxillary extending to below root of pectorals; scales, about 60 .......... nasus
Maxillary extending about to gill cleft; scales, about 75 ............... brachygnathus

Coilia nasus Temminck and Schlegel


Coilia rendahli, Chu, 1931, ibid., p. 16. Fresh-water references.

Coilia ectenes, Chu, 1931, ibid., p. 16. Fresh-water references.

Coilia playfairii, Chu, 1931, ibid., p. 17. Fresh-water references.

Locality of Material:—Shanghai, Ningpo, Pei Ho, and Tientsin (fide Gee). Specimens examined from Anhwei and near Canton.

Description:—Head in length to base of caudal, rather less than 7; eye in head, 4.5 to 6. Dorsal rays, 13; anal, 85 to 100; scales, about 60.

Coilia brachygnathus Kreyenberg and Pappenheim

Locality of Material:—Specimens examined from Tungting Lake, Hunan.

Description:—Depth in length to base of caudal, 6; head, 5.8; eye in head, 4.2 (specimen of 81 mm. standard length). Dorsal rays, 13 to 14; anal, 95 to 101; scales, about 75.

Remarks:— Called “mao-hua-yü” at Tungting Lake, where it plays an important part in the economics of fishing, and is caught in vast numbers in special nets. Countless thousands were taken off Huping by the fishermen of the neighboring island, Bien Shan, and there dried on racks. Early one morning two boats employed in their capture worked together with a net at least 100 yards long. The boats were maneuvered so that the net was set across the current and gradually worked round into a circular position. It was then slowly drawn in and from every foot of it the fishes were flipped into the boat. Small and large alike are used. Many are dried in the sand which is later washed off. Large areas of the island’s beach were covered with these fish drying in the sun (C. H. Pope, field notes).

Family SALMONIDAE

SALMONS

The salmons and trouts are characteristic, active, more or less predaceous fishes of the north. They are notably absent from our area of China proper, their invasion thereof seemingly having been blocked by extensive persistent desert areas, and almost the only satisfactory record of occurrence is for the oriental genus Plecoglossus. It is not improbable that other forms occasionally get into Chinese fresh waters through Manchuria or coastwise (for fishes of this family run into the sea more or less), and that there are in China streams favorable for their artificial introduction as game fish.

Genus Plecoglossus Temminck and Schlegel

Plecoglossus Temminck and Schlegel, 1846, in Siebold, Fauna Japonica, Pisces, p. 229. Type: Plecoglossus altivelis Temminck and Schlegel.

Plecoglossus altivelis Temminck and Schlegel


Locality of Material:—North China (Reeves, 1927, p. 4).

Description:—Trout-like fishes of Japan and Formosa, also recorded from North China, notable for the peculiar small teeth on the maxillaries and mandibles. These are movable, seated in a fold of skin; lamelliform, broad, truncated, lamellated, and serrated. Body covered with very small scales. Cleft of the mouth wide.
Premaxillaries with a few small, conical, pointed teeth; each mandible terminating in a small knob. A small adipose fin present; caudal well forked.

Depth in length to base of caudal, 4.5 to 5; head, 4.5; eye in head, about 5.8 (specimens about 100 to 180 mm. long). Dorsal rays, 12; anal, 16; scales, 140.

Remarks:—"This fish has been recorded from Yalu River (Mori, 1927), Ming River (Wu, 1931) and Chefoo (Wang, 1933). In the collections of the Biological Laboratory of the Science Society of China, there are some specimens of a considerable size, collected from Yen Tang Shan and Ping Yang in Chekiang Province. In the latter locality the brooks flowing into Ngao-Kiang are visited annually by the present species of fish in a considerable number. The fishes which have been dried under sun-light are known as Hiang-Yu or Sian-Yu, they are delicious and usually in high price" (Wu, 1934, p. 91).

"This fish appears in the mountain streams of Chekiang in April or May and goes back to the sea in August or September. The flesh of this fish is a delicate food to the natives" (Wang, K. F., 1935, p. 2).

Genus Brachymystax Günther


A fine-scaled, small-mouthed trout, usually with dark and red spots. The lower jaw is shorter than the upper, squarish at the end, and the maxillary reaches about to under the middle of the eye. Well-developed teeth on jaws, vomer, and palatines, those on vomer and palatines forming a continuous horseshoe-shaped band. A single species in Siberian and Manchurian rivers.

Brachymystax lenok (Pallas)


Description:—Depth in length to base of caudal, about 4.6 or 4.7; head, 4.4 or 4.5; eye in head, about 6 (large specimen of between 500 and 600 mm. standard length). Dorsal rays, 12 to 14; anal, 11 to 13; scales, 132 to 175.

Remarks:—No specimens collected, but Dr. Andrews photographed trout which were beyond reasonable doubt of this species caught in 1919 in a mountain stream a few miles north of Hsing-lung-shan in extreme northern Hopei.

It is not unlikely that this fish was of natural and general distribution in the mountains of Jehol and northeastern Hopei before these were deforested (C. H. Pope, field notes).

However, we find no mention of it in the Liao Ho drainage, and that of the Amur-Sungari, where it occurs, is some 300 or 400 miles to the north or east.
THE FRESH-WATER FISHES OF CHINA

Genus Hucho Günther


Large-mouthed, fine-scaled, black-spotted trout. Mouth oblique, terminal, maxillary in adult to posterior border of eye or beyond; vomer relatively short and wide with a few teeth on the sides but none on the basal part. Anal short. A few species in northern Asia.

_Huco bleekeri_ Kimura


_Description:_—Depth in length to base of caudal, about 6; head, 3.8 or 3.9; eye in head, 5.2 or 5.3 (specimen 280 mm. total length). Dorsal rays, 14 or 15; anal, 10 or 11; scales, 145 to 150.

**Family SALANGIDAE**

**SALANGIDS**

Small, translucent, trout-like fishes of fresh and salt waters of the Orient. Their mouth and dentition are very variable, and they have been divided into several genera, perhaps best recognized as subgenera.

Genus Salangichthys Bleeker


Small, elongate, free swimming, translucent, trout-like, typically estuarine fishes of China and Japan, with the dorsal fin placed far behind the ventrals; teeth subequal, or without large canines. Body scaleless, or with fine deciduous scales. Cleft of the mouth rather wide. Anal rather long, a small adipose present, and the caudal forked. Pseudobranchiae well developed. Head less elongate, depressed, and pointed than in _Salanx_, and the maxillary reaching the anterior border of the eye; teeth in jaws small, subequal.

One or two related species, sometimes exceedingly abundant, and taken en masse for food. The most divergent salangoids, probably entitled to generic rank.

**Key to Chinese Salangichthys**

No fleshy appendage at the tip of the lower jaw; origin of anal appreciably behind last dorsal ray ................................................................. _hyalocranius_

A fleshy appendage at the tip of the lower jaw. Origin of anal immediately behind last dorsal ray ................................................................. _anderssoni_
SYSTEMATIC ACCOUNT

Subgenus Protosalanx Regan


Salangichthys hyalocranius (Abbott)

Salanx hyalocranius Abbott, 1901, Proc. U. S. Nat. Mus., XXIII, p. 490, Fig. Tientsin.

Locality of Material:—Specimens examined from Tunghing Lake, Hunan; Foochow; Canton.

Description:—Depth in length, 8.55 to 13; head, 5.25 to 5.7; eye in head, 5 to 6 (specimens 55 to 130 mm. long). Dorsal rays, 14 to 18; anal, 26 to 32; scales small, deciduous, little evident.

Remarks:—Called "yin-yü" at Tunghing Lake, where it is more or less confused with somewhat larger Salanx. It is so transparent that when alive in clear water the eye, which is surrounded with silver, is about the only part of the fish visible. It is common, and to be distinguished among the other small fry of any large full basket, but often carefully picked out and sold in numbers by itself, being prized as a delicacy by the Chinese and served at feasts (C. H. Pope, field notes).

Subgenus Paraprotosalanx Fang

Paraprotosalanx Fang, 1934, Sinensia, IV, p. 246, Fig. 3. Type: Protosalanx anderssoni Rendahl.

Salangichthys anderssoni (Rendahl)

Paraprotosalanx anderssoni, Fang, 1934, Sinensia, IV, p. 246, Figs. 4–6.

Description:—Head in length to base of caudal, 5.6; eye in head, about 6.3 (specimen 79 mm. long). Anal rays, 29.

Genus Salanx Cuvier

Salanx Cuvier, 1817, Règne Animal, II, p. 185. Type: Salanx cuvieri Cuvier and Valenciennes.

Small, elongate, free swimming, translucent, trout-like, typically estuarine fishes of China and Japan, with the dorsal fin placed far behind the ventrals; large canine teeth variously developed; maxillary not reaching eye.

Body scaleless, or with fine deciduous scales. Cleft of the mouth wide. Anal rather long, a small adipose present, and the caudal forked. Pseudobranchiae well developed. Head elongate and depressed, terminating in a long, flat, pointed snout.
Several divergent groups of one or more species have been described as genera and may be recognized as subgenera.

**Key to Chinese Salanx**

1. Premaxillaries subnormal; lower jaw slightly projecting. Dorsal fin partly above the anal; tongue toothless; one series of teeth on each side of the palate; a pair of canines near the symphysis of the lower jaw; premaxillary teeth somewhat enlarged, strongly recurved (*Hemisalanx*) ........................................... **prognathus**

   Premaxillaries forming an anterior triangular expansion; lower jaw not projecting; a single series of teeth on each side of the palate; one or more anterior canines in the lower jaw, perforating the roof of the mouth behind the premaxillary expansion; premaxillary teeth strong, recurved, set rather far apart ................................................................. **see 2**

2. Dorsal fin entirely in advance of the anal; tongue with a single series of teeth; lower jaw ending in a short fleshy appendage (*Leucosoma*) .................. **chinensis**

   Dorsal fin wholly or partly above the anal; tongue toothless .................. **see 3**

3. Lower jaw ending in a short fleshy appendage (*Salanx*) .......................... **see 4**

   Lower jaw ending in a distinct, more or less movable presymphysial bone, with a double series of teeth (*Parasalanx*) .......................... **see 5**

4. Snout subequal to postorbital part of head ........................................ **brachyrostralis**

   Snout shorter than postorbital part of head .................................. **angusticeps**

5. Head nearly 4 times as long as broad; snout little longer than postorbital; origin of ventral equidistant from base of pectoral and origin of anal, which is below that of dorsal. Depth, 16; dorsal, 14; anal, 28 ........................ **see 6**

   Head nearly 3 times as long as broad; snout shorter than or as long as postorbital; origin of anal decidedly behind that of dorsal ........................ **see 7**

6. Origin of ventral equidistant from head and origin of anal ........................... **see 8**

   Origin of ventral not as above ................................................ **gracilimimus**

7. Snout as long as postorbital; origin of anal below 8th or 9th dorsal rays.

   Depth, 18; dorsal, 12; anal, 27 ........................................... **longianalis**

   Snout considerably shorter than postorbital; origin of anal below 5th to 7th dorsal rays. Depth, about 12 to 16; dorsal, 12 to 13; anal, 28 to 32 ........................ **see 2**

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**Plate I**

Fig. 1. *Misgurnus mizolepis hainan* Nichols and Pope. Type. 83 mm. standard length. *Nodoa*, Hainan.

Fig. 2. *Nemacheilus pulcher* Nichols and Pope. Type. 42 mm. standard length. *Nodoa*, Hainan.

Fig. 3. *Sarcocheilichthys hainanensis* Nichols and Pope. Type. 62 mm. standard length. *Nodoa*, Hainan.

Fig. 4. *Yaoshanicus normalis* (Nichols and Pope). Type. 64 mm. standard length. *Nodoa*, Hainan.
8. Origin of ventral nearer anal than base of pectoral; that of dorsal about 3
  times as distant from tip of snout as from base of caudal; that of anal below
  2d to 4th dorsal rays. Depth, 11 to 19 (or 20.5); dorsal, 11 to 15; anal, 26
to 32 ................................................................. acuticeps
Origin of ventral equidistant from preopercle and origin of anal; that of dorsal
about 1½ times as distant from tip of snout as from base of caudal; that of
anal below 3d dorsal ray. Depth, 17; dorsal, 14; anal, 27 ................. annitae

Subgenus Hemisalanx Regan


Salanx prognathus (Regan)


Description:—Depth in length, 14; head, 6.5 (specimen 122 mm. long). Dorsal rays, 13; anal, 26; scales small, deciduous, little evident.

Subgenus Leucosoma Gray


Salanx chinensis (Osbeck)

Albula chinensis Osbeck, 1765, Reise Ostindien, China, p. 309. China.

Locality of Material:—Specimens examined from Fukien.

Description:—Depth in length to base of caudal, 10; head, 4; eye in head, 10.4 (specimen of 133 mm. standard length; 7.5, specimen of 80 mm.). Dorsal rays, 10 to 12; anal, 28 to 31; scales small, deciduous, little evident.

Subgenus Salanx Cuvier

Salanx Cuvier, 1817, Règne Animal, II, p. 185. Type: Salanx cuvieri Cuvier and Valenciennes.

Salanx cuvieri Cuvier and Valenciennes


Locality of Material:—Specimens examined from Tungting Lake, Hunan.

Description:—Depth in length to base of caudal, 14.7; head, 4.6; eye in head, 8.2 (specimen of 147 mm. standard length). Dorsal rays, 13 to 14; anal, 26 to 28; scales small, deciduous, little evident. Snout subequal to postorbital part of head.
Salanx brachyrostralis Fang


**Description:**—Depth in length to base of caudal, 13.1 to 14.4; head, 5.14 to 5.27; eye in head, 8.2 to 10.7. Dorsal, 12 to 13; anal, 26. Anal origin under middle of dorsal. Snout shorter than postorbital part of head.

Subgenus *Parasalanx* Regan


**Salanx gracillimus** (Regan)


**Description:**—Depth in length, 18; head, 5.8 (specimen 120 mm. long). Dorsal rays, 12; anal, 27; scales small, deciduous, little evident.

**Salanx annitae** (van Dam)


**Description:**—Depth in length, 17; head, 6; eye in head, nearly 8 (specimen 134 mm. long). Dorsal rays, 14; anal, 27.

**Remarks:**—The recognized species of *Salanx* are better defined than the nominal species of *Coilia*, and are all included here, although it is perhaps equally uncertain how many of them are of regular occurrence in fresh water.

**Salanx acuticeps** Regan


**Locality of Material:**—Canton, Swatow, Amoy, Foochow, and Wenchow; Formosa (Fang, 1934.1, p. 262).

Specimens (so identified) examined from Canton.

**Description:**—Depth in length, 11 to 19 (or 20.5); head, 5.4; eye in head, 7 (specimen 113 mm. long). Dorsal rays, 11 to 15; anal, 26 to 32.

**Salanx longianalis** (Regan)


**Description:**—Depth in length, 13 to 15; head, 5.5 (specimens 110 to 125 mm. long). Dorsal rays, 12 to 13; anal, 28 to 32; scales small, deciduous, little evident.
SYSTEMATIC ACCOUNT

Salanx angusticeps (Regan)


Description:—Depth in length, 16; head, 5.2 (specimen 153 mm. long). Dorsal rays, 14; anal, 28; scales small, deciduous, little evident.

Family MONOPTERIDAE
SYMBRANCH EELS

Genus Fluta Bloch and Schneider

Fluta Bloch and Schneider, 1801, Syst. Ichthyologiae, p. 525. Type: Monoplerus javanensis Lacépède, conspecific with Fluta alba (Ziew).

Slender, scaleless, almost finless eels of southern Asia and the East Indies. The gill openings are narrow and joined on the under surface of the head to form a single cleft. One wide ranging species from the Indies through the Orient in fresh waters but also entering the sea, separable into a few poorly defined races.

Body more or less cylindrical; tail compressed, tapering to a slender point, much shorter than trunk. The only fins are a low keel, above and below, on the tail. Lower jaw slightly included; eye small, beneath the skin, placed over the mouth.

Fluta alba (Ziew)

Muraena alba Ziew, 1793, Nova Acta Acad. Sci. Petropolitanae, VII, p. 299, Pl. vii, fig. 2. No locality; assumed to be from Asiatic Russia.

Most recent authors consider this fish the same throughout its wide range, but in considerable Chinese material examined by the writer, that from South China is differentiable from the rest.

KEY TO CHINESE Fluta alba

Tail shorter, 2.5 to 3.3 (average, 2.9) in length to vent. Eye smaller, 1.7 to 3 (average, 2.3) in snout. Rarely or never boldly spotted or blotched with blackish. Nape more gibbous xanthognatha

Tail longer, about 2.6 in length to vent. Eye larger, 1.5 to 2.5 (average, 1.9) in snout. Frequently boldly spotted or blotched with blackish. Nape less gibbous cinerea

Fluta alba xanthognatha (Richardson)

Figure 2


**Locality of Material:**—Specimens examined from Fukien; Canton; Hainan Island; up to 452 mm. long.

*Fluta alba xanthognatha* (Richardson). 395 mm. total length.

**Description:**—Head in length to vent, 8.1 to 10.3 (average, 9.5), with tendency to increased head length with increased size; depth in head, 2.2 (174 mm. specimen); eye in snout, about 2 at length of 200 mm.; about 3 at 400 mm. A low keel along 3/4 of the upper and 3/8 of the lower edge of tail posteriorly.

*Fluta alba cinerea* (Richardson)

Plate II, figure 1


**Locality of Material:**—Specimens examined from Yunnan; Szechwan; Shansi; Tungting Lake, Hunan; up to 470 mm. long.

**Description:**—Head in length to vent, 8.5; depth in head, 2 (470 mm. specimen); eye in snout, about 1.5 at length of 300 mm.; about 2 at 400 mm. A low keel along most of the upper edge of tail posteriorly, and a shorter, less-developed keel below.

**Remarks:**—This eel, called "huang-shan" at Tungting Lake, was apparently not common there in the winter of 1921-1922, as we secured only two specimens, one bought on the Yochow streets. It is said to attain a weight of over a pound and to be quite common at certain seasons, seldom occurring in numbers in the Lake, but rather in the water-holes round about (C. H. Pope, field notes).
SYSTEMATIC ACCOUNT

Family MASTACEMBELIDAE

SPINY EELS

Genus Mastacembelus Scopoli


Compressed, eel-like fishes with pointed, more or less proboscis-like snout; many small sharp spines along the back and a concealed spine on the preorbital. A number of species in the fresh waters of southern Asia, the Indies, and Africa.

Pectoral rounded. Soft dorsal and anal fins continuous around the tail. Body covered with fine scales. Two or three spines before the anal, and one or more preopercular spines.

KEY TO CHINESE Mastacembelus

Two spines before the anal. Depth, 8 to 11.5 in length. Back dark; a dark band from snout through eye to nape; vertical fins dark, edged with whitish undulatus

Three spines before the anal. Depth, 9.5 to 12 in length. Back usually pale; dorsal and caudal reticulate sinensis

Mastacembelus armatus (Lacépède)

Macrognathus armatus Lacépède, 1800, Hist. Nat. Poissons, II, p. 286. No locality; assumed to be India.

Mastacembelus armatus undulatus (McClelland)

Figure 3 and Plate II, figure 3


Locality of Material:—Specimens examined from Hainan Island; up to 520 mm. in standard length.

Fig. 3. Mastacembelus armatus undulatus (McClelland). 160 mm. without caudal.

Description:—Depth in length to base of caudal, 8.6; head, 5.4; eye in head, 8 (in a 160 mm. specimen). Apparently becomes more slender with age, depth of a 295-mm. (standard length) specimen, 8.4; 367-mm. specimen, 9.7; 520-mm. specimen, 11.5. Dorsal rays XXXIII—about 75; anal, II, about 75; scales minute.
Mastacembelus sinensis (Bleeker)

Plate II, figure 2


*Bdellorhynchus aculeatus*, Reeves, *loc. cit.*


**Locality of Material:**—Ningpo and Shanghai (*fide* Gee).

Specimens examined from TunTing Lake, Hunan; Anhwei; Kiangsi; Shantung; up to 190 mm. standard length.

**Description:**—Depth in length to base of caudal, 11.6; head, 5.8; eye in head, 7.4 (in a 190-mm. specimen). Dorsal rays, XXXI—about 60; anal, II—I, about 60; scales minute.

**Remarks:**—The spiny eel is called “t’zu-ni-ch’iu” at TunTing Lake, and appears to be rather scarce in the lake. Only a few specimens were seen (not more than 10) all winter. Apparently it is never sold in numbers here. A few very small ones were picked out of the baskets of small fish in the streets of Yochow (C. H. Pope, field notes).

Family ANGUILLIDAE

TRUE EELS

Genus Anguilla Shaw


The true eels are distinguished from their relatives by the presence of small, embedded, linear scales placed in groups, those of one group at right angles to those of adjoining groups. Found in all temperate and warm coastal waters of the Northern Hemisphere with the exception of the west coast of America, indifferently coastal or fresh water, retiring to the deeps of ocean basins under the warm water of the open sea to spawn; and with a flat, translucent, pelagic, larval stage.

Body more or less cylindrical, tail compressed. Mouth large, the lower jaw projecting, teeth strong. Eye well developed, placed well forward, over the corner of the mouth. Pectoral well developed, rounded. Vertical fins well developed, the dorsal originating on the back, well behind the head, continuous around the tail with the anal. Ventrals absent.
SYSTEMATIC ACCOUNT

Key to Chinese Anguilla

1. Distance between verticals from dorsal and anal origins equal to or less than length of head. Plain colored, paler below, fins dark edged posteriorly .......... see 2
   Distance between verticals from dorsal and anal origins equal to or greater than length of head. Body and fins spotted ................................ mauritiana

2. Distance between verticals from dorsal and anal origins about equal to head.
   Length of pectoral about ½ that of head, or a little less ....................... sinensis
   Distance between verticals from dorsal and anal origins less than length of head.
   Length of pectoral about ½ that of head or less .................................. japonica

Anguilla sinensis McClelland

Figure 4

? Anguilla macroptera McClelland, 1844, ibid., p. 407, Pl. xxv, fig. 1.
Anguilla remifera Jordan and Evermann, 1902, Proc. U. S. Nat. Mus., XXV, p. 325, Fig. 7. Hokoto, Formosa.

Locality of Material:—Specimen examined from Hainan Island; standard length 440 mm.

Description:—Head in length to base of caudal, 7.9; tail, 1.7; depth in head, 2; eye in snout, 3 (specimen 440 mm. standard length). Dorsal and anal rays numerous; scales minute, embedded, linear, in groups placed at about right angles to one another.

Remarks:—Chinese specimens of plain-colored Anguilla vary considerably in proportions and presumably represent more than one form. Examination of the type figure of Anguilla sinensis (McClelland, 1844) leaves little doubt that Anguilla remifera is the same and close to if distinguishable from Anguilla japonica. Two specimens about 425 mm. long from Tungting Lake combine the proportions of the two, one of these having horizontal distance between dorsal and anal origins in head, 1, pectoral, 3; the other, this distance, 1.5, pectoral, 2.2.

Fig. 4. Anguilla sinensis McClelland. 440 mm. without caudal.
THE FRESH-WATER FISHES OF CHINA

The name *sinensis* seems to have been used by some authors for a more aberrant form in which the horizontal distance between dorsal and anal origins is less in relation to the length of head. A specimen about 345 mm. long from Tungting Lake has this measurement 2.5 in head and one of 175 mm. from Yenping, Fukien, 2.1. These oriental eels are in need of revision based on more careful studies and with reference to off-shore spawning grounds. One might reasonably expect that there would be a group spawning in the South China Sea, more or less isolated and differentiable from another spawning in the Pacific.

*Anguilla japonica* Temminck and Schlegel


*Locality of Material:*—Specimens examined from Tungting Lake, Hunan; Fukien, Canton; largest, 622 mm. standard length.

*Description:*—Depth in head, 2.6 to 2.1; head in length to base of caudal, 8.6 to 7.6; tail, 1.6 to 1.7; eye in snout, 2.3 to 2.6 (specimens 325 to 400 mm. standard length). Dorsal and anal rays numerous; scales minute, embedded, linear, in groups placed at about right angles to one another.

*Remarks:*—Called "pai-shan" at Tungting Lake, where it occurs only now and then in the market, in no great quantity, nor of large size. Specimens seen were a little under two feet in length, dark, dull green above and white below (C. H. Pope, field notes).

To judge from our collections this is the predominant form of Chinese eel, wherein the ratio between the horizontal distance from dorsal to anal origins, and length of head, is fairly constant. Thus in a series of 22 specimens with approximate standard lengths of 118 to 395 mm., from Yenping, Fukien, 11 of less than 200 mm. have this distance in head, 1.1 to 1.5, average, 1.3; 11 of more than 200 mm. have it 1.3 to 1.7, average, 1.5; and 4 from Tungting Lake, Hunan, 326 to 390 mm. long, have it 1.3 to 1.6, average, 1.45.

*Anguilla mauritiana* Bennett


*Locality of Material:*—East Indian oceans and archipelagoes in general. Hainan (Oshima, 1926, p. 4).

Specimens examined from Fukien.

*Description:*—Depth in head, 2.7; head in length to base of caudal, 6.9; tail, 1.7; eye in snout, 2 (in a specimen of 263 mm. total length). Dorsal and anal rays
numerous; scales minute, embedded, linear, in groups placed at about right angles to one another.

Family SILURIDAE

CATFISHES

The catfishes are a continental fresh-water family, whereof a few genera have become marine. These have established allied genera and species in the Australian region and in Madagascar and elsewhere which are truly fresh-water fishes, but not in China. Estuarine species of or allied to *Plotosus* and *Arius* which may occur in China are not included in this work.

Genus *Parasilurus* Bleeker


Flat-headed, compressed-bodied, Eurasian catfishes with a very long anal fin, a very small, anterior, spineless dorsal, and no adipose. Four barbels only (a pair of maxillary and of mandibular). Few species, three or four in China. Common.

Anal with 60 to 85 rays, contiguous or connected with the caudal, which is rounded or truncate. Pectoral with a spine. Eye placed above the angle of the mouth, which is large. Teeth in jaws, and in a transverse uninterrupted band on the vomer.

**Key to Chinese *Parasilurus***

1. Lower jaw projecting .................................................. see 2
   Lower jaw included. Depth, less than 6. Maxillary barbels twice head or more, reaching about to front of anal ...........................................
   Jaws equal. Depth, more than 6. Ventrals present or absent, absent in the
   type .................................................................
   2. Anal with 50 rays. Maxillary barbels very long, reaching base of anal, 5 times
      the length of the mandibular barbels ........................................ cinereus
      Anal with 71 to 73 rays. Maxillary barbels extending to base of pectoral or
      beyond; mandibular barbels nearly ½ as long. Ventral rays, 10 ..........
      Anal with 73 to 78 rays; depth, 6 to 9.2 .................................. anomalus
      Anal with 76 to 82 rays. Maxillary barbels reaching past the base but not to
      the tip of the pectorals; mandibular barbels about ½ as long. Depth, about 5
      3. Anal with about 73 rays, dorsal with 4. Maxillary barbels reaching the ends
      of the pectorals; mandibular barbels ½ as long. Ventral rays, 12. Depth,
      about 6 ............................................................. cinereus
      Anal with 73 to 78 rays, dorsal with 5. Depth, about 6 ..................
      Anal with 73 to 77 rays, dorsal with 5. Depth, 8.8 to 9.2 ...............
THE FRESH-WATER FISHES OF CHINA

Parasilurus cinereus (Dabry de Thiersant)


*Description:*—Close to *Parasilurus asotus*. Dorsal rays, 7; anal, about 50.

*Parasilurus mento* (Regan)


*Locality of Material:*—Specimens examined from Yunnan.

*Description:*—Depth in length, 5.25 to 5.5; head, 4 to 4.33; eye in head, 7.5 to 9.5 (in specimens of 115 to 215 mm. total length). Dorsal rays, 4; anal, 71 to 73.

*Parasilurus grahami* (Regan)


*Description:*—Depth in length, 6; head, 5; eye in head, 8 (in a specimen of 260 mm. total length). Dorsal rays, 4; anal, 73.

*Parasilurus asotus* (Linnaeus)


*Parasilurus asotus asotus* (Linnaeus)


*Locality of Material:*—Tientsin; Ningpo; Shanghai; Chinwangtao (*fide* Gee).

Specimens examined from Shansi; Tungting Lake, Hunan; Anhwei; Kiangsi; Fukien; up to 370 mm. standard length.

*Description:*—Depth in length to base of caudal, 5; head, 4.2; eye in head, 7 (in a specimen of 135 mm. standard length). Dorsal rays, 4 to 6; anal, 76 to 82.

*Remarks:*—Called "nien-yü" at Tungting Lake where it is by far the commonest of two common catfishes of great size sold in the market. The large specimens, several feet long, are sold in sections. It is to be seen everywhere for sale, large and small alike, the latter in great numbers; large baskets of them, about a foot long, in the Yochow streets.

The color of this fish varies from a uniform dark carpet green to a uniform dirty, milky white. Sometimes the dark green is mottled with lighter spots, which is probably a color change each individual is capable of making, as fish of both colors may be seen in the same basket. However, all the very large ones seen were yellow (*C. H. Pope, field notes*).
Parasilurus asotus bedfordi (Regan)


Description:—Depth in length, 6; head, 4.5 to 5.5; eye in head, 7.5 to 9 (in specimens of 130 to 275 mm. total length). Dorsal rays, 5; anal, 73 to 78.

Parasilurus asotus longus Wu


Locality of Material:—Specimen examined from the Min River.
Description:—Depth in length to base of caudal, 8.8 to 9.2; head, 4.6 to 4.9; eye in head, 8 to 8.9 (in specimens 250 to 265 mm. long). Dorsal rays, 5; anal, 73 to 77.

Parasilurus cochinchenensis (Cuvier and Valenciennes)

Figure 5


Locality of Material:—Specimens examined from Hainan Island; Fukien; up to 185 mm. standard length.

Fig. 5. Parasilurus cochinchenensis (Cuvier and Valenciennes). 145 mm. without caudal.

Description:—Depth in length to base of caudal, 4.7; head, 5.6; eye in head, 7.5 (in a specimen of 125 mm. standard length). Dorsal rays, 4 or 5; anal, 62 to 66.

Parasilurus anomalus (Herre)

Herkotsella anomalala Herre, 1933, Hong Kong Nat., IV, p. 179. Hong Kong. Type of Herkotsella Herre.

Description:—Depth in length, 7.2 to 7.8; head, 5.8 to 6; eye in head, 6.7 to 7.3 (specimens 108 to 164 mm. long). Dorsal rays, 4; anal, 62.
THE FRESH-WATER FISHES OF CHINA

Genus Silurodon Kner


A large-mouthed siluroid catfish with small dorsal fin, no adipose, and 3 pairs of barbels, a maxillary pair and 2 pairs on the lower jaw. The anal is very long (about 90 rays) adnate to the small caudal, and the eye is without a free rim. Lower jaw projecting. There are 3 or 4 rows of rather long, sharp teeth in each jaw, and a crescentic band on the vomer. Ventral with 12 rays.

Silurodon hexanema Kner

Silurodon hexanema Kner, 1867, Reise “Novara,” Zool., I, Fische, p. 305, Pl. xii, fig. 2. Probably Shanghai.

Description:—Head in length to base of caudal, about 4; depth in head, 2; eye, more than 7 (specimen about 160 mm. long). Dorsal rays, 5; anal, 90.

Remarks:—Based on a specimen preserved in the same glass container with Pseudobagrus fulvidraco, and thought to have come from the vicinity of Shanghai.

Genus Aoria Jordan


Standardized, free swimming catfishes of moderate size, with forked caudal fin, and rather short anal of less than 20 rays. A number of species in southern Asia and the East Indies. Questionably separable from Pseudobagrus.

Eye with a free rim. Dorsal with a spiae and 7 branched rays. A well-developed adipose fin, long or of moderate length, free behind. Pectoral with a strong, serrate spine. Four pairs of barbels; one pair at the posterior nostrils, which are remote from the anterior. Teeth in a continuous band on the vomer. Lower jaw somewhat included.

Macrones [Aoria] sinensis Bleeker (1873.5, p. 153) from China is unidentifiable as it is based on an insufficient description. Aoria cavasius, Chu (1931.6, p. 76) and Aoria cornula, Chu (loc. cit.), species of the western borders, are questionably Chinese.

Key to Chinese Aoria

Brownish, a silvery or dark lateral band, a dark spot on the upper part of the dorsal and dark streak on each caudal lobe. Maxillary barbel reaching middle of pectoral. Adipose not longer than high. Depth, 3 to 4...

argentivittata

Blotched with dusky, especially below the dorsal, a pale band across the nape. Tips of barbels slender, the maxillary barbel reaching margin of opercle only.

Tips of barbels slender, the maxillary barbel reaching margin of opercle only.

Dorsal base, 1.3 to 1.9 in length of adipose. Depth, 3.8 to 4.3...

henryi

No round black blotches. Depth, 7.5 to 8...

seenghala
Two round black blotches: one on shoulder, one on peduncle. Maxillary barbel reaching anal. Adipose long and low .................................................. pulcher

Aoria argentiivittata (Regan)


*Description:*—Depth in length, 3.5; head, 4; eye in head, 3. Dorsal rays, I, 7; anal, 14 or 15.

Aoria henryi Herre


*Description:*—Depth in length, 3.8 to 4.3; head, 3.2 to 3.8; eye in head (evidently an error), 2 to 2.2 (specimens 68 to 91 mm. long). Dorsal rays, I, 7; anal, 18 to 20.

Upper surface of head partially covered with skin, supra-occipital process mostly exposed; pectoral spine equal to or slightly shorter than dorsal spine; dorsal and adipose separated by a distance much greater than dorsal base.

*Remarks:*—This may be a *Pseudobagrus* close to *P. affinis*, which its description does not fit.

Aoria seenghala (Sykes)


*Description:*—Depth in length, 7.5 to 8; head, 4.5; eye in head, 7 to 8. Anal rays, 11 to 12.

Aoria pulcher (Chaudhuri)

*Macrones pulcher* Chaudhuri, 1911, Rec. Indian Mus., Calcutta, VI, p. 20, Pl. 1, fig. 4. Bhamo, close to the Yunnan border.

*Description:*—Depth in length to base of caudal, 3.8; head, 3 to 3.6; eye in head, 3.8 to 4.3 (specimens 60 to 67 mm. in total length). Dorsal rays, I, 7; anal, 12.

Genus Cranoglanis Peters


A standardized, free swimming Chinese catfish with a rough bony plate on top of the head; fine teeth on the jaws, but none on the palate; resembles *Pseudobagrus*.

Head narrowed forward, depressed, the mouth small, lower jaw included. Four pairs of barbels, one pair at the posterior nostrils, which are remote from the
THE FRESH-WATER FISHES OF CHINA

anterior. Dorsal short, with about 6 branched rays and a spine. Adipose short, free behind; anal rather long, with more than 30 branched rays; caudal deeply forked. Eye rather large, with a free rim.

KEY TO CHINESE Cranoglanis

Depth, 5 or 6; anal, about 36; pectoral spine weakly serrate .................. 
Cranoglanis sinensis

Depth, 3 or 4; anal, 37 to 41; dorsal and pectoral spines with moderately large teeth ............................................. 
Cranoglanis multiradiatus

Cranoglanis sinensis Peters

Cranoglanis sinensis Peters, 1880, Monatsber. Akad. Wiss. Berlin, p. 1030, Fig. 1. Hong Kong.

Description:—Depth in length to base of caudal, 5.3; head, 3.8; eye in head, 4.5 (specimen 280 mm. long). Dorsal rays, I, 6; anal, 36; no scales.

“In 1880 Dr. Peters of Berlin described as new a number of fishes sent him from Hong Kong by a Dr. Gerlach. Although many people have made collections at Hong Kong during the intervening years, most of these species have not been seen since. As they were all fresh-water fishes it was self evident that they did not come from Hong Kong, which is a mountainous rock without streams except a few rills and torrents, and is surrounded by salt water. As given by Peters the species were as follows: Cranoglanis sinensis; Barbus brevifilis; Barbus gerlachi; Hemiculter dispar; Labeo decorus; Pseudogobio productus; and Semilabeo notabilis. While collecting at Wuchow, Kwangsi Province, in February, 1934, I was able to secure specimens of all the species described by Peters. There is no doubt in my mind that all his specimens were actually caught at Wuchow.

“Cranoglanis sinensis Peters is a very peculiar cat-fish that occurs in abundance in the West River and its tributary the Fu River, at Wuchow. It does not attain a large size, probably not more than 5 pounds” (Herre, 1934.3, p. 327).

Cranoglanis multiradiatus (Koller)


Description:—Depth in length to base of caudal, 3.7 to 3.8; head, 3.7 to 3.8; eye in head, almost 6 (specimens of 280 to 300 mm. total length). Dorsal rays, I, 5 to 6; anal, 37 to 41; no scales.

Genus Pseudobagrus Bleeker


Standardized, free swimming catfishes of moderate size, with forked caudal
fin; eye moderate or rather large, with more or less of a free rim. Abundant and represented by numerous species in southern and eastern Asia.

Dorsal rather short, with a spine and 5 to 7 branched rays; anal somewhat longer, with some 20 or more rays altogether; a well-developed short adipose fin, free behind; pectoral with a strong, serrate spine. Four pairs of barbels; one pair at the posterior nostrils, which are remote from the anterior. Teeth on jaws, and in a continuous transverse crescentic band on the vomer.

**SYSTEMATIC ACCOUNT**

**1. Upper surface of head almost or completely smooth, covered with skin. Maxillary barbel about as long as head, or a little longer. Anal rays, 20 to 24.**

1. "vachellii" see 2

1. "fulvidraco" see 4

**2. Dorsal spine longer than pectoral spine. Depth in length to base of caudal, 4.2 (specimen 125 mm. standard length). Pectoral spine smooth in front.**

2. "vachellii" see 3

2. "intermedius" see 4

**3. Depth, 5.2 (specimen about 200 mm.). Anal rays, 23.**

3. "fangi" see 3

3. "nitidus" see 4

**4. Maxillary barbel as long or longer than head. Pectoral spine finely serrate in front.**

4. "vachellii" see 4

4. "fulvidraco" see 5

**5. Barbels very slender. Pectoral spine finely serrate in front. Depth in length to base of caudal, 4.4 (specimen 106 mm. standard length). Anal rays, about 20.**

5. "intermedius" see 5

5. "nitidus" see 5

**Key to Chinese Pseudobagrus**

1. Upper surface of head almost or completely smooth, covered with skin. Maxillary barbel about as long as head, or a little longer. Anal rays, 20 to 24 ..............

1. "vachellii" see 2

1. "fulvidraco" see 4

2. Dorsal spine longer than pectoral spine. Depth in length to base of caudal, 4.2 (specimen 125 mm. standard length). Pectoral spine smooth in front .............

2. "vachellii" see 3

2. "intermedius" see 4

3. Depth, 5.2 (specimen about 200 mm.). Anal rays, 23 .................

3. "fangi" see 3

3. "nitidus" see 4

4. Maxillary barbel as long or longer than head. Pectoral spine finely serrate in front. Anal rays, about 19 .................

4. "vachellii" see 4

4. "fulvidraco" see 5


5. "intermedius" see 5

5. "nitidus" see 5

Pseudobagrus vachellii (Richardson)


_Pseudobagrus chinensis_ Wu, 1930, ibid., p. 53, Fig. 4. Szechwan.

**Locality of Material:**—Ningpo (fide Gee).

Specimens examined from Tungting Lake, Hunan; Fukien; up to 235 mm. standard length.

**Description:**—Depth in length to base of caudal, 4.2 (4.5 in larger fish); head, 4; eye in head, 5 (specimen of 125 mm. standard length; smaller specimens have a larger eye). Dorsal rays, I, 7; anal, 24.
Pseudobagrus fangi Wu

*Pseudobagrus fangi* Wu, 1930, *Sinensia*, I, p. 84, Fig. 8. Kiating.

**Description:**—Depth in length to base of caudal, 5.2; head, 4.8; eye in head, 5 (specimen of 210 mm., total length). Dorsal, I, 7; anal, 23.

**Remarks:**—This species has a rather long adipose and rounded snout suggesting forms placed in *Leiocassis*. It is close to *Pseudobagrus eupogon*, and both may be indistinguishable from *P. vachelli*, which is a widely distributed and variable form.

Pseudobagrus eupogon Boulenger


**Description:**—Depth in length to base of caudal, 6; head, 5 (specimen of 250 mm.). Dorsal rays, I, 7; anal, 22.

Pseudobagrus ondon Shaw


**Description:**—Depth in length to base of caudal, 7; head, 4.3; eye in head, 4.5 (specimen of 77 mm. standard length). Dorsal rays, I, 7; anal, 20.

Pseudobagrus fulvidraco (Richardson)

Plate III, figure 3


**Locality of Material:**—Shanghai; Canton (*fide* Gee).

Specimens examined from Chihli; Shansi; Tungting Lake, Hunan; Anhwei; Fukien; up to 170 mm. standard length.

**Description:**—Depth in length to base of caudal, 5.4; head, 3.9; eye in head, 3.8 (specimen of 80 mm. standard length). Dorsal rays, I, 6 to 7; anal, 19.

**Remarks:**—This is one of several kinds of small related catfishes called “huang-ku-yü” by the lake fishermen at Tungting Lake. It is to be distinguished by its long barbels and chunky build; is very common and sold in great numbers,

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**PLATE II**

Fig. 1. *Fluta alba cinerea* (Richardson). 470 mm. total length. Tungting Lake.

Fig. 2. *Mastacembelus sinensis* (Bleeker). 190 mm. standard length. Tungting Lake.

Fig. 3. *Mastacembelus armatus undulatus* (McClelland). 160 mm. standard length. Nodoa, Hainan.
being larger than the others, probably reaching a length of 10 inches. Baskets and baskets of them are to be seen for sale at almost any time, and it thus has a definite though no great economic importance (C. H. Pope, field notes).

**Pseudobagrus intermedius** Nichols and Pope

*Figure 6*

*Pseudobagrus intermedius* Nichols and Pope, 1927, Bull. Amer. Mus. Nat. Hist., LIV, p. 331, Fig. 5. Hainan.

_Description_:—Depth in length to base of caudal, 4.4; head, 3.4; eye in head, 5.4 (specimen of 106 mm. standard length). Dorsal rays, I, 7; anal, 20.

![Fig. 6. Pseudobagrus intermedius Nichols and Pope. Type. 106 mm. without caudal.](image)

**Pseudobagrus nitidus** Sauvage and Dabry de Thiersant


_Locality of Material_:—Specimens examined from Tungting Lake, Hunan; Min River.

_Description_:—Depth in length to base of caudal, 5.4; head, 4; eye in head, 4 (specimen of 105 mm. standard length). Dorsal rays, I, 7; anal, 25.

**Pseudobagrus virgatus** (Oshima)

*Figure 7*


![Fig. 7. Pseudobagrus virgatus (Oshima). 95 mm. without caudal.](image)
Locality of Material:—Specimens examined from Hainan.

Description:—Depth in length to base of caudal, 3.3; head, 3.9; eye in head, 3.8 (specimen of 95 mm. standard length). Dorsal rays, I, 7; anal, 16.

Genus Leiocassis Bleeker


Moderate or large-sized, varied catfishes closely related to Pseudobagrus, with a rather long, low adipose, the eye either small or more or less covered by skin (without a free rim). Abundant and represented by numerous species in southern and eastern Asia and the East Indies.

Dorsal rather short, with a spine and 5 to 7 branched rays; anal with 15 to 22 rays altogether; pectoral with a strong, serrate spine. Four pairs of barbels; one pair at the posterior nostrils, which are remote from the anterior.

The subgenus Leiocassis is extralimital. The subgenus Rhinobagrus is characterized by small eye, expanded snout, and forked caudal; the subgenus Dermocassis by eye without a free rim, caudal rounded, truncate or emarginate. The last two subgenera, in China, are connected by intermediate species, and the series of forms here referred to Leiocassis is not sharply separated from those referred to Pseudobagrus, recognition of the genus being largely a matter of convenience.

Key to Chinese Leiocassis

1. Caudal well forked. Snout more or less elongate or swollen (Rhinobagrus)...
   Caudal emarginate, truncate or rounded. Snout not elongate or swollen (Dermocassis) .................................................. see 2

2. Bones of top of the head not exposed. Dorsal spine with slight serrations or weakly barbed behind ................................................................. see 5
   Bones of top of the head more or less exposed and striate. Anal, 16 to 17 .... dumerili
   Upper surface of head roughened, with a median longitudinal groove. Anal, 10 to 11 .......................................................... hainanensis
   3. Depth in standard length, less than 6 .................................. see 4
   Depth in standard length, more than 6 ................................ tenuifurcatus

4. Eye in head, 5.5 to 6.5 (specimens 70 and 100 mm. length). Dorsal spine smooth or with slight serrations behind ........................................ crassirostris
   Eye in head, 5.5 (specimen 74 mm. standard length). Dorsal spine weakly barbed behind. Dorsal spine in head, 1.3 to 1.4; pectoral spine, 1.5 .... crassilabris
   Eye in head, 4 (specimen 100 mm. standard length). Dorsal spine in head, 1.5; pectoral spine, 1.7 .............................................. macrops
   Eye in head, 8.6 or 8.7 (specimen 94 mm. standard length). Dorsal spine in head, 1.7 or 1.8; pectoral spine, 2 or 2.1 .................................. microps
   Eye in head, 4.6 (specimen 110 mm. total length). Dorsal spine in head, 1.4; pectoral spine, 1.4. Caudal shallowly but sharply forked. Maxillary barbel extending to slightly beyond eye .................................... brevicaudatus
SYSTEMATIC ACCOUNT

5. Caudal distinctly emarginate or notched. Dorsal spine without appreciable serration .......................... see 6

Caudal subtruncated to rounded (sometimes notched in *ussuriensis*) 

6. Depth in length to base of caudal, 4.5 to 5.5. Bases of vertical fins dark; distal portions of dorsal and caudal and center of anal slightly dusky. Anal, 20 ........ see 9

Depth in length to base of caudal, less than 4. Head and back with a conspicuous nap of fibrillae ................................................. medianalis

Depth in length to base of caudal, 6 or more ............................................... pratti

7. Anal rays, 19. The nasal barbel does not reach beyond and the maxillary barbel reaches somewhat beyond the orbit .......... see 10

Anal rays, 16 to 18. The nasal barbel reaches posterior border of eye; the maxillary barbel reaches operculum ... similis

Anal rays, 17. The nasal barbel reaches posterior border of eye; the maxillary barbel a little farther back .................. emarginatus

analis

8. Eye in head, 5.5 to 6 (at about 100 mm. length) .......... see 11

Eye in head, 11 (at about 300 mm. length) ....................... kaifcnensis

9. Dorsal spine low, about 2 in head 

Dorsal spine higher, less than 2 in head.......................... see 12

10. Peduncle more than twice as long as deep. A broad dark lateral band, at least posteriorly ......................... truncatus

Peduncle less than twice as long as deep. No noticeable dark lateral band .................................. morii

11. Depth greater (5 or less in standard length at 100 mm.; 5.9 or less at 200 mm.). Eye smaller (7 in head at 100 mm.; 8.5 at 200 mm.) .......... see 13

Depth less (6.6 in standard length at 132 mm.; 8 in length at 260 mm.). Eye larger (5.5 in head at 132 mm.; 7 at 260 mm.). Anal rays, 20 to 22 ... tenuis

analis

12. Anal rays, about 23 ........................................ see 14

Anal rays, about 18 ........................................ taphrophilus

13. Depth in length, less than 5 at 150 mm. ...................

Depth in length, more than 5 at 150 mm. ..............................

14. Mouth inferior, transverse ........................................

Upper jaw extending little beyond the lower .........................................

Subgenus *Rhinobagrus* Bleeker


Leiocassis dumerili (Bleeker)


Locality of Material:—Ningpo; probably Hong Kong (*fide* Gee).

1 *L. albomarginatus* Rendahl, 1928, Anhwei, comes here. Caudal with a broad white margin; depth, 4.2 to 5; eye, 5.3 to 6.8 (at 49 to 90 mm. standard length).
Specimens examined from Tungting Lake, Hunan; Min River; up to 230 mm. standard length.

Description:—Depth in length to base of caudal, 4.6 to 4.9; head, 3.5 to 3.6; eye very small, about 10 (specimens of 95 and 220 mm. standard length). Dorsal rays, I, 7; anal, 16 to 17.

Remarks:—This big, long-snouted, grape-colored catfish is called "hui-t’ou" at Tungting Lake, where it reaches a great size and is often sold in pieces. The young are caught in numbers by the shrimp fishermen, and on the whole the fish is very common, and of considerable economic importance (C. H. Pope, field notes).

Leiocassis hainanensis Tchang


Description:—Depth in length to base of caudal, 6 to 6.4; head, 3.7 to 4; eye in head, 6 (at 185 mm., specimens 130 to 185 mm. standard length). Dorsal rays, I, 7; anal, 10 to 11.

Caudal well forked; snout much depressed, projecting; a long, narrow fronticular on dorsal surface of interorbital; maxillary barbel long, nearly reaching ventral origin; adipose normally long. Said to be allied to Leiocassis armatus (Day) from India.

Leiocassis crassirostris Regan


Description:—Depth in length, 5.5; head, 4 to 4.3; eye, 5.5 to 6.5 (specimens of 70 to 140 mm.). Dorsal, I, 7; anal, 18.

Leiocassis crassilabris Günther


Leiocassis crassilabris crassilabris Günther


Locality of Material:—Specimens examined from Tungting Lake, Hunan; Hokou, Kiangsi; Kienning and Yenping, Fukien; up to 152 mm. in standard length. Those from Kiangsi and Fukien approach macrops.

Description:—Depth in length to base of caudal, 4.2 to 4; head, 3.7 to 3.9; eye in head, 5 to 5.9 (specimens of 74 to 152 mm. standard length; eye, 6, in a specimen of about 180 mm. total length). Dorsal rays, I, 7; anal, 16 to 18.
SYSTEMATIC ACCOUNT

Leiocassis crassilabris macrops Nichols

Figure 8

Leiocassis crassilabris macrops Nichols, 1926, Amer. Mus. Novitates, No. 214, p. 2, Fig. 2. Near Yenping, Fukien.

Locality of Material:—Specimens examined from Hokou, Kiangsi; Chungan Hsien and near Yenping, Fukien; largest, 160 mm. standard length.

Description:—Depth in length to base of caudal, 3.8 to 3.9; head, 3.7 to 4; eye in head, 4 (specimens of 99 and 100 mm. standard length; depth, 4.8, and eye, 5.2, at 160 mm.). Dorsal rays, I, 7; anal, 17.

Leiocassis microps Rendahl


Description:—Depth in length to base of caudal, 4.9 or 5; head, 3.6 or 3.7; eye in head, 8.6 or 8.7 (specimen 94 mm. standard length). Dorsal rays, I, 7; anal, 17.

Leiocassis brevicaudatus Wu

Leiocassis brevicaudatus Wu, 1930, Sinensia, I, p. 81, Fig. 7. Chungking, Szechwan.

Description:—Depth in length to base of caudal, 5.7; head, 4.1; eye in head, 4.6 (specimen 110 mm. total length). Dorsal, I, 7; anal, 18.

Leiocassis tenuifurcatus Nichols

Figure 9

Description:—Depth in length to base of caudal, 7.7; head, 5; eye in head, 5 (specimen of 155 mm. standard length). Dorsal, I, 7; anal, 18.

Remarks:—This species bears a general resemblance to Leiocassis (Dermocassis) tenuis, except for its forked caudal.

Subgenus Dermocassis Nichols


Leiocassis medianalis (Regan)


Locality of Material:—Specimens examined from Yunnan.

Description:—Depth in length to base of caudal, 4.9; head, 3.8; eye in head, 6.5 (specimen of 115 mm. standard length). Dorsal rays, I, 7; anal, 20.

Leiocassis emarginatus Regan


Description:—Depth in length to base of caudal, 6 to 6.5; head, 4 to 4.3; eye in head, 5.5 to 6 (specimens of 80 to 115 mm. total length). Dorsal rays, I, 7; anal, 16 to 18.

Leiocassis kaifenensis Tchang


Description:—Depth in length to base of caudal, 7.2; head, 4.7; eye in head, 11 (specimen 280 mm. standard length). Dorsal rays, I, 6; anal, 18.

Dorsal spine smooth, 1.5 in head; pectoral, 1.8. Nasal barbel to posterior border of eye; maxillary barbel to operculum. Caudal moderately emarginate, middle rays about 1/2 of the longest. Allied to L. pratti but deeper, and questionably distinct from L. emarginatus.

Leiocassis pratti (Günther)

Macrones pratti Günther, 1892, in Pratt, Snows of Tibet, p. 245, Pl. i, fig. B. Szechwan.
**Description:**—Depth in length to base of caudal, 9; head, about 5; eye in head, 7 (specimen about 206 mm. long). Dorsal rays, I, 6; anal, 19.

*Leiocassis similis* Nichols

Figure 10

*Leiocassis similis* Nichols, 1926, Amer. Mus. Novitates, No. 214, p. 1, Fig. 1. Fukien.

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**Description:**—Depth in length to base of caudal, 6; head, 4.4; eye in head, 5 (specimen of 119 mm. standard length). Dorsal rays, I, 7; anal, 17.

*Leiocassis hirsutus* Herre


**Description:**—Depth in length, 3.3 to 3.6; head, 3.9; eye in head, about 8.5 (specimens 230 and 280 mm. long). Dorsal rays, I, 7; anal, 18.

*Leiocassis albomarginatus* Rendahl


**Description:**—Depth in length to base of caudal, 4.2 to 5; head, 3.6 to 3.9; eye in head, 5.3 to 6.8 (specimens 49 to 90 mm. standard length). Dorsal rays, I, 7; anal, 19 or 20.

*Leiocassis taeniatus* (Günther)


**Locality of Material:**—Ningpo (*fide* Gee).

Specimens examined from Fukien; largest, 190 mm. standard length.

**Description:**—Depth in length to base of caudal, 6 to 6.7; head, 5 to 4.7; eye in head, 6 to 7 (specimens of about 125 and 190 mm. standard length, respectively). Dorsal rays, I, 6 to 7; anal, 18 to 20.
Remarks:—Specimens of this species, and *Leiocassis tenuis* in particular, of the subgenus *Dermocassis* in general, and doubtless of various other catfishes are more slender as they become larger. Their eyes, however, become relatively smaller with increased size of the fish, as is usual.

*Leiocassis truncatus* Regan


*Description:—* Depth in length, 5.5 to 6; head, 4 to 4.3; eye, 5 to 6 (specimens of 75 to 130 mm.). Dorsal rays, I, 7; anal, 18 to 20.

*Leiocassis tenuis* (Günther)


*Locality of Material:—* Specimens examined from Chungan Hsien, Kienning, and near Yenping, Fukien; up to 235 mm. standard length.

*Description:—* Depth in length to base of caudal, 6.6 to 8; head, 3.8 to 5; eye in head, 5.5 to 7 (in specimens of 132 and about 220 mm. standard length, respectively). Dorsal, I, 7; anal, 20 to 22.

*Leiocassis analis* Nichols

*Figure 11*

*Leiocassis analis* Nichols, 1930, Amer. Mus. Novitates, No. 440, p. 4, Fig. 3. Hokou, northeastern Kiangsi.

*Description:—* Depth in length to base of caudal, 5; head, 4.4; eye in head, 7 (specimen 101 mm. standard length). Dorsal rays, I, 7; anal, 23 or 24.

*Leiocassis lui* Tchang and Shih


*Description:—* Depth in length to base of caudal, 4.6; head, 4; eye in head, 7; dorsal and pectoral spines, 1.5 (specimen 140 mm. standard length). Dorsal rays,
I, 6; anal, 17. Dorsal spine serrate, caudal truncate. Questionably distinct from *taphrophilus* and *ussuriensis*.

Leiocassis *ussuriensis* (Dybowski)


*Locality of Material:*—Specimens examined from Shansi; Tungting Lake, Hunan; up to 240 mm. standard length.

Description:—Depth in length to base of caudal, 5.9; head, 4.8; eye in head, 8.5 (specimen of 200 mm. standard length). Dorsal rays, I, 7; anal, 18.

Leiocassis _taphrophilus_ (Sauvage and Dabry de Thiersant)


*Locality of Material:*—Ningpo (fide Gee).

Specimens examined from Hokou, Kiangsi.

Description:—Depth in length to base of caudal, 4.9 to 5.5; head, 4 to 4.5; eye in head, 6.6 to 7.2 (specimens 76 to 121 mm. standard length). Dorsal, I, 7; anal, 17.

Remarks:—We were somewhat puzzled in the identification of this classical species until three small specimens from Hokou were examined which seem to be referable to it. They have a rather small adipose for _Leiocassis_, and further suggest the young of _Pseudobagrus_ in a faint pattern consisting of a pale collar and obscure dark blotches on the sides. Dorsal spine almost smooth; pectoral spine barbed behind and granular in front. Maxillary barbel reaching to middle or margin of opercle; nasal barbel to past eye or edge of preopercle. Orbital rim with an imperfect fold, pronounced below.

Genus _Hemibagrus_ Bleeker


A genus of East Indian catfishes, allied to _Pseudobagrus_, etc., with two Chinese species, representing the subgenus _Macropterobagrus_, one of which is common and widely distributed in China, whereas the other reaches its southern border.

Eight barbels in 4 pairs, one of which is situated at the posterior nostrils, which are remote from the anterior. Dorsal short, dorsal and pectoral with strong spines.
Key to Chinese *Hemibagrus*

Depth in standard length, about 8; adipose (longer), less than 2.5; dorsal and pectoral spines in head, 2 to 2.3 ............................ *macropterus*

Depth in standard length, 6 or 7; adipose (shorter), more than 2.5; dorsal and pectoral spines in head, about 1.7; color more silvery .......................... *elongatus*

Subgenus *Macropterobagrus* Nichols


Distinguished by elongate body and depressed head, very long adipose fin occupying practically the entire distance between dorsal and caudal, and weakly forked caudal fin.

**Hemibagrus macropterus** Bleeker

*Plate III, figure 2*


**Locality of Material:**—Specimens examined from Tungting Lake, Hunan; Anhwei; Hokou, Kiangsi; up to 440 mm. standard length.

**Description:**—Depth in length to base of caudal, 8; head, 4; eye in head, 4 (specimen of 77 mm. standard length). Dorsal rays, I, 7; anal, about 13.

**Remarks:**—Called “hui-yii” at Tungting Lake, where it is apparently one of the rarer catfish of the lake, not often seen for sale on the streets of Yochow. The boats of the shrimp fishermen now and then yielded a small specimen. It is, as a rule, uniformly dark colored (C. H. Pope, field notes).

**Hemibagrus elongatus** (Günther)


**Locality of Material:**—Specimen examined from Kwangtung.

**Description:**—Depth in length to base of caudal, 6 to 6.4; head, 4 (specimens 185 mm. and more standard length). Dorsal rays, I, 7; anal, 12 to 14.

**Remarks:**—This species differs from the similar catfishes listed by Weber and de Beaufort (1913, II, pp. 335–365) as described by them. It is possible that Günther’s locality, “Singapore,” is in error.
SYSTEMATIC ACCOUNT

“Sometime in the ‘nineties’ Steindachner described a catfish from Hong Kong under the name of Macrones chinensis, and for many years it too was not seen. In recent years a few specimens were obtained at Canton. This fish is abundant in the Fu River and West River at Wuchow. It becomes more than a meter long and reaches a weight, according to the fishermen, of over 50 pounds. I saw several which weighed over 30 pounds apiece. When there is a surplus in the local market it is shipped to Canton, more rarely to Hong Kong if a steamer is available” (Herre, 1934.3, p. 327).

Genus Liobagrus Hilgendorf


Small, more or less elongate, Asiatic catfishes with the adipose long, low, keel-like, continuous with the rounded or truncate caudal; body, and especially fins with the exception of the caudal, covered with lax skin. Not common, the species scattered, with more or less restricted ranges, usually in hilly country.

Dorsal small, placed far forward over the pectoral; dorsal and pectoral with small pungent spines, more or less concealed. Anal rather short (about 16 rays or less). Eye small, superolateral, without free rim. Barbels 8, one pair at the posterior nostrils, which are remote from the anterior.

**KEY TO CHINESE Liobagrus**

1. Lower jaw included ................................................................. see 2
   Jaws equal or lower the longer .................................................. see 3
2. Dorsal rays, I, 6 to 7; anal, 16. Body and fins rather uniform grayish; end of caudal somewhat darker, its margin pale ........................................... anguillicauda
   Dorsal rays, I, 5; anal, 18. Grayish with small pale spots on the sides; fins broadly edged with white ...................................................... styani
3. Adipose long and low, about as long as the anal, separated by a notch from the precurrent base of caudal. Fins dark basally, broadly margined with white .. marginatus
   Adipose short, fully united to the precurrent base of caudal, than which it is higher. Adipose dusky with a pale edge and whitish spot in its axil; caudal black with 2 whitish spots and a pale edge .................................... nigricauda

Liobagrus anguillicauda Nichols

Figure 12

Liobagrus anguillicauda Nichols, 1926, Amer. Mus. Novitates, No. 224, p. 1, Fig. 1. Chungan Hsien, northwestern Fukien.

**Description:**—Depth in length to base of caudal, 5.4 to 4.8; head, 4.4 to 5 (specimens 72 to 85 mm. standard length); eye in head, 9 (specimen 75 mm. standard). Dorsal rays, I, 6 or 7; anal, 16.
**Fig. 12. Liobagrus anguillicauda** Nichols. Type. 75 mm. standard length.

**Remarks:**—Plentiful at Chungan Hsien, the only locality where the Asiatic Expeditions of the American Museum of Natural History found catfish of this genus.

**Liobagrus styani** Regan


*Description:*—Depth in length to base of caudal, 6 to 7; head, 5 (specimens of 70 and 85 mm.). Dorsal rays, I, 5; anal, 18.

**Liobagrus marginatus** (Günther)

*Amblyceps marginatus* Günther, 1892, in Pratt, Snows of Tibet, p. 245, Pl. II, fig. A. Szechwan.


*Description:*—Depth in length to base of caudal, about 6; head, 4 (specimen of about 93 mm. standard length); eye very small. Dorsal rays, I, 6; anal, 15.

**Liobagrus nigricauda** Regan


*Locality of Material:*—Specimens examined from Yunnan.

*Description:*—Depth in length to base of caudal, 4.6; head, 3.4; eye in head, 7 (specimen 79 mm. standard length). Dorsal rays, about I, 7; anal, about 15.

**Genus Glyptosternon** McClelland


Small, standardized, bottom catfishes with the eye small, more or less superolateral, without a free rim; the anal short; the basal portion of the maxillary barbel furnished with a conspicuous membranous flap, adnate to the side of the snout; bones of the top of the head covered with smooth skin, though the nape may be rugose, striate.
SYSTEMATIC ACCOUNT

Mouth inferior, transverse. Four pairs of barbels, one of these between the nostrils, which are close together, well forward. Gill membranes narrowly joined to the isthmus. Dorsal, which is short, and pectoral each with a strong, serrate spine. Adipose well developed, usually short; caudal forked; anal usually with about 10 rays.

A genus of southern Asia and the East Indies, locally not uncommon in China, where four or five closely related species are recognized from different localities.

Key to Chinese Glyptosternon

1. Moderately slender or deep bodied (depth, less than 6.5 in length); anal moderate (9 to 12) .......................................................... see 2
   Very slender (depth, more than 7.5 in length); anal short (5 to 7) .......................................................... yunnanensis

2. Relatively slender (depth in length to base of caudal, 4.7 to 5.8) with a slender peduncle (its least depth, 3.6 to 4 in head). Pectoral and caudal large (the pectoral spine, 1.1 to 1.4 in head). Anal rays, 10 to 12. Dark bands between adipose and anal and across end of peduncle sometimes present. (Specimens examined of 37 to 71 mm. standard length.) .......................................................... sinense
   Slender (depth, 6.2), with a moderate peduncle (its depth, 3 in head), and very small eye (17 in head); white bands on lateral line and midline of back between dorsals .......................................................... pallozonum
   Deeper (depth, 3.6 to 4.6), with a deeper peduncle (its least depth, 2.3 to 2.8) .......................................................... see 3

3. Anal rays, 11 or 12. Dorsal and pectoral spines about equal (about 1.4 in head).
   Brownish yellow, fins stained with black .......................................................... conirostre
   Anal rays, 9 or 10. Pectoral and caudal usually small (the pectoral spine, [1.2]
   1.5 to 1.7 in head). Dark bands between adipose and anal, and across end of peduncle usually indicated. (Specimens examined of 41 to 81 mm. standard length.) .......................................................... fokiensis
   Anal rays, 10 or 11. Pectoral and caudal larger, pectoral spine decidedly longer
   than the dorsal (1.2 to 1.3 in head). Fins more patterned than body, or in
   above species, dorsal and anal at least with dark cross bands. (Specimens exami-
   ned of 55 to 61 mm. standard length.) .......................................................... hainanensis

Glyptosternon conirostre Steindachner

Glyptosternum conirostrum, Günther, 1892, in Pratt, Snows of Tibet, p. 245. Mountain streams running into the Min River, Szechwan.

Description:—Depth in length to base of caudal, about 4.5; head, about 4.2;
eye small. Dorsal rays, I, 6; anal, 11 to 12.

Remarks:—Günther's identification of this species from Szechwan has been questioned.

Glyptosternon sinense Regan

**Locality of Material:**—Specimens examined from Tungting Lake, Hunan.

**Description:**—Depth in length to base of caudal, 4.7 to 5.8; head, about 3.5 or 3.6; eye in head, 8.5 to 10 (specimens 37 to 71 mm. standard length). Dorsal rays, I, 6 or 7; anal, 10 to 12.

Noticeably lower naped, more slender peduncled, with longer pectorals and caudal than *Glyptosternon fokiensis*.

**Remarks:**—Called "shih-yü" at Tungting Lake, where small individuals, banded yellow and black in color, were very commonly caught by, and to be seen in the bottom of every shrimp fisherman's boat. No large specimen was seen, but my local man said it attains a length of a foot and at that size retreats to the rocks for shelter (C. H. Pope, field notes).

*Glyptosternon pallozonum* Lin


**Description:**—Depth in length, 6.2; head, 3.7; eye in head, 17 (specimen 62 mm. standard length). Dorsal rays, I, 7; anal, 10. Pectoral spine in head, 1.6; dorsal spine shorter (fig.).

*Glyptosternon fokiensis* Rendahl


**Locality of Material:**—Specimens examined from Yungtai Hsien and Chungan Hsien, Fukien; Hokou, Kiangsi.

**Description:**—Depth in length to base of caudal, 3.6 to 4.6; head, 3.3 to 3.7; eye in head, 7.5 to 9.6 (specimens 41 to 81 mm. standard length). Dorsal rays, I, 6; anal, 9 or 10.

**Remarks:**—A deeper, more round-headed fish than *Glyptosternon sinense*, variable. Hokou and Chungan Hsien material examined has the anal uniformly 10, and Chungan Hsien material is slender, with the peduncle slightly less deep and the pectoral spine longer, thus approaching *G. sinense* (depth, 4.6 to 5.5; depth, peduncle in head, 2.5 to 2.9; pectoral spine, 1.3 to 1.5). It may be that the Chinese forms of this genus intergrade and should be considered races.

*Glyptosternon hainanensis* Nichols and Pope

Figure 13


**Locality of Material:**—Specimens examined from Hainan; largest, 61 mm. standard length.

**Description:**—Depth in length to base of caudal, 4.6; head, 3.7; eye in head,
Glyptosternon hainanensis Nichols and Pope. Type. 55 mm. without caudal.

8.8 (specimen 55 mm. standard length; depth, 4.2 in specimen of 61 mm.). Dorsal rays, I, 6; anal, 10 or 11.

Glyptosternon yunnanensis Tchang


*Description:*—Depth in length to base of caudal, 7.7 to 12; head, 4.1 to 4.8; eye in head, 8.5 (at 115 mm., specimens 55 to 115 mm. standard length). Dorsal rays, I, 6; anal, 5 to 7.

The figure shows depth of peduncle in head, about 4; a long low adipose; and somewhat lunate caudal, dark basally and subterminally with a pale band across its center.

Genus Erethistes Müller and Troschel


Small, bottom catfishes of southern Asia, questionably separable from *Glyptosternon*. Essentially as in that genus except that the bones on the top of the head are exposed, rough striate. A few species, one described from China.

Erethistes asperus (McClelland)


*Description:*—Depth in length to base of caudal, about 3.7; head, about 3; eye in head, about 6 (from fig.). Dorsal rays, I, 6; anal, about 8. Dorsal and pectoral spines heavily barbed; fins more or less banded in color.

Genus Exostoma Blyth


Small, mountain catfishes of southern Asia, with ventrals inserted below the end of the small dorsal; gill openings very small, not extending on the lower surface of the head; anterior and posterior nostrils close together; mouth inferior, the lips reflected and spread continuously round the mouth to form a broad flat sucker.
Adipose fin long; dorsal with a weak or rudimentary spine and 6 rays; anal short. Barbels 6 (3 pairs), 2 at the nostrils, 2 at the maxillaries, and 2 below the mandible. Head depressed, covered with soft skin above; eyes small. Teeth in 2 separate patches above, and below; palate without teeth. Caudal fin forked; pectorals horizontal, without adhesive apparatus between them.

**Key to Chinese Exostoma**

1. Teeth all pointed. Pectoral with 13 to 14 branched rays 
   see 2
   Teeth compressed, truncate or notched. Pectoral with 11 branched rays 
   andersonii

2. Width of mouth, 2.5 to 3 in length of head; caudal peduncle, less than 2.5 times as long as deep 
   davidi
   Width of mouth, less than 2.5 in length of head; caudal peduncle, 3 times as long as deep
   myzostoma

**Subgenus Euchiloglanis Regan**


*Exostoma davidi* (Sauvage)


*Description:*—Depth in length, 5 to 6.5; head, 4.1 to 4.6; eye very small (specimens 125 to 155 mm. long). Dorsal rays, I, 6; anal, 6.

*Exostoma myzostoma* (Norman)


*Description:*—Depth in length, 7 to 8; head, 4 to 4.5; eye very small (specimens 75 to 125 mm. long). Dorsal rays, I, 6; anal, 5 or 6.

*Exostoma kishinouyei* (Kimura)


*Description:*—Depth in length to base of caudal, 6.5; head, 3.7; eye in head, 20 (specimen 148 mm. standard length). Dorsal rays, I, 6; anal, 6.

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1 *Exostoma kishinouyei* probably comes here. Nasal barbel long, reaching eye, versus short, not nearly reaching eye in *myzostoma*, which it is said to resemble otherwise.

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**PLATE III**

**Fig. 1.** Clarias fuscus (Lacépède). 77 mm. standard length. Nodoa, Hainan.

**Fig. 2.** Hemibagrus macropterus Bleeker. 77 mm. standard length. Tungting Lake.

**Fig. 3.** Pseudobagrus fulvidraco (Richardson). 80 mm. standard length. Tungting Lake.
Origin of dorsal about equidistant from end of snout and middle of anal base (fig.).

Subgenus Glaridoglanis Norman


Exostoma andersonii Day


Description:—Depth in total length, 7; head, 5; eye very small. Dorsal rays, I, 6; anal, 7 or 8.

Genus Clarias Scopoli


More or less elongate, Old World, fresh-water catfishes, with a spineless, elongate, rayed dorsal extending the length of the back, longer than the anal which is also long; caudal truncate or rounded. Abundant in the tropics, many closely related species in Africa, most Chinese records referable to a single form, widely distributed in the Orient.

Top and sides of the head bony. Four pairs of barbels, one at the posterior nostrils. Mouth wide, transverse, slightly inferior. Gill membranes narrowly united, free from the isthmus. Pectoral with a strong spine.

Key to Chinese Clarias

Depth in total length, more than 5 ........................................... fuscus
Depth in total length, about 5 ........................................... abbreviatus

Clarias fuscus (Lacépède)

Figure 14 and Plate III, figure 1


Locality of Material:—Specimens examined from Yunnan; Chungan Hsien, Fuching Hsien, Kienning, and Yenping, Fukiên; near Canton; Hainan Island; up to 260 mm. standard length.

Description:—Depth in length to base of caudal, 5.4; head (to end of bony covering on side), 3.8; eye in head, 9 (specimen of 96 mm. standard length). Dorsal rays, 59 to 65; anal, 44 to 50.
Clarias abbreviatus Cuvier and Valenciennes


Description:—Depth in total length, 5. Dorsal rays, 62; anal, 32.

Family CATOSTOMIDAE
SUCKERS

The suckers are closely related and almost certainly ancestral to the carps. They have a toothless mouth and a comb-like row of teeth on the pharyngeal bones of the throat, correlated with their bottom feeding “sucker” habits. In the carps the pharyngeal teeth are reduced in number and more specialized. Various free swimming, sometimes predaceous members of the carp family could, it would seem, make good use of jaw teeth, but such have never been re-acquired by any carp-like fishes.

Suckers are a numerous and varied group in North America, but in Asia, aside from one or two far northern forms, are represented by a single specialized species in the valley of China. They have presumably been superseded in China by the more modern carps, which are there very abundant and diversified, that is to say, China is in a later evolutionary stage as regards carp-like fishes than North America.

Genus Myxocyprinus Gill

Myxocyprinus Gill, 1878, Johnson's Cyclopaedia, p. 1574. Type: Carpiodes asiaticus Bleeker.

Rather large suckers found in central China, with back compressed and elevated; dorsal long and high, running the length of the back; color blackish or boldly marked. A single species with recognizable local races.

Myxocyprinus asiaticus (Bleeker)


Remarks:—Fang (1934.2, pp. 329-337) concludes that this species is subject
to great individual, age, and other variation, and that its alleged races are untenable.

**Key to Chinese Myxocyprinus asiaticus**

Dorsal rays, about 52; anal, 12; scales, 53 .......................... *asiaticus*
Dorsal rays, about 57; anal, 14; scales, 55 .......................... *chinensis*
Dorsal rays, 52 to 56; anal, 13 to 14; scales, 47 to 49 ............... *fukiensis*

*Myxocyprinus asiaticus asiaticus* (Bleeker)

Figures 15, 16


![Fig. 15. *Myxocyprinus asiaticus asiaticus* (Bleeker).](image)

![Fig. 16. *Myxocyprinus asiaticus asiaticus* (Bleeker).](image)
Locality of Material:—Specimens examined from Anhwei.

Description:—Depth in length to base of caudal, 2.4; head, 4.6; eye in head, 6 (specimen 220 mm. standard length). Dorsal rays, 52; anal, 12; scales, 53.

Myxocyprinus asiaticus chinensis (Dabry de Thiersant)

Locality of Material:—Specimens examined from Tungting Lake, Hunan.

Description:—Depth in length to base of caudal, 2.3; head, 4.2; eye in head, 5.5 (specimen of 200 mm. standard length). Dorsal rays, 57; anal, 14; scales, 55.

Remarks:—Called “huo-shao-pien” at Tungting Lake, where it is rather scarce and was not seen every day nor certainly every week. When fresh its sides may have a brilliant red color (C. H. Pope, field notes).

Myxocyprinus asiaticus fukiensis Nichols

Figure 17


Locality of Material:—Specimens examined from Yenping, Fukien; up to 100 mm. standard length.

Description:—Depth in length to base of caudal, 2.5 to 2.7; head, 3.6 to 4.4; eye in head, 3 to 3.9 (specimens 36 to 100 mm. standard length). Dorsal rays, 52 to 56; anal, 13 or 14; scales, 47 to 49.
SYSTEMATIC ACCOUNT

Remarks:—There seem to be slight differences of contour and color correlated with the technical characters on which the three races of *Myxocyprinus asiaticus* here recognized are separable. These races are not well defined, however, and with more material for comparison may not prove recognizable. One of eight specimens examined from Yenping, which measures 90 mm. in standard length, is aberrant, with depth, 2.2; dorsal, 51; anal, 14; scales, 52.

Family **CYPRINIDAE**

**CARPS**

Genus *Cyprinus* Linnaeus


Rather sluggish, heavy-bodied, free swimming, Eurasian carps of moderate or large size, feral elsewhere in temperate regions. This genus comprises the carp proper, its many domesticated varieties, and two or three allied forms of doubtful status.

Dorsal and anal each with a serrate bony spine. Dorsal with rarely less than 14 branched rays; anal with 5 or 6, its origin anterior to the vertical from the end of the dorsal. Usually 2 pairs of barbels. Pharyngeal teeth in 3 rows.

Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

**Key to Chinese Cyprinus**

1. Dorsal soft rays, 16 to 22 ................................................................. micristius
   Dorsal soft rays fewer (about 11) ........................................................ micristius
2. Two pairs of barbels present ............................................................. see 3
   No barbels. Mouth large, oblique, maxillary to under front of eye .......... pellegrini
3. Scales, 32 or 33 ................................................................. fossicola
   Scales, 35 to 39 ................................................................. carpio
   Scales, about 45 ................................................................. rabaudi

*Cyprinus carpio* Linnaeus

Figure 18


**Locality of Material:**—Chihli (*fide* Gee).

Specimens examined from Tungting Lake, Hunan; Shantung; Swatow; Fu-kien; near Canton; Hainan.

**Description:**—Depth in length to base of caudal, 3; head, 3.2; eye in head,
4.3 (specimen 120 mm. standard length). Dorsal rays, II, 17 to 22; anal, II, 5; scales, 35 to 39.

Domestic varieties occur with very large scales or lacking scales. The common hybrid between *Cyprinus carpio* and *Carassius carassius* or *auratus* has the barbels of *Cyprinus*, but smaller; teeth in 2 rows (4, 1, or 2); dorsal soft rays, 17 to 20; scales, 30 to 38.

![Fig. 18. Cyprinus carpio Linnaeus. 122 mm. without caudal.](image)

**Remarks:**—Called "li-yü" at Tungting Lake, where it attains a large size, from 3 to 5 feet long, and is perhaps of the greatest economic importance of any lake fish. The fishermen catch it in great numbers for the Yochow market; dozens may be seen for sale in a single day. The passing of the year seems to be the time it is especially relished, as then "li-yü" were on sale when almost no other kinds of fish were to be seen. It is also caught when small by the men who fish for small fish, and the young sold along with countless numbers of other small fry. One day several Chinese were seen fishing for "li-yü" in the following manner.

Two small boats (Chinese row boats) made a team and each boat carried two men, one to handle the line and the other to row. A cord extended between the boats and was allowed to sag deeply in the shallow water. From this cord-line several barbless hooks 4 or 5 inches in length were suspended by short strings. This sagging line was pulled back and forth, first a few feet toward one boat and then back toward the other, by means of two handles, each held by a fisherman, one at either end of the line. In this way the large "li-yü" were snagged by a hook, and then careful drawing in of the line brought the fish near enough the surface to be caught by a large iron hand-hook or gaff and quickly landed (C. H. Pope, field notes).

*Cyprinus fossicola* Richardson


**Locality of Material:**—Canton (*fide* Gee).
Description:—Depth in length to base of caudal, less than 3; head, 3. Dorsal rays, II, 19 or 20; anal, II, 5; scales, 32 or 33.

Cyprinus micristius Regan


Locality of Material:—Specimens examined from Yunnan.

Description:—Depth in length to base of caudal, 3 to 3.1; head, 3.3 to 3.5; eye in head, 3.6 (specimens 97 to 104 mm. standard length). Dorsal rays, II, 11; anal, II, 5; scales, 36 to 38.

Cyprinus pellegrini Tchang

Cyprinus pellegrini Tchang, 1933, Zool. Sinica, (B) II (1), p. 20, Fig. 5. Tunghai, Yunnan.

Description:—Depth in length to base of caudal, 3.3 to 3.6; head, 2.8 to 3; eye in head, 3.2 to 4 (specimens 90 to 120 mm. standard length). Dorsal rays, II, 16 to 18; anal, II, 5; scales, 34 to 38.

Head very broad, mouth oblique, no barbels.

Remarks:—It is hard to evaluate this form, whether a “good” species or an abnormality of Cyprinus carpio. Cyprinus yunnanensis Tchang (ibid., p. 21, Fig. 6) from the same locality, a carp with a small pair of maxillary barbels only, is intermediate.

Cyprinus rabaudi Tchang


Description:—Depth in length to base of caudal, 3; head, 4; eye in head, 4 (specimens 195 and 155 mm. long). Dorsal rays, II, 20; anal, II, 6; scales, 45. Body compressed, nape elevated; dorsal and anal spines high.

Genus Carassius Nilsson


Rather sluggish, heavy-bodied, free swimming, Eurasian carps of small or moderate size, feral elsewhere in temperate regions; the domestic goldfish and its allies.

Dorsal and anal each with a serrate, bony spine. Dorsal with not less than 14 branched rays; anal with 5 or 6, its origin anterior to the vertical from the end of the dorsal. No barbels. Pharyngeal teeth in one row.

Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.
Key to Chinese Carassius

Deeper (depth in length to base of caudal, 1.8 or more); 7 to 8 rows of scales above lateral line; gill rakers, 23 to 33 ___________________________ Carassius carassius

Less deep (depth in length to base of caudal, about 2.4 to 3); 5 or 6 rows of scales above lateral line; gill rakers, 39 to 50 ___________________________ Carassius auratus

Carassius carassius (Linnaeus)


Locality of Material:—North China (fide Gee).

Description:—Depth in length to base of caudal, 1.8; head, 3.5; eye in head, 5. Dorsal rays, II, 15 to 18; anal, II, 5 or 6; scales, 31 to 35.

Remarks:—None of the material obtained in North China by the Asiatic Expeditions of the American Museum of Natural History is referable to this species.

According to Berg (1932.4, pp. 15-18, Figs. 1-3), Cyprinus gibelio Bloch, which has been considered a form of Carassius carassius, is the native European and northern race of Carassius auratus, and Carassius carassius is found with it as far east as the Lena basin, but does not occur in the Amur, etc. This throws considerable doubt on Chinese records of Carassius carassius.

Carassius auratus (Linnaeus)

Figure 19


Carassius auratus var. wui Tchang, 1930, Cyprinidés du Bassin du Yangtze, p. 65.

Carassius auratus var. cantonensis Tchang, 1933, Zool. Sinica, (B) II (1), p. 27, Fig. 8. Canton.

Locality of Material:—Shanghai; Ningpo; Canton; Yangtze River; Pei Ho; Hong Kong (fide Gee).

Fig. 19. Carassius auratus (Linnaeus). 83 mm. without caudal.
Specimens examined from Paotou (Yellow River); Chihli; Shansi; Shantung; Anhwei; Tungting Lake, Hunan; Szechwan; Yunnan; Kiangsi; Fukien; Kwangtung; Hainan Island; up to 190 mm. standard length.

*Description:*—Depth in length to base of caudal, 2.4; head, 3.6; eye in head, 3.4 (specimen 99 mm. standard length). Dorsal, II, 14 to 20; anal, II, 5; scales, 26 to 28.

*Remarks:*—Wild goldfish, of a silvery color, are called “chi-yü” at Tungting Lake, where they are about one foot in total length when full grown. This is one of the important food fishes and incidentally expensive. Fish dealers often have special tanks in which they are kept alive. They are to be seen for sale in great numbers on the streets of Yochow, and the young are caught and sold as well as the adult (C. H. Pope, field notes).

**Genus Carassoides Oshima**


Local South Chinese carps with 4 small barbels and 2 series of pharyngeal teeth, the outer series (4) strongly compressed, inverted cone-shaped, with narrow oval grinding surfaces, the inner series (1 or 2) exceedingly slender with blunt tips; otherwise like *Carassius*. The single species is a compressed, rhomboidal fish, apparently a perfectly good species, though with characters like those described for the hybrid between *Cyprinus* and *Carassius*.

**Carassoides cantonensis (Heincke)**


*Locality of Material:*—Specimens examined from Kwangtung; largest 110 mm. long.

*Description:*—Depth in length, 2.2; head, 3.5 or 3.6; eye in head, 3 or 3.1. Dorsal rays, II, 18 or 19; anal, II, 5 or 6; scales, 30 or 31.

**Genus Procypris Lin**


A genus which seems to be more or less intermediate between *Cyprinus* and *Barbus*. Last simple ray of anal, as of dorsal, a serrate spine; 3 rows of hooked pharyngeal teeth; 2 pairs of barbels; dorsal long (with 16 branched rays).

The single specimen on which this genus is based may have affinity with *Puntius proctozisron* Bleeker from Siam, type of *Puntioplites* Smith, 1929, or it may possibly have been a hybrid.
The Fresh-water Fishes of China

Procypris merus Lin


Description:—Depth in length to base of caudal, 3; head, 3.5; eye in head, 3.1. Dorsal rays, II, 16; anal, II, 5; scales, 42.

Genus Cirrhinus Oken

Cirrhinus Oken, 1817, Isis, pp. 1181-1183, after Cuvier. Type: Cyprinus cirrkosus Bloch.

Moderate or large-scaled, soft-finned carps with depressed snout, transverse mouth, lips thin, the upper not fringed, dorsal of 13 to 17 rays, opposite the ventrals; anal short, with 5 or 6 (exceptionally 7) branched rays. A few Indian and one Chinese species.

Edge of mandible rather sharp, with a symphysial tubercle. Gill rakers short, subconical. Lateral line running in the middle of the peduncle. Barbels small (1 or 2 pairs) or absent. Pharyngeal teeth in 3 rows, none molar-like.

Vent and anal fin not bordered by a row of enlarged scales. Anal base behind that of the dorsal. No scaleless keel before anal fin. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

Cirrhinus chinensis Günther


Description:—Depth in length to base of caudal, 3.2 to 3.3; head, 5 to 5.3 (specimens about 190 mm. to 260 mm. long). Dorsal rays, 16; anal, 8; scales, 38 to 39.

Genus Osteochilus Günther


Rather thick-bodied, soft-finned carps of small or moderate size, of which a number of closely related species occur in the East Indies and on the adjacent Asiatic mainland.

Dorsal fin long, of 13 to 21 soft rays. Mouth terminal or inferior, with fringed lips. Two pairs of small barbels. Anal with 5 or 6 branched rays (rarely 7). Pharyngeal teeth in 3 rows.

No scaleless keel before the anal fin. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.
SYSTEMATIC ACCOUNT

Osteochilus salsburyi Nichols and Pope

Figure 20


Locality of Material:—Specimens examined from Kwangtung and Hainan; up to 155 mm. standard length.

Description:—Depth in length to base of caudal, 3.1; head, 4; eye in head, 3.9 (specimen of 85 mm. standard length). Dorsal rays, 13; anal, 7.5; scales, 34.

Genus Barbus Cuvier

Barbus Cuvier, 1817, Règne Animal, II, p. 192. Type: Cyprinus barbus Linnaeus.

As here understood a large and varied genus of small or moderate-sized carps with pharyngeal teeth in 3 rows and normally 2 pairs of barbels (sometimes reduced to a single pair, or absent). When a spine is present in the dorsal it is usually serrate behind (in Chinese species), and usually with a soft tip. Mouth terminal or slightly inferior; not transverse, with a sharp-edged lower jaw; lower jaw rarely with a cartilaginous covering. Intestinal tract short. Anal fin with 5 or 6 branched rays (exceptionally 7).

Vent and anal fin not bordered by a row of enlarged scales. Origin of anal behind or under posterior end of dorsal. No scaleless keel before anal fin. No serrate spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

Many species occur in Eurasia and Africa, especially southern Asia, where numerous nominal genera, best considered subgenera, are almost impossible to recognize without violating the relationships of the forms involved.
Key to Chinese Barbus

1. Mouth various, not as below ........................................ see 2
   Lower jaw included, with a free tip (sometimes with a horny sheath)
   projecting beyond the lip, the front margin of which is notched in the
   center. Scales, about 40 (except rendahli). ¹ Two pairs of longish barbels.
   (Lissocliichthys) ........................................ see 14

2. Two pairs of barbels ........................................ see 3
   A single pair of barbels or none. Dorsal with a serrate spine ...........
   No barbels. No spinous dorsal ray. A tubercle at the symphysis fitting
   a depression in the upper jaw. Scales, 88 to 90 ......................

3. Last simple dorsal ray not osseous .................................. see 4
   Last simple dorsal ray more or less osseous, smooth. Scales, 29. Dark
   along the back, scales on the sides with dark borders, lower surfaces
   with golden shades, vertical fins blackish ........................ see 11
   Last simple dorsal ray more or less osseous, smooth. Scales, 22 or 23.
   Dorsal with a sharply defined black marginal band ......................
   Last simple dorsal ray more or less osseous, serrate behind, at least in
   large examples ........................................ see 6

4. Scales small, about 53. Lower jaw projecting ........................ see 5
   Scales large, 20 to 26. Dorsal with a sharply defined black marginal band

5. Scales, 24 to 26. Moderately compressed, the head broad, snout pointed;
   width of head and of body in length of head, about 1.8 ............
   Scales, 22 or 23. Dorsal origin nearer base of caudal than end of snout
   Dorsal origin nearer end of snout than base of caudal ...............

6. Scales small, more than 100 ....................................... see 7
   Scales, 55 to 59 ........................................ see 8
   Scales, about 53 ........................................ see 9
   Scales moderate or rather large, less than 50 ........................

7. Scales, 45 or 46 ........................................ sinensis
   Scales, 35 to 41 ........................................ regani
   Scales, about 29 to 32. Serration on dorsal spine fine, little if at all
   appreciable in the young. Fins more or less dark colored ............

8. Dorsal origin much nearer end of snout than base of caudal. Well-devel-
   oped free lips all around ......................................
   Dorsal origin about equidistant from end of snout and base of caudal

9. Dorsal origin about equidistant from base of caudal and hind margin of
   eye. Scales, about 39 ......................................
   Dorsal origin nearer end of snout than base of caudal. Scales, about 41
   Dorsal origin about equidistant from base of caudal and end of snout

¹ Barbus rendahli Lin presumably comes here. Edge of lower jaw leathery. Maxillary barbel about ¾ of
   eye; dorsal with a spinous ray; scales, 48 or 49; coloration uniform.

² This species not examined. It is described with a spine in the dorsal fin, but the last simple dorsal ray of
   closely allied forms we consider relatively non-osseous.
SYSTEMATIC ACCOUNT

10. Dorsal spine $\frac{3}{4}$ to $\frac{3}{4}$ of head. Scales, 36 to 38 .................
    Dorsal spine equal to or longer than head. Scales, 35. A dark band across dorsal
    see barbodon .......... margarianus
11. Small species with dark cross marks in the middle of the side. Scales, about 25 .................
    Larger; scales, 40 to 45 .................
    see szechwanensis .......... 13
    see parallens .......... 12
12. Color uniform. Scales, 40. No barbels .................
    Lower lip with an uninterrupted transverse fold. Scales, 45. A pair of short barbels
    see semifasciolatus .......... simus
13. Six or seven cross marks. Barbels more than $\frac{1}{2}$ length of eye .................
    Fewer cross marks. Barbels absent .................
    see snyderi .......... 15
14. Last simple dorsal ray not spinous and serrate behind .................
    Last simple dorsal ray spinous (at least at base) and serrate behind ........
    see hemispinus .......... 16
15. A horny edge to the lower jaw; sides with distinct blackish cross marks;
    barbel moderate or long .......... lissochiloides (ad.)
    No noticeable horny edge to the jaw .................
    see hemispinus .......... 17
16. Lower jaw with a well-developed horny edge; depth in length to base of
    caudal, 3.5 or more .................
    Lower jaw without a horny edge; barbel moderate or long .................
    see hemispinus .......... 18
17. Sides with distinct blackish cross marks and without lateral band; barbel long (less than 4, usually less than 3, in head) .................
    Sides without cross marks or lateral band; barbel moderate (about 3.5
    to 4.5 in head) .................
    Sides with lateral band, and abruptly pale below it, distinct short cross
    marks, confined to the sides of the back (except in young); barbel
    moderate (usually 3 or more in head) .................
    see parallens .......... 19
18. Barbel small (6 or 7 in head), and no distinct cross marks (at 193 mm.)
    Barbel moderate or long (4 or less), black cross marks distinct ........
19. Deeper (depth, 3.1 to 3.4 at 56 to 95 mm.); cross marks faint or
    wanting .................
    Less deep (depth, 3.4 to 3.6 at 48 to 67 mm.); cross marks distinct .......... lissochiloides (juv.)

Subgenus Barbus Cuvier

Barbus Cuvier, 1817, Regne Animal, II, p. 192. Type: Cyprinus barbus Linnaeus.

Barbus pingi (Tchang)


Description:—Depth in length to base of caudal, 3; head, 3.5; eye in head,
7.7 or 7.8 (specimen 440 mm. total length). Dorsal rays, 10; anal, 7; scales, 53.
Chu says “dorsal with the third simple ray ossified and serrated at the proximal
portion.”

Barbus regani Tchang

**Description:**—Depth in length to base of caudal, 3.6 to 4.5; head, 3.1 to 3.2; eye in head, 6.3 (at 310 mm., specimens 220 to 310 mm. standard length). Dorsal rays, II, 8; anal, 7; scales, 55 to 59.

Lower jaw projecting; maxillary barbel slightly shorter than the diameter of eye; dorsal origin nearer caudal base than tip of snout.

*Barbus grahami* Regan


**Locality of Material:**—Specimens examined from Yunnan.

**Description:**—Depth in length, 3.5; head, 3.7 or 3.8; eye in head, 5.7 (specimen 170 mm. long). Dorsal rays, II, 7; anal, 7; scales, 110.

*Barbus normani* Tchang


**Description:**—Depth in length to base of caudal, 4.3 to 4.6; head, 4.3 to 4.6; eye in head, 7.5 (at 480 mm., specimens 360 to 480 mm. standard length). Dorsal rays, 10; anal, 7; scales, 88 to 90.

Head pointed, mouth large, jaws equal. Teeth 2-rowed, pointed, and hooked.

*Barbus brevifilis* Peters

*Barbus (Labeobarbus) brevifilis* Peters, 1880, Monatsber. Akad. Wiss. Berlin, p. 1033, Fig. 4. Hong Kong.

**Description:**—Depth in length to base of caudal, about 4.7; head, not quite 4; eye in head, about 4 (specimen 120 mm. long). Dorsal rays, II, 8; anal, 7; scales, 45 or 46.

*Barbus zonatus* (Lin)

*Tor zonatus* Lin, 1935, Lingnan Sci. Jour., Canton, XIV, p. 308, Fig. 5. Liuchow, Kwangsí.

**Description:**—Depth in length to base of caudal, 3.4 to 3.8; head, 3.6 to 3.9; eye in head, 3.5 to 5 (specimens 105 to 265 mm. standard length). Dorsal rays, II, 10; anal, 7; scales, 41.

Lips thick, completely covering edge of jaws, with a median labial lobe. Maxillary barbel about as long as eye. Dorsal with a strong serrate spine. Three sharp black bars followed by two rounded spots in middle of side. This species, said to be close to *brevifilis*, is suggestive of the subgenus *Lissochilichthys* but with a different mouth.

*Barbus yunnanensis* Regan

**SYSTEMATIC ACCOUNT**

*Description:*—Depth in length, 3.7 or 3.8; head, 4.4; eye in head, 5 (specimen 210 mm. long). Dorsal rays, II, 8; anal, 7; scales, 46.

*Barbus szechwanensis* Tchang


*Description:*—Depth in length to base of caudal, 3.9; head, 3.9; eye in head, 4.8 (specimen 192 mm. standard length). Dorsal rays, II, 8; anal, 7; scales, 45.

**Subgenus Barbodes Bleeker**


*Barbus deauratus* Cuvier and Valenciennes

*Barbus deauratus* Cuvier and Valenciennes, 1842, Hist. Nat. Poissons, XVI, p. 188. Cochinchina.

*Locality of Material:*—Canton (*fide* Gee).

*Description:*—Dorsal rays, II, 8; anal, 7; scales, 29.

*Barbus cogginii* Chaudhuri

*Barbus cogginii* Chaudhuri, 1911, Rec. Indian Mus., Calcutta, VI, p. 16, Pl. 1, fig. 2. Yunnan.

*Locality of Material:*—Specimens examined from Yunnan.

*Description:*—Depth in length to base of caudal, 3.2; head, 4; eye in head, 3.7 (specimen 141 mm. standard length). Dorsal rays, II, 8; anal, 7; scales, 39.

*Barbus gregorii* Norman


*Description:*—Depth in length, 3 to 3.7; head, 3.5 to 4; eye in head, 3.5 to 4.5 (specimens 110 to 260 mm. total length). Dorsal rays, II, 7 or 8; anal, 7; scales, 36 to 38.

*Barbus margarianus* Anderson

*Barbus margarianus* Anderson, 1878, Anat. and Zool. Researches Western Yunnan, I, p. 867; II, Pl. LXXIX, fig. 1. Western Yunnan border.

*Description:*—Depth in length to base of caudal, 3.2; head, 4.7; eye in head, 3.5. Dorsal rays, II, 8; anal, 7; scales, 35.

*Barbus simus* Sauvage and Dabry de Thiersant

Description:—Depth in total length, 4.7; head, 6 (specimen 180 mm. total length). Dorsal rays, II, 8; anal, 6; scales, 40.

Subgenus Spinibarbus Oshima


This subgenus is characterized by a precumbent, forwardly directed spine before the dorsal, which is not here counted as a fin ray.

Barbus caldwelli Nichols

Figure 21


Locality of Material:—Tien-mu-san, Chekiang (Chu, 1932.1, p. 135).

Specimens examined from Hokou, Kiangsi; Chungan Hsien, Fuching Hsien, Kienning, and Yenping, Fukien; up to 220 mm. standard length.

Description:—Depth in length to base of caudal, 3.6 to 4.8; head, 3.3 to 4; eye in head, 3.7 to 5.5 (specimens 59 to 220 mm. standard length). Dorsal rays, II; anal, 7; scales, 24 to 26.

Barbus mandarinus (Rendahl)


Description:—Depth in length to base of caudal, 4.1 to 3.9; head, 3.3 to 3.4; eye in head, 4.2 to 5 (specimens of 144 to 153 mm. standard length). Dorsal rays, II, 9; anal, 7; scales, 22 or 23.
SYSTEMATIC ACCOUNT

Barbus nigrodorsalis (Oshima)

Figure 22 and Plate IV, figure 1


**Locality of Material:**—Specimens examined from Noda, Hainan.

![Barbus nigrodorsalis](image)

**Fig. 22. Barbus nigrodorsalis** (Oshima). 115 mm. without caudal.

**Description:**—Depth in length to base of caudal, 4.1; head, 3.6; eye in head, 4 (specimen 115 mm. standard length). Dorsal rays, 11; anal, 7; scales, 20.

**Remarks:**—Constantly taken in the immediate environs of Noda, but not found personally by Mr. Pope in numbers in any particular environment.

Barbus sinensis (Bleeker)

*Puntius (Barbodes) sinensis* Bleeker, 1871, Verhandel. Akad. Wetensch., Amsterdam, Afd. Natuurk., XII, p. 17, Pl. III, Fig. 2. Yangtze?

**Key to Chinese Barbus sinensis**

Dorsal origin over ventral base; equidistant from base of caudal and front of eye.

Scales, 30 to 32 ................................................................. *denticulatus*

Dorsal origin in advance of ventral; nearer end of snout than base of caudal. Scales, 28 or 29 ................................................................. *sinensis*

Barbus sinensis denticulatus (Oshima)

Figure 23


**Locality of Material:**—Specimens examined from Noda, Hainan.

**Description:**—Depth in length to base of caudal, 3; head, 3.7; eye in head, 3.3 (specimen 85 mm. standard length). Dorsal rays, II, 9; anal, 8; scales, 29.
THE FRESH-WATER FISHES OF CHINA

Fig. 23. Barbus sinensis denticulatus (Oshima). 85 mm. without caudal.

Barbus sinensis sinensis (Bleeker)

Puntius (Barbodes) sinensis Bleeker, 1871, Verhandel. Akad. Wetensch., Amsterdam, Afd. Natuurk., XII, p. 17, Pl. 11, fig. 2. Yangtze?

Description:—Depth in length to base of caudal, 3.1 to 3.2; head, 4; eye in head, 4.2 to 4.4 (specimens about 175 mm. standard length). Dorsal rays, II, 9; anal, 7; scales, 30 to 32.

Subgenus Puntius Hamilton-Buchanan

Puntius Hamilton-Buchanan, 1822, Fishes in Ganges, p. 388. Type: Cyprinus puntio Hamilton-Buchanan.

Barbus semifasciolatus Günther

Figure 24 and Plate V, figure 1

Barbus hainani Lohberger, 1929, Zool. Anz., LXXXIV, p. 49, Fig. 1. Hainan.

Fig. 24. Barbus semifasciolatus Günther. 34 mm. without caudal.
SYSTEMATIC ACCOUNT

Locality of Material:—Specimens examined from Hainan.

Description:—Depth in length to base of caudal, 2.6 to 2.8; head, 3.2 to 3.5; eye in head, 2.8 to 3.3 (specimens about 35 mm. standard length). Dorsal rays, II, 8; anal, 8; scales, 24.

Remarks:—This brilliantly colored little fish is common in the many small, grass grown, irrigation reservoirs and ditches of the rice fields about Noda, Hainan. It is very variable in color.

Barbus snyderi (Oshima)


Locality of Material:—Specimens examined from Fukien.

Description:—Depth in length to base of caudal, 3; head, 3.2 to 3.6; eye in head, 3 to 3.7 (specimens 43 to 77 mm. in length). Dorsal rays, II, 8 or 9; anal, 7 or 8; scales, 23 or 24.

Subgenus Lissochilichthys Oshima


Fishes referable to this subgenus, Lissochilichthys of the genus Barbus, seem to be everywhere plentiful in eastern China south of the Yangtze Valley, very variable, but the species are difficult to define. To some extent they are geographic and representative, but in Fukien B. matsudai and B. hemispinus occur plentifully together. Besides other minor quantitative differences from matsudai, B. hemispinus shows a marked qualitative difference in having a serrate dorsal spine, which, however, is more or less reduced or absent in large specimens, though it holds in large specimens of B. barbodon from Hainan Island. Whether or not these two forms hybridize or intergrade, is complicated by the presence of a third in the same province, B. lissochiloides as understood by the writer, which he believes has the serrated dorsal spine when small, and another qualitative difference, a horny edge to the lower jaw when large. From the considerable material and complicated literature examined, it would be possible to recognize more (or fewer) forms than are recognized here. Crossochilus fasciatus Steindachner (preoccupied in Barbus = lissochiloides) belongs in subgenus Lissochilichthys. The common, banded, soft-rayed, soft-jawed Fukien form seems to be indistinguishable from Lissochilichthys matsudai Oshima described from Formosa. Barbus paradoxus Günther may be identical with it or with some other Chinese form, but presumably is not. Lissochilichthys matsudai is apparently the same as Gymnostomus labiatus Regan (labiatus preoccupied in Barbus).
Barbus matsudai (Oshima)


*Acrossochilus rabaudi* Tchang, 1930, Cyprinides du Bassin du Yangtze, p. 76, Pl. IV, fig. 1. Tche-Kiang [Chekiang].

**Locality of Material:**—Specimens examined from Chungan Hsien and Yenping, Fukien; up to 130 mm. standard length.

**Description:**—Depth in length to base of caudal, 3.3 to 4.2; head, 3.5 to 3.9; eye in head, 3 to 5 (specimens 22 to 117 mm. standard length). Dorsal rays, 10; anal, 7; scales, 39 to 42.

Barbus parallens Nichols

Figure 25

*Barbus (Lissochilichthys) parallens* Nichols, 1931, Lingnan Sci. Jour., Canton, X, p. 455, Fig. 1. Lung T'au Shaan, Kwangtung.

**Locality of Material:**—Specimens examined from the type locality; up to 122 mm. standard length.

![Fig. 25. Barbus parallens Nichols. Cotype. About 75 mm. standard length.](image)

**Description:**—Depth in length to base of caudal, 3.8 to 4.4; head, 3.4 to 3.8; eye in head, 3.7 to 4.8 (specimens 55 to 122 mm. standard length). Dorsal rays, 10; anal, 7; scales, 38 to 40.

Barbus lissochiloides Nichols


**Locality of Material:**—Specimens examined from Hokou, Kiangsi; Kienning and Yenping, Fukien; up to 89 mm. standard length.
**SYSTEMATIC ACCOUNT**

*Description*:—Depth in length to base of caudal, 3.4 to 3.7; head, 3.4 to 3.9 (more in larger specimens); eye in head, 3.2 to 4.4 (specimens 41 to 89 mm. standard length). Dorsal rays, II, 8; anal, 7; scales, 38 to 43.

*Barbus hemispinus* Nichols

*Description*:—Depth in length to base of caudal, 3.4 to 3.7; head, 3.4 to 3.9 (more in larger specimens); eye in head, 3.2 to 4.4 (specimens 41 to 89 mm. standard length). Dorsal rays, II, 8; anal, 7; scales, 38 to 43.

*Barbus hemispinus* Nichols

*Locality of Material*:—Specimens examined from Chungan Hsien, Fuching Hsien, and Yenping, Fukien; up to 155 mm. standard length. A single small specimen from Yungtai Hsien, Fukien, approaches *B. barbodon*.

*Barbus barbodon* Nichols and Pope

*Description*:—Depth in length to base of caudal, 3 to 3.6 (rarely 3.8); head, 3 to 3.7; eye in head, 3.5 to 5 (specimens 56 to 140 mm. standard length). Dorsal rays, II, 8; anal, 7 or 8; scales, 38 to 40.

*Barbus rendahli* Lin

THE FRESH-WATER FISHES OF CHINA

Description:—Depth in length, 4.1; head, 4.6; eye in head, 4.4. Dorsal rays, II, 8; anal, 7; scales, 48 or 49.

Fig. 27. Barbus barbodon Nichols and Pope. Type. 193 mm. without caudal.

Genus Cyclocheilichthys Bleeker


This genus contains a few carps of southeastern Asia and the East Indies, questionably distinct from *Barbus*. They have the mouth small, inferior, horseshoe-shaped, horizontal, more or less specialized, and the lower jaw may have a cartilaginous tip; a serrated dorsal spine; normally 2 pairs of barbels, sometimes very small or reduced to a single pair.

Scales of moderate size, the lateral line running in the center of the peduncle. Anal fin with 5 or 6 branched rays (exceptionally 7). Pharyngeal teeth in 3 rows. Vent and anal fin not bordered by a row of enlarged scales. Anal base well behind that of dorsal. No scaleless keel before anal fin. No serrate spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed above the axis of the body.

**Key to Chinese Cyclocheilichthys**

<table>
<thead>
<tr>
<th>Scales, about 42</th>
<th></th>
<th>iridescens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scales, 35 or 36</td>
<td></td>
<td>sinensis</td>
</tr>
</tbody>
</table>

*Cyclocheilichthys iridescens* Nichols and Pope

Figure 28


Description:—Depth in length to base of caudal, 3.3; head, 4.1; eye in head, 3.8 (specimen of 102 mm. standard length). Dorsal rays, II, 8; anal, 7; scales, 42.
SYSTEMATIC ACCOUNT

Fig. 28. Cyclocheilichthys iridescens Nichols and Pope. Type. 102 mm. without caudal.

Remarks:—Apparently confined to the higher mountain streams some miles south of Noda, Hainan.

Cyclocheilichthys sinensis Bleeker


Description:—Depth in length to base of caudal, a little more than 3; head, 3.7 to 3.8; eye in head, about 3.3 (specimen about 315 mm. long). Dorsal rays, II, 8 or 9; anal, 7 or 8; scales, 35 to 38.

Genus Crossocheilus Van Hasselt


Carpas of southern Asia, which have the lower jaw transverse, with a narrow lip which is not continuous with the upper lip, and with a sharp, inner, transverse edge; no spines in dorsal or anal fins; dorsal with not more than 9 branched rays, anal with 5 or 6 (exceptionally 7).


No sucking disk on the lower jaw. Vent and anal fin not bordered by a row of enlarged scales. Anal base well behind that of the dorsal. No scaleless keel before anal fin. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

Key to Chinese Crossocheilus

Anterior barbel minute, posterior nearly as long as eye. Color uniform .......... monticola
Anterior barbel a little shorter, posterior a little longer than eye. A dark lateral stripe, and sometimes indistinct dark cross bars ........................................ styani
Crossochilus monticola Günther


**Description:**—Depth in length to base of caudal, 3.5; head, 4.5; eye in head, 4.5 (specimen about 175 mm. long). Dorsal rays, 10 or 11; anal, 7 or 8; scales, 42.

Crossochilus styani Boulenger


Acrossochilus styani, Chu, 1931, China Jour., XIV, pp. 187–194, Fig. 14, 14B. Chekiang.


**Description:**—Depth in length to base of caudal, 3.5 to 3.8; head, 4.2 to 4.3; eye in head, 4 to 4.5. Dorsal rays, 10; anal, 7; scales, 39 to 41.

Genus Sinibarbus Sauvage


A small Chinese carp, closely resembling certain members of the genus Barbus, but pharyngeal teeth one-rowed, 5, hooked and recurved.

Scales of moderate size, lateral line complete. Dorsal opposite ventrals. Mouth transverse, with a single pair of barbels, the lower jaw somewhat included. A strong, serrate, dorsal spine. Anal fin with 5 or 6 branched rays.

Vent and anal fin not bordered by a row of enlarged scales. Anal base well behind that of dorsal. No scaleless keel before the anal fin. No serrate spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

Sinibarbus vittatus Sauvage


**Description:**—Head in length to base of caudal, 4; eye, longer than snout and equal to interorbital (specimen 70 mm. long). Dorsal rays, II, 8; anal, 7; scales, 40.

Genus Danio Hamilton-Buchanan

Danio Hamilton-Buchanan, 1822, Fishes in Ganges, p. 390. Type: Cyprinus dangila Hamilton-Buchanan.

Active, free swimming, soft-finned minnows of tropical or subtropical Asia, with the lateral line running along the lower half of the tail; no scaleless keel before the anal; dorsal fin with 9 or more branched rays, the posterior of which are over the origin of the anal fin which has 10 or more branched rays; mouth narrow.

Scales of moderate size. Lateral line complete. Mouth oblique. Normally 2, sometimes a single pair of barbels, which may be rudimentary or absent. Gill rakers very short. Pharyngeal teeth in 3 rows, hooked.
Upper jaw protractile. Vent and anal fin not bordered by a row of enlarged scales. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

Danio kakhiienensis Anderson

Danio kakhiienensis Anderson, 1878, Anat. and Zool. Researches Western Yunnan, I, p. 868; II, Pl. lxxix, fig. 2. Western Yunnan border (Nampoung River).


Description: Depth in length to base of caudal, 3.5; head, 3.9; eye in head, 3.5. Dorsal rays, 10; anal, 14; scales, 32.

Genus Schizothorax Heckel

Schizothorax Heckel, 1838, Fische aus Caschmir, p. 11. Type: Schizothorax plagistomus Heckel.

Fine-scaled carps of high Asia, a few species occurring in western China.

Vent and base of anal fin bordered by a row of enlarged scales. Anal short, with 5 or 6 branched rays. Two pairs of barbels. Pharyngeal teeth in 3 rows.

Anal base well behind that of dorsal. No scaleless keel before anal fin. No serrate spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

Key to Chinese Schizothorax

1. Mouth arched, normal (Schizothorax) ................................................................. see 2
   Mouth inferior, transverse, margin of lower jaw horny (Schizopyge) ................. see 4

2. Origin of dorsal about equidistant from nostrils and base of caudal. Scales, 110 to 115 ................................................................. potanini
   Origin of dorsal a little nearer base of caudal than end of snout; profile somewhat concave; lower lip widely interrupted; numerous small, unequal, dark spots on the back. Scales, 70 to 77 ......................................................... multipunctatus
   Origin of dorsal about equidistant from end of snout and base of caudal. Scales, 85 to 105 ................................................................. see 3
   Dorsal with a strong, serrate spine, its origin midway between end of snout and base of caudal, or nearer the former. Scales, 150 to 160 .... progastus
   Mouth inferior, lower lip interrupted. Scales, about 102 ................................... yunnanensis
   Mouth inferior, lower lip continuously free across the chin, with a small central lobe; posterior barbel, 1.25 to 1.75 times eye. Scales, 95 to 100 ...... griseus

4. Last simple dorsal ray strongly spinous, coarsely serrated behind ................................................................. see 5
   Last simple serrated dorsal ray weakly spinous. Scales, 95 to 125 ................. see 6
   Last simple dorsal ray not spinous. Scales, 100 to 105 .................................... prenanti

5. Scales, 150 to 160 ................................................................. progastus
   Scales, 105 to 110 ................................................................. molesworthi

6. Scales, 115 to 125 ................................................................. sinensis
   Scales, about 98 ................................................................. grahame
Subgenus Schizothorax Heckel

Schizothorax Heckel, 1838, Fische aus Caschmir, p. 11. Type: Schizothorax plagiostomus Heckel.

Schizothorax potanini Herzenstein


Description:—Depth in length to base of caudal, 4.4; head, 3.9 to 4.4; eye in head, about 5.5. Dorsal rays, 10 (II, 8); anal, 7; scales, 110 to 115.

Schizothorax multipunctatus Pellegrin


Description:—Depth in length to base of caudal, 3 to 3.3; head, 3 to 3.3; eye in head, 5.3 to 5.5. Dorsal rays, 10 (II, 8); anal, 7; scales, 70 to 77 (lateral line). Mouth terminal or slightly inferior; barbels subequal, about 2 times eye.

Schizothorax taliensis Regan


Description:—Depth in length to base of caudal, 5 to 6; head, 4.7 to 5; eye in head, 3.5 to 3.8. Dorsal rays, II, 7; anal, 7; scales, 85 to 100.

Schizothorax yunnanensis Norman


Description:—Depth in length to base of caudal, 4.6; head, 4.6; eye in head, 5.2 to 5.3 (specimen of 270 mm. total length). Dorsal rays, 11 (II, 9); anal, 7; scales, 102.

Schizothorax griseus Pellegrin


Description:—Depth in length to base of caudal, 4 to 4.3; head, 3.7 to 4; eye in head, 5.5 to 6. Dorsal rays, 10 (II, 8); anal, 7; scales, 95 to 100 (lateral line).

Subgenus Schizopyge Heckel


Schizothorax progastus (McClelland)

Description:—Depth in length to base of caudal, about 4.8; head, about 4.3; eye in head, 4.5 to 6. Dorsal rays, II, 8 or 9; anal, 7; scales, 150 to 160.

The mouth of this species seems to be somewhat intermediate between that typical of the subgenera *Schizothorax* and *Schizopyge*.

**Schizothorax molesworthi** (Chaudhuri)


*Schizothorax molesworthi*, Tchang, 1933, Zool. Sinica, (B) II (1), p. 39, Fig. 16. Yunnan, Szechwan.

Description:—Depth in length to base of caudal, 3.7 to 4.3; head, 4 to 4.4; eye in head, 5 to 5.8 (specimens 105 to 205 mm. standard length). Dorsal rays, II, 8; anal, 7; scales, 105 to 110. Sides of body with small, scattered, black spots.

**Schizothorax prenanti** (Tchang)

*Oreinus prenanti* Tchang, 1930, Cyprinidés du Bassin du Yangtze, p. 74. Szechwan.

Description:—Depth in length, 4.4 to 5; head, 4 to 4.5; eye in head, 5 to 5.7 (specimens 150 to 250 mm. long). Dorsal rays, 10; anal, 7; scales, 100 to 105.

**Schizothorax sinensis** Herzenstein


Locality of Material:—Specimen examined from Wuting Chou district, Yunnan.

Description:—Depth in length to base of caudal, 4.2 to 4.6; head, 4.2 to 4.8; eye in head, 4.1 to 5.3. Dorsal rays, 10 (II, 8); anal, 7; scales, 115 to 125.

**Schizothorax grahami** (Regan)


Description:—Depth in length to base of caudal, 4.5 to 5; head, 4 to 4.3; eye in head, 4.2 to 4.6 (specimens 118 to 170 mm. total length). Dorsal rays, 10 (II, 8); anal, 7; scales, about 98.

Genus **Schizopygopsis** Steindacher


Carps of high Asia with a single species known from western China.

Vent and base of anal fin bordered by a row of enlarged scales. Anal short, with 5 or 6 branched rays. Body mostly scaleless, a few fine scales present. No barbels.

Anal base well behind that of dorsal. No keel before anal fin. No serrate spi-
nous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

Schizopygopsis pylzovi Kessler


Description:—Depth in length to base of caudal, 4.5 to 5.4; head, 4.2 to 4.5; eye in head, 3.6 to 5.8. Dorsal rays, 9 or 10; anal, 7.

Genus Diptychus Steindachner


Carps of high Asia with a single species known from western China.

Vent and base of anal fin bordered by a row of enlarged scales. Anal short, with 5 or 6 branched rays. Body mostly scaleless, a few fine scales present. A single pair of barbels. Pharyngeal teeth in 2 rows.

Anal base well behind that of dorsal. No keel before anal fin. No serrate spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

Subgenus Gymnodiptichus Herzenstein


Characterized by absence of scales except on the lateral line. Absence of sharp cartilaginous sheath to lower jaw; very fleshy and thick lower lip.

Diptychus dybowskii Kessler


Description:—Body elongate; head in length to base of caudal, 4 or a little more; eye in head, 6 to 6.5 (specimens 220 to 230 mm. long). Dorsal rays, 10; anal, 8; scales, about 97 or 98.

Genus Leuciscus Cuvier

Leuciscus Cuvier, 1817, Règne Animal, II, p. 194. Type: Cyprinus leuciscus Linnaeus.

A large, north Eurasian genus of mostly rather elongate, actively free swim-
ming carps of small or moderate size. One or two forms only, seemingly races of the same Siberian species, are known in China.

Origin of dorsal over ventrals. Scales imbricated. Lateral line complete. Dorsal with 7 to 9 branched rays; anal with 7 to 12. Lower jaw not projecting. Pharyngeal teeth in 2 rows: 2, 5–5, 2; 2, 4–5, 2; or 3, 5–5, 3, not or but slightly serrate. Upper jaw protractile, without a noticeable knob. Belly behind ventrals rounded. Gill membranes attached behind the vertical of the posterior edge of the eye.

No barbels. Mouth more or less oblique and terminal, not transverse with sharp-edged lower jaw. Vent and anal fin not bordered by a row of enlarged scales. Origin of anal behind or under posterior end of dorsal. No scaleless keel before the anal fin. No serrate spinous ray in the anal. Gill rakers not fused. Eye placed in or above the axis of the body.

Chinese forms belong to the genus or subgenus *Idus*, if this is recognized.

**Leuciscus waleckii** (Dybowski)


**Key to Chinese Leuciscus waleckii**

Larger (commonly over 150 mm. standard length), more compressed (interorbital in head, 4), the nape elevated, mouth larger (maxillary in head, 3), lower jaw slightly projecting, fins lower (dorsal height in head, 1.6; anal, 2), scales smaller (about 58) ................................................................. **sinensis**

Smaller (usually 150 mm. or less standard length), less compressed (interorbital in head, 3.2), fusiform, mouth smaller (maxillary in head, 3.4), lower jaw slightly included, fins higher (dorsal height in head, 1.4; anal, 1.7), scales larger (about 52) **waleckii**

**Leuciscus waleckii waleckii** (Dybowski)


**Locality of Material:**—Specimens examined from Shansi.

**Description:**—Depth in length to base of caudal, 4.4; head, 3.6; eye in head, 4 (specimen of 93 mm. standard length). Dorsal rays, 9½; anal, 11; scales, 52.

**Leuciscus waleckii sinensis** (Rendahl)

*Idus waleckii sinensis* Rendahl, 1925, Fauna och Flora, Uppsala, p. 197. Hoangho, Ping-lu-hsien; Shansi; also Honan.

**Locality of Material:**—Specimens examined from the Yellow River at Paotou, Mongolia.

**Description:**—Depth in length to base of caudal, 4.2; head, 3.6; eye in head, 5 (specimen 165 mm. standard length). Dorsal rays, 9; anal, 11; scales, 50 to 58.
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Genus Phoxinus Rafinesque

Phoxinus Rafinesque, 1820, Ichthyologia Oblensis, p. 45. Type: Cyprinus phoxinus Linnaeus (Europe).

Fine-scaled minnows of Europe and northern Asia, closely related to Leuciscus. Abundant in northern China, where it is seemingly referable to two races of a species described from the Amur River.

Origin of dorsal more or less behind ventral base. Scales small, particularly anteriorly, little if at all imbricated. Lateral line sometimes incomplete. Small fishes.

Dorsal with 7 to 9 branched rays; anal with 7 to 12; no spinous dorsal or anal ray. Lower jaw not projecting. Pharyngeal teeth in 2 rows: 2, 5–5, 2; 2, 4–5, 2; or 3, 5–5, 3, not or but slightly serrate. Upper jaw protractile, without a noticeable knob. Belly behind ventrals rounded. Gill membranes attached behind the vertical of the posterior edge of the eye.

No barbels. Mouth more or less oblique and terminal, not transverse with sharp-edged lower jaw. Vent and anal fin not bordered by a row of enlarged scales. Origin of anal behind or under posterior end of dorsal. No scaleless keel before the anal fin. Gill rakers not fused. Eye placed in or above the axis of the body.

Phoxinus lagowskii Dybowski


Key to Chinese Phoxinus lagowskii

<table>
<thead>
<tr>
<th>Scales finer, 80 to 100</th>
<th>variegatus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scales coarser, 70 to 80</td>
<td>oxycephalus</td>
</tr>
</tbody>
</table>

Phoxinus lagowskii variegatus ( Günther)


Probable Habitat:—Chihli and Shansi south to the middle Yangtze, Hupeh and Kiangsi.

Description:—Depth in length to base of caudal, 4.5 to 5.5; head, 3.4 to 3.8; eye in head, 3.6 to 5. Dorsal rays, 9; anal, 9; scales, 80 to 100.

Phoxinus lagowskii oxycephalus (Sauvage and Dabry de Thiersant)


Rhyncocypris variegata, Berg, loc. cit., not of Günther.
Probable Habitat:—Hopei (Fowler, 1924, p. 389), northern Shansi, and eastern Mongolia, southwest to western Szechwan.

Description:—Depth in length to base of caudal, 4.3 to 5.8; head, 3.4 to 3.7; eye in head, 3.8 to 4.5. Dorsal rays, 9; anal, 9; scales, 70 to 80.

Genus Aspius Agassiz


Large-mouthed, active, elongate carps without a spine in dorsal or anal. Belly compressed to form a keel, over which, however, the scales pass freely. A few species in Europe and Asia, one of them in China.

Gill membranes attached on the vertical of the posterior edge of the eye. Pharyngeal teeth not serrate: 3, 5–5, 3, or 2, 5–5, 3. Dorsal with 7 to 10, anal with 10 to 14 branched rays. Lateral line, 46 to 105. No barbels. Mouth more or less oblique, the lower jaw projecting.

Vent and anal fin not bordered by a row of enlarged scales. Dorsal opposite the space between ventrals and anal. Upper jaw a little protractile. Gill rakers not fused. Eye placed in or above the axis of the body.

*Aspius spilurus* Günther


Description:—Depth in length to base of caudal, 4.5; head, 4; eye in head, about 3.3 (specimens about 40 to 65 mm. long). Dorsal rays, 9; anal, 14; scales, 46.

Genus Elopichthys Bleeker


A large, elongate, large-mouthed, small-scaled, predaceous carp with mouth parts more or less fused into a pointed, mackerel-like snout; upper jaw not protractile.

Dorsal and anal without spinous rays, their branched rays 9 to 12, and 10 to 13, respectively. Pharyngeal teeth in 3 rows.

No scaleless keel on the belly. Barbels absent. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

*Elopichthys bambusa* (Richardson)

Figures 29 and 30

Fig. 29. *Elopichthys bambusa* (Richardson). 198 mm. standard length.

Fig. 30. Diagrammatic sketch of the jaws of *Opsariichthys uncirostris hainanensis* Nichols and Pope (upper) and *Elopichthys bambusa* (Richardson) (lower).

**PLATE IV**

Fig. 1. *Barbus nigrodorsalis* (Oshima). 115 mm. standard length. Nodoa, Hainan.

Fig. 2. *Erythroculter dabryi* (Bleeker). 117 mm. standard length. Tungting Lake.

Fig. 3. *Parabramis pekinensis* (Basilewski). 85 mm. standard length. Tungting Lake.

Fig. 4. *Hemiculter clupeoides* Nichols. Type. 127 mm. standard length. Tungting Lake.
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Locality of Material: — Ningpo, Canton, Shanghai, Pei Ho, Tientsin (fide Gee). Yangtze at Hankow (Kreyenberg and Pappenheim, 1909, p. 17).

Specimens examined from Tungting Lake, Hunan.

Description: — Depth in length to base of caudal, 6.6; head, 4.1; eye in head, 6.7 (specimen of 198 mm. standard length). Dorsal rays, 11 to 14; anal, 12 to 14; scales, 100 to 120.

Remarks: — Called “kan-yii” at Tungting Lake, where it reaches a very large size. The Chinese have a little rhyme:

One thousand “chin huang-yii”
Ten thousand “chin kan-yii.”

The “kan-yii” is the fish in question, while the “huang-yii” is the sturgeon. A “chin” is about a pound and a quarter. This gives an indication as to the size of this fish. It is very commonly seen in the villages hereabouts, both large and small specimens being caught and sold (C. H. Pope, field notes).

Genus Mylopharyngodon Peters


Large-scaled, Chinese carps superficially resembling Ctenopharyngodon but characterized by a single series of pharyngeal teeth, some of which are broad, short molars, none serrate. The three or four species described may be synonyms of a single widely distributed form, Leuciscus aethiops of Basilewski.

Belly rounded; mouth terminal, somewhat oblique. Lateral line complete. Dorsal and anal without spinous rays; branched rays, about 7 and 8.

No barbels. Vent and anal fin not bordered by a row of enlarged scales. Origin of anal well behind posterior end of dorsal. No scaleless keel before anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

Mylopharyngodon aethiops (Basilewski)


Locality of Material: — Peking, Chihli; Yangtze; North China (fide Gee). Yangtze at Hankow (Kreyenberg and Pappenheim, 1909, p. 16).
Specimens examined from Tungting Lake, Hunan, and near Canton.

Description:—Depth in length to base of caudal, 3.9; head, 3.7; eye in head, 4.4 (specimen of 122 mm. standard length). Dorsal rays, about 9; anal, about 10; scales about 45.

Remarks:—Called “ch’ing-yü” at Tungting Lake, where it is sold in great numbers on the streets of Yochow. In appearance it is very like the “huan-yü” but is much blacker than that fish, uniformly black on sides and back. It is said by fishermen to attain a length of 4 or 5 feet (C. H. Pope, field notes).

Genus Ctenopharyngodon Steindachner


A widely distributed, broad-headed, large-scaled carp. Pharyngeal teeth in 2 rows, sharply serrate, and with a longitudinal groove on their chewing surface. Belly rounded, mouth terminal, somewhat oblique. Lateral line complete. Dorsal and anal without spinous rays; branched rays, about 7 and 8.

No barbels. Vent and anal fin not bordered by a row of enlarged scales. Origin of anal well behind posterior end of dorsal. No scaleless keel before anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

Ctenopharyngodon idella (Cuvier and Valenciennes)


Locality of Material:—Ningpo and Shanghai (fide Gee).

Specimens examined from Tungting Lake, Hunan, and from near Canton.

Description:—Depth in length to base of caudal, 4.2; head, 3.4; eye in head, 3.8 (specimen of 107 mm. standard length). Dorsal rays, 9 to 11; anal, 10 to 11; scales, 38 to 42.

Remarks:—Called “huan-yü” at Tungting Lake, where it is sold in great quantity on the streets of Yochow. It is a blackish fish, white beneath, but less black than the “ch’ing-yü” which it otherwise resembles. It is said by fishermen to attain a length of 4 or 5 feet (C. H. Pope, field notes).

Genus Squaliobarbus Günther


A moderate-sized, soft-finned, fusiform carp; mouth almost horizontal, lower
jaw included; maxillary with a minute subterminal barbel, sometimes lacking, and a minute rostral barbel sometimes present. Peritoneum black. A single widely distributed species in China, from which only one of the several others described seems to be distinguishable.

Mouth small, not reaching the vertical from the posterior margin of the eye. Gill membranes attached under the posterior edge of the preopercle. Premaxillary without a notch. One or 2 pairs of minute barbels. Pharyngeal teeth in 3 rows.

Lower jaw not transverse and sharp-edged. Vent and anal fin not bordered by a row of enlarged scales. Anal base well behind that of dorsal. No scaleless keel before the anal fin. No spinous rays in dorsal or anal. Upper jaw protractile. Gill rakers not fused. Eye placed in or above the axis of the body.

**Key to Chinese Squaliobarbus**

Origin of dorsal about equidistant from tip of snout and base of caudal. Barbels normally present .................................................. *curriculus*

Origin of dorsal decidedly nearer tip of snout than base of caudal. Barbels absent .... *panwingi*

*Squaliobarbus curriculus* (Richardson)


**Locality of Material:**—Yangtze at Hankow (Kreyenberg and Pappenheim, 1909, p. 16). Specimens examined from Shansi; Tungting Lake, Hunan; Fukien; and near Canton.

**Description:**—Depth in length to base of caudal, 4.5; head, 4; eye in head, 4.5 (specimen of 128 mm. standard length). Dorsal rays, 9 or 10; anal, 9 to 11; scales, 40 to 47.

**Remarks:**—Called “ma-lang-yü” at Tungting Lake, where it is one of the common large fish of the lake, often to be seen for sale in Yochow (C. H. Pope, field notes).

*Squaliobarbus panwingi* Lin


**Description:**—Depth in length to base of caudal, 4.2; head, 3.8; eye in head, 3.6 (specimen 55 mm. standard length). Dorsal rays, 9; anal, 11; scales, 46.

**Genus Ochetobius** Günther


A moderate-sized, fine-scaled, soft-finned, slender, more or less fusiform, ac-
tive, free swimming carp. No barbels. Peritoneum pale. Apparently but a single widely distributed species, at least in China.

Mouth moderate, terminal, slightly oblique. Premaxillary without a notch. Pharyngeal teeth in 3 rows.

Lower jaw not transverse and sharp-edged. Vent and anal fin not bordered by a row of enlarged scales. Anal base well behind that of dorsal. No scaleless keel before the anal fin. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

**Ochetobius elongatus** (Kner)


**Locality of Material:**—Specimens examined from Tungting Lake, Hunan, and from Anhwei; up to 190 mm. standard length.

**Description:**—Depth in length to base of caudal, 6.8; head, 4.4; eye in head, 4 (specimen of 123 mm. standard length). Dorsal rays, 11 or 12; anal, 11 or 12; scales, 68 to 70.

**Remarks:**—Called "chih-ma-tiao" at Tungting Lake, where it is fairly common and said to reach a weight of 3 or 4 pounds (C. H. Pope, field notes).

**Genus Barilius** Hamilton-Buchanan

*Barilius* Hamilton-Buchanan, 1822, Fishes in Ganges, p. 384. Type: *Cyprinus barila* Hamilton-Buchanan.

Large-mouthed, soft-finned, more or less compressed and elongate, actively free swimming carps of small or moderate size. Numerous species in tropical Asia and Africa.

Mouth oblique, more or less terminal, without lips. Gill membranes narrowly attached to the isthmus. Dorsal fin with 7 to 10 branched rays, its origin behind the ventrals and before the anal, which has 8 to 20 branched rays. Lateral line evenly bent down, running low, below the center on the peduncle. Pharyngeal teeth conical, hooked, in 2 or 3 rows.

No definite knob or angle on the side of the lower jaw fitting into a notch in the upper. Vent and anal fin not bordered by a row of enlarged scales. No scaleless keel before anal fin. Upper jaw protractile. Gill rakers not fused. Eye placed in or above the axis of the body.

**Barilius interrupta** Day


**Locality of Material:**—Hotha, Yunnan (Anderson, 1878, I, p. 869).

**Description:**—Depth in total length, 3.5; head, 4.5; eye in head, 2.5 (speci-
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men up to about 50 mm. long). Dorsal rays, 9; anal, 14; scales, 34.

Remarks:—This species may or may not rightly belong in Barilius, but Chu's reference of it to Brachydanio Weber and de Beaufort is probably wrong.

Genus Atrilinea Chu


Elongate, head pointed, abdomen rounded. Lower jaw flat, fitting flatly into the upper jaw, barbels none, a prominent symphysial knob at the end of the lower jaw. Gill rakers short, 12 or 13 on the first arch. No spinous fin rays, origin of dorsal considerably behind that of anal. Peritoneum black; air bladder bipartite; teeth in 3 rows. Apparently an oriental derivative of Barilius balancing the unlike Zacco.

Atrilinea chenchiwei (Chu)

Barilius chenchiwei Chu, 1931 (July), China Jour., XV, p. 33, Fig. 17. Tien-mu-san, Chekiang.
? Barilius macrops Lin, 1931 (April), Carps of Kwangtung, p. 144, Fig. 10. Yaoshan, Kwangsi.

Description:—Depth in length, 4.6 to 5; head, 4.4 to 4.7; eye in head, 3.3 to 3.5 (specimens 101 to 120 mm. standard length). Dorsal rays, 9; anal, 13 to 15; scales, 50 to 55.

Remarks:—If the same, macrops Lin has priority over chenchiwei Chu.

Genus Zacco Jordan and Evermann


Large-mouthed, soft-finned, compressed, predaceous carps of small or moderate size, represented by a few species in eastern temperate Asia and adjacent islands. Closely allied to Barilius but somewhat shorter bodied, larger mouthed, with head in the adult (males at least) characteristically much beset with horny asperities, anal with some of its rays enlarged, simple, exserted.

Mouth oblique, more or less terminal. Gill membranes narrowly attached to the isthmus behind the hind edge of eye. Dorsal origin over or behind the ventrals. Anal with 10 or more branched rays. Lateral line evenly bent down, running low, reaching the center of peduncle before its end. Pharyngeal teeth in 3 rows.

No definite knob or angle on the side of the lower jaw fitting into a notch in the upper. Vent and anal fin not bordered by a row of enlarged scales. Anal origin behind a vertical from the end of the dorsal base. No scaleless keel before anal fin. Upper jaw protractile. Gill rakers not fused. Eye placed above the axis of the body.
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Key to Chinese *Zacco*

1. Lower jaw projecting .......................................................... see 2
   Jaws about equal. Eye large, 3.7 or 3.8 in head (at 70 to 90 mm. standard length). Scales few, about 45 .......................................................... *macrophthalmus*
   Lower jaw included; tubercles forming conspicuous serrate ridges on pre- opercle and above upper jaw; scales, 49 to 51 .......................................................... *acanthogenys*
   Lower jaw included; tubercles not forming conspicuous serrate ridges; scales, about 46 .......................................................... *platypus*

2. Depth in length to base of caudal, 3 to 4 (at 85 to 100 mm. standard length). Scales, 47 to 51. Tubercles forming conspicuous serrate ridges on opercle and lower jaw ................................. *asperus*
   Depth in length to base of caudal, 4.5 (at 150 to 160 mm. total length). Scales, 58 to 60 ................................. *chengtui*

*Zacco asperus* Nichols and Pope

*Zacco asperus* Nichols and Pope, 1927, Bull. Amer. Mus. Nat. Hist., LIV, p. 367, Fig. 32. Hainan.


*Aspius spilurus*, Lin, 1935, Lingnan Sci. Jour., Canton, XIV, p. 310, Fig. 6. White Cloud Mountain, near Canton.

![Figure 31. *Zacco asperus* Nichols and Pope. Type. 106 mm. without caudal.](image-url)

*Description:*—Depth in length to base of caudal, 3.9 to 3.2; head, 3.3 to 3.6; eye in head, 3.6 to 4.4 (specimens of 85 to 110 mm. standard length). Dorsal rays, 9 or 10; anal, 13 to 15; scales, 47 to 51.

*Zacco chengtui* Kimura


*Description:*—Depth in length to base of caudal, 4.5; head, about 4; eye in head, 5 to 5.7 (specimens 150 to 160 mm. total length). Dorsal rays, 9 or 10; anal, 12 or 13; scales, 58 to 60.

Lower jaw slightly longer than upper.
Zacco macrophthalmus Kimura


**Description:**—Depth in length to base of caudal, 4.6 or 4.7; head, 3.8 or 3.9; eye in head, 3.7 or 3.8 (specimens 70 to 92 mm. standard, 80 to 107 mm. total length). Dorsal rays, 9; anal, 13 or 14; scales, 45.

Zacco acanthogenys (Boulenger)


**Description:**—Depth in length to base of caudal, 3.3 to 4; head, 4; eye in head, 4.5 to 5 (specimens up to 130 mm. long). Dorsal rays, 9; anal, 11; scales, 49 to 51.

Zacco platypus (Temminck and Schlegel)


**Locality of Material:**—Yangtze at “Nankanho” (Kreyenberg and Pappenheim, 1909, p. 16).

Specimens examined from Chihli; Shantung; Chungan Hsien, Fuching Hsien, Kienning, Yungtai Hsien and Yenping, Fukien; up to 100 mm. standard length.

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**Fig. 32. Zacco platypus** (Temminck and Schlegel). Fukien.

**Description:**—Depth in length to base of caudal, 3.7 to 3.8; head, 3.6; eye in head, 4 to 5 (specimens about 90 mm. standard length). Dorsal rays, 9; anal, 11 to 13; scales, about 46.
Remarks:—The young of about 55 mm. standard length may look quite different from the adult, slender, anal small, with a dark longitudinal shade posteriorly, and no cross marks.

Genus *Opsariichthys* Bleeker


Large-mouthed, compressed, soft-finned, predaceous carps, mostly of moderate size. A few closely related species, common fishes in eastern temperate Asia and adjacent islands.

Mouth oblique, usually reaching to or beyond the vertical from the posterior margin of the eye. A knob or angle on the side of the lower jaw fitting into a notch in the upper. Gill membranes attached close together, about under the posterior border of the eye. No barbels. Pharyngeal teeth in 3 rows.

Vent and anal fin not bordered by a row of enlarged scales. Anal base well behind that of dorsal. No scaleless keel before anal fin. Upper jaw protractile. Gill rakers not fused. Eye placed above the axis of the body.

The genus *Opsariichthys* is generally abundant in China and very variable. In the Yangtze Valley there is a well-marked form with heavily hooked jaws, which is elongate when young and broad headed when large (*bidens*). Contrast with it we find in Chekiang and Kiangsi a form which approaches more closely to the genus *Zacco* (*chekianensis*), and the fish which Berg (1916, p. 193, Fig. 140 [141]) has figured from Lake Hanka in the Amur basin is more like this. Records for true *uncirostris* in China are presumably not correct. A deep-bodied form, with few scales, seems to be recognizable in Hainan (*hainanensis*) and to be approached by some specimens from elsewhere in South China.

**Key to Chinese *Opsariichthys***

1. Comparatively deep bodied (depth, 3.5 at 37 mm. standard length); scales, about 45. Size small ........................................... *minutus*  
   Less deep (depth, 3.5 to 4 at 100 to 125 mm.); scales, 40 to 47. Size moderate  
   More slender at comparable sizes (depth, about 5 at 85 mm.); scales, 44 to 47;  
   notch in jaw less anterior and stronger. Size moderate or large. Central Valley  
   bidens

2. Depth, 3.7 to 4; scales, 42 to 47; notch in jaw more anterior and relatively weak  
   Depth, 3.5 to 3.8; scales, 40 to 43; notch in jaw strong. Hainan Island ......... *hainanensis*

*Opsariichthys uncirostris* (Temminck and Schlegel)

*Leuciscus uncirostris* Temminck and Schlegel, 1846, in Siebold, Fauna Japonica, Pisces, p. 211, Pl. cxx, fig. 1.  
Japan (the typical race extralimital).
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Opsariichthys uncirostris chekianensis Shaw


Locality of Material:—Specimens examined from Hokou, Kiangsi, and Chungan Hsien, Fukien; up to 124 mm. standard length.

Description:—Depth in length to base of caudal, 3.7 to 4; head, 3.3 to 3.7; eye in head, 5 to 6.5 (specimens 103 to 124 mm. standard length). Dorsal rays, 9 or 10; anal, 10 to 12; scales, 42 to 47.

Opsariichthys uncirostris bidens Günther


Locality of Material:—Specimens examined from Shansi; Anhwei; Szechwan; (approaching chekianensis) Tsinan, Shantung; Chungan Hsien, Fukien; (approaching hainanensis) Foochow, Fukien.

Fifteen specimens from Kienning, Fukien, are particularly “mixed” and variable, not assignable to this or either of the other races. Standard lengths, 41 to 117 mm.; depth, 3.9 to 4.8; scales, 40 to 50.

Description:—Depth in length to base of caudal, 5; head, 3.5; eye in head, 4 (specimen 85 mm. standard length). Dorsal rays, 9 or 10; anal, 11; scales, 44 to 47.

Opsariichthys uncirostris hainanensis Nichols and Pope

Figures 30 and 33

Opsariichthys hainanensis Nichols and Pope, 1927, Bull. Amer. Mus. Nat. Hist., LIV, p. 368, Fig. 33. Hainan.

Fig. 33. Opsariichthys uncirostris hainanensis Nichols and Pope. Type. 115 mm. without caudal.

Locality of Material:—Specimens examined from Hainan Island; (approaching chekianensis or bidens) Yenping and Yungtai Hsien, Fukien.
Description:—Depth in length to base of caudal, 3.5 to 3.8; head, 3.2 to 3.4; eye in head, 4.8 to 5.3 (specimens of about 120 mm. standard length). Dorsal rays, 9 or 10; anal, 11 or 12; scales, 40 to 43.

**Opsariichthys minutus** Nichols

*Figure 34*

*Opsariichthys minutus* Nichols, 1926, Amer. Mus. Novitates, No. 224, p. 6, Fig. 5. Fukien.

Description:—Depth in length to base of caudal, 3.5; head, 3.3; eye in head, 3.6 (specimen of 37 mm. standard length). Dorsal rays, 9 or 10; anal, 10 or 11; scales, 45.

*Fig. 34. Opsariichthys minutus* Nichols. Type. 37 mm. standard length.

Remarks:—Four anomalous specimens of 80 to 93 mm. standard length from Kienning, Fukien, may or may not be the adult of this form. They have depth, 3.5 to 3.6; head, 3.4 to 3.6; eye, 4.4 to 5; dorsal rays, 9; anal, 11; scales, 42 to 45.

**Genus Tanichthys** Lin


Moderately large-scaled, large-eyed, soft-finned minnows, with strongly oblique mouth and projecting lower jaw. No ventral keel; no barbels; dorsal and anal with about 7 and 8 branched rays, respectively; the origin of the dorsal well behind the ventral axil, anal origin under about middle of dorsal; lateral line not distinguishable; teeth in 2 rows, slender, hooked.

Vent and anal fin not bordered by a row of enlarged scales; upper jaw protractile; gill membranes broadly attached to the isthmus; gill rakers not fused; eye placed above the axis of the body.
SYSTEMATIC ACCOUNT

Tanichthys albonubes Lin


Description:—Depth in length to base of caudal, 4.2; head, 4.2; eye in head, 2.5 (specimen 21 mm. standard length). Dorsal rays, 9; anal, 10; scales, about 30.

Genus Rasbora Bleeker


Moderate or large-scaled, soft-finned, active, free swimming minnows, with lateral line evenly bent down, running low, below the center on the peduncle. Numerous species in southern Asia and the East Indies.

Mouth moderate, oblique, terminal, or the lower jaw projecting. Gill membranes narrowly attached to the isthmus. No barbels. Dorsal fin more or less behind the ventrals. Anal with not more than 7 branched rays. Pharyngeal teeth in 3 rows.

No prominent knob or angle on the side of the lower jaw fitting into a notch in the upper. Vent and anal fin not bordered by a row of enlarged scales. Anal origin more or less behind a vertical from the end of the dorsal base. No scaleless keel before anal fin. Upper jaw protractile. Gill rakers not fused. Eye placed in or above the axis of the body.

Key to Chinese Rasbora

Eye in head, 3.5 (at 65 mm.); a black stripe from opercle to caudal ................. steineri
Eye in head, 4 (at 45 mm.); a dark streak back from under dorsal ................. alios

Rasbora cephalotaenia (Bleeker)


Rasbora cephalotaenia steineri Nichols and Pope

Figure 35 and Plate V, figure 2


Description:—Depth in length to base of caudal, 3.6; head, 3.7; eye in head, 3.5 (specimen of 65 mm. standard length). Dorsal rays, 9; anal, 7; scales, 30.
Rasbora alios Lin

*Rasbora lateristriata alios* Lin, 1931, Carps of Kwangtung, p. 67. 1934, Lingnan Sci. Jour., Canton, XIII, p. 237, Fig. 2. Canton.

**Description:**—Depth in length to base of caudal, 4; head, 3.7; eye in head, 4 (specimen 45 mm. standard length). Dorsal rays, 9; anal, 7; scales, 27 to 29. Lower jaw with a symphysial knob.

**Remarks:**—A doubtful species based on a single small (perhaps young) specimen.

Genus *Pseudorasbora* Bleeker


A genus of soft-finned minnows with very small, superior (upwardly directed), transverse mouth, and the lateral line running straight in the center of the body. Common in North and central China where it is divisible into several races, representative species, or ecological forms.

Pharyngeal teeth in one row. Anal fin with 5 or 6 branched rays (exceptionally 7). No barbels. No scaleless keel before the anal fin.

Vent and anal fin not bordered by a row of enlarged scales. Origin of anal behind posterior end of dorsal base. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

**Key to Chinese Pseudorasbora**

1. Dorsal high (longest ray about equals head); anal small; scales, 38 .......................... *altipinna*
   Dorsal lower (longest ray, 1.1 to 1.6 in head) ................................................. see 2
2. Scales, 38. Nape elevated and snout depressed ........................................ *depressirostris*
   Scales, 32 to 37 ............................................................... see 3
3. Scales, 35 to 37; depth, 3.4 to 3.9; interorbital (broader with age) in head, 1.8 to 2.4; longest dorsal ray, 1.2 to 1.6 (specimens 49 to 73 mm. standard length). Tendency to rather uniform dusky color ...................... parvula
Scales, 33 to 35; depth, 4 to 4.5; interorbital, 2.3 to 2.4; longest dorsal ray, 1.1 to 1.2 (specimens of 31 to 40 mm.) ...................... tenuis
Scales, 34 to 37; depth, 3.8 to 4.1; interorbital, 2.3 to 2.6; longest dorsal ray, 1.3 to 1.4 (specimens of 55 to 65 mm.) ...................... fowleri
Scales, 32 to 36; depth, 3.5 to 4.4; interorbital, 2.2 to 2.9; longest dorsal ray, 1.2 to 1.5 (specimens of 36 to 61 mm.). Lateral line frequently incomplete. Tendency to have fins with heavy black margins ...................... monstrosa

Pseudorasbora parva (Temminck and Schlegel)

*Leuciscus parvus* Temminck and Schlegel, 1846, *in* Siebold, Fauna Japonica, Pisces, p. 215, Pl. cxii, fig. 3. *Japan (typical form extralimital).*

**Pseudorasbora parva altipinna** Nichols

*Figure 36*


![Am. Mus. No. 8428](am-mus-no-8428.png)

*Fig. 36. Pseudorasbora parva altipinna* Nichols. Type. 55 mm. standard length.

*Description:*—Depth in length to base of caudal, 4; head, 3.8; eye in head, 4 (specimen 55 mm. standard length). Dorsal rays, 9; anal, 8; scales, 38.

**Pseudorasbora parva depressirostris** Nichols

*Figure 37*


*Description:*—Depth in length to base of caudal, 3.8; head, 3.6; eye in head, 4.2 (specimen of 49 mm. standard length). Dorsal rays, 9; anal, 8; scales, 38.
Pseudorasbora parva parvula Nichols

Figure 38

*Pseudorasbora parva parvula* Nichols, 1929, Amer. Mus. Novitates, No. 377, p. 8, Fig. 5. Tsinan, Shantung.

*Description:*—Depth in length to base of caudal, 3.4 to 3.9; head, 3.8 to 4.2; eye in head, 3.8 to 4.6 (specimens 49 to 73 mm. standard length). Dorsal rays, 9; anal, 8; scales, 35 to 37.

*Remarks:*—In this genus the interorbital becomes broader with age. Bearing this in mind *P. p. parvula* has a relatively broad interorbital, 2.1 or less in head in all specimens examined over 52 mm. standard length. It is most frequently dark colored, central part of each scale dusky, fins dusky or grayish. The young, however, are as a rule pale or with a dark streak, and an occasional *P. p. fowleri* is also similarly dark. At a standard length of 50 to 55 mm. *P. p. parvula* frequently has horny warts on the face which are relatively somewhat larger, especially those under the eye, than such warts in *P. p. fowleri* at 65 to 70 mm. standard length.
Both these forms are present in collections from Tsinan, but so far *P. p. parvula* has not been found elsewhere.

**Pseudorasbora parva tenuis** Nichols  
Figure 39

*Pseudorasbora parva tenuis* Nichols, 1929, Amer. Mus. Novitates, No. 377, p. 10, Fig. 6. Tsinan, Shantung.

**Description:**—Depth in length to base of caudal, 4 to 4.5; head, 3.6 to 4.1; eye in head, 3 to 3.3 (specimens 31 to 41 mm. standard length). Dorsal rays, 9; anal, 8; scales, 33 to 35.

**Remarks:**—Probably an ecological form, based on seven specimens only, from Tsinan, readily picked out from other *Pseudorasbora* material with which they were collected by their slenderness and the relative conspicuousness of the lateral streak. *P. p. parvula* tends to be a chubby fish, and at comparable sizes the young of *P. p. fowleri* have a narrower interorbital, 2.5 or more in head in specimens examined under 60 mm. standard length.

**Pseudorasbora parva fowleri** Nichols  
Figure 40

*Aphyocypris chinensis*, Fowler, 1924, *ibid.*, p. 383, Fig. 1 (not of Günther). Anhwei.

**Locality of Material:**—Specimens examined from Chihli (Fowler, 1924, p. 382); Shantung; Anhwei; Hokou, Kiangsi, and Fukien (approaching *monstrosa*).

**Description:**—Depth in length to base of caudal, 3.7 to 4.1; head, 3.5 to 4.2; eye in head, 3.4 to 4 (specimens 50 to about 84 mm. standard length). Dorsal rays, 9; anal, 8; scales, 34 to 37.
Pseudorasbora parva monstrosa Nichols

Figure 41


Locality of Material:—Specimens examined from Yenping and Foochow, Fukien.

Description:—Depth in length to base of caudal, 3.5 to 4.4; head, 3.6 to 4.5; eye in head, 3 to 4.4 (specimens of 36 to 62 mm. standard length). Dorsal rays, 9; anal, 8; scales, 32 to 36.
**SYSTEMATIC ACCOUNT**

*Remarks:*—This form is characterized by low scale count and frequently incomplete lateral line, and tends to have a distinctive color pattern wherein the scales have dusky borders and the fins heavy blackish margins. Specimens examined from Foochow have scales 34 to 36, but a larger proportion of them show imperfect lateral line and color pattern than of those examined from Yenping which have scales 32 to 34.

**Genus Luciobrama** Bleeker


A rather large, peculiar, elongate, fine-scaled, soft-finned Chinese carp, wherein the eye is placed far forward near the small, oblique mouth with projecting lower jaw; the front part of the head is slightly depressed; the head and body behind the eye somewhat compressed; nape rising on a slant so as to make the outline of the top of the head concave.

Dorsal and anal equal, rather short, with about 8 branched rays, dorsal about midway between ventrals and anal, caudal forked. No barbels.

Upper jaw protractile. No scaleless keel before the anal fin. Vent and anal fin not bordered by a row of enlarged scales. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

**Luciobrama typus** Bleeker

*Figure 42*


*Yangtze?*

**Locality of Material:**—Specimens examined from Tungting Lake, Hunan.

*Fig. 42. Luciobrama typus* Bleeker.

*Description:*—Depth in length to base of caudal, 6.3; head, 3.4; eye in head, 9 (specimen of 240 mm. standard length). Dorsal rays, 10 to 11; anal, 10 to 14; scales, about 130 to 137.
**Remarks:**—Called "lou-er-yü" at Tungting Lake where it is common but not numerous. Every day the fishermen's baskets contained single specimens, but seldom more than two in the same basket. The average length was slightly over a foot and a half, and very small ones were never seen (C. H. Pope, field notes).

**Genus Semilabeo** Peters


A Chinese, bottom living carp related to *Garra* and *Labeo*, which has the mouth surrounded by continuous, broad, papillose lips, ending in a bib-like point but not free behind; the eye placed high and posteriorly.

Mouth inferior, transverse. A pair of small rostral barbels and minute maxillary barbels sometimes present. No spine in dorsal or anal fin; dorsal origin well in advance of ventrals; dorsal and anal short, the former with 8, the latter with 5 or 6 branched rays. No sucking disk on the lower jaw. Lateral line running in about the center of body and peduncle. Scales of moderate size. Gill membranes broadly joined to isthmus; vent appreciably before anal origin. Pharyngeal teeth in 3 rows.

Vent and anal fin not bordered by a row of enlarged scales. Anal base behind that of the dorsal. No scaleless keel before anal fin. Gill rakers not fused.

The two fishes described by Tchang as *Gyrinocheilus* from China look like this and may be referable to *Semilabeo*, though described without pharyngeal teeth, and with other differences.

**Semilabeo notabilis** Peters


**Description:**—Depth in length to base of caudal, about 4.7 to 4.8; head, 4.2 to 4.7; eye in head, 5 to 5.5 (specimens 135 to 340 mm. long). Dorsal rays, 10; anal, 7; scales 46 or 47.

**Genus Ptychidio** Myers

*Ptychidio* Myers, 1930, Copeia, No. 4, p. 110. Type: *Ptychidio jordani* Myers.

Mouth small, inferior, with an expanded, extrusible, fimbriated upper lip which is not connected with the slightly movable fimbriated lower lip which it covers when folded.

Two pairs of barbels. No spine in dorsal or anal fin. Eight branched rays in the dorsal fin and 5 in the anal. No sucking disk on the lower jaw. Lateral line running in about the center of body and peduncle. Pharyngeal teeth in 2 rows.

Vent and anal fin not bordered by a row of enlarged scales. Anal base behind
that of the dorsal. No scaleless keel before anal fin. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed above the axis of the body.

**Ptychidio jordani** Myers

*Ptychidio jordani* Myers, 1930, *Copeia*, No. 4, p. 110, Fig. Central Formosa.


**Locality of Material:**—Hong Kong market (Herre, 1934.1, p. 26).

**Description:**—Depth in length to base of caudal, 3.5; head, 5; eye in head, 5.4 (specimen 270 mm. standard length). Dorsal rays, 10; anal, 7; scales, 42 to 45.

**Remarks:**—"This very peculiar fish *Ptychidio jordani* Myers] is confined to the West River from Wuchow upward, and to the Fu River and perhaps other tributaries in Kwangsi Province. It is certainly not native to Formosa, and its presence there was purely accidental. It lives among rocks in the rapids of the rivers of Kwangsi, and in common with a number of carps, spawns there. The fry of certain of these carps are gathered in vast numbers and taken to Kau Kong, a town in the West River delta, which is one of the chief centers of the carp industry. The fry are placed in ponds and when large enough are shipped all over southeastern China, to the Yangtze valley, Hainan, Singapore, and Formosa. There they are placed in ponds and reared till large enough for the market.

"Unquestionably the specimen of *Ptychidio jordani* collected in Formosa was gathered up with the fry of *Aristichthys*, *Hypophthalmichthys*, *Mylopharyngodon*, *Ctenopharyngodon*, and *Cirrhina*, and later sent across to Formosa. None of the fishes named above by Peters, Steindachner, and Myers, occurs more than a few miles down stream from Wuchow, but are common on the West River from Wuchow on toward Nanning, the capital of Kwangsi Province, and in the Fu River. It is unfortunate that the type locality of these fishes is incorrect, and that they all occur in a region far from the one ostensibly their habitat” (Herre, 1934.3, pp. 327–328).

**Genus Labeo** Cuvier


Small or moderate-sized carps with an inferior, transverse, more or less curved mouth, the lower jaw more or less sharp, sometimes leathery but not covered by cartilage. Numerous species in southern Asia and Africa, the few oriental ones so identified perhaps not congeneric.

Two pairs of barbels present or absent. No spine in dorsal or anal fin. No sucking disk on the lower jaw. Snout more or less swollen, each lip with an inner transverse fold. Gill rakers short, subconical. Lateral line little bent down, running in the center of the peduncle. Dorsal fin opposite ventrals, with 13 to 20 rays in all; anal with 5 or 6 branched rays (exceptionally 7). Pharyngeal teeth in 3 rows.
Vent and anal fin not bordered by a row of enlarged scales. Anal base behind that of the dorsal. No scaleless keel before anal fin. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

**Key to Chinese Labeo**

1. No barbels. A black blotch on caudal peduncle ........................................... \textit{yunnanensis}  
   At least one pair of small barbels ................................................................. \textit{see 2}  
2. More slender, depth (in standard length), 3.7 or 3.8; scales, 43  
   Deeper, depth (in standard length), 2.9 to 3.4; scales, 39 to 40. Anterior barbels the best developed ................................................................. \textit{decorus}  
   \textit{see 3}  
3. Anterior barbels, 2.5 in eye, posterior minute; depth in length to base of caudal, 3.4 (at 152 mm. standard length) ................................................................. \textit{jordani}  
   Anterior barbels minute, posterior absent; depth in length to base of caudal, 2.9 (at 202 mm. standard length). A conspicuous blackish band of small bars over the pectoral (a mark which is usually absent or less distinct in the preceding) ................................................................. \textit{melanostigma}  

**Labeo yunnanensis Chaudhuri**

\textit{Labeo yunnanensis} Chaudhuri, 1911, Rec. Indian Mus., Calcutta, VI, p. 14, Pl. 7, fig. 1, 1a, 1b. Yunnan.  

**Description:**—Depth in length, 3.5; head, 4.5. Dorsal rays, 13; anal, 7; scales, 43.

**Labeo decorus Peters**

\textit{Labeo decorus} Peters, 1880, Monatb. Akad. Wiss. Berlin, p. 1031, Fig. 2. Hong Kong.

**Description:**—Depth in length to base of caudal, 3.7 or 3.8; head, 4.5; eye in head, 5 (specimen 330 mm. long). Dorsal rays, 13; anal, 7; scales, 43.

**Labeo jordani Oshima**

\textit{Labeo jordani} Oshima, 1910, Ann. Carnegie Mus., XII, p. 204, Pl. xlix, fig. 3. Formosa.  
\textit{Labeo collaris}, Chu, 1931, China Jour., XIV, p. 193, Fig. 16. Not of Nichols and Pope.  

**Locality of Material:**—Specimens examined from Swatow and near Canton. More or less generally cultivated by the Chinese.  

**Description:**—Depth in length to base of caudal, 3.4; head, 4.5; eye in head, 4 (specimen 152 mm. standard length). Dorsal rays, 14; anal, 7 or 8; scales, 40.

**Labeo melanostigma** (Fowler and Bean)

**Figure 43**

\textit{Cirrhus melanostigma} Fowler and Bean, 1922, Proc. U. S. Nat. Mus., LXII, p. 4, Fig. 1. Koroton, Formosa.
SYSTEMATIC ACCOUNT


**Locality of Material:**—Specimens examined from Hainan.

**Description:**—Depth in length to base of caudal, 2.9; head, 4.7; eye in head, 3.6 (specimen 202 mm. standard length). Dorsal rays, 14; anal, 7 or 8; scales, about 39.

![Fig. 43. Labeo melanostigma (Fowler and Bean). Type of Labeo collaris Nichols and Pope. 202 mm. without caudal.](image)

**Remarks:**—This fish is closely related to but apparently distinct from *Labeo jordani*, and very likely does not belong in *Labeo*, though one hesitates to place it in *Cirrhinus* without a critical examination of material representing that genus. *L. jordani*, on the other hand, seems to have phylogenetic affinity with *Varicorhinus tungting*.

**Genus Tylognathus** Heckel


Small or moderate-sized carps, with the mouth essentially as in *Labeo*, but the dorsal fin shorter, with not more than 9 branched rays. Several species in southern Asia and the East Indies.

One or 2 pairs of very small barbels. No spine in dorsal or anal fin. No sucking disk on the lower jaw. Lateral line running in the center of the peduncle. Anal with 5 or 6 branched rays (exceptionally 7). Pharyngeal teeth in 3 rows.

Vent and anal fin not bordered by a row of enlarged scales. Anal base behind that of the dorsal. No scaleless keel before anal fin. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

**Tylognathus davidi** Sauvage


**Description:**—Depth in length to base of caudal, about 3.7; head, 4.5; eye in snout, 1.5. Dorsal rays, 10; anal, 8; scales, 35.
THE FRESH-WATER FISHES OF CHINA

Genus Paratylognathus Sauvage


Resembles Tylognathus, but scales finer. Four barbels. Chu (1935, p. 7), who has examined types of this genus, considers it a primitive Schizothoracin, allied to Schizothorax.

Paratylognathus davidi Sauvage


Description:—Depth in length to base of caudal, 5; head, 5; eye in head, 3.5 (specimen 125 mm. long). Dorsal rays, 11; anal, 7; scales, 115.

Genus Pseudogyrinocheilus Fang

Pseudogyrinocheilus Fang, 1933, Sinensia, III, p. 255. Type: Discognathus prochilus Sauvage and Dabry de Thiersant.

Bottom living, soft-finned carps. Mouth inferior, curved, opening downward in a subcircular sucker-like disk with many small, regularly arranged, horny papillae. Middle of lower lip thick, triangular, fitting into a cleft in the upper lip when the mouth is closed. Two pairs of barbels, the anterior the longer, posterior minute. Teeth in 3 rows: 5, 4, 2. Anal fin with 5 branched rays. Vent and anal fin not bordered by a row of enlarged scales. Anal base well behind that of dorsal. No scaleless keel before anal fin. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed above the axil of the body.

Apparently but a single species, a native of China.

Pseudogyrinocheilus prochilus (Sauvage and Dabry de Thiersant)


Description:—Depth in length to base of caudal, 4.2 to 6.5; head, 3.9 to 5; eye in head, 4.1 to 6 (specimens 89 to 206 mm. standard length). Dorsal rays, 10 (rarely 9); anal, 7; scales, 41 to 48.

Genus Garra Hamilton-Buchanan

Garra Hamilton-Buchanan, 1822, Fishes in Ganges, p. 303. Type: Cyprinus lamta Hamilton-Buchanan.

Small or moderate-sized, bottom living, spineless finned carps with a sucking disk on the lower jaw, usually free in front. Lower lip well developed, continuous, free behind. Vent usually about midway between bases of ventral and anal fins or
nearer the latter. Normally 4 barbels, sometimes absent. Lower jaw sharpened and covered by cartilage. Intestinal tract long. Pharyngeal teeth in 3 rows. Anal fin with 5 or 6 branched rays (exceptionally 7).

Vent and anal fin not bordered by a row of enlarged scales. Anal base well behind that of dorsal. No scaleless keel before anal fin. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed above the axis of the body.

A south Asiatic and African genus with a few Chinese species.

**KEY TO CHINESE *Garra***

1. Two pairs of barbels. Scales, 33 to 40
   - No barbels .......................................................... see 2
   - Scales, about 40; depth, about 5; head, about 4.5 see 4
   - Scales, about 33; depth, about 4.5; head, about 4 see 3
2. Depth (in standard length), 5.2 or 5.3; head, 4.2 or 4.3. Scales, about 51
   - Depth (in standard length), 5.6 to 6.8. Scales, about 44

**Subgenus *Garra* Hamilton-Buchanan**

*Garra* Hamilton-Buchanan, 1822, Fishes in Ganges, p. 393. Type: *Cyprinus lamta* Hamilton-Buchanan.

*Garra yunnanensis* (Regan)


*Description:*—Depth in length, 5; head, 4.5; eye in head, 4 (specimen 53 mm. long). Dorsal rays, 10; anal, 7; scales, 40.

*Garra orientalis* Nichols

**Figure 44**

Description:—Depth in length to base of caudal, 4.4; head, 3.9; eye in head, 5.5 (specimen 75 mm. in standard length). Dorsal rays, 10 or 11; anal, 7 or 8; scales, 33.

Garra rhynchota Koller

Figure 45


Description:—Depth in length to base of caudal, 4.5; head, 4.1; eye in head, 4.6 (specimen 108 mm. standard length). Dorsal rays, 10; anal, 7; scales, 33.

Subgenus Ageneiogarra Garman


Ageneiogarra may be generically separable from Garra, with which it agrees in having 3 rows of pharyngeal teeth, and from which it differs in a more anterior vent and the lower lip not free in front. G. pingi (Tchang) seems close to and may be inseparable from G. imberba Garman. Whereas G. imberba and G. imberbis (Vinciguerra) have sometimes been synonymized, the author is not convinced of their close relationship, or that identifications of the latter from China may not be in error.

Garra pingi (Tchang)


Description:—Depth in length to base of caudal, 5.2 to 5.3; head, 4.2 to 4.3; eye in head, 5 (specimen of 273 mm. total length). Dorsal rays, 13; anal, 7; scales, 51.
**Garra imberba** Garman


Type examined in Museum of Comparative Zoology, Cambridge.

**Description:**—Depth in length to base of caudal, 6; head, 5.1; eye in head, 4.8 (specimen 200 mm. standard length). Dorsal rays, 11; anal, 8; scales, 50 or 51.

**Garra imberbis** (Vinciguerra)

Figure 46


![Fig. 46. Garra imberbis (Vinciguerra). After Vinciguerra.](image_url)

**Locality of Material:**—Hainan (Boulenger, 1899, p. 961).

**Description:**—Depth in length to base of caudal, 5.6 to 6.8; head, 4.5 to 5.3; eye small, 2.2 to 2.5 in snout. Dorsal rays, 11; anal, 7; scales, 44.

**Genus Discogobio** Lin

*Discogobio* Lin, 1931, Carps of Kwangtung, p. 72. Type: *Discogobio tetrabarbatus* Lin.

Related to *Varicorhinus*; with inferior transverse mouth; lower lip free behind, its center a small, smooth "suctorial disk"; 2 pairs of small barbels.

**Discogobio tetrabarbatus** Lin

*Discogobio tetrabarbatus* Lin, 1931, Carps of Kwangtung, p. 72. Yaoshan. 1933, Lingnan Sci. Jour., Canton, XII, p. 494, Fig. 2.

**Description:**—Depth in length to base of caudal, 5; head, 5; eye in head, 6 (specimen 110 mm. standard length). Dorsal rays, 10; anal, 7; scales, about 38.

**Genus Varicorhinus** Rüppell

Small or moderate-sized carps with an inferior, transverse mouth, the lower jaw sharpened and covered by cartilage. No spine in dorsal or anal fin. Intestinal tract long. No sucking disk on the lower jaw. Pharyngeal teeth in 3 rows. Anal fin with 5 or 6 branched rays (exceptionally 7).

Ventr and anal fin not bordered by a row of enlarged scales. Anal base well behind that of dorsal. No scaleless keel before anal fin. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

Usually common in China, where several species occur.

**Key to Chinese Varicorhinus**

1. Two pairs of barbels, the longest about equal to diameter of eye. Scales, 39 to 42 ........................................... see 6
   No barbels ................................................................ see 2
   Usually 2 pairs of small or minute barbels, the longest not more than \( \frac{1}{2} \) and usually less than \( \frac{1}{2} \) diameter of eye .......................................................... see 3
   Rostral barbels minute, the maxillary barbels from \( \frac{1}{2} \) as long to as long as eye. Scales, 48 to 50 .................................................. *barbatus* *macrolepis*

2. Scales, about 50 .......................................................... see 7
   Scales, 39 to 44 ................................................................ see 4

3. Lower lip not free in front. Scales, 47 to 51 .......................... see 5
   Lower lip free in front, with a fluted edge or basal fold. Scales, about 45 ...

4. Depth, about 4.3 (at 95 mm. standard length). Edge of lower jaw brown ...
   Depth, about 3.7 (at 103 mm. standard length). Edge of lower jaw brown ...
   Depth, about 3.9 (at 114 mm. standard length). Edge of lower jaw pale ...

5. Lower lip not papillose; maxillary barbels the longer ............... *tamusuiensis*
   Lower lip (especially) papillose; snout barbels the longer .......................... *shansiensis*

6. Dorsal rays, 10; anal, 5 ................................................. *tungting*
   Dorsal rays, 13; anal, 7. Lower lip free in front ................................. *mutabilis*

7. Lower lip slightly free behind .......................... *kreyenbergii*
   Lower lip not free behind ................................................ *pogonifer*

Subgenus Altigena Lin


**Varicorhinus brevis** Lin


**Description:**—Depth in length, 4; head, 4.3; eye in head, 6. Dorsal rays, 14; anal, 7; scales, 42 to 44.

No barbels; a papillose labial fold, not free behind.
**SYSTEMATIC ACCOUNT**

Varicorhinus discognathoides Nichols and Pope

**Figure 47**


*Fig. 47. Varicorhinus discognathoides* Nichols and Pope. Type. 225 mm. without caudal.

**Description:**—Depth in length to base of caudal, 3.6; head, 4.6; eye in head, 6 (specimen 225 mm. standard length). Dorsal rays, 12; anal, 7; scales, 39.

**Remarks:**—The type of this species was taken in the Golden River at its point of emergence from the mountains five miles southeast of Namfong, Hainan, and it may be a hill form.

Varicorhinus pogonifer Lin


Osteochilus pogonifer, Lin, 1933, Lingnan Sci. Jour., Canton, XII, p. 344.

**Description:**—Depth in length to base of caudal, 4.3; head, 4.3; eye in head, 5.8 (specimen 152 mm. standard length). Dorsal rays, 13; anal, 7; scales, 39 to 42.

Lower lip free in front, papilllose. Four barbels, rostral minute, maxillary nearly as long as eye and deeply inserted in lateral-postlabial groove. Lin may be right in considering this form to have affinity with *Osteochilus*.

Subgenus Varicorhinus Rüppell


Varicorhinus kreyenbergii (Regan)

Gymnostomus kreyenbergii Regan, 1908, Ann. Mag. Nat. Hist., (8) I, p. 109, Fig. a, Pl. iv, fig. 1. Nankancho near Tinghsiang [probably in Kiangsi].

**Locality of Material:**—Yangtze; “Nankanho at Pinghsiang” (Kreyenberg and Pappenheim, 1909, p. 11).

**Description:**—Depth in length, 3.7; head, 4; eye in head, 4 to 5 (specimens of 90 and 160 mm. total length). Dorsal rays, 10; anal, 5; scales, 41 or 42.
Varicorhinus macrolepis (Bleeker)


_Description:_—Depth in length to base of caudal, 5; head, 4.7; eye in head, about 4 (specimen about 400 mm. long). Dorsal rays, 10 or 11; anal, 7 or 8; scales, about 50.

Varicorhinus barbatus (Lin)


_Description:_—Depth in length to base of caudal, 4.5 to 4.7; head, 4.3 to 4.9; eye in head, 4 to 5 (specimens 118 mm., etc., standard length). Dorsal rays, 10; anal, 7; scales, 48 to 50.

Varicorhinus tamusuiensis (Oshima)


_Locality of Material:_—Specimens examined from Chungan Hsien, Yenping, etc., Fukien; up to 200 mm. standard length.

_Description:_—Depth in length to base of caudal, 4.3; head, 4; eye in head, 3.4 (specimen of 95 mm. standard length). Dorsal rays, 10; anal, 7 or 8; scales, about 48.

Varicorhinus robustus Nichols

_Figure 48_


Locality of Material:—Specimens examined from Fuching Hsien and Yenping, Fukien; up to 175 mm. standard length.
Description:—Depth in length to base of caudal, 3.7; head, 4; eye in head, 3.5 (specimen of 103 mm. standard length). Dorsal rays, 10; anal, 8; scales, 47.

Varicorhinus shansiensis Nichols

Description:—Depth in length to base of caudal, 3.9; head, 4.5; eye in head, 5 (specimen of 174 mm. standard length). Dorsal rays, 10; anal, 7; scales, 51.

Varicorhinus mutabilis (Lin)

Description:—Depth in length to base of caudal, 4.4; head, 4.7; eye in head, 5.8 (specimen 128 mm. standard length). Dorsal rays, 10; anal, 7; scales, 44.

Remarks:—This may be generically separable from Varicorhinus but seems to have no close relationship with Epalzeorhynchus.

Subgenus Rectoris Lin


Varicorhinus posehensis (Lin)


Description:—Depth in length to base of caudal, 5.4; head, 5.2; eye in head, 4.7 (specimen 109 mm. long). Dorsal rays, 10; anal, 7; scales, 45. Four barbels, the rostral slightly longer than the maxillary, about 2 in eye.

Subgenus Sinilabeo Rendahl

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Varicorhinus tungting Nichols

Figure 50


Labeo diplostomus, Tchang, 1933, Zool. Sinica, (B) II (1), p. 32, Fig. 11. Szechwan.

Labeo (Varicorhynus) rendahli Kimura, 1934, Jour. Shanghai Sci. Inst., Sec. 3, I, p. 125, Pl. iii, fig. 2. Chungking, Szechwan; and Luchow.

![Figure 50. Varicorhinus tungting Nichols. Type. 126 mm. standard length.](image)

Description:—Depth in length to base of caudal, 4.5; head, 4.4; eye in head, 5 (specimen of 126 mm. standard length). Dorsal rays, 12; anal, 7; scales, 45.

Remarks:—This is close to Varicorhinus diplostomus Heckel (1838, Fische aus Caschmir, p. 67, Pl. xi, Kashmir) but seems to have a more inferior, slightly different mouth and more deeply forked caudal.

Genus Onychostoma Günther


Rather small or moderate-sized, free swimming, Chinese carps with an inferior, transverse mouth (straight across) without free lips, the lower jaw covered by cartilage; a more or less serrate spine in the dorsal, sometimes with a soft terminal portion. No barbels. Gill membranes attached to breast under edge of preopercle. Anal fin with 5 branched rays.

Vent and anal fin not bordered by a row of enlarged scales. Anal base well behind that of dorsal. No scaleless keel before anal fin. Gill rakers not fused. Eye placed above the axis of the body.
SYSTEMATIC ACCOUNT

Key to Chinese Onychostoma

1. Deeper; depth, 3 to 3.5 (specimens of 198 mm. standard and 240 mm. total length). Serrate dorsal spine strong. Interorbital wide (2 or less in head) .......... see 2
   More slender; depth, 4 (specimens of about 125 mm. standard length) ......... see 3
2. Depth, 3 (at 198 mm. standard length) ........................................ fontouensis
   Depth, 3.5 (at 240 mm. total length). Greatest depth before dorsal origin; peduncle relatively long ........................................ gerlachi
3. Serrate dorsal spine rather strong ........................................ leptura
   Serrate dorsal spine weak ...........................................

Onychostoma laticeps Günther


Onychostoma laticeps laticeps Günther


Description:—Depth in length to base of caudal, 3; head, 5; eye in head, 4.4 (specimen of 198 mm. standard length). Dorsal rays, II, 8 or 9; anal, 7 or 8; scales, 47.

Onychostoma laticeps fontouensis Tchang

Varicorhinus rarus Lin, 1933, Lingnan Sci. Jour., Canton, XII, p. 204, Fig. 1. Kweichow.

Description:—Depth in length to base of caudal, 3.5; head, 4.7 to 4.8; eye in head, 5 (specimen of 240 mm. total length). Dorsal rays, II, 8; anal, 7; scales, 48.

Onychostoma gerlachi (Peters)

Barbus gerlachi Peters, 1880, Monatsber. Akad. Wiss. Berlin, p. 1034, Fig. 5. Hong Kong.

Description:—Depth in length to base of caudal, 4; head, 5; eye in head, 3.5 (specimen 165 mm. long). Dorsal rays, II, 8; anal, 7; scales, 49.

Onychostoma leptura (Boulenger)

Figure 51


Locality of Material:—Specimens examined from Hainan.

Description:—Depth in length to base of caudal, 4; head, 4.5; eye in head, 3.3 (specimen of 125 mm. standard length). Dorsal rays, 10 (II, 8); anal, 7 or 8; scales, 46 to 49.
Genus Xenocypris Günther


This genus comprises compressed, more or less silvery, actively free swimming carps of moderate size. They are characterized by small, inferior, transverse mouth with cartilaginous border, and a strong smooth spine in the dorsal.

Pharyngeal teeth in 2 or 3 rows. No barbels. Anal with 8 to 12 branched rays; dorsal with 7 or 8, ending before anal origin.

Vent and anal fin not bordered by a row of enlarged scales. No serrate spinous ray in the anal. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

The comparatively deep-bodied, fine-scaled subgenera Plagiognathops (with a scaleless keel behind the ventrals) and Distoechodon (with only 2 rows of teeth) are represented by one or two species. Fishes of the subgenus Xenocypris are common in China, representing several related forms which are not easily differentiable.

**Key to Chinese Xenocypris**

1. Scales, less than 70
   - Scales, 70 or more
   - Scales, 50 to 60
   - Scales, 60 to 65
   - Scales, about 50. Anal rays, 11
   - Scales, about 54. Anal rays, 13
   - Scales, about 58. Anal rays, 11. Interorbital broad, 2.5 in head

2. Scales, 70 or more
   - Scales, 50 to 60
   - Scales, 60 to 65
   - Scales, about 50. Anal rays, 11
   - Scales, about 54. Anal rays, 13
   - Scales, about 58. Anal rays, 11. Interorbital broad, 2.5 in head

3. Scales, 50 to 60
   - Scales, 60 to 65
   - Scales, about 50. Anal rays, 11
   - Scales, about 54. Anal rays, 13
   - Scales, about 58. Anal rays, 11. Interorbital broad, 2.5 in head

4. Scales, 60 to 65
   - Scales, about 50. Anal rays, 11
   - Scales, about 54. Anal rays, 13
   - Scales, about 58. Anal rays, 11. Interorbital broad, 2.5 in head

5. Scales, 70 or more
   - Scales, 50 to 60
   - Scales, 60 to 65
   - Scales, about 50. Anal rays, 11
   - Scales, about 54. Anal rays, 13
   - Scales, about 58. Anal rays, 11. Interorbital broad, 2.5 in head

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**PLATE VI**

**Fig. 1.** Acanthorhodeus guichenoti Bleeker. 73 mm. standard length. Tungting Lake.

**Fig. 2.** Sarcocheilichthys sinensis sinensis Bleeker. 120 mm. standard length. Tungting Lake.

**Fig. 3.** Hemibarbus maculatus Bleeker. 135 mm. standard length. Tungting Lake.
SYSTEMATIC ACCOUNT

4. Longest dorsal ray slightly shorter than head; length of peduncle distinctly greater than its depth. Anal rays, 10 to 13 ...........................................  davidii
   Longest dorsal ray slightly longer than head; length of peduncle only slightly greater than its depth. Anal rays, 13 ...............................................  insularis

5. Teeth 3-rowed .................................................................  see 6
   Teeth 2-rowed ...............................................................  see 9

6. Dorsal spine slender (shorter than head), its tip usually articulated. Keel on the belly little developed. Scales, 70 to 74 .................................  see 7
   Dorsal spine strong. Keel on the belly well developed. Scales, 76 to 84 .......  microlepis

7. Eye small (5 in head at about 150 mm. length). Anal rays, 11 ..................  jangi
   Eye larger (3.5 in head at 123 mm. standard length). Anal rays, 13 or 14  ........  see 8

8. Tip of dorsal spine articulated. Scales, 72 .........................................  yunnanensis
   Tip of dorsal spine not articulated. Scales, 70 .....................................  suifuensis

9. Depth, about 4.75 .............................................................  tumirostris
   Depth, about 3.8 (specimen of 103 mm. standard length) ...........................  compressus

Subgenus Xenocypris Günther


Xenocypris argentea Günther


Description:—Depth in length to base of caudal, 5; head, 4.3; eye in head, somewhat more than 3 (specimen about 100 mm. long). Dorsal rays, II, 7 or 8; anal, 13; scales, 54.

Xenocypris davidi Bleeker


Xenocypris davidi davidi Bleeker


Locality of Material:—Specimens examined from Shansi; Tungting Lake, Hunan; Anhwei; Yenping; up to 146 mm. standard length.

Description:—Depth in length to base of caudal, 4.1; head, 4.3; eye in head, 4 (specimen of 118 mm. standard length, perhaps grows much deeper with age). Dorsal rays, II, 7 or 8; anal, 10 to 13; scales, 62 to 65.

Xenocypris davidi lampertii Popta


Locality of Material:—Specimen of 107 mm. standard length from Tsinan, Shantung, is the only one examined which seems referable to this form, of which we have not been able definitely to locate the type locality. It is close to X. d. davidi.

Description:—Depth in length to base of caudal, 3.8 to 3.9; head, 4.7 to 4.9; eye in head, 3.5 (specimens of 106 and 107 mm. standard length). Dorsal rays, II, 7; anal, 11; scales, 58 or 59.

Xenocypris davidi insularis Nichols and Pope

Figure 52

Xenocypris insularis Nichols and Pope, 1927, Bull. Amer. Mus. Nat. Hist., LIV, p. 363, Fig. 29. Hainan.


Fig. 52. Xenocypris davidi insularis Nichols and Pope. Type. 213 mm. without caudal.

Description:—Depth in length to base of caudal, 3.7; head, 4.9; eye in head, 4 (specimen of 213 mm. standard length). Dorsal rays, II, 7; anal, 13; scales, 63.

Xenocypris macrolepis Bleeker


Xenocypris tapeinosoma Bleeker, 1871, ibid., p. 55. Yangtze.


Description:—Depth in length to base of caudal, about 4; head, about 4.5; eye in head, a little more than 3 (specimen about 300 mm. long). Dorsal rays, II, 7; anal, 11 or 12; scales, about 50.

Xenocypris fangi Tchang

Xenocypris fangi Tchang, 1930, Sinensia, I, p. 92, Fig. 3. Soo-foo [Suifu, Szechwan].

Description:—Depth in length to base of caudal, 4 to 4.7; head, 4.4 to 4.8; eye in head, 5 (specimens about 150 mm. long). Dorsal rays, II, 7; anal, 11; scales 72 to 74.
SYSTEMATIC ACCOUNT

Xenocypris yunnanensis Nichols

Figure 53


![Image of Xenocypris yunnanensis](image)

**Description:**—Depth in length to base of caudal, 4.2; head, 3.9; eye in head, 3.5 (specimen of 123 mm. standard length). Dorsal rays, II, 7 or 8; anal, 13 or 14; scales, 72.

*Xenocypris suifuensis* Kimura


**Description:**—Depth in length to base of caudal, 4; head, 4.7 to 5; eye in head, 3.6 to 3.7 (specimens 162 to 170 mm. standard length). Dorsal rays, II, 7; anal, 13; scales, 70.

Depth of peduncle equal to or slightly greater than its length; dorsal origin midway between tip of snout and caudal base. Questionably distinct from *Xenocypris yunnanensis*.

Subgenus *Plagiognathops* Berg


*Xenocypris microlepis* Bleeker


*Xenocypris setchuanensis* Tchang, 1930, Cyprinidés du Bassin du Yangtze, p. 105. Szechwan.

**Description:**—Depth in length to base of caudal, 3.1 to 3.6; head, about 5; eye in head, 3.7 to 3.8 (last two measurements for a large specimen about 675 mm. long). Dorsal rays, II, 7; anal, 13 or 14; scales, 74 to 84.
Subgenus Distoechodon Peters


Xenocypris tumirostris (Peters)


Description:—Depth in length, 4.7 to 4.8; head, scarcely longer than depth; eye in head, 4.5. Dorsal rays, II, 7; anal, 11; scales, 75 to 80.

Xenocypris compressus Nichols

Figure 54


Locality of Material:—Specimens examined from Kienning and Yenping, Fukien; up to 173 mm. standard length.

Description:—Depth in length to base of caudal, 3.8 to 4.2; head, 3.6 to 3.9; eye in head, 3 to 3.5 (specimens of 36 to 103 mm. standard length). Dorsal rays, II, 7; anal, 12; scales, 74.

Genus Acanthobrama Heckel


Silvery, compressed, free swimming, Asiatic carps of small or moderate size, with a small mouth, terminal or subterminal; a strong, smooth spine in the dorsal; scaleless keel between anal and ventral fins; the lateral line little bent down.

Scales small. Dorsal fin inserted behind the ventrals. Anal fin rather long, of something like 20 rays. Pharyngeal teeth in one row.

Barbels absent. Vent and anal fin not bordered by a row of enlarged scales. No serrate, spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.
SYSTEMATIC ACCOUNT

Key to Chinese Acanthobrama

Depth, 3.4 to 3.7; scales, 40 to 45 .................................................. \textit{dumerili}
Depth, about 3.8 (at 100 mm. standard length); scales about 50 .......................... \textit{simoni}

\textbf{Acanthobrama dumerili} (Bleeker)


\textit{Locality of Material:}—Specimens examined from Anhwei.

\textit{Description:}—Depth in length to base of caudal, 3.4; head, 3.9; eye in head, 3.2 (specimen of 47 mm. standard length). Dorsal rays, II, 7; anal, 12 to 13; scales, 40 to 45.

\textbf{Acanthobrama simoni} Bleeker


\textit{Locality of Material:}—Specimens examined from Tungting Lake, Hunan.

\textit{Description:}—Depth in length to base of caudal, 3.8; head, 4.1; eye in head, 3.1 (specimen of 101 mm. standard length). Dorsal rays, II, 7; anal, 12; scales, 51.

Genus Culticula Abbott


A small, free swimming, Chinese carp with a scaleless keel behind the ventrals, not extending forward of same; a well-developed spine in the dorsal; lateral line moderately bent down, without abrupt changes in direction; anal with about 11 branched rays; teeth in one row, knife-shaped, not hooked.

Mouth terminal, oblique, of moderate size. Peritoneum black. Sides with a dark lateral band.

Barbels absent. No serrate spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

Key to Chinese Culticula

Anal, 13. Scales, 47 .......................................................... \textit{emmelas}
Anal, 11. Scales, 58 .......................................................... \textit{tchangi}

\textbf{Culticula emmelas} Abbott


\textit{Description:}—Depth in length to base of caudal, 4; head, 4.4; eye in head, 4 (specimen 70 mm. long). Dorsal rays, II, 7; anal, 13; scales, 47.
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Culticula tchangi Shaw


Description:—Depth in length to base of caudal, 4 to 4.5; head, 4.8 to 4.9; eye in head, 3.5 to 3.7 (specimens 112 to 120 mm. long). Dorsal rays, II, 7; anal, II; scales, 58.

Remarks:—This form suggests Xenocypris davidi lampertii and is described as having a “rounded abdomen between ventrals and anal,” but is here retained provisionally as a second species of Culticula.

Genus Yaoshanicus Lin

Yaoshanicus Lin, 1931, Carps of Kwangtung, p. 50. Type: Yaoshanicus arcus Lin.

This genus with thick, adherent scales and complete lateral line, evenly bent down and rising on the peduncle to terminate in its center, separated from Aphyocypris by Chu, seemingly also contains Yaoshanicus arcus Lin, named at an earlier date.

Key to Chinese Yaoshanicus

Mouth moderately oblique; breast not particularly deep; jaws equal .................. normalis
Mouth very oblique; breast deep and rounded; lower jaw slightly included ............ arcus

Yaoshanicus normalis (Nichols and Pope)

Figure 55 and Plate I, figure 4


Fig. 55. Yaoshanicus normalis (Nichols and Pope). Type. 64 mm. without caudal.

Description:—Depth in length to base of caudal, 4; head, 4; eye in head, 4 (specimen 64 mm. standard length). Dorsal rays, 10; anal, 10 or 11; scales, 35.
SYSTEMATIC ACCOUNT

Yaoshanicus arcus Lin


Description:—Depth in length, 4; head, 4; eye in head, 4 (specimen 61 mm. long). Dorsal rays, 9; anal, 9; scales, 36.

Looks much like Aphyocypris normalis, but breast deep and rounded; mouth very oblique, maxillary not reaching to under front of eye; lower jaw slightly included; teeth 3-rowed: 5, 4, 2.

Genus Aphyocypris Günther


Moderately large-scaled, soft-finned, free swimming minnows with a scaleless keel before the anal, not passing forward of the ventral fins, the anal fin short, with about 7 branched rays. Three or four species in China and adjacent islands.

Mouth oblique, terminal, the jaws approximately equal or the lower projecting. Lateral line incomplete.

Barbels absent. Vent and anal fin not bordered by a row of enlarged scales. Upper jaw protractile. Anal origin behind the vertical from the end of the dorsal. Gill rakers not fused. Eye placed in or above the axis of the body.

Key to Chinese Aphyocypris

1. Depth, 3.5 (at 60 mm. length); scales, 30; lower jaw distinctly projecting; dorsal origin equidistant between front of eye and base of caudal .................. kikuchii
   Depth, 4 (at 30 to 50 mm. length); scales, 32; lower jaw scarcely projecting .... chinensis
   Depth, 3.2 to 3.8 (at 30 to 45 mm. length); scales, 30 to 33; lower jaw more or less projecting; dorsal origin equidistant between edge of preopercle and base of caudal; a dark lateral band more or less pronounced .................. see 2
2. Lower jaw slightly projecting; mouth moderately oblique; maxillary to under front of eye, about 2.6 times in length of head .................. shantung
   Lower jaw decidedly projecting, mouth very oblique; maxillary barely to under front of eye; about 3 times in length of head .................. agilis

Aphyocypris chinensis Günther


Aphyocypris chinensis chinensis Günther


Locality of Material:—Chekiang (fide Gee).

Specimen examined from southern Hupeh (by courtesy of the British Museum).

Description:—Depth in length to base of caudal, 4; head, 3.7; eye in head,
slightly less than 4 (specimen about 50 mm. long). Dorsal rays, 9; anal, 9; scales, 31 or 32.

Aphyocypris chinensis shantung Nichols

Figure 56

*Aphyocypris chinensis shantung* Nichols, 1930, Amer. Mus. Novitates, No. 402, p. 1, Fig. 1. Tsinan, Shantung.


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**Description:**—Depth in length to base of caudal, 3.2 to 3.8; head, 3.4 to 3.8; eye in head, 3.2 to 3.6 (specimens 30 to 46 mm. standard length). Dorsal rays, 9 (rarely 8); anal, 9 (rarely 10); scales, 30 to 33.

Aphyocypris agilis (Nichols)

Figure 57


**Description:**—Depth in length to base of caudal, 3.3; head, 3.6; eye in head, 3.5 (specimen of 41 mm. standard length). Dorsal rays, 9; anal, 9; scales, 31.

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**Remarks:**—This shy and active little fish, found in a cold spring on the edge of a paddy field by Walter Granger, was at first thought to represent an unde-
scribed genus, but on the contrary is doubtless close to certain other forms of *Aphyocypris*.

*Aphyocypris kikuchii* (Oshima)


**Locality of Material:**—Specimen examined from Fukien.

**Description:**—Depth in length to base of caudal, 3.5; head, 3.5; eye in head, 4 (specimen 60 mm. long). Dorsal rays, 9; anal, 9; scales, 30.

**Genus Hypophthalmichthys Bleeker**


An aberrant genus of heavy-bodied, broad-headed, fine-scaled carps, valued as food and raised in ponds by the Chinese. Systematic position uncertain.

Eye placed more or less below the axis of the body. Gill membranes broadly united, free from the isthmus. Breast and belly with a keel, which is scaled to the edge but not crossed by scales.

Dorsal with 11 to 15 branched and no spinous rays. Pharyngeal bones perforate; the teeth in one row: 4–4, much compressed. Gill rakers more or less fused.

**Key to Chinese* Hypophthalmichthys**

Keel on breast as well as belly, not freely crossed by scales ———— *molitrix*

Keel on breast absent or indistinct, freely crossed by scales. Head, about 3; eye in snout, at least 1.5, usually more than 2; pectoral fin longer than postorbital part of head *nobilis*

*Hypophthalmichthys molitrix* (Cuvier and Valenciennes)


**Locality of Material:**—Ningpo; Yangtze (fide Gee).

Specimens examined from Tungting Lake, Hunan; near Canton.

**Description:**—Depth in length to base of caudal, 3.2 to 3.6; head (with opercular membrane), 3.2; eye in head, 4.3 to 5.2 (specimens of 150 to 180 mm. standard length). Dorsal rays, 9 to 10; anal, 13 to 17; scales, 107 to 115.

**Remarks:**—Called “p’ang-t’ou-yü” at Tungting Lake, where it is very common. It attains a length of approximately 2 feet, perhaps more, and is to be seen for
sale in great numbers. Every day baskets of it are displayed on the streets of Yochow (C. H. Pope, field notes).

Hypophthalmichthys nobilis (Richardson)


Locality of Material:—Ningpo; Shanghai; Yangtze (fide Gee). Yangtze at Hankow (Kreyenberg and Pappenheim, 1909, p. 17).

Specimens examined from near Canton; up to 195 mm. standard length.

Description:—Depth in length to base of caudal, 3.1; head (without opercular membrane), 3.1 (with membrane, 2.9); eye in head, 5 to 6 (specimens of 165 mm. standard length). Dorsal rays, 10; anal, 16; scales, about 115.

Genus Rasborinus Oshima


Rather small, more or less elongate or deep-bodied, compressed, soft-finned carps with a scaleless keel before the anal not passing forward of the ventral fins, the anal fin long, with more than 15 branched rays. Two or three forms in southeastern China and adjacent islands.

Mouth rather small, oblique, terminal or the lower jaw included. Lateral line evenly bent down, rising on peduncle to terminate near its center. Dorsal placed behind the ventrals. The vertical from the hind end of its base anterior to the origin of the anal. Gill membranes attached to the isthmus under the hind margin of eye, or narrowly united at base, free from isthmus.

Barbels absent. Upper jaw protractile. Gill rakers not fused. Eye placed in or above the axis of the body.

Berg (1932.2, p. 156) synonymizes Rasborinus with Metzia Jordan and Thompson, 1914 (Mem. Carnegie Mus., VI, pp. 206, 227), type Acheilognathus mesembrinum Jordan and Evermann (1902, p. 323, Fig. 6) from Formosa, a different looking fish with very similar formulae.

Rasborinus takakii Oshima


Key to Chinese Rasborinus takakii

Lower jaw slightly projecting; depth, 3.4 (at 69 mm. standard length) .............. jukiensis
Lower jaw slightly included; depth, 3.2 (at 95 mm. standard length) .............. hainanensis
SYSTEMATIC ACCOUNT

Rasborinus takakii fukiensis Nichols

Figure 58


**Locality of Material:**—Specimens examined from Fuching Hsien, and near Yenping, Fukien; up to 77 mm. standard length.

![Fish diagram](image1)

**Description:**—Depth in length to base of caudal, 3.4; head, 4; eye in head, 3.5 (specimen of 69 mm. standard length). Dorsal rays, 10; anal, 17; scales, 39.

Rasborinus takakii hainanensis Nichols and Pope

Figure 59


**Description:**—Depth in length to base of caudal, 3.2; head, 3.8; eye in head, 3.8 (specimen of 95 mm. standard length). Dorsal rays, 9; anal, 19; scales, 38 to 41.

![Fish diagram](image2)

**Remarks:**—This species was constantly taken in the immediate environs of Nodoa, Hainan (C. H. Pope, field notes).
Hemiculterella Warpachowski

Hemiculterella Warpachowski, 1888, Bull. Acad. Sci. St. Pétersbourg, XXXII, p. 23. Type: Hemiculterella sau-
vagei Warpachowski.

Rather elongate, free swimming carps with a scaleless keel before anal, which keel may be more or less appreciable though scaled, forward of the ventrals; lateral line descending rather steeply, running low, ascending rather abruptly to run in the center of peduncle; no spinous ray in the dorsal. Not common; three or four species described are probably referable to this genus.

Mouth oblique, the jaws equal. Anal with 12 or more branched rays. Gill membranes narrowly attached to the center of the isthmus. Pharyngeal teeth in 3 rows.

Barbels absent. No serrate spinous ray in the anal. Upper jaw protractile. Gill rakers not fused. Eye placed in or above the axis of the body.

Key to Chinese Hemiculterella

1. Anal rays, 14 or 15 .......................................................... see 2
   Anal rays, 21 or 22 .......................................................... see 3
   Anal rays, about 18 .......................................................... tsaninensis

2. Eye in head, about 4. Scales, 50 .......................................................... sauvagei
   Eye in head, about 5. Scales, 45 to 48 .......................................................... eigenmanni

3. Depth in standard length, about 5. Snout longer than eye .......................................................... engraulis
   Depth in standard length, about 4. Snout shorter than eye .......................................................... setchuanensis

Hemiculterella sauvagei Warpachowski

Nicholsiculter rendahli Wu, 1930, Sinensia, I, p. 74, Fig. 4. Kiating.

Description:—Depth in length to base of caudal, 4.2 to 4.8; head, 4.2 to 4.4; eye in head, 3.4 to 3.8 (specimens 115 to 120 mm. total length). Dorsal rays, 9; anal, 15; scales, 50 to 52.

Hemiculterella eigenmanni (Jordan and Metz)


Locality of Material:—Tsinan, Shantung (Mori, 1928, p. 69).

Description:—Depth, about equal to head; head in length, 4.3 to 4.8; eye, about 5 (specimens 77 to 169 mm. long). Dorsal rays, 9 or 10; anal, 14 to 16; scales, 45 to 48.

Hemiculterella tsinanensis (Mori)

Pseudolaubuca tsinanensis Mori, 1933, Japanese Jour. Zool., V, p. 165, Fig. 1. Tsinan.

Description:—Depth in length, 5.3; head, 4; eye in head, 4.8 (specimen 128 mm. total length). Dorsal rays, 9; anal, 18; scales, 52.
Mouth little oblique; maxillary in head, 2.7 (fig.); pectoral pointed, almost to ventral origin.

**Hemiculterella engraulis** Nichols

Figure 60


*Pseudolaubuca shawi* Tchang, 1930, Cyprinidés du Bassin du Yangtze, p. 147, Pl. III, fig. 4. Szechwan.


![Fig. 60. Hemiculterella engraulis Nichols. Type. 148 mm. standard length.](image)

**Description:**—Depth in length to base of caudal, 5; head, 3.7; eye in head, 4.4 (specimen of 148 mm. standard length). Dorsal rays, 9; anal, 21 or 22; scales, 45 to 50.

**Remarks:**—Called "hsien-tsan" at Tungting Lake—a small species (C. H. Pope, field notes).

**Hemiculterella setchuanensis** (Tchang)

*Pseudolaubuca setchuanensis* Tchang, 1930, Cyprinidés du Bassin du Yangtze, p. 147. Szechwan.

**Description:**—Depth in length to base of caudal, 4; head, 4; eye in head, 4.5 (specimens 130 to 140 mm. total length). Dorsal rays, 9; anal, 21; scales, 48.

**Genus Hemiculter** Bleeker


More or less slender, compressed, silvery, actively free swimming carps of small or moderate size, generally common in Chinese fresh waters. Several closely related and not easily separable species.

A naked keel before the anal, the keel sometimes extending forward of the ventrals onto the breast. A strong, smooth spine in the dorsal. Mouth oblique, jaws about equal. Lateral line descending steeply in front, running low, and slanting abruptly upward to the center of the peduncle, over the anal axil.

Anal with not less than 10 branched rays. Pharyngeal teeth in 3 rows.
Barbels absent. No serrate spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

**Key to Chinese Hemiculter**

1. Keel extending forward of ventrals (*Hemiculter*) .................................................. see 2
   Keel between ventrals and anal only (*Pseudohemiculter*) ........................................see 6
2. Body well compressed; scales adherent ................................................................. see 3
   Body only moderately compressed (width in head, about 2); scales more or less deciduous; anterior flexure in lateral line not abrupt; dorsal spine slender ... clupeoides
3. Head less than depth; scales, usually less than 50 ............................................. see 4
   Head equal to or greater than depth ................................................................. see 5
4. Depth, 4 or less (at 100 mm.). Scales, 45 to 50 .................................................. schrencki
   Depth, more than 4 (at 100 mm.). Scales, less than 45 ........................................ shibatae
5. Head and depth, 4.5 or more (in grown fish) .................................................... leucisculus
   Head and depth, about 4 (in grown fish) .......................................................... kneri
6. Dorsal spine much shorter than head, smooth ..................................................... see 7
   Dorsal spine almost as long as head, finely serrate on its hind edges ...................... serrata
7. Depth, 4 or less (at 115 mm. standard length); scales, about 56 ....................... hainanensis
   Depth, about 5 (at 105 mm. standard length); scales, 50 to 55 ............................... dispar
   Depth, 4.5 to 4.8 (at 150 to 185 mm. total length); scales, about 48 ........................ hunanensis

**Subgenus Hemiculter Bleeker**


**Hemiculter leucisculus** (Basilewski)


**Locality of Material:**—Shanghai; Chihli; Yangtze (*fide* Gee).

Small specimens examined from Shantung.

**Description:**—Depth in length to base of caudal, 4.6 to 4.8; head, 4 (young fish) to 4.8; eye in head, 4.2 to 4.4. Dorsal rays, II, 7; anal, 13 to 15; scales, 50 to 53.

**Hemiculter schrenki** Warpachowski


**Hemiculter schrencki schrencki** Warpachowski

Localities of Material:—Specimens examined from Fukien and near Canton; up to about 170 mm. standard length.

Description:—Depth in length to base of caudal, 3.7 to 3.9; head, 4.3 to 4.4; eye in head, 3.9 to 4.1 (specimens 80 to 98 mm. standard length). Dorsal rays, II, 8; anal, 12 to 15; scales, 45 to 50.

Hemiculter schrencki shibatae Mori

Hemiculter shibatae Mori, 1933, Japanese Jour. Zool., V, p. 166, Fig. 2. Tsinan.

Description:—Depth in length, 4.3; head, 4.5; eye in head, 4.5 (specimen 108 mm. total length). Dorsal rays, II, 7; anal, 15; scales, 41.

Hemiculter kneri Warpachowski


Locality of Material:—Specimens examined from Anhwei.

Description:—Depth in length to base of caudal, 4.4; head, 4; eye in head, 3.3 (specimens of 83 to 85 mm. standard length). Dorsal rays, II, 7 or 8; anal, 13 to 17; scales, 46 to 50.

Hemiculter clupeoides Nichols

Figure 61 and Plate IV, figure 4


![Hemiculter clupeoides Nichols. Type. 127 mm. standard length.](image_url)

Description:—Depth in length to base of caudal, 4.3; head, 4.6; eye in head, 3.7 (specimen of 127 mm. standard length). Dorsal rays, II, 7; anal, 14; scales, about 55.
THE FRESH-WATER FISHES OF CHINA

Subgenus Pseudohemiculter Nichols and Pope


**Hemiculter hainanensis** Nichols and Pope

*Figure 62*


![Image of Hemiculter hainanensis](image)

**Description:**—Depth in length to base of caudal, 3.7; head, 3.5; eye in head, 3.8 (specimen of 115 mm. standard length). Dorsal rays, II, 7; anal, 17; scales, 56.

**Remarks:**—This species was constantly taken in the immediate environs of Nodox, Hainan (C. H. Pope, field notes).

**Hemiculter dispar** Peters

_Hemiculter dispar_ Peters, 1880, Monatsber. Akad. Wiss. Berlin, p. 1035, Fig. 7. Hong Kong.

**Hemiculter dispar dispar** Peters

*Figure 63*

_Hemiculter dispar_ Peters, 1880, Monatsber. Akad. Wiss. Berlin, p. 1035, Fig. 7. Hong Kong.

?_Barilius hainanensis_ Boulenger, 1899, Proc. Zool. Soc. London, p. 901, Pl. lxix, fig. 2. Hainan. Chu (1935, p. 4) says he has examined the type and this is a _Hemiculter_.

![Image of Hemiculter dispar dispar](image)

**Locality of Material:**—Specimens examined from Chungan Hsien, Kienning, and Yenping, Fukien; Hokou, Kiangsi; up to 122 mm. standard length.
Description:—Depth in length to base of caudal, 5 to 5.4; head, 3.9 to 4.3; eye in head, 3.2 to 3.7 (specimens 95 to 122 mm. standard length). Dorsal rays, II, 7; anal, 16 to 19; scales, 50 to 55.

Hemiculter dispar hunanensis Tchang


Description:—Depth in length to base of caudal, 4.5 to 4.8; head, 4; eye in head, 4 (specimens 150 to 185 mm. total length). Dorsal rays, II, 7; anal, 15 to 18; scales, about 48.

Subgenus Hainania Koller


Hemiculter serrata (Koller)

Figure 64

Hainania serrata Koller, 1927 (July), Ann. Naturhist. Mus. Wien, XLI, p. 45, Fig. 5. Hainan. (Description inaccurate?)

Hemiculter serracanthus Nichols and Pope, 1927 (Sept.), Bull. Amer. Mus. Nat. Hist., LIV, p. 373, Fig. 37. Hainan.

Fig. 64. Hemiculter serrata (Koller). Type of Hemiculter serracanthus Nichols and Pope. 113 mm. without caudal.

Description:—Depth in length to base of caudal, 4.5; head, 3.8; eye in head, 3.1 (specimen of 113 mm. standard length). Dorsal rays, II, 7; anal, 16; scales, 53.

Genus Toxabramis Günther


More or less slender, compressed, silvery, actively free swimming Chinese carps of small or moderate size, resembling Hemiculter but the dorsal spine serrated and the teeth in 2 rows. Uncommon, the species few and difficult.

A scaleless keel before the anal extending forward of the ventrals onto the
breast. Mouth oblique, jaws about equal or the lower slightly projecting. Lateral line descending steeply in front, running low and slanting abruptly upward to the center of the peduncle over the anal axil. Anal with more than 10 branched rays.

Barbels absent. No serrate spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

**Key to Chinese Toxabramis**

- Anal rays, 20; scales, 62
- Anal rays, 14; scales, 44
- Anal rays, 15; scales, 49 to 51

**Toxabramis swinhonis** Günther


*Description:—* Depth in length to base of caudal, about 4.7; head, 4.5; eye in head, 3.5 (specimen about 100 mm. long). Dorsal rays, II, 7; anal, 20; scales, 62.

**Toxabramis argentifer** Abbott

*Toxabramis argentifer* Abbott, 1901, Proc. U. S. Nat. Mus., XXIII, p. 484, Fig. Chihli.

*Description:—* Depth in length to base of caudal, 4.5; head, about 4.7; eye in head, 4 (specimen 130 mm. long). Dorsal rays, II, 7; anal, 14; scales, 44.

**Toxabramis hoffmanni** Lin

*Toxabramis hoffmanni* Lin, 1934, Lingnan Sci. Jour., Canton, XIII, p. 440, Fig. 1. Wuchow, Kwangsi.

*Description:—* Depth in length to base of caudal, 5.1; head, 4.1; eye in head, 3.1 (specimen 46 mm. standard length). Dorsal rays, II, 7; anal, 15; scales, 49 to 51. Teeth in 2 rows; dorsal spine scarcely serrate.

A young fish resembling *Hemiculter leucisculus* closely.

**Genus Parapelecus** Günther


Active, slender, compressed, soft-finned, silvery carps with a scaleless keel from before the pectorals to the anal; lateral line running low, slanting down steeply in front and gaining the center of the peduncle by a flexure behind; dorsal small, placed well back, its axil just in front of the anal, without a spine. Not common, a few closely related representative species recognized from different Chinese localities.
Mouth terminal or the lower jaw slightly included. Scales small, deciduous. Anal with 21 to 29 rays. Pharyngeal teeth 3-rowed.

No barbels. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye in or above the axis of the body.

**Key to Chinese Parapelecus**

<table>
<thead>
<tr>
<th>Description</th>
<th>Argenteus</th>
<th>Fukiensis</th>
<th>Machaerius</th>
<th>Nickolsi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anal rays, 25; scales, 75</td>
<td>argenteus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anal rays, 21; scales, about 65</td>
<td></td>
<td>fukiensis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anal rays, 29; scales, 68</td>
<td></td>
<td></td>
<td>machaerius</td>
<td></td>
</tr>
<tr>
<td>Anal rays, 25 or 26; scales, 62</td>
<td></td>
<td></td>
<td></td>
<td>nickolsi</td>
</tr>
</tbody>
</table>

**Parapelecus argenteus Günther**


*Description:* — Depth in length to base of caudal, 4.3; head, 5.3; eye in head, 4 (specimen about 240 mm. long). Dorsal rays, 10; anal, 25; scales, 75.

**Parapelecus fukiensis Nichols**

*Figure 65*

*Parapelecus fukiensis* Nichols, 1926, Amer. Mus. Novitates, No. 224, p. 7, Fig. 6. Fukien.

*Description:* — Depth in length to base of caudal, 4.6; head, 4.4; eye in head, about 4 (specimen of 95 mm. standard length). Dorsal rays, 9; anal, 21; scales, about 65.

![Fig. 65. Parapelecus fukiensis Nichols. Type. 95 mm. standard length.](image)

*Remarks:* — Based on a single specimen collected by H. R. Caldwell in Fukien Province, but more exact locality data lost. This form may not be valid, as three specimens from Kienning, Fukien, are referable to *Parapelecus nicholsi* (Fowler), rather than to it.

**Parapelecus machaerius Abbott**


*Description:* — Depth in length to base of caudal, 4.4; head, 5.2; eye in head, 3.7 or 3.8 (specimen 130 mm. long). Dorsal rays, 10; anal, 29; scales, 68.
Parapelecus nicholsi (Fowler)

Figure 66


**Fig. 66. Parapelecus nicholsi** (Fowler). After Fowler.

*Locality of Material:*—Specimens examined from Anhwei; Kienning, Fukien.

*Description:*—Depth in length to base of caudal, 4 to 5.7; head, 4.6 to 4.8; eye in head, 3.3 to 3.7 (specimens 96 to 122 mm. standard length). Dorsal rays, 9 (rarely 10); anal, 24 to 26; scales, 60 to 62.

Genus *Pseudolaubuca* Bleeker


Compressed, soft-finned carps with a keel along the entire abdominal edge, the lateral line gradually bent downwards, without an abrupt bend above the pectorals, which are unusually long. Cleft of the mouth very oblique. Dorsal fin situated entirely in advance of the anal. One or a few more or less lost species of questionable affinities with *Parapelecus, Hemiculterella,* and *Chela.*


No barbels. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye in or above the axis of the body.

*Pseudolaubuca sinensis* Bleeker


*Description:*—Depth in length to base of caudal, 6:5; head, about 6. Dorsal rays, 9; anal, 26; scales of moderate size.

Genus *Ischikauia* Jordan and Snyder


Rather small-scaled, compressed, free swimming, silvery carps of small or moderate size, with a scaleless keel between ventrals and anal, the belly rounded; lateral line running low, usually slanting down steeply in front and reaching the center of the peduncle by a flexure behind. Dorsal and anal (which is rather long) without spinous rays. A few species in China and adjacent islands.

Barbels absent. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

In differentiating Ischikauia from Anabarilius, Chu (1935, pp. 5, 11) does not agree with the characters of the former given in Jordan and Snyder's description nor with their figure of its type species, specimens of which, however, I have not seen.

**Key to Chinese Ischikauia**

1. Anal rays, 12 to 19 ................................................................. see 2
   Anal rays, 12; dorsal origin over or slightly in advance of that of anal; mouth rather large, lower jaw projecting, maxillary to or not quite to under front margin of eye; scales, about 66 .................................. transmontana
2. Scales, about 50; anal rays, 18 to 19 ........................................ see 3
   Scales, 60 to 106 ................................................................. hainanensis
3. Anal rays, 13; scales, about 60 ................................................ see 3
   Anal rays, 15; scales, about 70 ............................................ grahami
   Anal rays, 15 to 17; scales, 76 to 84 .................................. polylepis
   Anal rays, 12; scales, 97 to 105 ........................................... alburnops
   Scales, about 97 to 105 ...................................................... andersoni

Subgenus Ischikauia Jordan and Snyder


*Ischikauia hainanensis* Nichols and Pope

Figure 67 and Plate V, figure 3


---

![Fig. 67. Ischikauia hainanensis Nichols and Pope. Type. 71 mm. without caudal.](image)

**Description:**—Depth in length to base of caudal, 3.6; head, 3.6; eye in head, 3 (specimen of 71 mm. standard length). Dorsal rays, 9; anal, 18 or 19; scales, 50.
Ischikauia grahami (Regan)


*Description:*—Close to *Ischikauia polylepis* and *Ischikauia andersoni*. Dorsal rays, 9; anal, 13; scales, about 60.

Ischikauia polylepis (Regan)


*Description:*—Depth in length, 4.7; head, 4.4; eye in head, 3.7 (specimen 130 mm. long). Dorsal rays, 9; anal, 15; scales, 70.

Ischikauia alburnops (Regan)

Figure 68


Description:—Depth in length, 4.5 to 5; head, 3.5 to 4; eye in head, 3.6 to 4 (specimens 150 to 200 mm. long). Dorsal rays, 9; anal, 15 to 17; scales, 76 to 84.

Ischikauia andersoni (Regan)


*Description:*—Depth in length, 4.4 to 4.8; head, 4; eye in head, 4 to 4.3 (specimens 95 to 125 mm. long). Dorsal rays, 9; anal, 12; scales, 97 to 105.

Subgenus Rohanus Chu


Ischikauia transmontana Nichols

Figure 69

**SYSTEMATIC ACCOUNT**

![Image of fish](Am.Mus.No.8441)

**Fig. 69. Ischikauia transmontana** Nichols. Type. 100 mm. standard length.

*Description:*—Depth in length to base of caudal, 4.4; head, 3.7; eye in head, 4 (specimen of 100 mm. standard length). Dorsal rays, 9 or 10; anal, 11; scales, 66.

**Genus Erythroculter** Berg


More or less slender, compressed, silvery, actively free swimming carps of moderate size generally common in Chinese fresh waters. Several closely related species.

A scaleless keel on belly not extending forward of ventrals. Lateral line but slightly bent down. Lower jaw projecting. A strong, smooth spine in the dorsal.

Mouth oblique or vertical. Air bladder with 3 divisions. Anal long (usually 20 rays or more). Pharyngeal teeth in 3 rows.

Barbels absent. No serrate spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

**Key to Chinese Erythroculter**

1. Scales, 65 to 75; anal rays, 26 to 29  
   Scales, about 60; anal rays, about 21  
   Scales, 77 to 87; anal rays, 22 to 26  
   see 2  
   Scales, about 65  
   see 3  
   2. Depth, about 4; scales, 70 to 75; nape elevated  
   Depth, about 3.4; scales, about 65  
   see 4  
   3. Moderate as to obliqueness of mouth and bending down of lateral line; scales, about 70  
   Mouth more oblique; lateral line almost straight; scales, about 75  
   see 2  
   3. oxycephalus  
   dabryi  
   pseudobrevicauda
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4. Scales, about 77; anal rays, about 22; outlines of *dabryi* but nape less elevated .......................................................... *mongolicus*
Scales, 80 or more; anal rays, 24 to 26 ................................................... see 5

5. Mouth almost vertical; lower outlines more convex than upper; lateral line well bent down ............................................... *oxycephaloides*
Mouth not very oblique; upper outlines more convex than lower; lateral line almost straight ..................................................... *erythropterus aokii*

6. Less slender (depth, about 4) .......................................................... *erythropterus*
More slender (depth, about 4.5) ......................................................... *mongolicus*

Erythroculter *erythropterus* (Basilewski)


Locality of Material:—Chihli; North China (*fide* Gee).
Specimens examined from Tungting Lake, Hunan; up to 261 mm. standard length.

Description:—Depth in length to base of caudal, 4; head, 4.4; eye in head, 3.9 (specimen of 261 mm. standard length). Dorsal rays, II, 7; anal, about 25; scales, about 82.

Remarks:—Called “pai-yii” or “whitefish” at Tungting Lake where it is very common, seen for sale in Yochow. It is said to reach a very large size (200 pounds) (C. H. Pope, field notes).
There is possibility of confusion with some other species here.

Erythroculter *mongolicus* (Basilewski)


Locality of Material:—Specimens examined from Tungting Lake, Hunan.

Description:—Specimens examined from Tungting Lake, Hunan.

Description:—Depth in length to base of caudal, 4.1; head, 3.9; eye in head, 5 (specimen of 213 mm. standard length). Dorsal rays, II, 7; anal, about 22; scales, about 77.

Erythroculter *dabryi* (Bleeker)

Plate IV, figure 2


SYSTEMATIC ACCOUNT


Locality of Material:—Shanghai; Chihli; Canton (fide Gee).
Specimens examined from Tungting Lake, Hunan; up to 180 mm. standard length.

Description:—Depth in length to base of caudal, 4.2; head, 3.6; eye in head, 4 (specimen of 117 mm. standard length). Dorsal rays, II, 7 or 8; anal, 27 to 29; scales, 67 to about 70.

Erythroculter oxycephalus (Bleeker)


Description:—Depth in length to base of caudal, about 3.3; head, about 3.8; eye in head, about 5 (specimen about 600 mm. long). Dorsal rays, II, 7 or 8; anal, 27 or 28; scales, about 65.

Erythroculter oxycephaloides (Kreyenberg and Pappenheim)


Locality of Material:—Specimens examined from Tungting Lake, Hunan.

Description:—Depth in length to base of caudal, 3.6 to 4; head, 3.6 to 4; eye in head, 3.3 to 4.3 (specimens of 96 mm. standard length, and of 172 mm.). Dorsal rays, II, 7; anal, about 26; scales, 80 to 87.

Erythroculter wangi Tchang


Description:—Depth in length to base of caudal, 4.7; head, 3.8; eye in head, 4 (specimen 160 mm. standard length). Dorsal rays, II, 7; anal, 21; scales, 60.

Mouth almost horizontal; upper profile of body more curved than lower; lateral line little decurved.

Erythroculter aokii (Oshima)


Locality of Material:—Specimens examined from Fukien.

Description:—Depth in length to base of caudal, 4.3 to 4.6; head, 3.9 to 4; eye in head, 3.8 to 4 (specimens 254 to 280 mm. long). Dorsal rays, II, 7; anal, 24 or 25; scales, 80 to 86.
Erythroculter pseudobrevicauda Nichols and Pope

Figure 70

Locality of Material:—Specimens examined from Hainan, and near Canton; up to 245 mm. standard length.

Description:—Depth in length to base of caudal, 3.9; head, 4; eye in head, 3.3 (specimen of 170 mm. standard length). Dorsal rays, II, 7; anal, about 26; scales, about 75.

Genus Culter Basilewski


More or less slender, compressed, silvery carps with a scaleless keel on breast (forward of ventrals) as well as on belly. Lateral line dipping very slightly back of the head, running almost straight and in the middle of body. Lower jaw projecting. A strong, smooth spine in the dorsal.

Mouth oblique or almost vertical. Air bladder with 3 divisions. Anal long (more than 20 rays). Pharyngeal teeth in 3 rows.

Barbels absent. No serrate spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

Key to Chinese Culter

1. Pectoral not reaching ventral base; lateral line rather well curved down ... see 2
   Pectoral reaching ventral base; lateral line almost straight ..... see 3
2. Anal rays, about 30; mouth almost vertical ........................................ alburnus
   Anal rays, 23; mouth moderately oblique ........................................ kashinensis
3. Depth, 3.7 to 4; scales, 65 or 66 ...................................................... brevicauda
   Depth, 3.5 (specimen 120 mm. long); scales, about 60 ...................... tientsinensis
SYSTEMATIC ACCOUNT

Culter alburnus Basilewski


*Description:*—Depth in length to base of caudal, about 4; head, about 4.2; eye in head, about 5.5. Dorsal rays, about II, 7; anal, about 30; scales, about 75.

*Remarks:*—There is no specimen referable to this species in the American Museum of Natural History collections, and Berg is followed in supposing it to belong to the genus *Culter* as here defined, not to *Erythroculter*. Otherwise it might be identical with *Erythroculter erythropterus*, in which case *Erythroculter* would become a synonym of *Culter* and a new generic name necessary for the species referred to it.

Culter kashinensis Shaw


*Description:*—Depth in length to base of caudal, 4.2; head, 4; eye in head, 4.7 (specimen 152 mm. standard length). Dorsal rays, II, 8; anal, 23; scales, 72.

Culter brevicauda Günther


? *Culter alburnus*, Fu and Tchang, 1933, Bull. Honan Mus., I (1), p. 18, Fig. 18. Kaifeng.

*Locality of Material:*—Shanghai; Yangtze (*fide* Gee). Hainan (Oshima, 1926, p. 19).

Specimens examined from Anhwei.

*Description:*—Depth in length to base of caudal, 3.7 to 4; head, 4; eye in head, 3.5 to 4.5 (specimens of 80 mm. standard length and about 225 mm. long). Dorsal rays, II, 7; anal, 27 to 29; scales, 65 or 66.

*Remarks:*—This form seems to be rather common, and related ones recognized, which are uncommon, may not be distinct from it.

Culter tientsinensis Abbott

*Culter tientsinensis* Abbott, 1901, Proc. U. S. Nat. Mus., XXIII, p. 489, Fig. Chihli.

*Description:*—Depth in length to base of caudal, 3.5; head, 4; eye in head, 4 (specimen 120 mm. long). Dorsal rays, II, 7; anal, 28; scales, 60.

Genus Megalobrama Dybowski


More or less deep-bodied, free swimming carps of small or moderate size. Few Chinese species, representing some three rather unrelated forms.
A scaleless keel behind the ventrals, not extending forward of same. Jaws approximately equal, or the mouth slightly inferior. Lateral line little or moderately bent down, not running especially low and without abrupt changes in direction. A strong, smooth spine in the dorsal.


Barbels absent. No serrate spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

**Key to Chinese Megalobrama**

1. Less deep and compressed (depth, more than 2); peduncle at least as long as deep; anal rays, usually less than 30 ............................  see 2
   Deeper, rhombic, compressed (depth, about 2); peduncle deeper than long; anal rays, more than 30 ............................  bramula

2. Depth, about 3 (or more); anal rays, 22 to 25 (rarely 27) ............................  see 3
   Depth, 2.3 to 2.7; anal rays, 26 to 28 (rarely 30) ............................  see 4

3. Lower jaw slightly included; scales, about 57 ............................  macrops
   Jaws equal; scales, 58 to 63 ............................  kurematsui
   Jaws equal; scales, about 54 ............................  melrosei

4. Depth, 2.6 to 2.7; anal rays, 26 to 28; scales, 49 to 53. Dorsal spine strong; mouth small (maxillary more than 4 in head) ............................  hoffmanni
   Depth, about 2.5; anal rays, 26 or 27; scales, about 55 ............................  terminalis
   Depth, 2.3 or 2.4; anal rays, about 30; scales, about 55 ............................  pellegrini

**Megalobrama macrops** (Günther)


**Key to Chinese Megalobrama macrops**

Anal rays, 22 to 25 ............................  macrops
Anal rays, about 27 ............................  wui

**Megalobrama macrops macrops** (Günther)


Locality of Material:—Specimens examined from Chungan Hsien, Kiennings, and Yenping, Fukien.

Description:—Depth in length to base of caudal, 3 (to 3.6 in 55- to 75-mm. specimens); head, 4; eye in head, 2.7 (specimen of 145 mm. standard length). Dorsal rays, II, 7 to 8; anal, 22 to 25; scales, 55 to 59.
SYSTEMATIC ACCOUNT

Megalobrama macrops wui (Lin)


Description:—Depth in length, 3.2 or 3.3; head, 4; eye in head, 3.2 (specimens 130 mm. long). Dorsal rays, II, 7; anal, 27; scales, 56 to 60.

Megalobrama kurematsui (Kimura)


Description:—Depth in length to base of caudal, 3.7 to 4; head, 3.9 to 4.1; eye in head, 2.9 to 3 (specimens 135 to 164 mm. standard length). Dorsal rays, II, 7; anal, 24 to 25; scales, 58 to 63.

Megalobrama melrosei Nichols and Pope

Figure 71


Fig. 71. Megalobrama melrosei Nichols and Pope. Type. 66 mm. without caudal.

Description:—Depth in length to base of caudal, 3.1; head, 3.8; eye in head, 2.7 (specimen of 66 mm. standard length). Dorsal rays, II, 7; anal, 23; scales, 54.

Megalobrama hoffmanni Herre and Myers


Locality of Material:—Specimens examined from Kwangtung.

Description:—Depth in length to base of caudal, 2.6 to 2.7; head, 4.5 to 4.7; eye in head, 3.1 to 3.3 (specimens about 200 mm. standard length). Dorsal rays, II, 6 or 7; anal, 26 to 28; scales, 47 to 53.
Megalobrama terminalis (Richardson)


The type locality of *Megalobrama hoffmanni* is the same as that given for *terminalis*, and it may be that *hoffmanni* is a synonym of *terminalis*, in which case *pellegrini* Tchang would replace *terminalis* as here understood.

Megalobrama terminalis terminalis (Richardson)


**Locality of Material:**—Specimens examined from Fukien.

**Description:**—Depth in length to base of caudal, 2.5; head, 4; eye in head, 3 (specimen of 130 mm. standard length). Dorsal rays, II, 7 or 8; anal, 26 or 27; scales, 55.

Megalobrama terminalis pellegrini (Tchang)

*Parosteobrama pellegrini* Tchang, 1930, Bull. Soc. Zool. France, LV, p. 50, Fig. 4. Szechwan.

**Description:**—Depth in length to base of caudal, 2.3 or 2.4; head, 4.5 to 4.7; eye in head, 3.5 (specimens 190 to 207 mm. total length). Dorsal rays, II, 7; anal, 30; scales, 55.

Megalobrama bramula (Cuvier and Valenciennes)


**Locality of Material:**—Ningpo; Yangtze; Canton (*fide* Gee).

**Specimens examined from Tungting Lake, Hunan; Anhwei.**

**Description:**—Depth in length to base of caudal, 2; head, 4.2; eye in head, 4.1 (specimen 174 mm. standard length). Dorsal rays, II, 7; anal, about 34; scales, about 57.

Genus Parabramis Bleeker


A rather deep-bodied, compressed carp of moderate size. Apparently a single, variable, widely distributed species in China.

A scaleless keel on the belly, passing forward of the ventrals onto the breast. Jaws equal or the lower slightly included. Lateral line in the middle of the body, very little bent down. A strong, smooth spine in the dorsal.

Air bladder with 3 divisions. Anal long with more than 25 rays. Pharyngeal teeth in 3 rows.

Barbels absent. No serrate spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.
SYSTEMATIC ACCOUNT

Parabramis pekinensis (Basilewski)

Plate IV, figure 3

*Parabramis Bramula*, Fu and Tchang, 1933, Bull. Honan Mus., I (1), p. 26, Fig. 25. Kaifeng.

**Locality of Material:**—Chihli; Yangtze; North China; Shanghai (*fide* Gee). Hainan (as *Chanodichthys stenzi*), a doubtful record, Oshima, 1926, p. 18.

Specimens examined from Tungting Lake, Hunan; and near Canton; up to about 195 mm. standard length.

**Description:**—Depth in length to base of caudal, 2.8 (3.1); head, 4.1 (3.7); eye in head, 3 (2.8) (specimens of 85 [and 46] mm. standard length). Dorsal rays, II, 7; anal, 28 to 34; scales, 55 to 65.

**Remarks:**—Called "yu-pien-tzu" at Tungting Lake. It is one of the very common food fishes seen in the streets of Yochow; the average size seen for sale, over a foot in length. The "pien-tzu-yü," a similar, somewhat deeper-bodied fish of about the same size and equally common, may or may not be a distinct species (C. H. Pope, field notes).

**Genus Rhodeus** Agassiz


Very small, active, deep-bodied, compressed Eurasian carps.

Origin of anal anterior to the vertical from the end of the dorsal base. Anal branched rays, 8 to 14; dorsal, 9 or 10. Pharyngeal teeth in one row, not serrate. Lateral line incomplete. No barbels. Dorsal and anal usually without spines.

No scaleless keel before anal fin. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

**Key to Chinese Rhodeus**

1. Anal with 8 to 10 branched rays ............................................. see 2
Anal with about 14 branched rays; well-developed dorsal and anal spines ...... *spinalis*
2. Simple rays of dorsal and anal not spinous. Deeper (depth, 2.4 to 2.6 at 28 to 36 mm. standard length) ......................................................... *sinensis*
Simple rays of dorsal and anal moderately spinous. More slender (depth, 2.6 to 3.9 at 23 to 33 mm. standard length). Black "rhodein" lateral stripe notably strong .. *notatus*

**Rhodeus sinensis** Günther


**Locality of Material:**—Southern China (Berg, 1907.1, p. 160).
Specimens examined from Shansi; Shantung; Anhwei; Fukien; Shaohsing; up to 44 mm. standard length.

Description:—Depth in length to base of caudal, 2.4 to 2.6; head, 3.7 to 4.1; eye in head, 2.7 to 3.3 (specimens 28 to 41 mm. standard length). Dorsal rays, 9 to 12 (usually 10); anal, 10 to 13 (usually 10 or 11); scales, 31 to 35.

Remarks:—Females usually have a black blotch on the front of the dorsal fin (maculatus).

Rhodeus notatus Nichols

Figure 72

Rhodeus notatus Nichols, 1929, Amer. Mus. Novitates, No. 377, p. 6, Fig. 4. Tsinan, Shantung.

Rhodeus kwanghensis Mori, 1928, Japanese Jour. Zool., II, p. 68. Tsinan. If identifiable as the above, this has priority.

Am. Mus. No. 9654.

Fig. 72. Rhodeus notatus Nichols. Type. 33 mm. standard length.

Description:—Depth in length to base of caudal, 2.6 to 2.9; head, 3.9 to 4.4; eye in head, 2.6 to 2.9 (specimens 23 to 33 mm. standard length). Dorsal rays, II, 9 or 10; anal, II, 8 or 9; scales, 31 to 34.

Rhodeus spinalis Oshima


PLATE VII

Figs. 1 and 2. Barbatula yarkandensis sellaefer Nichols. Type. 73 mm. standard length. Chin-ssu, Shansi.

Figs. 3 and 4. Barbatula toni posteroventralis Nichols. Type. 66 mm. standard length. Chin-ssu, Shansi.
Description:—Depth in length to base of caudal, 2; head, 4.1 or 4.2; eye in head, 3 (specimen 78 mm. long). Dorsal rays, II, 10; anal, II, 14; scales, 34.

Genus Pseudoperilampus Bleeker


Small, deep-bodied, compressed carps, closely allied to _Rhodeus_ but deeper, more compressed, with smaller scales, more rays in dorsal and anal, teeth serrate. A few species in eastern China and adjacent islands, usually abundant where found.

Anal origin before the vertical from dorsal axil. Mouth small, somewhat inferior, eye large. A dark streak in the middle of the side posteriorly. Pharyngeal teeth in a single row, 5 in number. Lateral line incomplete. Dorsal and anal without developed spines. No barbels. Dorsal with some 12 to 14, anal with some 11 to 18 rays; scales, more than 30.

Upper jaw protractile. No scaleless keel before the anal fin. Gill membranes narrowly joined to the isthmus. Eye in or above the axis of the body.

**Key to Chinese Pseudoperilampus**

- Anal rays, about 14 ......................................................... _ocellatus_
- Anal rays, about 18 ......................................................... _hainanensis_

_Pseudoperilampus ocellatus_ Kner

_Rhodeus_ wangkinjui Wu, 1930, Sinensia, I, p. 77, Fig. 5. Luchow.

Locality of Material:—Shanghai; Yangtze (Berg, 1907, I, p. 162). Yangtze at Pinghsiang (Kreyenberg and Pappenheim, 1909, p. 15).

Specimens examined from Shantung, Anhwei, Szechwan, and Fukien.

Description:—Depth in length to base of caudal, 2 to 2.5; head, 3.9 to 4.2; eye in head, 2.7 to 3.1 (specimens of 29 to 52 mm. standard length). Dorsal rays, 12 to 14; anal, 11 to 14; scales, 32 to 34.

_Pseudoperilampus hainanensis_ Nichols and Pope

Figure 73 and Plate V, figure 4

_Pseudoperilampus hainanensis_ Nichols and Pope, 1927, Bull. Amer. Mus. Nat. Hist., LIV, p. 379, Fig. 42. Hainan.

Description:—Depth in length to base of caudal, 2.3; head, 3.9; eye in head, 2.5 (specimen of 39 mm. standard length). Dorsal rays, about 14; anal, about 18; scales, about 34.

Remarks:—This species was abundant and constantly taken in the immedi-
ate environs of Nodoa, though less abundant than *Acanthrhodeus tonkinensis* in the same places (C. H. Pope, field notes).

![Fig. 73. Pseudoperilampus hainanensis Nichols and Pope. Type. 39 mm. without caudal.](image)

Genus *Paracheilognathus* Bleeker


Small, active, deep-bodied, compressed Asiatic carps allied to *Rhodeus*.

Origin of anal anterior to the vertical from the end of the dorsal base. Pharyngeal teeth in one row, serrate. Lateral line complete. Barbels absent or minute. Dorsal and anal without spinous rays.

No scaleless keel before anal fin. No serrate spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

**Key to Chinese *Paracheilognathus***

1. Dorsal with 12 rays ............................................................... *imberbis*
   Dorsal with 14 to 16 rays ................................................... see 2
   Dorsal with 18 to 20 rays ..................................................... *jeholicus*

2. Dark shoulder blotch present; dorsal rays, 14 ................................ *peihoenis*
   Dark shoulder blotch absent; dorsal rays, 15 to 16 ............................ *bleckeri*

*Paracheilognathus imberbis* (Günther)


*Locality of Material:*—Ningpo; Pei Ho; Tientsin (*fide* Gee).

Specimen examined from Tsinan, Shantung; 52 mm. standard length.

*Description:*—Depth in length to base of caudal, about 2.8; head, about 4.1; eye in head, 3 to 3.3 (specimens from 52 mm. standard length to about 67 mm. long). Dorsal rays, 12; anal, 11 to 14; scales, 35.
SYSTEMATIC ACCOUNT

Paracheilognathus peihoensis Fowler


Description:—Depth in length to base of caudal, 2.1; head, 3.8; eye in head, 3 (specimen about 63 mm. long). Dorsal rays, 14; anal, 12; scales, 36.

Paracheilognathus bleekeri Berg


Description:—Depth in length to base of caudal, 2.5; head, 4; eye in head, 2.7. Dorsal rays, 15 or 16; anal, 12 to 13; scales, 35.

Paracheilognathus jeholicus (Mori)


Description:—Depth in length to base of caudal, 2.2 to 2.5; head, 4.1 to 4.3; eye in head, 3 to 3.8 (specimens 83 to 123 mm. total length). Dorsal rays, 18 to 20; anal, 15 to 16; scales, 35 to 37.

Minute barbel present; fins with lengthwise streaks, no shoulder mark. The figure indicates non-spinous anterior dorsal and anal rays—otherwise it might be Acanthorhodeus guichenoti.

Genus Acheilognathus Bleeker


Small, active, deep-bodied, compressed Asiatic carps allied to Rhodeus.

Origin of anal anterior to the vertical from the end of the dorsal base. Anal branched rays, 8 to 14; dorsal, 8 to 15. Pharyngeal teeth in one row, not serrate. Lateral line complete. Barbels present or absent; dorsal and anal with or without spinous rays.

No scaleless keel before anal fin. No serrate spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

KEY TO CHINESE Acheilognathus

1. Depth, 2.8 to 3; no barbel ............................................. see 2
   Depth, about 2.5; barbel present ............................................. see 3
2. Depth, about 3; dorsal, II, 9; anal, II, 7 .................................. gracilis
   Depth, about 2.8; dorsal, II, 11; anal, II, 9 .................................. luchowensis
3. Barbel much less than diameter of eye; dorsal and anal spines more or less developed; anal, about 11 (II, 9); scales, about 37 or 38 .......................... see 4
   Barbel about equal diameter of eye; dorsal and anal without developed spines; anal, about 13 or 14; scales, about 33 .................. himantegus
4. Barbel less than $\frac{1}{2}$ diameter of eye ........................................... barbatulus
   Barbel about $\frac{1}{2}$ diameter of eye, or more ................................ barbatus

Acheilognathus gracilis Nichols

Acheilognathus gracilis Nichols, 1926, Amer. Mus. Novitates, No. 214, p. 5, Fig. 5. Tungting Lake.

Preoccupied by Acanthorhodeus gracilis Regan, 1908, if Acanthorhodeus is not considered differentiable from Acheilognathus.

Acheilognathus gracilis gracilis Nichols

Figure 74

Acheilognathus gracilis Nichols, 1926, Amer. Mus. Novitates, No. 214, p. 5, Fig. 5. Tungting Lake.

Fig. 74. Acheilognathus gracilis gracilis Nichols. 44 mm. standard length.

Description:—Depth in length to base of caudal, 3; head, 3.8; eye in head, 2.5 (specimen of 44 mm. standard length). Dorsal rays, II, 9; anal, II, 7; scales, 35.

Acheilognathus gracilis luchowensis Wu

Acheilognathus gracilis luchowensis Wu, 1930, Sinensia, I, p. 29, Fig. 6. Luchow [in Szechwan].

Description:—Depth in length to base of caudal, 2.8; head, 4; eye in head, 3.5 (specimen 37 mm. total length). Dorsal rays, II, 11; anal, II, 9; scales, 37.

Remarks:—There is a possibility that this is Acanthorhodeus elongatus of Yunnan.
Acheilognathus barbatulus Günther


Locality of Material:—Specimens examined from Shantung; Anhwei; Yen-ping, Fukien; up to 80 mm. standard length.

Description:—Depth in length to base of caudal, 2.2 to 2.4; head, 3.8 to 4.3; eye in head, 3 to 3.4 (specimens of 47 to 53 mm. standard length). Dorsal rays, about 14 (II, 11 or 12); anal, about 11 (II, 8 to 10); scales, 34 to 37.

Acheilognathus barbatus Nichols

Figure 75

Acheilognathus barbatus Nichols, 1926, Amer. Mus. Novitates, No. 214, p. 6, Fig. 6. Anhwei.

Locality of Material:—Specimens examined from Anhwei; Hokou, Kiangsi (not typical); Chungan Hsien and Kienning, Fukien (not typical).

Description:—Depth in length to base of caudal, 2.3; head, 3.5; eye in head, 3 (specimen of 40 mm. standard length). Dorsal rays, II, 10; anal, II, 9; scales, 38.

Acheilognathus himantegus Günther


Locality of Material:—Specimens examined from Fukien.

Description:—Depth in length to base of caudal, 2.5; head, 4.5; eye in head, 2.6 (specimen of 47 mm. standard length). Dorsal rays, 11; anal, 13 to 14; scales, 33 to 34.
Genus Acanthorhodeus Bleeker

Type: Acanthorhodeus macropterus Bleeker.

Small or medium-sized, active, deep-bodied, compressed Asiatic carps allied to Rhodeus.

Origin of anal anterior to the vertical from the end of the dorsal base. Anal branched rays, 8 to 14; dorsal, 11 to 18. Pharyngeal teeth in one row, serrate. Lateral line complete. Barbels absent or minute. Dorsal and anal with spinous rays.

No scaleless keel before anal fin. No serrate, spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

Key to Chinese Acanthorhodeus

1. Barbel present .................................................. see 2
   Barbel absent .................................................. see 5
2. Dorsal with 17 or 18 branched rays; anal with 12 to 14 ..............
   Dorsal with about 15 branched rays; anal with about 11; depth, about 2; scales, about 36 ..............
   Dorsal with about 10 branched rays. Barbel longer than eye ..............
   tonkinensis
   omeiensis
3. Depth, about 2.5; scales, 34 or 35 ..............
   Depth, less than 2.5; scales, more than 35 ..............
   guichenoti
4. Head, about 5 in standard length ..............
   Head, about 4.4 in standard length ..............
   macropterus
   dicaeus
5. Scales, about 30 ..............
   Scales, 35 to 38 ..............
   hypselonotus
6. Dorsal with 11 to 13 branched rays, anal with 10 to 12 ..............
   Dorsal with 16 to 17 branched rays, anal with 13 to 14 ..............
   taenianalis
7. Depth, about 2.5; scales, about 35 ..............
   Depth, 3 to 3.7; scales, 36 to 39 ..............
   atranalis
   elongatus

Acanthorhodeus macropterus Bleeker

Acanthorhodeus macropterus Bleeker, 1871, Verhandel. Akad. Wetensch., Amsterdam, Afd. Natuurk., XII, p. 40,
Pl. II, fig. 2. Yangtze?

Locality of Material:—Yangtze; Ningpo (fide Gee).

Description:—Depth in length to base of caudal, 2.5; head, about 5; eye in head, about 3 (specimen about 275 mm. long). Dorsal rays, III, 17 to 18; anal, III, 12 to 13; scales, 35.

Acanthorhodeus dicaeus Rutter


Description:—Depth in length to base of caudal, 2.5; head, 4.4. Dorsal rays, III, 17; anal, III, 13 to 14; scales, 34.
Acanthorhodeus omeiensis Shih and Tchang


**Description:**—Depth in length to base of caudal, 2.7; head, 4; eye in head, 3 (specimen 60 mm. standard length). Dorsal rays, II, 10; anal, III, 8; scales, 36. Barbel longer than eye, 3.2 in head (from fig.), spines in vertical fins strong; a slanting dark bar above origin of lateral line (in fig.).

Acanthorhodeus guichenoti Bleeker

Plate VI, figure 1


**Locality of Material:**—Specimens examined from Tungting Lake, Hunan; Anhwei.

**Description:**—Depth in length to base of caudal, 2.2; head, 3.6 (to 4.5 in larger specimens); eye in head, 3.5 (specimen of 73 mm. standard length). Dorsal rays, III, 17 or 18; anal, III, 13 or 14; scales, 36 to 40.

**Remarks:**—Called “p'ang-ch'ih-p'i” at Tungting Lake, where it seems to be one of the common small lake fish (C. H. Pope, field notes).

Acanthorhodeus tonkinensis Vaillant

**Figure 76**


Fig. 76. *Acanthorhodeus tonkinensis* Vaillant. 77 mm. without caudal.
Locality of Material:—Specimens examined from Hainan; Kiencing, Fukien; up to 77 mm. standard length.

Description:—Depth in length to base of caudal, 2 to 2.6; head, about 4; eye in head, about 3.5. Dorsal rays, III, 13 to 15; anal, III, 11 to 14; scales, about 36.

Remarks:—This species was found by Pope to be very abundant and generally distributed about Nodoa, Hainan.

Acanthorhodeus hypselonotus Bleeker


? *Acanthorhodeus ngowyangi* Tchang, 1930, Cyprinidés du Bassin du Yangtze, p. 115, Pl. iii, fig. 2.

Description:—Depth in length to base of caudal, about 1.7 or 1.8; head, about 4; eye in head, about 3 (specimen about 165 mm. long). Dorsal rays, III, 14 to 15; anal, III, 12 to 13; scales, about 30.

Acanthorhodeus atranalis Günther


Locality of Material:—Specimens examined from Tsinan, Shantung; Shao-hsing; up to 75 mm. standard length.

Description:—Depth in length to base of caudal, 2.6; head, 4.3; eye in head, 2.8 (specimen of 67 mm. standard length). Dorsal rays, II, 12 or 13; anal, II, 10 or 11; scales, 35. An unusually slender specimen from Tsinan of 42 mm. standard length has depth, 2.9.

Acanthorhodeus elongatus Regan


Description:—Depth in length to base of caudal, 3 to 3.7; head, 4 to 4.5; eye in head, 2.7 or 2.8 (specimens of 54 mm. standard length to 70 mm. long). Dorsal rays, II, 11 to 13; anal, II, 10 to 12; scales, 36 to 39.

Acanthorhodeus taenianalis Günther


Locality of Material:—Tungting Lake, Hunan (Kreyenberg and Pappenheim, 1909, p. 15).

Specimens examined from Shansi and Anhwei.
**SYSTEMATIC ACCOUNT**

*Description:*—Depth in length to base of caudal, 2.3; head, 3.6; eye in head, 2.6 (specimen of 50 mm. standard length). Dorsal rays, II, 16 to 17; anal, II, 12 to 14; scales, 35 to 36.

**Genus Paracanthobrama** Bleeker


Scales of moderate size; lateral line straight, in the center of peduncle. Dorsal fin short, with an osseous and smooth spine; opposite to the ventrals. Anal fin of moderate length (9 rays). Mouth small, subinferior, subhorizontal; lips thin. A pair of maxillary barbels. Pharyngeal teeth hooked, in 2 rows. China. (Description chiefly from Günther, 1868, p. 205.)

Anal base entirely behind that of dorsal. Vent and anal fin not bordered by a row of enlarged scales. No serrate spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

**Paracanthobrama guichenoti** Bleeker


*Description:*—Depth in length to base of caudal, about 4; head, 4.5; eye in head, 3.7 or 3.8. Dorsal rays, II, 8; anal, 9; scales, 46 to 48.

**Genus Hemibarbus** Bleeker


Small or moderate-sized carps, with thickish-lipped, inferior mouth, a single pair of barbels and a strong, smooth, sharp spine in the dorsal. Common in China, where it is represented by three or four rather ill-defined species.

Lower jaw not sharpened or covered by cartilage. Intestinal tract short. Pharyngeal teeth in 3 (usually, sometimes 2) rows. Anal with 5 or 6 branched rays (exceptionally 7).

Vent and anal fin not bordered by a row of enlarged scales. Anal base well behind that of dorsal. No scaleless keel before the anal fin. No serrate, spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed above the axis of the body.

**Key to Chinese Hemibarbus**

1. Vent well in advance of anal .............................................. *dissimilis*
   Vent immediately before anal .............................................. see 2
2. Scales, about 47 or 48. 
   Scales, about 42. Interorbital about equal eye. Back, dorsal, and caudal spotted
3. A row of dark marks along the side, fins essentially immaculate; interorbital
   about equal to eye. 
   Back and sides irregularly blotched, dorsal and caudal sharply spotted with
   black; interorbital decidedly greater than eye (in a specimen of 135 mm.
   standard length) 

**Hemibarbus dissimilis** Bleeker


**Description:**—Depth in length to base of caudal, 3.3 to 3.4; head, about 4.8;
   eye in head, about 4 (specimens about 375 to 415 mm. long). Dorsal rays, II, 7 or
   8; anal, 8 or 9; scales, about 48.

**Hemibarbus labeo** (Pallas)

**Figure 77**

*Cyprinus labeo* Pallas, 1776, Reise d. russischen Reiches, III, pp. 207, 703. Upper Amur River.

*Hemibarbus longianalis* Kimura, 1934, Jour. Shanghai Sci. Inst., Sec. 3, I, p. 123, Pl. iv, fig. 1. Suining and
   Howchwan, Szechwan. Scales, 44 to 45.

Fig. 77. *Hemibarbus labeo* (Pallas). 131 mm. without caudal.

**Locality of Material:**—Chefoo (*fide* Gee).
   Specimens examined from Chihli; Tungting Lake, Hunan; Anhwei; Chungan
   Hsien and Yenping, Fukien; Hainan; up to 155 mm. standard length.

   **Description:**—Depth in length to base of caudal, 4.3; head, 3.3; eye in head,
   4 (specimen 133 mm. standard length). Dorsal rays, II, 7; anal, about 8; scales,
   about 47.

   **Remarks:**—In this species, length (height) of anal is a function of size, per-
   haps complicated with sex. Upon examining specimens from Hainan, I found one
   of about 250 mm. with the anal quite as long as described for *longianalis*. Of two
   measuring about 150 mm., one has the anal not quite so long, the other short.
SYSTEMATIC ACCOUNT

Hemibarbus maculatus Bleeker

Plate VI, figure 3


Locality of Material:—Specimens examined from Tungting Lake, Hunan.

Description:—Depth in length to base of caudal, 4.1; head, 3.9; eye in head, 4 (specimen 135 mm. standard length). Dorsal rays, II, 7 or 8; anal, 8 or 9; scales, about 48.

Remarks:—Called "chi-ha-yü" at Tungting Lake, not uncommon, to be found at any time for sale on the Yochow streets, but in small numbers. The color of this fish is most interesting. When in water and viewed from directly above, its profuse black spots conceal its scales so perfectly by their irregular arrangement that it presents the appearance of a long, slender, scaleless fish and reminds one of the catfish or mudfish. Take it out of water, however, and its appearance changes as if by magic; you have a scaled, silver fish, with a few small black spots scattered over its back and upper sides; the largest black spots, seen from above, have disappeared. The unusually long, tapering spine of the dorsal is noticeable, and when the fish's body is bent in the act of turning, this spine sticks off to one side in a curious fashion (C. H. Pope, field notes).

Hemibarbus shingtsonensis Shaw


Description:—Depth in length to base of caudal, 3.8; head, 3.6; eye in head, 3.5 (specimen 100 mm. standard length). Dorsal rays, II, 8; anal, 9; scales, 42.

This is close to if not indistinguishable from Acanthogobio longirostris Regan (1908.4, p. 60, Pl. iii, fig. 3) from Chong-ju, Korea. Dorsal, II, 7; anal, 8; scales, 43; dorsal origin decidedly nearer end of snout than base of caudal, versus almost equidistant. Depth, 4.6 or 4.7; head, 3.4; eye, 3.8 (specimen 95 mm. total length). For the present we may consider that the two are distinct and refer Chinese references for H. longirostris (Regan) to H. shingtsonensis Shaw.

Genus Acanthogobio Herzenstein

This genus is close to and sometimes synonymized with *Hemibarbus*, from which it may be distinguished by a scaleless strip on the back.

**Acanthogobio guentheri** Herzenstein


*Locality of Material:* —Southern Kansu (Günther, 1896, p. 215).

*Description:* —Depth in length to base of caudal, 4; eye in head, 4.5 (specimen of 200 mm. standard length). Dorsal rays, II, 8; anal, 8; scales, 45.

**Genus Leucogobio** Günther


Small, rather short-bodied carps with a single pair of small barbels (sometimes absent). Breast scaled. Mouth terminal or subterminal. Closely allied to *Gobio*. One species (subgenus *Paraleucogobio*) has the last simple dorsal ray spinous except at the tip. A few species locally common in northern and western China.

Vent about midway between bases of ventral and anal fins or nearer the anal. Lips thin. Ventral origin under that of the dorsal. Pharyngeal teeth in 2 rows. Lower jaw never sharp-edged nor covered by cartilaginous or bony integument. Anal fin with 5 or 6 branched rays (exceptionally 7).

Vent and anal fin not bordered by a row of enlarged scales. Origin of anal behind posterior end of dorsal. No scaleless keel before the anal fin. No serrate spinous ray in the anal. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

**Key to Chinese Leucogobio**

1. Most of last simple dorsal ray stiffened, spinous (*Paraleucogobio*). Barbel about $\frac{1}{2}$ diameter of eye, or less ........................................ notacanthus

Dorsal without spinous rays (*Leucogobio*) ........................................ see 2

2. Barbels about $\frac{3}{4}$ diameter of eye; scales, about 36 ........................................ taeniellus

Barbels about $\frac{1}{2}$ diameter of eye ........................................ see 3

Barbels minute (or absent) ........................................ see 5


Scales, 39 or 40 ........................................ taeniatus

Depth, about 3.7 to 3.9 (specimens of 60 to 86 mm. standard length) ...... see 4

4. Dark on back and sides, differentiated into a broader central and several narrower stripes above and below by pale streaks between; a blackish spot on front of dorsal continued across the fin as a faint dark shade. Scales, 39 or 40.

Paired fins longer, pectoral about 1.3 and ventral 1.5 in head ........ polyaenia

Scales, 36 to 38. Paired fins shorter, pectoral, 1.4 or 1.5, ventral, 1.6 or 1.7 in head ........................................ tienmusanensis
SYSTEMATIC ACCOUNT

5. Dorsal origin equidistant from end of snout and base of caudal. Barbels minute, present. Scales, 36 to 39 .............................. tsinanensis
Dorsal origin equidistant from end of snout and base of caudal; barbels imperfect or absent; depth and head, less than 4 in length (specimen about 70 mm. long); scales, 38 to 42 .............................. imberbis
Dorsal origin nearer end of snout than base of caudal; depth and head, 4 or more (specimen about 70 mm. long); scales, about 39 .............................. herzensteini

Subgenus Paraleucogobio Berg


Leucogobio notacanthus (Berg)


Locality of Material:—Specimens examined from Chihli.

Description:—Depth in length to base of caudal, 3.6; head, 3.6; eye in head, 4 (specimen of 73 mm. standard length). Dorsal rays, 9 (II, 7); anal, 8; scales, 34 to 40.

Subgenus Leucogobio Günther


Leucogobio taeniellus Nichols

Figure 78


Description:—Depth in length to base of caudal, 3.7; head, 3.8; eye in head, 3.5 (specimen 55 mm. standard length). Dorsal rays, 9; anal, 8; scales, 36.

Leucogobio taeniatus Günther

Description:—Depth in length to base of caudal, 4; head, 4; eye in head, 4.5 (specimen 105 mm. long). Dorsal rays, 10; anal, 8; scales, 40.

Leucogobio polytaenia Nichols


Leucogobio polytaenia polytaenia Nichols

Figure 79


![Image of Leucogobio polytaenia polytaenia](Am_Mus_No.8421)

*Fig. 79. Leucogobio polytaenia polytaenia* Nichols. Type. 76 mm. standard length.

Description:—Depth in length to base of caudal, 3.7; head, 3.7; eye in head, 4 (specimen of 76 mm. standard length). Dorsal rays, 9 or 10; anal, 8; scales, 39.

Leucogobio polytaenia tienmusanensis Chu

*Leucogobio tienmusanensis* Chu, 1931, China Jour., XV, p. 37, Fig. 10. Tien-mu-san, Chekiang.

Description:—Depth in length to base of caudal, 3.7 to 3.9; head, 4; eye in head, 3.7 to 3.9 (specimens 60 to 86 mm. standard length). Dorsal rays, 9; anal, 8; scales, 36 to 38.

Remarks:—Perhaps indistinguishable from *L. p. polytaenia*, but apparently with shorter paired fins.

Leucogobio polytaenia tsinanensis Mori

Figure 80

*Leucogobio polytaenia microbarbus* Nichols, 1929, Amer. Mus. Novitates, No. 377, p. 1, Fig. 1. Tsinan, Shantung.

Locality of Material:—Specimens examined from Tsinan, Shantung; and (provisionally so identified) from Hokou, Kiangsi.
Description:—Depth in length to base of caudal, 3.8 to 4.2; head, 3.4 to 3.8; eye in head, 3.8 to 4.8 (specimens 54 to 86 mm. standard length). Dorsal rays, 9; anal, 8; scales, 36 to 39.

Am. Mus. No. 9651.

Fig. 80. Leucogobio polytaenia tsinanensis Mori. Type of Leucogobio polytaenia microbarbus Nichols.

Leucogobio imberbis Nichols

Figure 81


Am. Mus. No. 8439

Fig. 81. Leucogobio imberbis Nichols. Type. 68 mm. standard length.

Locality of Material:—Specimens examined from Anhwei and Shantung.

Description:—Depth in length to base of caudal, 3.7; head, 3.4; eye in head, 4.4 to 4.6 (specimens 68 to 75 mm. standard length). Dorsal rays, 9; anal, 8; scales, 38 to 42.

Leucogobio herzensteini Günther


Description:—Depth in length to base of caudal, 4; head, 4.5; eye in head, 4.5 (specimen 70 mm. long). Dorsal rays, 10; anal, 8; scales, 39.
Genus Gnathopogon Bleeker


More or less elongate and fusiform, active, soft-finned, large-eyed minnows with a pair of rather long and slender terminal maxillary barbels. Breast scaled. Mouth slightly inferior. Closely allied to Gobio. A few allied species in China and adjacent islands.

Vent about midway between bases of ventral and anal, or nearer the anal. Lips thin. Ventral origin under that of the dorsal. Pharyngeal teeth in 2 rows. Lower jaw never sharp-edged nor covered by cartilaginous or bony integument. Anal fin with 5 or 6 branched rays (exceptionally 7).

Vent and anal fin not bordered by a row of enlarged scales. Anal base well behind that of dorsal. No scaleless keel before the anal fin. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

Gnathopogon is largely a genus of convenience for several very similar free swimming minnows, closely related to the variable genus Gobio. They are probably even more closely related to Leucogobio, though divergent members of these two genera are rather unlike. The type of Gnathopogon is unfortunately somewhat intermediate, but that of Sinigobio, also in some respects intermediate and aberrant, is no better selection.

Key to Chinese Gnathopogon

1. Depth (in standard length), 3.4 to 4; barbel (in head), 6 or more; scales, 35 to 38 ........................................... intermedius
   Depth, more than 4; barbel longer, 5 or less (except in G. sihuensis) .........

2. Color pale; lower part of opercle white with a narrow blackish margin above;
   an ill-defined plumbeous streak in center of peduncle; smaller specimens
   with about 5 or 6 dark linear marks posteriorly, just above lateral line. Barbel
   in head, about 3; scales, about 38 ........................................... argentatus
   A series of small dark spots above the lateral line (frequently lacking in larger
   individuals) and a faint plumbeous streak in the center of peduncle. Barbel
   in head, 3 to 5 (average, 3.7); scales, 34 to 37 ..............................
   Resembles G. a. punctatus to which it is closely allied but with a short barbel
   (more than 6 in head), and more gobiod form ................................. sihuensis
   Color pale; some black markings along base of dorsal, particularly a black
   spot at its origin; a faint dark stripe in center of peduncle, rising above lateral
   line over ventral; a short dark stripe behind the vent; a faint dark shade
   at the base of each caudal lobe; smaller specimens with scales of back slightly
   outlined in dark; peduncular stripe bolder; marking along lateral line as in
   G. walterstorfi sometimes faintly indicated. The spot at the dorsal origin is
   constant. Barbel in head, about 3; scales, about 36. Hainan ................. atromaculatus
   Close to G. atromaculatus. Barbel in head, about 4; scales, 37 or 38. Shantung
   similis
Color pale; top of head and snout darker; lateral line splitting a row of small dark spots at the tips of the scales; sides above lateral line with less marked, irregular, small, dark spots, irregularly arranged in 2 or 3 horizontal rows.

**Gnathopogon intermedius** Nichols

*Figure 82*

**Gnathopogon intermedius** Nichols, 1929, Amer. Mus. Novitates, No. 377, p. 3, Fig. 2. Tainan, Shantung.

**Am. Mus. No. 9652.**

*Fig. 82. Gnathopogon intermedius* Nichols. Type. 65 mm. standard length.

*Description:*—Depth in length to base of caudal, 3.4 to 4; head, 3.3 to 3.8; eye in head, 3.5 to 4 (specimens 52 to 69 mm. standard length). Dorsal rays, 9; anal, 8; scales, 35 to 38.

**Gnathopogon argentatus** (Sauvage and Dabry de Thiersant)


**Gnathopogon argentatus argentatus** (Sauvage and Dabry de Thiersant)


*Locality of Material:*—Specimens examined from Tungting Lake, Hunan.

*Description:*—Depth in length to base of caudal, 4.6; head, 3.7; eye in head, 2.9 (specimen of 69 mm. standard length). Dorsal rays, 10; anal, 8; scales, about 38.

**Gnathopogon argentatus punctatus** Nichols

*Figure 83*


*Locality of Material:*—Specimens examined from Foochow, Yenping, and Yungtai Hsien, Fukien.

*Description:*—Depth in length to base of caudal, 4.3 to 5 (average, 4.7); head, 3.5 to 4.2; eye in head, 2.7 to 3.3 (average, 3); barbel, 3 to 5 (average, 3.7),
in 21 specimens 43 to 76 mm. standard length. Dorsal rays, 9 (rarely 10); anal, 8; scales, 34 to 37.

Am. Mus. No 8423

Fig. 83. Gnathopogon argentatus punctatus Nichols. Type. 46 mm. standard length.

Remarks:—The several species of this genus here recognized are closely interrelated, and G. punctatus seems as distinct as the others, but specimens from Kienning, Fukien, appear to be intermediates between it and G. argentatus. Ten such from 47 to 75 mm. standard length have depth, 4.3 to 5 (average, 4.65); head, 3.7 to 4.2; eye, 3 to 3.5 (average, 3.3); barbel, 3.2 to 4 (average, 3.5); scales, 37 to 40; colors sometimes more like one, sometimes more like the other of these two forms.

Gnathopogon sihuensis (Chu)

Gobio sihuensis Chu, 1932, Fishes of the West Lake, p. 22, Figs. 11, 23. West Lake.

Description:—Depth in length to base of caudal, 4.3 to 4.5; head, 4 to 4.1; eye in head, 3.1 to 3.4; barbel in eye, more than 2 (specimens up to 70 mm. standard length). Dorsal rays, 9; anal, 8; scales, 36 or 37.

Gnathopogon atromaculatus Nichols and Pope

Figure 84


Am. Mus. No. 8442

Fig. 84. Gnathopogon atromaculatus Nichols and Pope. Type. 54 mm. standard length.
Description:—Depth in length to base of caudal, 4.2; head, 3.5; eye in head, 2.8 (specimen of 54 mm. standard length). Dorsal rays, 9; anal, 8; scales, 36.

Gnathopogon similis Nichols

Figure 85

Gnathopogon similis Nichols, 1929, Amer. Mus. Novitates, No. 377, p. 4, Fig. 3. Tsinan, Shantung.

Gnathopogon woterstorffi (Regan)


Locality of Material:—Specimens examined from Chihli.

Description:—Depth in length to base of caudal, 4.5; head, 3.7; eye in head, 3 (specimen 58 mm. standard length). Dorsal rays, 9; anal, 8; scales, 37 or 38.

Genus Gobio Cuvier


Small, soft-finned, more or less bottom living carps. Usually with a single pair of moderate barbels and the mouth more or less inferior. Frequently a scaleless area on the breast. An Eurasian genus abundant in individuals and represented by a number of species, several in northern China, the more specialized approaching the genera Coreius, Rhinogobio, or Saurogobio.

Vent about midway between bases of ventral and anal fins, or nearer the anal. Lips thin, the lower lip never free behind across the chin. Ventral origin under that of the dorsal. Pharyngeal teeth in 2 rows. Lower jaw never sharp-edged nor covered by cartilaginous or bony integument. Anal fin with 5 or 6 branched rays (exceptionally 7).
Vent and anal fin not bordered by a row of enlarged scales. Anal base well behind that of dorsal. No scaleless keel before the anal fin. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

**Key to Chinese Gobio**


2. Scales, 40 to 45.
   - Scales, 48 to 52; longest dorsal ray equal to or greater than length of head; barbel small. Scales present on breast forward to a line between the gill clefts.
   - Scales, about 48.


4. Barbel decidedly less than \( \frac{3}{4} \) length of head.
   - Barbel about \( \frac{1}{2} \) length of head, or more.

5. Pectoral not passing ventral origin.
   - Pectoral falciform, passing ventral origin.

6. Breast with scales; scales, about 45; barbel less than diameter of eye.
   - Breast scaleless; scales, about 40 to 41.

7. Barbel greater than diameter of eye; pectoral reaching about \( \frac{3}{4} \) the distance to ventral. Barbel less than diameter of eye; pectoral reaching almost to ventral.

8. Pectoral rounded, not nearly to ventral; barbel, 2.6 to 3.1 in head; dark blotches along the side.
   - Pectoral not reaching ventral; barbel, 2.4 to 2.6 in head; a faint dark longitudinal band along middle of side.
   - Pectoral falcate, passing ventral origin; barbel very long, about 2.3 in head, peduncle with a dark longitudinal shade.

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**Gobio nitens** Günther


*Description:*—Depth in length to base of caudal, 5; head, 4; eye in head, 3.5 (specimen about 65 mm. long). Dorsal rays, 10; anal, 8; scales, 35.

**Gobio nummifer** Boulenger


*Description:*—Depth in length to base of caudal, about 4.7; head, 3.7 or 3.8; eye in head, 3.7 or 3.8 (specimen 102 mm. long). Dorsal rays, 9; anal, 8; scales, 45.

**Gobio soldatovi** Berg

*Gobio gobio* var. *soldatovi* Berg, 1914, Faune Russie, Poissons, III (2), p. 461, Fig. 63. Amur River.
SYSTEMATIC ACCOUNT

Gobio soldatovi soldatovi Berg

*Gobio gobio* var. *soldatovi* Berg, 1914, Faune Russie, Poissons, III (2), p. 461, Fig. 63. Amur River.

**Locality of Material:**—Specimens examined from Chihli and Anhwei.

**Description:**—Depth in length to base of caudal, 4.6; head, 3.4; eye in head, 4 (specimen of 76 mm. standard length). Dorsal rays, about 9; anal, 8; scales, about 40.

Gobio soldatovi minulus Nichols


**Description:**—Depth in length to base of caudal, 4.6; head, 3.5; eye in head, 3.8 (specimen of 57 mm. standard length). Dorsal rays, 9 or 10; anal, 8; scales, 41.

Gobio vaillanti (Sauvage)


**Description:**—Head in length to base of caudal, 3.5. Dorsal rays, 11; anal, 8; scales, 40.

Gobio rivuloides Nichols

**Figure 86**


**Description:**—Depth in length to base of caudal, 5.5; head, 3.7; eye in head, 6 (specimen of 133 mm. standard length). Dorsal rays, 9 or 10; anal, 9; scales, 41 or 42.

*Fig. 86. Gobio rivuloides* Nichols. 126 mm. standard length.
**Gobio coriparoides** Nichols


**Gobio coriparoides coriparoides** Nichols


Fig. 87

**Gobio coriparoides coriparoides** Nichols. Type. 77 mm. standard length.

*Description:*—Depth in length to base of caudal, 4.6; head, 3.5; eye in head, 4.5 (specimen of 77 mm. standard length). Dorsal rays, 9 or 10; anal, 8; scales, 42.

**Gobio coriparoides tenuicorpus** Mori


*Description:*—Depth in length to base of caudal, 5.4 to 6.1; head, 4 to 4.1; eye in head, 4.7 to 4.9 (specimens 80 to 108 mm. total length). Dorsal rays, 9; anal, 7 to 8; scales, 42 to 43.

**Gobio longipinnis** Nichols


**Gobio longipinnis longipinnis** Nichols


*Description:*—Depth in length to base of caudal, 4.7; head, 3.9; eye in head, 7 (specimen of 95 mm. standard length). Dorsal rays, 10; anal, 9; scales, 52.
Fig. 88. *Gobio longipinnis longipinnis* Nichols. Type. 95 mm. standard length.

**Gobio longipinnis roulei** (Tchang)


**Description:**—Depth in length to base of caudal, 4.4; head, 4.2; eye in head, 6 (specimen 195 mm. long). Dorsal rays, 9; anal, 8; scales, 48.

**Genus Megagobio** Kessler


A doubtful genus with snout much produced and conical, mouth inferior, transverse, eye very small, and ventrals somewhat behind dorsal. It resembles *Rhinogobio* and *Gobio longipinnis* and is probably most nearly related to this last.

**Megagobio nasutus** Kessler


**Locality of Material:**—Tsinan, Shantung (Mori, 1928, p. 65).

**Description:**—Depth in length, 6; head, 4.3; eye in head, 8.5 (specimen 200 mm. long). Dorsal, 10; anal, 8; scales, 48.

**Genus Coreius** Jordan and Starks


Medium-sized, soft-finned, bottom living carps related to *Gobio*, with a single pair of exceptionally long barbels, small eye a little before the center of the head, and long compressed peduncle.

Vent about midway between bases of ventral and anal fins, or nearer the anal. Lips rather thick, more or less confined to the sides of the lower jaw, in no case forming a free fold across it. Mouth rather small, inferior, transverse, horizontal, curved. Ventral fins placed under the dorsal. Anal with about 6 branched rays, its

Lower jaw not covered by cartilaginous or bony integument. Vent and anal fin not bordered by a row of enlarged scales. No scaleless keel before anal fin. Gill membranes rather broadly attached to the isthmus. Gill rakers not fused. Eye placed above the axis of the body.

**Key to Chinese *Coreius***

1. Vent midway between ventral and anal; origin of dorsal midway between end of snout and front of anal .................................................. see 2
   Vent much nearer anal origin than ventral axil; origin of dorsal midway between end of snout and middle of anal base, or a little farther back ......... see 3

2. Profile not concave at the nape; barbel in head, about 1.7; pectoral not quite reaching ventral. More or less well-defined streaks following the rows of scales Profile concave at the nape; barbel in head, 1.2 or 1.3; pectoral passing front of ventral ........................................ cetopsis

3. Interorbital in head, 3 (specimen of 240 mm. standard length); dorsal origin equidistant from end of snout and middle of anal base; back elevated so that profile is slightly concave at the nape ................................ septentrionalis
   Interorbital in head, 2.6 (specimen of 74 mm. standard length); dorsal origin equidistant from end of snout and middle of last anal ray; profile not concave at nape ........................................ styani

**Coreius cetopsis** (Kner)

*Labeo cetopsis* Kner, 1867, Reise “Novara,” Zool., I, Fische, p. 351, Pl. xv, fig. 2. Shanghai.

*Description.*—Depth in length to base of caudal, about 5; head, 5; eye in head, about 5 (specimen about 165 mm. long). Dorsal rays, 9; anal, 8; scales, 55.

**Coreius zeni** Tchang

*Coreius zeni* Tchang, 1930, Bull. Soc. Zool. France, LV, p. 49, Fig. 3. Szechwan.

*Description.*—Depth in length to base of caudal, 4.5; head, 4.7 or 4.8; eye in head, 13 (specimen of 350 mm. total length). Dorsal rays, 10; anal, 9; scales, 57.

**Coreius septentrionalis** (Nichols)

Figure 89


*Locality of Material.*—Specimens examined from Paotou, Mongolia.

*Description.*—Depth in length to base of caudal, 4.5; head, 4.8; eye in head, 8.6 (specimen of 240 mm. standard length). Dorsal rays, 9; anal, 8; scales, 55.
Fig. 89. Coreius septentrionalis (Nichols). Type. 240 mm. standard length.

Coreius styani (Günther)


_Zezea rathbuni_ Jordan and Seale, 1905, Proc. U. S. Nat. Mus., XXIX, p. 518, Fig. 2. Shanghai.


-Coreius longibarbus_ Mori, 1928, Japanese Jour. Zool., II, p. 65, Pl. 11, Fig. 2. Tsinan, Shantung.


_Locality of Material:_—Specimens examined from Tungting Lake, Hunan.

_Description:_—Depth in length to base of caudal, 5; head, 4.1; eye in head, 6 (specimen of 74 mm. standard length). Dorsal rays, 9 or 10; anal, 8 or 9; scales, 52 to 57.

_Remarks:_—Called “huang-p’i-tiao-tzu” at Tungting Lake, where it was found in the boats of the shrimp fishermen. It is quite common and could be found at almost any time (C. H. Pope, field notes).

Genus _Agenigobio_ Sauvage


An elongate, bottom living carp from Lake Po-Yang, Kiangsi, China, with the appearance of _Saurogobio_, without barbels, and with the vent placed at the anal origin.

Gill opening wide, extending to under the front margin of the eye. Breast completely scaled. Dorsal and anal without spinous rays, the former with 9 articulated, the latter with more than 7 branched rays. Dorsal opposite the ventrals. Lower jaw with a symphysial knob. Scales, about 75. Pharyngeal teeth in 2 rows, long and pointed.

Vent and anal fin not bordered by a row of enlarged scales. Anal base well behind that of dorsal. No scaleless keel before anal fin. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed above the axis of the body.
Agenigobio halsoueti Sauvage


*Description:*—Depth in length, about 7.7; head, 6; eye a little shorter than snout. Dorsal rays, 12; anal, 11; scales, 75.

**Genus Rhinogobio** Bleeker


Elongate, soft-finned, bottom living carps, with a single pair of moderate barbels and the mouth inferior. Snout long, more or less soft at the tip; scales present on breast, though sometimes small and embedded; the lower lip never free behind across the chin. A Chinese specialization of *Gobio*, not uncommon, two or three poorly differentiated species.

Vent slightly nearer anal than ventrals, or nearer the ventrals; ventral origin slightly behind that of dorsal. Anal fin with 5 or 6 branched rays, exceptionally 7. Scales, 50, or slightly more.

Lower jaw never covered by cartilaginous or bony integument. Vent and anal fin not bordered by a row of enlarged scales. Anal base well behind that of dorsal. No scaleless keel before the anal fin. Upper jaw protractile. Gill membranes broadly joined to the isthmus. Gill rakers not fused. Eye placed above the axis of the body.

**Key to Chinese Rhinogobio**

Depth in standard length, less than 6; eye in head, 5, more or less; interorbital, 3.6 to 3.8 (specimens 110 to 125 mm. standard length). Scales, about 50 ........... *cylindricus*

Depth in standard length, 6 to 7; eye in head, 3.4 to 4.5; interorbital, 4 to 4.4 (specimens 77 to 200 mm. standard length). Scales, 51 to 53 ............... *tytus*

Depth in standard length, about 9; eye in head, 4.6 or 4.7; interorbital, little more than 3 (specimen 250 mm. total length). Scales, about 50 ................. *dereimsi*

**Rhinogobio cylindricus** Günther


*Locality of Material:*—Specimens examined from Tungting Lake, Hunan.

*Description:*—Depth in length to base of caudal, 5.3; head, 4; eye in head, 5.5 (specimen of 111 mm. standard length). Dorsal rays, 9; anal, 8; scales, about 50.

*Remarks:*—Called "chin-ch’iu” at Tungting Lake, where it was quite common in the boats of the shrimp fishermen (C. H. Pope, field notes).
Rhinogobio typus Bleeker


Locality of Material:—Specimens examined from Tungting Lake, Hunan; Yenping, Fukien.

Description:—Depth in length to base of caudal, 6 to 6.8; head, 3.7 to 4.3; eye in head, 3.4 to 4.4 (specimens of 77 to 105 mm. standard length). Dorsal rays, 9 or 10; anal, 8; scales, 51 to 53.

Rhinogobio dereimisi Tchang

Rhinogobio dereimisi Tchang, 1930, Cyprinidés du Bassin du Yangtze, p. 96, Pl. II, fig. 4. Tchoung-King [Chung-king].

Description:—Depth in length to base of caudal, 9; head, 5; eye in head, 4.6 or 4.7 (specimen 250 mm. total length). Dorsal rays, 9; anal, 8; scales, 50.

Genus Abbottina Jordan and Fowler


In obvious technical characters this genus resembles Pseudogobio, except that the dorsal is high and convex in the adult. Dorsal and caudal are sharply barred, with a black spot in center of caudal base; sides with regular rows of dark specks. Depth in length, 4 or 5 (specimens of 60 or 70 mm. standard length); scales, about 35.

It comprises abundant small fish, generally distributed in northeast and central China, probably there separable into two or three races or representative species.

Key to Chinese Abbottina

Lower lip with a pair of narrow ended central lobes. Depth, 4.5; interorbital in head, 3.4 to 3.5 (at 65 mm. standard length) ................................................. rivularis

Lower lip with a single central lobe, cleft behind in the middle. Averaging somewhat more slender than the above; interorbital in head, about 3.8 (at 75 mm. standard length) ................................. sinensis

Abbottina rivularis (Basilewski)


Locality of Material:—Specimens examined from Chihli, Shansi, and (not typical) from Shantung.

Description:—Depth in length to base of caudal, 4.5; head, 3.4; eye in head, 4.5 (specimen of 65 mm. standard length). Dorsal rays, 8 to 10; anal, 7 or 8; scales, about 36.
Abbottina sinensis (Kner)

Tylognathus sinensis Kner, 1867, Reise "Novara," Zool., I, Fische, p. 354, Pl. xv, fig. 5. Shanghai.

Locality of Material:—Specimens examined from Tungting Lake, Hunan; Shaohsing; Anhwei; Hokou, Kiangsi; Fukien.

Description:—Depth in length to base of caudal, 5; head, 3.6; eye in head, 5 (specimen of 74 mm. standard length). Dorsal rays, 9 or 10; anal, 7 or 8; scales, about 35.

Genus Pseudogobio Bleeker


Small, more or less bottom living, sucker-like carps with the mouth inferior, lips fleshy, the lower lip free behind across the chin. Vent nearer base of ventrals than anal. A single pair of barbels.

Pharyngeal teeth in 1 or 2 rows. Predorsal distance greater than postdorsal. Origin of ventrals behind vertical from origin of dorsal. Anal fin with 5 or 6 branched rays (exceptionally 7). Dorsal and anal without spines.

Dorsal not enlarged, with straight or concave margin. Fins not sharply barred, or sides with regular rows of dark specks. Depth, usually more than 4.5; scales, 34 to 44.


Fishes of this genus are generally uncommon or local, differentiable species occurring in different localities.

Key to Chinese Pseudogobio

1. Barbel small; scales, 42 or less .................................................. see 2
Barbel reaching beyond eye; scales, 42 to 44 ...................................

2. Scales, 34; depth, 6.4 ............................................................... filifer
Scales, 35; depth, 4.9 ............................................................... kachekensis
Scales, 35; depth, 5.5; snout in head, 1.8 ........................................ kukiensis
Scales, 36; depth, 5.4. Sharply bicolor, dark above, pale below ........... hsinlungshanensis
Scales, 36; depth, 5.9; interorbital, 3 to 3.6 ..................................... bicolor
Scales, 37; depth, 4.5; eye, 3.9 ...................................................... shangtungensis
Scales, 38; depth, 4.5; eye, 3 ...................................................... obtusirostris
Scales, 38; depth, 6.5 ............................................................... chaoi
Scales, 39; depth, 5; interorbital, 2.7 ............................................. suifuensis
Scales, 39; depth, 6 ............................................................... chinssuensis
tungtingensis
Scales, 39 to 41; depth, 5; interorbital, 4.4 (at 112 mm. standard length); edge of lower jaw rounded, horny, and sharpened .......... exigus

Scales, 40 to 43; depth, 4.8 to 7.5 .................................................. see 3

3. Depth, 4.8 (at 90 mm. standard length). Lower lip with 2 smooth pads larger than the other papillae (as in allied species examined except papillabrus) ................................................................. labeoides

Depth, 5 to 5.9; barbel in eye, 1 to 1.3 (specimen 101 to 144 mm. standard length) ................................................................. anderssoni

Depth, 6.5 to 7.5 (at 45 to 54 mm. standard length); 5.4 to 6.5 (at 57 to 77 mm.); 4.9 to 5.6; barbel in eye, 1.5 to 1.7 (specimens 111 to 142 mm. standard length). Lower lip evenly papillose with a cross furrow ..

Depth, 5.5; snout long, 1.7 in head (specimen 155 mm. total length); barbel longer than eye; lips uniformly papillose .................. longirostris

Pseudogobio kachekensis Oshima


Description:—Depth in length, 6.4; head, 4.2 or 4.3; eye in head, 3 (specimen 62 mm. long). Dorsal rays, 10; anal, 8; scales, 34.

Pseudogobio fukiensis Nichols

Figure 90

Pseudogobio fukiensis Nichols, 1926, Amer. Mus. Novitates, No. 224, p. 5, Fig. 4. Fukien.
Pseudogobio kiatingensis Wu, 1930, Sinensia, I, p. 70, Fig. 1. Kiating.

Locality of Material:—Specimens examined from Kienning and Yenping, Fukien; Hokou, Kiangsi; up to 78 mm. standard length.

Description:—Depth in length to base of caudal, 4.7 to 5.4; head, 4 to 4.5; eye in head, 3 to 3.2 (specimens 49 to 78 mm. standard length). Dorsal rays, 9 or 10; anal, 7 or 8; scales, 34 to 36.
Pseudogobio bicolor Nichols

Figure 91

*Pseudogobio bicolor* Nichols, 1930, Amer. Mus. Novitates, No. 440, p. 1, Fig. 1. Hokou, northeastern Kiangsi.

![Am.Mus.9678](image)

**Fig. 91. Pseudogobio bicolor** Nichols. Type. 60 mm. standard length.

*Description:*—Depth in length to base of caudal, 5.4; head, 4.5; eye in head, 3 (specimen 60 mm. standard length). Dorsal rays, 9; anal, 7; scales, 36.

Pseudogobio chinssuensis Nichols

*Pseudogobio chinssuensis* Nichols, 1926, Amer. Mus. Novitates, No. 214, p. 3, Fig. 3. Shansi.

Races of *P. chinssuensis* have the snout blunt, its profile rounding down abruptly and steeply, and a backwardly pointed, more or less heart-shaped pad in the middle of the chin.

Pseudogobio chinssuensis chinssuensis Nichols

Figure 92

*Pseudogobio chinssuensis* Nichols, 1926, Amer. Mus. Novitates, No. 214, p. 3, Fig. 3. Shansi.

![image](image)

**Fig. 92. Pseudogobio chinssuensis chinssuensis** Nichols. Type. 50 mm. standard length.

*Description:*—Depth in length to base of caudal, 5; head, 4.7; eye in head, 4 (specimen of 50 mm. standard length). Dorsal rays, 9; anal, 8; scales, 39.
Pseudogobio chinssuensis shangtungensis Mori


Locality of Material:—Specimens examined from Shantung; up to 43 mm. standard length.

_Description:_—Depth in length to base of caudal, 5 to 5.9; head, 4.2 to 4.8; eye in head, 3.1 to 4 (specimens 36 mm. standard length to 50 mm. long). Dorsal rays, 9; anal, 8; scales, 36 to 39.

Pseudogobio chinssuensis hsinglungshanensis (Mori)


_Description:_—Depth in length to base of caudal, 5.5; head, 4.5; eye in head, 3.8 (specimen 54 mm. total length). Dorsal rays, 9; anal, 8; scales, 35.

Pseudogobio obtusirostris Wu and Wang


_Description:_—Depth in length to base of caudal, 4.5; head, 4; eye in head, 3.9; interorbital, 2.9; barbel slightly shorter than eye (specimen 75 mm. total length). Dorsal rays, 9; anal, 7; scales, 37.

Pseudogobio chaoi Evermann and Shaw


_Description:_—Depth in length, 4.5; head, 3.5; eye in head, 3 (specimen 97 mm. long). Dorsal rays, 9; anal, 7; scales, 38.

Pseudogobio suifuensis Wu

_Pseudogobio suifuensis_ Wu, 1930, Sinensia, I, p. 71, Fig. 2. Suifu, Szechwan.

_Description:_—Depth in length to base of caudal, 6.5; head, 4.5; eye in head, 3.8 (specimen 73 mm. total length). Dorsal rays, 9; anal, 7; scales, 38.

Pseudogobio tungtingensis Nichols

_Figure 93

_Pseudogobio tungtingensis_ Nichols, 1926, Amer. Mus. Novitates, No. 214, p. 4, Fig. 4. Tungting Lake.

_Description:_—Depth in length to base of caudal, 6; head, 4.3; eye in head, 3.2 (specimen of 52 mm. standard length). Dorsal rays, 9 or 10; anal, 8; scales, 39.
Pseudogobio exigus (Lin)


Description:—Depth in length to base of caudal, 5; head, 5; eye in head, 4.4; interorbital, 4.4 (specimen 112 mm. standard length). Dorsal rays, 9; anal, 7; scales, 39 to 41. Edge of lower jaw rounded, horny, and sharpened.

Pseudogobio labeoides Nichols and Pope

Figure 94


Description:—Depth in length to base of caudal, 4.8; head, 3.4; eye in head, 3.7 (specimen of 90 mm. standard length). Dorsal rays, 9; anal, 8; scales, 40.

Pseudogobio anderssoni Rendahl


Description:—Depth in length to base of caudal, 5 to 5.9; head, 3.4 to 3.6; eye in head, 4.9 to 5.6 (specimens 101 to 144 mm. standard length). Dorsal rays, 9; anal, 8; scales, 41 to 42.
Pseudogobio papillabrus Nichols

Figure 95

Pseudogobio papillabrus Nichols, 1930, Amer. Mus. Novitates, No. 440, p. 2, Fig. 2. Kienning, Fukien.

Description:—Depth in length to base of caudal, 6.5 to 7.5; head, 3.5 to 3.7; eye in head, 4 to 4.2 (at 45 to 54 mm. standard length). Depth, 5.4 to 6.5; head, 3.5 to 3.7; eye, 4 to 5 (at 57 to 77 mm.). Depth, 4.9 to 5.6; head, 3.5 to 3.8; eye, 5 (at 111 to 142 mm.). Dorsal rays, 9; anal, 8; scales, 40 to 41.

Remark:—This species may be the same as Pseudogobio andersoni Rendahl, not seen by the author.

Pseudogobio papillabrus probably has closer true relationship with some species of Saurogobio than with other Chinese species of Pseudogobio examined, that is to say, the criterion of scale count for separating these two genera is arbitrary and not altogether satisfactory.

Pseudogobio longirostris Mori


Description:—Depth in length to base of caudal, 5.5; head, 3.6 or 3.7; eye in head, 5.8 (specimen 155 mm. total length). Dorsal rays, 9; anal, 7; scales, 43. Barbel, 1.6 times eye (from fig.); a row of linear dark marks along side.

Pseudogobio (? filifer Garman


Description:—Depth in length, about 7; head, about 5; eye in head, 5. Dorsal rays, 10; anal, 9; scales, 42 to 44.
Genus *Saurogobio* Bleeker


Elongate, bottom living, sucker-like carps with the mouth inferior, lips fleshy, the lower lip free across the chin. Vent nearer base of ventrals than of anal. A single pair of barbels. Scales, more than 45.

Pharyngeal teeth in one row. Dorsal fin far forward so that the predorsal distance is less than the postdorsal. Origin of ventrals behind vertical from origin of dorsal. Anal fin with 5 or 6 branched rays (exceptionally 7). Dorsal and anal without spines.

Lower jaw not sharp-edged, nor covered by cartilaginous or bony integument. Vent and anal fin not bordered by a row of enlarged scales. Anal base well behind that of dorsal. No scaleless keel before anal fin. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed above the axis of the body.

**Key to Chinese *Saurogobio***

1. Scales, 45 to 50 .......................................................... see 2
   Scales, about 55. Barbel more than twice diameter of eye .................. *heterodon*
   Scales, 55 to 65. Barbel short ..................................... see 4
2. Lower lip in a very narrow fold across chin, not papillose .................. *drakei*
   Lower lip thicker, in a broader fold, papillose ............................. see 3
3. Barbel, 6 or 7 times in length of head .................................. *productus*
   Barbel, 4 or 5 times in length of head .................................. *dabryi*
4. Pectoral passing ventral origin ........................................... see 5
   Pectoral not reaching ventral; breast scaled; a narrow plumbeous lateral stripe ... *dumerilii*

*Saurogobio drakei* (Abbott)


**Locality of Material:**—Specimens examined from Tungting Lake, Hunan.

**Description:**—Depth in length to base of caudal, 5.5; head, 5; eye in head, about 4.3 (specimen 140 mm. long). Dorsal rays, 11; anal, 8; scales, 46 to 48.

*Saurogobio productus* (Peters)

*Pseudogobio productus* Peters, 1880, Monatsber. Akad. Wiss. Berlin, p. 1035, Fig. 6 (head). Hong Kong.


**Locality of Material:**—Specimens examined from Anhwei.

**Description:**—Depth in length to base of caudal, 6.9; head, 4.1; eye in head, 4 (specimen of 158 mm. standard length). Dorsal rays, 10 or 11; anal, 8 or 9; scales, about 50.
SYSTEMATIC ACCOUNT

Saurogobio dabryi Bleeker


Locality of Material:—Specimens examined from Tungting Lake, Hunan.

Description:—Depth in length to base of caudal, 6.1; head, 4; eye in head, 3.7 (specimen of 73 mm. standard length). Dorsal rays, 9 or 10; anal, 7 to 9; scales, 45 to 50.

Remarks:—Berg (1916, p. 238) synonymizes Gobiosoma amurensis with this species, as have some other recent ichthyologists, but his figure looks more like S. productus or S. dumerili as here understood.

Called “t’u-ma-ku-lin-tzu” at Tungting Lake (C. H. Pope, field notes).

Saurogobio heterodon (Bleeker)


Description:—Depth in length, about 7; head, about 6.3; eye in head, about 5.5 (specimen 210 mm. long). Scales, ?55.

Saurogobio guichenoti Sauvage and Dabry de Thiersant


Description:—Dorsal rays, 9; anal, 9; scales, 57.

Saurogobio dumerili Bleeker


Saurogobio dorsalis Chu, 1932, China Jour., XVI, p. 133, Fig. 30. Shanghai Market.

Locality of Material:—Specimens examined from Tungting Lake, Hunan.

Description:—Depth in length to base of caudal, 7.8; head, 4.8; eye in head, 4 (specimen of 115 mm. standard length). Dorsal rays, 9 or 10; anal, 8 or 9; scales, 55 to 62.

Genus Fustis Lin


An elongate, subcylindrical, soft-finned carp. Abdomen rounded; a shallow dent before nostrils; jaws equal or the lower little longer; mouth wide, slightly protractile downward, maxillary reaching to under front margin of eye. Lips sim-
THE FRESH-WATER FISHES OF CHINA

Fustis vivus Lin

*Fustis vivus* Lin, 1932, Lingnan Sci. Jour., Canton, XI, p. 517. Southern Kweichow. 1933, ibid., XII, p. 491, Fig. 1.

*Description:*—Depth in length, 6; head, 4; eye in head, 5.2 (specimen 170 mm. long). Dorsal rays, 10; anal, 7; scales, 104.

Genus Sarcocheilichthys Bleeker


Small, moderately slender, soft-finned carps, abundant and generally distributed in eastern temperate Asia and adjacent islands.

Body not greatly compressed. Lips thick, confined to the corners of the mouth. A single pair of minute barbels present or absent. Mouth small, inferior, more or less transverse. Lower jaw sharpened, with or without horny integument. Suborbital narrow. Pharyngeal teeth in 1 or 2 rows. Anal fin with 5 or 6 branched rays (exceptionally 7).

Vent and anal fin not bordered by a row of enlarged scales. Anal base well behind that of dorsal. No naked keel before anal fin. Upper jaw protractile. Gill membranes attached to the isthmus. Gill rakers not fused. Eye placed in or above the axis of the body.

The intermediate subgenus *Sarcocheilichthys* is primarily Japanese. Minnows of the subgenus *Chilogobio* (moderately compressed, no barbels, lower jaw without horny integument) occur as representative species in various parts of the mainland, where slightly larger fishes of the subgenus *Barbodon* (little compressed, barbels present, horny integument on lower law) represent races of a single species, more confined to the larger rivers. Strangely enough, however, a dwarf species of *Barbodon* has recently been described from Hokou in northeastern Kiangsi, associated there with a larger species of the subgenus *Sarcocheilichthys*.

**Key to Chinese Sarcocheilichthys**

1. No barbels; lower jaw without a horny tip. Body moderately compressed

(*Chilogobio*) ................................................................. see 2
SYSTEMATIC ACCOUNT

Barbels rudimentary; end of lower jaw somewhat callous or slightly horny. Body moderately compressed (Sarcocheilichthys). Scales, 43. A vertical black bar behind the gill opening; dorsal grayish, lower fins pale .............. kiansiensis

A pair of minute barbels; lower jaw with a horny tip (Barbodon) .............. imberbis

2. Slender (depth less than head); ventral under first third versus middle of dorsal .......... see 7

Not as above .............................................. see 3

3. Lower fins pale, unmarked; scales, 39 to 40; depth, 3.7 to 3.8; eye, 3.4 to 3.6; length of peduncle, 1 to 1.1; dark mark on front of dorsal, dark center to caudal lobes. Ventral origin before center of dorsal base ............... see 4

Lower fins grayish, dusky, or largely occupied by blackish blotches; scales, 38 to 42; depth, 3.9 to 4.2; eye, 3.7 to 4; length of peduncle, 1.7 to 1.8; dorsal dusky, more or less darker before and behind, or with extensive black marks before and behind and a pale center; marks on caudal lobes obscure or absent. Ventral origin about under center of dorsal base (S. nigripinnis) ......... see 5

Body and fins pale with sharp blackish marks, such on front and back of dorsal, center of lower fins, center of caudal lobes; scales, 40; depth, 4; eye, 3; length of peduncle, 1. Ventral origin before center of dorsal base .......... hainanensis

4. Pectoral less than head ................................ maculatus1 scaphignathus

Mouth horizontal; pectoral, 1 ................................

5. Length of peduncle, 1.3 to 1.5; scales, 38 to 42; depth, 3.9 to 4.5; dorsal darker before and behind; body dark with more or less conspicuous blackish bar behind head ............................................. see 6

Length of peduncle, 1.7; scales, 38; depth, 4.1; dorsal black before and behind; pale in center; lower fins largely covered with black blotches .... nigripinnis

6. Dorsal origin equidistant from tip of snout and middle of peduncle; depth, 4 to 4.5; scales, 38 to 40; length of peduncle, 1.3; pectoral, 1.3 ....... sciistius
dorsal origin equidistant from tip of snout and anal axil; depth, 3.9; scales, 42. Length of peduncle, 1.5; pectoral, 1.4 ................................ nungting

7. Scales, about 41. Depth, 3.7; length of mouth, 1.4 in its width; barbel 8 in eye (specimen of 90 mm. standard length) .................. sinensis

Scales, about 41. Depth, 3.7; length of mouth, 0.8 in its width; barbel 6 in eye (specimen of 90 mm. standard length) ................. fukiensis

Scales, 36. Length of mouth equal to its width; barbel minute. A dwarf form parvus

Subgenus Chilogobio Berg


Sarcocheilichthys imberbis (Sauvage and Dabry de Thiersant)


Description:—Depth in length, 5.5; head in length to base of caudal, 4; eye in head, a little more than 4. Dorsal rays, 9; anal, 8; scales, 38.

1 S. (C.) maculatus (Gunther) probably comes here. Depth, 4; head, 4; pectoral slightly less than head; scales, 41; interorbital as wide as orbit.
**Sarcocheilichthys maculatus** (Günther)


*Description:*—Depth in length to base of caudal, 4; head, 4; eye in head, slightly more than 4 (specimens up to about 75 mm. long). Dorsal rays, 10; anal, 8; scales, 41.

**Sarcocheilichthys hainanensis** Nichols and Pope

Figure 96 and Plate I, figure 3

*Sarcocheilichthys hainanensis* Nichols and Pope, 1927, Bull. Amer. Mus. Nat. Hist., LIV, p. 352, Fig. 21, Pl. xxvi, fig. 3. Hainan.

*Description:*—Depth in length to base of caudal, 4; head, 4; eye in head, 3 (specimen of 62 mm. standard length). Dorsal rays, 9; anal, 9; scales, 40.

**Sarcocheilichthys scaphignathus** (Nichols)


*Locality of Material:*—Specimens examined from Fukien.

*Description:*—Depth in length to base of caudal, 3.8 to 3.5; head, 4; eye in head, 3.4 to 4 (specimens of 49 to 70 mm. standard length). Dorsal rays, 9 to 10; anal, 8 to 9; scales, 39 to 40.

**Sarcocheilichthys nigripinnis** (Günther)


**Sarcocheilichthys nigripinnis nigripinnis** (Günther)


*Locality of Material:*—Specimens examined from Anhwei.

*Description:*—Depth in length to base of caudal, 4.1; head, 3.8; eye in head, 3.7 (specimen of 66 mm. standard length). Dorsal rays, 10; anal, 8 or 9; scales, about 38.
Sarcocheilichthys nigripinnis sciistius (Abbott)

Leuciscus sciistius Abbott, 1901, Proc. U. S. Nat. Mus., XXIII, p. 487, Fig. Tientsin.

Locality of Material:—Specimens examined from Tsinan, Shantung; up to 68 mm. standard length.

Description:—Depth in length to base of caudal, 4.5; head, 4; eye in head, 4 (specimen 67 mm. long). Dorsal rays, 10; anal, 8; scales, 38.

Sarcocheilichthys nigripinnis tungting Nichols and Pope

Figure 97


Fig. 97. Sarcocheilichthys nigripinnis tungting Nichols and Pope. 80 mm. standard length.

Description:—Depth in length to base of caudal, 3.9; head, 4; eye in head, 4 (specimen of 80 mm. standard length). Dorsal rays, 9; anal, 8; scales, 42.

Subgenus Sarcocheilichthys Bleeker


Sarcocheilichthys kiangsiensis Nichols

Figure 98


Description:—Depth in length to base of caudal, 4 to 4.6; head, 4.7; eye in head, 4.5 to 4.8 (specimens 129 and 141 mm. standard length). Dorsal rays, 9 or 10; anal, 8 or 9; scales, 43.
Subgenus Barbonon Dybowski


Sarcocheilichthys sinensis Bleeker

Sarcocheilichthys sinensis Bleeker, 1871, Verhandel. Akad. Wetensch., Amsterdam, Afd. Natuurk., XII, p. 31, Pl. iv, fig. 2. Yangtze?

Sarcocheilichthys sinensis sinensis sinensis Bleeker

Plate VI, figure 2

Locality of Material:—Specimens examined from Tuntting Lake, Hunan; and from Anhwei.

Description:—Depth in length to base of caudal, 3.4 to 3.7; head, 4.3 to 4.4; eye in head, 3.5 to 4 (specimens of 90 to 122 mm. standard length). Dorsal rays, 8 or 9; anal, 7 or 8; scales, 41.

Remarks:—Called "huo-shao" at Tungting Lake, where it is very common and may be seen in the fishermen’s boats at any time. It frequently shows bright colors, black bands on a background of gold (C. H. Pope, field notes).

Sarcocheilichthys sinensis fukiensis Nichols

Figure 99

Sarcocheilichthys sinensis fukiensis Nichols, 1925, Amer. Mus. Novitates, No. 185, p. 3. Fukien.

Description:—Depth in length to base of caudal, 3.6; head, 4.4; eye in head, 3.5 (specimen of 90 mm. standard length). Dorsal rays, 9 or 10; anal, 8 or 9; scales, 41.
Sarcocheilichthys parvus Nichols

Figure 100


Locality of Material:—Tien-mu-san, Chekiang (Chu, 1932.1, p. 134, Fig. 31).

Description:—Depth in length to base of caudal, 3.8 to 4; head, 4.6 to 4.8; eye in head, 3.1 to 3.6 (specimens 40 and 57 mm. standard length). Dorsal rays, 9; anal, 8; scales, 36.

Family COBITIDAE

LOACHES

The loaches are closely related to the carps, from which they differ technically in having the air bladder more or less encased in a bony capsule. They have more numerous barbels, scales reduced in size or absent, and sometimes an adipose ridge
developed about precurrent caudal rays, so as to suggest an adipose fin on the hind end of the back. Such characters are, however, only superficially catfish-like. They seem to be in no sense intermediate between catfishes and carps, but rather a specialized offshoot from the true carps.

Their geographic distribution parallels that of the carps but is more restricted. Southwestward they have reached no farther than Abyssinia. Fragmentary remains of a supposed loach are recorded by Cope from a fresh-water Upper Tertiary formation in Idaho, but their identification was probably in error. The group does not now occur in America, and evidence of its ever having crossed to the New World from a probably Asiatic point of origin is inadequate.

The loaches are typically more or less elongate, somewhat eel-like, bottom fishes. One large series of them is armed with a concealed spine on the side of the head, and those of this series are relatively boldly patterned. Botia and allied genera of armed loaches comprise shorter-bodied, free swimming, usually bright-colored forms. The unarmed loaches are usually dull-colored.

Several genera of bottom living loaches are flattened below, with pectoral fins and sometimes body more or less expanded in a horizontal plane. These form a rather natural group and are sometimes recognized as a distinct family, Homalopteridae. They are, however, connected with the more normal type by intermediate forms.

Genus Gobiobotia Kreyenberg


Small, aberrant, gudgeon-like, Chinese, bottom loaches with comparatively large scales (about 42); a pair of barbels on the maxillaries and 3 pairs along the lower jaw; forked caudal fin. Swim bladder in a bony capsule. Rather uncommon, a single species recognized until recently when others have been described. The key to the species which follows is based mostly on Fang and Wang (1931, p. 291).

**Key to Chinese Gobiobotia**

1. Scales not embedded, 5 or 5.5 above lateral line and 3 or 3.5 below it; abdomen before ventral fins naked .................................................. see 2

   Scales embedded, 8.5 above lateral line and 6.5 below it; abdomen before anal and part of side of body naked; eye smaller than nostril. Dorsal origin about equidistant from end of snout and base of caudal ............. _boulengeri_ see 3

2. Dorsal origin in advance of ventral ........................................... _tungi_
Dorsal origin slightly behind that of ventral, nearer end of snout than base of caudal; pectoral equal to or longer than head; eye larger than nostril

3. Eye larger than nostril, nearer gill opening than tip of snout; second ray of pectoral not longer than the others; insertion of first median pair of barbels behind that of the first lateral pair

Eye larger than nostril, nearer tip of snout than gill opening; second ray of pectoral much longer than any of the rest; first median pair of barbels inserted in advance of first lateral pair

Eye small (9 or more in head), about equidistant from tip of snout and gill opening; abdomen naked to anal origin; form suggesting that of a *Homaloptera*

4. Pectoral fin short, not reaching origin of ventral; barbels short, not reaching base of pectoral; interorbital greater than eye

Pectoral reaching origin of ventral; last pair of barbels to beyond base of pectoral; diameter of eye equal to interorbital

5. Depth, between 4 and 5; origin of dorsal nearer tip of snout than base of caudal. Pectoral shorter than head

Depth, nearly 8; origin of dorsal equidistant from tip of snout and base of caudal

**Gobiobotia ichangensis** Fang

*Gobiobotia ichangensis* Fang, 1930, Sinensia, I, p. 58, Fig. 1. Ichang, Hupeh.

**Description:**—Depth in length to base of caudal, 4.3 or 4.4; head, 3.9 or 4; eye in head, 3.7 (specimen 91 or 92 mm. standard length). Dorsal rays, 9; anal, 8; scales, 42.

**Remarks:**—Perhaps a synonym of *G. pappenheimi*.

**Gobiobotia pappenheimi** Kreyenberg

Plate VIII, figure 1


**Locality of Material:**—Reported from Hainan by Koller (1927, p. 44). Specimens examined from Tungting Lake, Hunan.

**Description:**—Depth in length to base of caudal, 5; head, 3.6; eye in head, 4.6 (specimen of 39 mm. standard length); or depth, 6; head, 4.5; eye, 3.5 (specimens of 40 to 50 mm.). Dorsal rays, about 9; anal, about 7; scales, about 42.

**Remarks:**—A small, bottom fish quite commonly found in the boats of the shrimp fishermen at Tungting Lake (C. H. Pope, field notes).

**Gobiobotia boulengeri** Tchang


**Description:**—Depth in length to base of caudal, 4.5; head, 3.3 to 3.7; eye in
head, 8 (specimens 139 to 144 mm. total length). Dorsal rays, 9; anal, 8; scales, 44 to 45.

**Gobiobotia kiatingensis** Fang

*Gobiobotia kiatingensis* Fang, 1930, Sinensia, I, p. 58, Fig. 2. Kiating, western Szechwan.

*Description:*—Depth in length to base of caudal, 6.9 or 7; head, 4.3 or 4.4; eye in head, 4.8 (specimen 104 mm. standard length). Dorsal rays, 9; anal, 8; scales, 43.

**Gobiobotia abbreviata** Fang and Wang


*Description:*—Depth in length to base of caudal, 4.3; head, 3.8 or 3.9; eye in head, 4.6 or 4.7 (specimen 54 mm. standard length). Dorsal rays, 9; anal, 8; scales, 38. Dorsal origin slightly nearer tip of snout than base of caudal (from fig.).

**Gobiobotia longibarba** Fang and Wang


*Description:*—Depth in length to base of caudal, 5.4 or 5.5; head, 3.8; eye in head, 4.2 (specimen 80 mm. standard length). Dorsal rays, 9; anal, 8; scales, 40. Dorsal origin equidistant from tip of snout and base of caudal (from fig.).

**Gobiobotia homalopteroidea** Rendahl


*Description:*—Depth in length to base of caudal, 6 or 6.1; head, 3.7 or 3.8; eye in head, 9.1 or 9.2 (specimen 79 mm. standard length). Dorsal rays, 9; anal, 8; scales, 41.

**Gobiobotia tungi** Fang

*Gobiobotia tungi* Fang, 1933, Sinensia, III, p. 265, Fig. 1. Chekiang.

*Description:*—Depth in length to base of caudal, 5.1 to 5.2; head, 4.1 to 4.2; eye in head, 4.5 (specimen 124 mm. standard length). Dorsal rays, 10; anal, 8; scales, 42.

**Genus Cobitis Linnaeus**

Small, elongate, compressed, blotched or striped loaches with a more or less concealed, erectile spine under the eye. A single widely distributed Eurasian fish with a few local races or species.

Caudal truncate or rounded. Head strongly compressed, its sides without scales. Barbels, 6 or 8 (3 or 4 pairs). Air bladder encapsuled, without a free portion in the ventral cavity.

**Key to Chinese Cobitis**

1. Peduncle less than twice as long as deep; 90 to 110 scales before the dorsal; dorsal origin equidistant from end of snout and base of caudal; or nearer the latter (C. taenia) ................................................................. see 2

   Peduncle more than twice as long as deep; about 135 scales before the dorsal; dorsal origin equidistant from end of snout and middle of peduncle; few (about 6) large quadrate dark marks on the side ................. macrostigma

   Peduncle more than twice as long as deep; scales minute; dorsal origin slightly nearer snout than base of caudal; color typical of Cobitis taenia arenae

2. Deeper; depth, 6 or less; peduncle not conspicuously bordered with adipose keels, its length in head more than 1.5; dorsal origin nearer base of caudal than end of snout ................................................................. dolichorrhynchus

   More slender; depth, 6.5 or more; length of peduncle in head, 1.5 or less ..

3. Color sharply marked; (at 65 to 70 mm. length) 12 to 16 lengthwise blotches on side; spot on upper caudal base inconspicuous or absent; a more or less perfect, more extensive dark bar across caudal base. Peduncular keels not well developed; dorsal origin nearer base of caudal than end of snout ................................................................. melanoleuca

   Color less sharply marked; small black spot on upper caudal base conspicuous. Peduncle conspicuously bordered with adipose keels; dorsal origin equidistant from end of snout and base of caudal ................................................................. sinensis

**Cobitis taenia Linnaeus**


**Cobitis taenia dolichorrhynchus Nichols**

Figure 101 and Plate VIII, figure 3


**Fig. 101. Cobitis taenia dolichorrhynchus** Nichols. 61 mm. without caudal.
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Locality of Material:—Specimens examined from Fukien, Kwangtung, Hainan.

Description:—Depth in length to base of caudal, 5.5 to 6; head, 4 to 4.6; eye in head, 4.5 to 6 (specimens of 61 to 81 mm. standard length). Dorsal rays, 9 to 10; anal, 7 to 8; scales before dorsal, about 90.

Cobitis taenia melanoleuca Nichols

Figure 102


Am. Mus. No.8403

Fig. 102. Cobitis taenia melanoleuca Nichols. Type. About 70 mm. standard length.

Description:—Depth in length to base of caudal, 6.8 to 7 (specimens 65 to 72 mm. long).

Cobitis taenia sinensis Sauvage and Dabry de Thiersant

Figure 103 (upper) and Plate IX, figure 3


Locality of Material:—Specimens examined from Tungting Lake, Hunan; Anhwei; not typical from Kweihwa, Shansi; and Hsing-lung-shan, Hopei.

Description:—Depth in length to base of caudal, 7.3; head, 5.4; eye in head, 6 (specimen of 110 mm. standard length). Dorsal rays, 9 to 10; anal, about 8; scales before dorsal, 100 to 110.

Remarks:—At Tungting Lake the Chinese call this loach "hua-ni-ch'iu," "ni-ch'iu" being the name of various forms of Misgurnus. Many were taken from the shrimp fishermen’s boats (C. H. Pope, field notes).

Cobitis macrostigma Dabry de Thiersant

Figure 103 (lower)

**Locality of Material:**—Specimens examined from Tungting Lake, Hunan.

**Description:**—Depth in length to base of caudal, 8; head, 5.5; eye in head, 5.5 (specimen of 115 mm. standard length). Dorsal rays, 9 or 10; anal, about 8; scales before dorsal, about 135.

![Image](image-url)

**Fig. 103.** *Cobitis taenia sinensis* Sauvage and Dabry de Thiersant (upper) and *Cobitis macrostigma* Dabry de Thiersant (lower) compared.

**Cobitis arenae** (Lin)


**Description:**—Depth in length, 8.6; head, 4.7; eye in head, 11 (specimen 52 mm. standard length). Dorsal rays, 9; anal, 7; scales minute.

Barbels, 3 on a side plus 2 barbel-like fringes of lower lip; length of peduncle in head, 1.1; its depth, 2.7; predorsal space, 48 per cent of length; caudal truncate. Shape and color characteristic of *Cobitis taenia*, and the ocular spine presumably overlooked.

**Genus Acanthopsis** Van Hasselt


Small, elongate, compressed loaches with a small, erectile, suborbital spine, situated in advance of, not below the eye as in *Cobitis*. The caudal bilobed, versus truncate or rounded. Barbels, 8. A few species of East Indian affinity not well differentiated from *Cobitis*.

**Acanthopsis lachnostoma** Rutter


**Description:**—Depth in length, 7.6; head, 4.7 or 4.8; eye in head, about 6.3 (specimen about 150 mm. long). Dorsal rays, 8; anal, 6; scales minute, about 200.
Genus *Paralepidocephalus* Tchang


An elongate, compressed loach with erectile bifid spine below eye, and color pattern of *Cobitis*, without a conspicuous caudal spot. Six barbels in all, 4 on the snout and 2 on the maxillaries; scales lacking; origin of dorsal behind base of ventrals, caudal truncate.

*Paralepidocephalus yui* Tchang


*Description:*—Depth in length to base of caudal, 6.5 to 7.9; head, 5.2 to 5.7; eye in head, 7 (specimens 54 to 70 mm. standard length). Dorsal rays, 7; anal, 6.

Genus *Botia* Gray


Moderate or rather short-bodied, free swimming, frequently bright-colored (blotched or banded) loaches of southern Asia, with a few well-marked species occurring in the valley of the Yangtze.

Caudal forked. Head compressed, its sides mostly without scales. An erectile bifid spine under the eye, sometimes hidden in the skin. Barbels 6 (a maxillary pair and 2 pairs on the snout).

**Key to Chinese Botia**

1. Dorsal origin midway between base of caudal and about middle of opercle.
   - Color rather uniform. Depth, about 5.9 .............................. *compressicauda* see 2
   - Dorsal origin midway between base of caudal and eye or front of eye .............................. *citraurea*
   - Dorsal origin midway between base of caudal and middle of snout. Center of back dark with a series of close-spaced, rounded, pale marks. Slender; depth, about 5.5 .............................. *purpurea*
   - Dorsal origin midway between base of caudal and end of snout. Dark saddles across the back, sides finely marked. Deeper; depth, less than 4.5 ..............................

**Plate VIII**

Fig. 1. *Gobiobotia pappenheimi* Kreyenberg. 39 mm. standard length. Tungting Lake.

Fig. 2. *Lefua costata* (Kessler). Male. 42 mm. standard length. Chin-su, Shansi.

Fig. 3. *Cobitis taenia dolichorhynchus* Nichols. 61 mm. standard length. Noda, Hainan.

Fig. 4. *Lepturichthys fimbriata nicholsi* Hora. 59 mm. standard length. Tungting Lake.
2. Eye very small, more than 3 times in the interorbital, and about 8 times in the snout. No dark cross marks on back or sides. Eye in about the center of head. Depth, about 5 .............................. *pratti*

Eye small, 3.5 in interorbital. Dark saddles on back and imperfect bars across caudal lobes. Eye slightly before center of head. Depth, about 4.2 or 4.3 .............................. *fangi*

Eye somewhat larger, less than 3 times in the interorbital .............................. see 3

3. Eye, about 3.5 times in the snout. Plain colored, with a speckled caudal.
   Eye before the center of head. Depth, about 4.8 .............................. *tientainensis*

Eye, about 4 or 5 times in the snout. Dark cross marks on back which may be continuous downward, represented by blotches or absent across the sides. Eye behind the center of head. Depth, about 4.5 .............................. see 4

4. About 10 cross marks on the back. Peduncle short and deep .............................. *superciliaris*

About 5 to 7 cross marks on the back. Peduncle moderate, its length 1.8 in head .............................. *rubrilabris*

Botia compressicauda Nichols

Figure 104


*Description:*—Depth in length to base of caudal, 5.9; head, 4.7; eye in head, 10 (specimen 91 mm. standard length). Dorsal rays, 9; anal, 7; scales, about 165.

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Am.Mus.9682

Fig. 104. *Botia compressicauda* Nichols. Type. 91 mm. standard length.

Botia citrauratea Nichols


*Description:*—Depth in length to base of caudal, 5.4; head, 3.8; eye in head, 7.8 (specimen of 50 mm. standard length). Dorsal rays, 10; anal, 7; scales minute and embedded.

Botia pratti Günther

*Botia pratti* Günther, 1892, in Pratt, Snows of Tibet, p. 250, Pl. iv, fig. A. Szechwan.


*Description:*—Depth in length to base of caudal, rather less than 5; head, 3.5; eye in head, 19.5 or 19.6 (specimens about 200 mm. long). Dorsal rays, 11; anal, 8; scales minute.
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Botia fangi Tchang


Description:—Depth in length to base of caudal, 4.2 or 4.3; head, 3.4; eye in interorbital, 3.5 (specimen 170 mm. total length). Dorsal rays, 10; anal, 7.

Botia purpurea Nichols

Botia purpurea Nichols, 1925, Amer. Mus. Novitates, No. 177, p. 4, Fig. 3. Tungting Lake.

Description:—Depth in length to base of caudal, 4.2; head, 4; eye in head, 13.7 or 13.8 (specimen of 132 mm. standard length). Dorsal rays, 10; anal, 8; scales, about 150.

Botia tientainensis Wu


Description:—Depth in length to base of caudal, 4.8; head, 4.3; eye in head, 9.5 (specimen 82 mm. standard length). Dorsal rays, 8; anal, 7.

Botia rubrilabris (Dabry de Thiersant)

Figure 105


Locality of Material:—Specimens examined from Tungting Lake, Hunan.

Fig. 105. Botia rubrilabris (Dabry de Thiersant). 65 mm. without caudal. Tungting Lake.

Description:—Depth in length to base of caudal, 4.5; head, 3.3; eye in head, 10 (specimen of 50 mm. standard length). Dorsal rays, 11; anal, 7; scales very fine, evident only on peduncle.

Botia superciliiaris Günther

Botia superciliiaris Günther, 1892, in Pratt, Snows of Tibet, p. 250, Pl. iv, fig. B. Szechwan.
**SYSTEMATIC ACCOUNT**

**Description:**—Depth in length to base of caudal, 4.5; head, 3.5; eye in head, 9.5 (specimens about 150 mm. long). Dorsal rays, 11; anal, 8; scales minute.

**Genus Leptobotia** Bleeker


Moderately elongate, free swimming, rather bright-colored, banded loaches with a more or less concealed, simple, erectile spine under the eye. Few species—one widely distributed, with center of abundance in the Yangtze Valley.


**Key to Chinese Leptobotia**

Eye before center of head; 6 broad, irregular, dark cross bars .......... elongata

Eye about in center of head; about 15 blackish cross bars (narrower than the inter-spaces), a black spot on base of caudal and narrow oblique bars on its lobes .... fasciata

**Leptobotia elongata** (Bleeker)


**Locality of Material:**—Specimens examined from Yungtai Hsien, Fukien; up to 98 mm. standard length; from Ichang (in Museum of Comparative Zoölogy, labeled *Botia variegata*), of 300 mm. standard length.

**Description:**—Depth in length to base of caudal, 6; head, 3.5 to 4; eye in head, 13 to 18 (specimens 300 mm. standard length to about 500 mm. long). Dorsal rays, 9 to 11; anal, 7 or 8; scales very small (215, est.).

**Leptobotia fasciata** (Dabry de Thiersant)

*Parabotia fasciatus* (Guichenot) Dabry de Thiersant, 1872, Pisciculture et Pêche en Chine, p. 191, Pl. xliv, fig. 6. Yangtze.


*Botia multifasciata*, Reeves, 1927, loc. cit.


*Parabotia fasciata*, Chu, 1931, ibid., p. 70.

**Locality of Material:**—Specimens examined from Tungting Lake, Hunan; Anhwei; Hokou, Kiangsi; up to 130 mm. or more standard length.

**Description:**—Depth in length to base of caudal, 6; head, 3.5; eye in head, 6.5 (specimen of 87 mm. standard length). Dorsal rays, about 12; anal, about 7; scales very small.
Remarks:—Called "hua-chin-ch'iu" at Tungting Lake, where it was never found in numbers, only now and again one in the boat of a shrimp fisherman. Its maximum size seemed to be about 5 inches (C. H. Pope, field notes).

Genus Misgurnus Lacépède


More or less anguilliform, dull-colored, bottom living loaches of Europe and Asia. An uncertain number of variable, difficult species and races.

Ten barbels (5 pairs). No erectile spine below the eye.

Loaches of this genus seem to be abundant everywhere in China, very variable, separable into mostly ill-defined, more or less geographical forms. *M. mizolepis* Günther and *M. m. fukien* Nichols are comparatively well marked. A difficulty in considering the various forms examined races of a single species (*anguillicaudatus*), is that three different ones, *mizolepis*, *leopardus*, and *tungting*, occur together in the Yangtze basin. Hence the concept that three series or species are present: one northern and highland (*mohoity*), one central (*anguillicaudatus*), and one southern (*mizolepis*), in origin.

The following analysis of Chinese *Misgurnus* is based on considerable material from different parts of that country, but no doubt other areas from which there has not been opportunity to study adequate material will provide other forms that are comparably distinct. It may eventually be best to recognize fewer forms, only one basic, very variable, widely distributed one, and the few others which are more or less local and most different, as subspecies of it. Any treatment is at present admittedly unsatisfactory.

The following nominal species in the "Index Piscium Sinensium" by Chu (1931.6, pp. 68–69) are unidentifiable: *Misgurnus dichachrous*, *M. maculatus*, *M. polynema*, *M. spilurus*.

**Key to Chinese *Misgurnus***

1. Skin not thickened, scales rather regular and fully exposed ............................. see 2
   Skin more or less thickened and scales more or less embedded (sometimes exposed in *hainan*) ................................................................. see 4
2. Striae on scales well radiating. Scales moderate (about 130); depth moderate (about 6.5); head large (about 5.5); peduncle moderate (about equal to head); dorsal origin equidistant from base of caudal and gill cleft (*Misgurnus mohoity*, Tungting; Yunnan) ................................. see 3
   Striae on scales little radiating. Scales moderate (about 145); elongate (depth, over 7.5); head large (about 5.5); peduncle moderate (slightly less than head); dorsal origin equidistant from base of caudal and middle of opercle. Sides finely marked with dark, tending to form a broad band anteriorly ........................................... *tungting*
Head small (about 6); dorsal origin midway in the body length; rose colored with violet spots, smaller on the head, dorsal and caudal with dark marks. A poorly described species which probably comes here

3. Color, freckled olive above, pale below, without dark marking on body. Compressed; width of body, 2 in head. Color, back and sides with contrasting dark spots, rather regular and increasing in size upward to the diameter of eye along the back. Very little compressed (width, 1.6).

4. Moderate or elongate, peduncular keels about pre-current caudal rays sometimes fleshy, not excessively developed. Deep (depth, usually less than 6). Skin very thick, peduncular keels greatly developed, fleshy. Black spot at upper caudal base, faint or wanting.

5. Head large (less than 6). Dusky spotting on sides vague and irregular, the arrangement and size of spots variable; peduncle short, less than head; compressed (width, about 2); scales fine and irregular.

Head variable (5.3 to 6.8); peduncle longer than head; color lightly marbled with dark marks tending to form longitudinal bands, or with numerous dark spots and a black spot at the upper caudal base; very elongate (depth, 8.5 to 11).

Head small (6 or more). Dark markings on side usually contrasted; peduncle long (slightly longer than head), or else little compressed (width of body, less than 2), black spot at upper caudal base faint or wanting (Misgurnus mizolepis, Hainan, Fukien, Szechwan, Tungting in Hunan).

6. Spots on sides irregular, varying in size, some as large as eye. Compressed (width, 2).

Spots on sides small, blackish, or irregular, and not bold; very little compressed (width, less than 2).

Uniform yellowish red without spots; eye and fins, excepting dorsal, red.

7. Depth, more than 7.5. Brownish, irregular spots and bands on upper sides, dorsal, and caudal.

Depth, less than 7.5.

8. Spots on sides irregular, that on upper caudal base ill defined or absent.

Spots on sides fine, regular, blackish, that on upper caudal base usually sharply marked.

Finely speckled with black, base of the caudal above with no black spot. A form, of which no specimen has been examined by the writer, probably belongs here, perhaps intermediate between fukien and hainan.

**Misgurnus anguillicaudatus (Cantor)**


**Misgurnus anguillicaudatus anguillicaudatus (Cantor)**


1 This species, which is imperfectly described, probably comes here.
**Locality of Material:**—Specimens examined from Anhwei and Fukien.

**Description:**—Depth in length to base of caudal, 7.5; head, 5.8; eye in head, 5.4 (specimen of 130 mm. standard length). Dorsal rays, about 9; anal, 7 or 8; scales, about 155.

*Misgurnus anguillicaudatus tungting* Nichols

*Figure 106*


**Locality of Material:**—Specimens examined from Tungting Lake, Hunan; Hokou, Kiangsi; up to 114 mm. standard length.

*Am. Mus. No. 8393*

**Fig. 106. Misgurnus anguillicaudatus tungting** Nichols. Type. 89 mm. standard length.

**Description:**—Depth in length to base of caudal, 7.7; head, 5.6; eye in head, 5.2 (specimen of 89 mm. standard length). Dorsal rays, 9; anal, 8; scales, about 143.

*Misgurnus erikssoni* Rendahl


**Description:**—Depth in length to base of caudal, 8.5 to 11; head, 5.3 to 6.8; peduncle, 4.3 to 5.1; eye in head, 5.5, at 57 mm. total length (specimens 51 to 144 mm. long). Dorsal rays, 9; anal, 7; scales, very small, embedded.

**Remarks:**—Possibly based on more than one form.

*Misgurnus mizolepis* Günther


*Plate IX, figure 2*


**Locality of Material:**—Specimens examined from Tungting Lake, Hunan; Anhwei.

**Description:**—Depth in length to base of caudal, 5.5; head, 5.5; eye in head, 7.5 (specimen of 167 mm. standard length). Dorsal rays, about 7; anal, about 7; scales, about 135.
SYSTEMATIC ACCOUNT

Misgurnus mizolepis grangeri Nichols

Figure 107


*Description:*—Depth in length to base of caudal, 6.8; head, 5.9; eye in head, 7.8 (specimen of 117 mm. standard length). Dorsal rays, 9; anal, 7; scales, about 140.

Misgurnus mizolepis fukien Nichols

Figure 108


*Locality of Material:*—Specimens examined from Fuching Hsien and Yen-ping, Fukien; up to 160 mm. standard length.

*Description:*—Depth in length to base of caudal, 7.1; head, 6.6; eye in head, 6.5 (specimen of 127 mm. standard length). Dorsal rays, 8; anal, 7; scales, about 140.

Misgurnus mizolepis punctatus Oshima


*Locality of Material:*—Specimens examined from Foochow, Fukien; 100 to 107 mm. standard length, provisionally this.

*Description:*—Depth in length to base of caudal, 6.5; head, 6.5; eye in head, 6 (specimen 132 mm. long). Dorsal rays, 8; anal, 7; scales, about 140.
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Misgurnus mizolepis hainan Nichols and Pope

Figure 109 and Plate I, figure i

*Misgurnus mizolepis hainan* Nichols and Pope, 1927, Bull. Amer. Mus. Nat. Hist., LIV, p. 336, Fig. 9, Pl. xxvi, fig. i. Hainan.


**Locality of Material:**—Specimens examined from Hainan and from near Canton.

**Description:**—Depth in length to base of caudal, 7.5; head, 6; eye in head, 5.2 (specimen of 83 mm. standard length). Dorsal rays, 9; anal, 7; scales, about 150.

![Figure 109. *Misgurnus mizolepis hainan* Nichols and Pope. Type. 83 mm. without caudal.](image)

**Remarks:**—Some specimens from near Canton match this species, as described from Hainan, closely; in others there is a tendency for the markings to become finer and streaky along the rows of scales, and these suggest *M. a. tungting* of the Yangtze Valley, from which, however, they differ in various ways.

*Misgurnus mizolepis unicolor* Lin


**Description:**—Depth in length to base of caudal, 6.5; head, 6; eye in head, 7 (specimen 85 mm. standard length).

Depth of peduncle, 1.4; its length, 0.8 or 0.9. Uniform yellowish red without spots; eye and fins excepting dorsal, red. So far as the type description goes, color is the most diagnostic character of this species, based on a single, possibly erythristic, specimen.

*Misgurnus mizolepis elongatus* Kimura


**Description:**—Depth in length to base of caudal, 7.8; head, 6.7; eye in head, 7 (specimen 210 mm. total length). Dorsal rays, 6; anal, 6; scales, about 150.

Scales partly embedded, peduncular keels moderate; peduncle longer than head; dorsal origin equidistant from base of caudal and front of eye.

*Misgurnus mohoity* (Dybowski)

SYSTEMATIC ACCOUNT

Misgurnus mohoity yunnan Nichols

Figure 110


*Am.Mus. No. 8396*

**Fig. 110. Misgurnus mohoity yunnan** Nichols. Type. 123 mm. standard length.

*Description:*—Depth in length to base of caudal, 6.6; head, 5.4; eye in head, 6 (specimen of 123 mm. standard length). Dorsal rays, 9; anal, 7; scales, about 130.

Misgurnus mohoity leopardus Nichols

Figure 111


*Am. Mus. No 8397*

**Fig. 111. Misgurnus mohoity leopardus** Nichols. Type. 105 mm. standard length.

*Description:*—Depth in length to base of caudal, 6.5; head, 5.6; eye in head, 5.4 (specimen of 105 mm. standard length). Dorsal rays, 8; anal, 8; scales, about 135.

Misgurnus crossochilus Sauvage


*Description:*—Head in length to base of caudal, 6; eye small, smaller than interorbital. Dorsal rays, 9; anal, 7.

Genus Paramisgurnus Sauvage


A dull-colored Chinese loach, imperfectly known, related to *Misgurnus*. Eight barbels (4 pairs), 2 on the upper and 6 on the lower jaw. Adipose dorsal
and anal fins confluent with the pointed caudal. Ventrais opposite dorsal, retractile in a groove. Scales rather large. No erectile spine below the eye.

**Paramisgurnus dabryanus Sauvage**


*Description:*—Depth in length to base of caudal, 6.5; head, 6.5; eye equal to interorbital and \( \frac{3}{2} \) snout. Dorsal rays, 8; anal, 6; scales comparatively large.

**Genus Oreonectes Günther**


A small Chinese loach, with broad, depressed head, 6 barbels, no erectile suborbital spine, the dorsal fin at some distance behind the ventrais, its origin considerably nearer to the root of the caudal than to the opercle.


**Key to Chinese Oreonectes**

Dorsal rays, 9; scales conspicuous ........................................... *platycephalus*
Dorsal rays, 7; scales very small, embedded .................................. *yenlingi*

**Oreonectes platycephalus** Günther

*Oreonectes platycephalus* Günther, 1868, Cat. Fishes Brit. Mus., VII, p. 369. From a small stream near the top of Hong Kong Mountains (?).

*Description:*—Depth in length to base of caudal, 6 to 7; head, a little more than 5; eye very small (specimens up to about 70 mm. long). Dorsal rays, 9; anal, 7; scales conspicuous.

**Oreonectes yenlingi** Lin


*Description:*—Depth in length to base of caudal, 6.8; head, 4.6; eye small (specimen 48 mm. standard length). Dorsal rays, 7; anal, 6; scales very small, embedded.

**Genus Nemacheilus Van Hasselt**


More or less free swimming, small, fine-scaled loaches of southern Asia and the East Indies, frequently prettily barred, blotched, or spotted.
Moderate or short-bodied and symmetrical. Scalation evident, though sometimes incomplete, with non-imbricate scales. Barbels 6 (3 pairs, none at nostrils). No erectile spine (concealed or otherwise) below the eye. Head not laterally compressed. Lateral line complete or incomplete. Caudal margin slightly forked.

The East Indian subgenus Nemacheilus, with scalation and lateral line complete, nostrils close together, well before the eye, the anterior in an even-margined tube, has a species in Hainan Island. The subgenus Yunnanilus, with scales non-imbricate, lateral line imperfect, nostrils separated by a greater distance than that of the posterior from eye, the anterior in a flap-like tube, has two or more species in Yunnan.

**Key to Chinese Nemacheilus**

1. Nostrils close together, well before the eye, the anterior in an even-margined tube (Nemacheilus). A series of small dark cross marks in middle of side continued as larger, broader blotches on the peduncle, and a black spot in the center of caudal base; front of dorsal and caudal (above and below) with submarginal dark streaks ................................................................. pulcher

Nostrils separated by a distance greater than that of the posterior from eye, the anterior in a flap-like tube (Yunnanilus) ................................................................. see 2

2. Depth, 3.5 to 4; lateral line obscure or absent; back and sides tending to be blotched and marbled with dark, with narrower pale interspaces; eye less than interorbital ................................................................. nigromaculatus

Depth, about 4.5; lateral line evident, incomplete; markings fewer on a broader pale ground; eye about equal to interorbital ................................................................. pleurotaenia

Depth, 3.5 (4.5 in fig.); lateral line evident, incomplete; markings as above; eye in interorbital, about 1.5 ................................................................. salmonides

Subgenus Nemacheilus Van Hasselt


**Nemacheilus pulcher** Nichols and Pope

Figure 112 and Plate I, figure 2

*Nemacheilus pulcher* Nichols and Pope, 1926, Bull. Amer. Mus. Nat. Hist., LIV, p. 338, Fig. 10, Pl. xxvi, fig. 2. Hainan.


*Locality of Material:*—Canton; Poseh, Kwangsi (Lin, 1935, pp. 312-313, Figs. 7, 8).

*Description:*—Depth in length to base of caudal, 4.5; head, 3.8; eye in head, 3.5 (specimen of 42 mm. standard length). Dorsal rays, 14; anal, 8; scales, about 100.
Fig. 112. *Nemacheilus pulcher* Nichols and Pope. Type. 42 mm. without caudal.

Subgenus *Yunnanilus* Nichols


*Nemacheilus nigromaculatus* Regan


*Locality of Material:*—Specimen examined from Yunnan.

*Description:*—Depth in length to base of caudal, 3.5; head, 3.5; eye in head, 5 (specimen of 73 mm. standard length). Dorsal rays, 11 or 12; anal, about 8; scales, about 125.

*Nemacheilus pleurotaenia* Regan


*Locality of Material:*—Specimens examined from Yunnan.

*Description:*—Depth in length to base of caudal, 4.5; head, 3.9; eye in head, 5 (specimen of 52 mm. standard length). Dorsal rays, 11 or 12; anal, about 7; scales small, isolated.

*Nemacheilus salmonides* Chaudhuri

*Nemachilus salmonides* Chaudhuri, 1911, Rec. Indian Mus., Calcutta, VI, p. 18, Pl. 1, figs. 3, 3a. Yunnan.

*Description:*—Depth in length to base of caudal, 3.5 (about 4.5 in fig.); head, 4; eye in head, 4.6 (specimen 56 mm. long). Dorsal rays, 10; anal, 6.

Genus *Lefua* Herzenstein


Small loaches with a rounded caudal fin; no erectile spine below the eye; 8 barbels (4 pairs). A few species, which are questionably distinct from one another, in northeast temperate Asia.

A pair of small, slender, well-defined barbels near the anterior nostrils. Air bladder with a free portion in the ventral cavity. Head not compressed.
SYSTEMATIC ACCOUNT

KEY TO CHINESE Lefua

No bold black lateral stripe ........................................... costata
A bold black stripe from the eye to the middle of the caudal fin ........ andrewsi

Lefua costata (Kessler)

Figure 113 and Plate VIII, figure 2


Fig. 113. Lefua costata (Kessler). Type of Lefua andrewsi Fowler. After Fowler. (See page 276.)

Locality of Material:—Specimens examined from Chihli and Shansi.

Description:—Depth in length to base of caudal, 6.6; head, 4.5; eye in head, 5.8 (specimen of 53 mm. standard length). Dorsal rays, about 8; anal, about 7; scales small, little evident.

Lefua andrewsi Fowler


Locality of Material:—Specimens examined from Chihli and Shansi.

Description:—Depth in length to base of caudal, 6.6; head, 4; eye in head, 5 (specimen 42 mm. standard length). Dorsal rays, about 9; anal, about 8; scales small, little evident.

Remarks:—Vladykov (in MS) considers the difference between Lefua andrewsi and Lefua costata merely one of sex, an opinion in which the author concurs.

Genus Barbatula Linck


More or less elongate, little compressed, dull-colored, small loaches without noticeable scales, particularly abundant and varied in high central Asia, the species and races numerous and difficult. Several occur in northern and western China.

Barbels 6 (3 pairs, none at nostrils). No erectile spine (concealed or other-
wise) below the eye. Head not laterally compressed. Lateral line distinct, complete or essentially so. Nostrils narrowly separated from eye, close together, the anterior with a flap behind, its rim little raised in front. Caudal variously rounded, truncate or slightly indentate.

The extralimital subgenus Diplophysa has the posterior part of the air bladder free, only the anterior part enclosed in a bony capsule. The subgenus Homatula has somewhat the appearance of Homaloptera, head well depressed, tail strongly compressed. Jaws peculiar, premaxillaries fused in a rounded point above, each mandible firm, curved, prominent, the two separated by a notch.

**Key to Chinese Barbatula**

1. Head not particularly depressed, nor pectorals expanded in a horizontal plane; jaws not peculiar (Barbatula) .................................................. see 2
   Head well depressed, tail deep and compressed; pectorals expanded in a horizontal plane so as to suggest Homaloptera. Premaxillaries fused in a rounded point above; mandibles prominent, separated by a notch (Homatula) .................................................. see 10
2. Scales well marked ................................................................. see 3
   Scales obscure or absent .......................................................... see 4
3. Depth, a little more than 7. A violaceous band along the back and pale spots on the sides ............................................ livida
   Depth, 1 1/2. Marked with large brown blotches forming a series of bands variegata
4. Caudal pointed, with 3 dark bands ............................................ bleekeri
   Caudal slightly rounded. Yellowish marbled with darker, dorsal and caudal marbled ............................................ dabryi
   Caudal more or less emarginate .................................................. see 5
   Caudal forked for more than 1/3 of its length; ventral origin under or very slightly behind that of dorsal; head triangular ............................................ cuneicephalus
5. Deeper; depth, less than 6. Broad transverse dark bars on the back; dorsal and caudal with 1 to 3 series of dark spots on the rays .................................................. grahami
   Less deep; depth, more than 6 .................................................. see 6
6. Deeper; depth, less than 8 .................................................. see 7
   More slender; depth, more than 8 .................................................. see 8
7. Two distinct membranous keels at the chin ...................................... see 9
   Without distinct membranous keels at the chin. Broad dark saddles along the back and irregular blotches on sides .................................................. sellaefer
8. Ventral axil about under dorsal origin. Blotches forming an irregular, broad, almost or quite continuous dark band along the side; dorsal and caudal faintly barred .................................................. toni
   Ventral placed below front part of dorsal. Many vague broken dark bars on sides, and faint ones on dorsal and caudal .................................................. fowleri
   Ventral under hind part of dorsal, their axils apposed. A series of more or less confluent, small, obscure, dark blotches along the lateral line .................................................. posteroventralis
9. Ventral origin slightly before that of dorsal; ventrals not nearly reaching to anal .................................................. robusta
   Ventral origin slightly behind that of dorsal; ventrals reaching nearly to anal .................................................. stoliczka
10. Depth, 8 or more; caudal rounded; body with 15 or more dark cross bands
    Depth, about 7; caudal truncate or slightly forked .................. see 11
    Depth, little more than 6; caudal slightly forked; no cross bands ...... see 12
    Depth, 5.8 to 6.3; caudal emarginate; 12 or 13 broad, dark cross bands .. incerta
11. Head, 5 to 5.25; cross bands, about 15, 5 on caudal region ......... oxygnatha
    Head, about 6; about 9 cross bands on caudal region ................ potanini
12. Caudal truncate; a dark bar across caudal base but without conspicuous cross bands .............................................. fasciolata

Subgenus Barbatula Linck


Barbatula bleekeri (Sauvage and Dabry de Thiersant)


Description:—Depth in length, more than 5.5; head, 5.5; eye in head, 4 (specimen 25 mm. long). Dorsal rays, 9; anal, 8; scales invisible.

Barbatula (?) dabryi (Sauvage)


Locality of Material:—China (Sauvage and Dabry de Thiersant, 1874, p. 5).

Description:—Head in length to base of caudal, about 4.7; eye small, little more than half interorbital. Dorsal rays, 10; anal, 9; body scaleless.

Barbatula (?) livida (Sauvage and Dabry de Thiersant)


Description:—Depth in length, a little more than 7; head, 7; eye in head, about 5.5. Dorsal rays, 9; anal, 7; scales comparatively large.

Barbatula (?) variegata (Sauvage and Dabry de Thiersant)


Description:—Depth in length, 11; head, 6; eye small (specimen 110 mm. long). Dorsal rays, 9; anal, 6; scales well visible.

1 Barbatula humilis probably comes here. Side of body with 14 or 15 narrow, vertical bands.
Barbatula grahami (Regan)


Description:—Depth in length to base of caudal, about 5.3; head, 4 to 4.3; eye in head, 4.5 to 4.7 (specimens 70 to 82 mm. long). Dorsal rays, 11; anal, 8.

Barbatula toni (Dybowski)


Barbatula toni toni (Dybowski)


Description:—Depth in length to base of caudal, 6.5 to 8.7; head, 4.4; eye in head, 9 (specimen about 120 mm. total length). Dorsal rays, 8 or 9; anal, 6 or 7; scales fine and inconspicuous.

Barbatula toni fowleri Nichols

Figure 114


Am.Mus.No.8409

Fig.114. Barbatula toni fowleri Nichols. Type. 85 mm. standard length.

Description:—Depth in length to base of caudal, 6.2; head, 4.6; eye in head, 5.7 (specimen of 85 mm. standard length). Dorsal rays, 9; anal, 7 or 8; scales very fine, only evident on peduncle.

Barbatula toni posteroventralis Nichols

Figure 115 and Plate VII, figures 3 and 4


Description:—Depth in length to base of caudal, 7.3; head, 4; eye in head, 5.3 (specimen of 66 mm. standard length). Dorsal rays, 9; anal, 7 or 8; no evident scales.
SYSTEMATIC ACCOUNT

Barbatula yarkandensis (Day)


**Barbatula yarkandensis sellaefer Nichols**

Figure 116 and Plate VII, figures 1 and 2


Description:—Depth in length to base of caudal, 6.8; head, 3.9; eye in head, 6.2 (specimen of 73 mm. standard length). Dorsal rays, 9; anal, 6; no evident scales.

Barbatula robusta (Kessler)


Description:—Depth in length to base of caudal, 8.4 to 9.7; head, 4.6 to 5; eye in head, 6.7 to 7.3 (specimens up to 158 mm. long). Dorsal rays, 10; anal, 7; no evident scales.

Barbatula stoliczkai (Steindachner)

Plate IX, figure 1

**Locality of Material:**—Specimens examined from Shansi.

**Description:**—Depth in length to base of caudal, 9; head, 4.5; eye in head, 6 (specimen of 78 mm. standard length). Dorsal rays, 10; anal, 7; no evident scales.

*Barbatula cuneicephalus* Shaw and Tchang


**Description:**—Depth in length to base of caudal, 8 to 8.3 (once 10); head, 4.4 to 4.7; eye in head, 5 to 6.3 (specimens 47 to 92 mm. standard length). Dorsal rays, 9 to 11; anal, 7 or 8; scales not appreciable. Caudal forked for more than 3/5 of its length; ventral origin under or very slightly behind that of dorsal; head triangular.

**Remarks:**—This is a doubtful species; the figure by Shaw and Tchang does not agree with the description and measurements, showing depth, about 5.4; head, 4.3; eye, 7.4; dorsal, 8 1/2; anal, 7.

**Subgenus Homatula** Nichols


**Barbatula oxygnatha** (Regan)


**Description:**—Depth in length, 8 to 9.5; head, 5 to 5.3; eye in head, 6 (specimens 102 to 131 mm. long). Dorsal rays, 11; anal, 7; body with small scales behind the level of the dorsal fin; farther forward, rudimentary scales on sides.

**Barbatula berezowskii** (Günther)


**Description:**—Depth in length to base of caudal, 8; head, 6 (specimen of 122 mm. standard length). Dorsal rays, 11; anal, 6.

**Barbatula potanini** (Günther)


**Locality of Material:**—Specimens examined from Szechwan.

**Description:**—Depth in length to base of caudal, 7; head, 4.4; eye in head, 5.3 (specimen of 75 mm. standard length). Dorsal rays, 10; anal, 7; no evident scales.
Barbatula incerta Nichols

Figure 117

*Barbatula (Homatula) incerta* Nichols, 1931, Lingnan Sci. Jour., Canton, X, p. 458, Fig. 2. Kwangtung.

![Image of Barbatula incerta](image)

**Fig. 117. Barbatula incerta** Nichols. Type. 63 mm. standard length.

**Description:**—Depth in length to base of caudal, 6.2; head, 4.4; eye in head, 6.5 (specimen 63 mm. standard length). Dorsal rays, 9; anal, 7; scales, about 100 behind dorsal origin.

**Barbatula hingi** (Herre)


**Description:**—Depth in length, 5.8 to 6.3; head, 3.7 to 4; eye in head, 6.2 to 6.6 (specimens 25 to 58 mm. long). Dorsal rays, 10; anal, 7; scales, about 130.

**Barbatula fasciolata** (Nichols and Pope)

Figure 118


![Image of Barbatula fasciolata](image)

**Fig. 118. Barbatula fasciolata** (Nichols and Pope). 60 mm. without caudal.

**Description:**—Depth in length to base of caudal, 7; head, 4.4; eye in head, 6 (specimen of 60 mm. standard length). Dorsal rays, 10; anal, 7; scales very fine, scarcely evident except on sides posteriorly.

**Barbatula humilis** (Lin)


**Description:**—Depth in length to base of caudal, 6.6; head, 4; eye in head,
10 (specimen 60 mm. standard length). Dorsal rays, 9; anal, 6; scales minute, embedded.

Caudal emarginate; side of body with 14 or 15 narrow, vertical bands. Apparently related to *fasciolata*, but description unsatisfactory.

**Genus Homaloptera** Van Hasselt


Small, moderate or elongate, bottom loaches with the head more or less depressed and the body compressed. Flattened below anteriorly and with the paired fins, particularly the pectorals, expanded and rounded, lying in a horizontal plane. Eye small; orbital rim free. Mouth small, inferior, transverse. Scales fine, appreciable; lateral line complete. No erectile spine below the eye. Six barbels (2 pairs on snout and 1 at corners of mouth). Ventrals separate, with 8 to 11 rays.

Numerous species in southern Asia and the East Indies.

**Key to Chinese Homaloptera**

1. Caudal rounded; 4 pairs of barbels .................................................. see 2
   Caudal truncate or subtruncate; peduncle a little deeper than long. Scales, about 85 .......................................................... stenosoma
   Caudal obliquely emarginate; peduncle moderately longer than deep; scales, about 70; zigzag bands and large spots on back ................................ see 3
   Caudal forked ................................................................. disparis
2. Eye, about 5; dorsal, 6; scales, more than 120 .................................. rotundicauda
   Eye, 8 or 10; dorsal, 8; scales, less than 120 ................................ hofmanni
3. Peduncle moderately longer than deep ............................................ see 4
   Peduncle slender, much (4 times) longer than deep ......................... sinensis
4. A bold black lateral stripe. Scales, about 150 .................................. coldwelli
   No black lateral stripe. Scales, 65 to 75 ........................................ see 5
5. Scales, about 66; dorsal scales keeled ........................................... kwangsiensis
   Scales, about 71 or 72; dorsal scales smooth .................................. yaotanensis
   Ventrolateral scales spinous; caudal lobes rounded .......................... acuticauda
   Ventrolateral scales smooth; caudal lobes pointed .......................... subgenus Octonema Martens


It is possible that this subgenus belongs in *Barbatula* and should replace subgenus *Homatula* Nichols.

**Homaloptera rotundicauda** Martens

Description:—Depth in total length with caudal, 7.2; head, 5.4; eye in head, 5 (specimen of 54 mm. total length). Dorsal rays, 6; anal, 6; scales, more than 120.

Homaloptera hoffmanni (Herre)


Description:—Depth in length, 5.7 to 6.3; head, 4.4 to 4.6; eye in head, 8.5 to 9.3 (specimens 35 to 76 mm. long). Dorsal rays, 8; anal, 7; scales, 115 to 118, 85 to 88 predorsal.

Subgenus *Vanmanenia* Hora


Homaloptera stenosoma (Boulenger)


Description:—Depth in length to base of caudal, 6; head, 5.5; eye in head, 6 (specimen 105 mm. long). Dorsal rays, 9; anal, 7; scales, 85.

Subgenus Sinohomaloptera Fang


Homaloptera caldwelli Nichols

Figure 119


*Vanmanenia caldwelli*, Fang, 1935, Sinensia, VI, p. 68.

Locality of Material:—Specimens examined from Chungan Hsien (many), Fuching Hsien, and Yenping, Fukien; up to 85 mm. standard length.
Description:—Depth in length to base of caudal, 5; head, 4.6; eye in head, 5 (specimen of 48 mm. standard length). Dorsal rays, 10; anal, 7; scales, about 150.

Remarks:—This species has a forked caudal, more or less banded, not as figured from the type specimen (Nichols, 1928, p. 47, Fig. 42) which had an imperfect caudal fin.

**Homaloptera kwangsiensis** Fang


Description:—Depth in length to base of caudal, 6.4 or 6.5; head, 4.7 or 4.8; eye in head, 5.4 or 5.5 (specimen 77.5 mm. standard length). Dorsal rays, 10; anal, 7; scales, 66.

**Homaloptera yaotanensis** (Fang)

*Sinohomaloptera yaotanensis* Fang, 1931, Sinensia, I, p. 138, Fig. 1.

**Homaloptera yaotanensis yaotanensis** (Fang)

*Sinohomaloptera yaotanensis* Fang, 1931, Sinensia, I, p. 138, Fig. 1. Yao-tan, Wa-chang, Luchow, Szechwan.


Description:—Depth in length to base of caudal, 7.5; head, 4.8; eye in head, 6.2 or 6.3 (specimen 60 mm. standard length). Dorsal rays, 10; anal, 7; scales, about 71.

Remarks:—“The fishes of this species are found very numerous in the streams during the late spring and summer, all adhering on rock surface. They become rare in the winter... In the summer, these fishes are scraped off from the rocks with thin knives and collected in saxes [sic] by the natives. They are either dried or pickled for sale” (Fang, 1931.1, p. 143).

**Homaloptera yaotanensis acuticauda** (Fang)

*Sinohomaloptera yaotanensis acuticauda* Fang, 1931, Sinensia, I, p. 143, Fig. 5. Yao-tan, Wa-chang, Luchow, Szechwan.


Description:—Depth in length to base of caudal, 7.5 or 7.6; head, 4.7; eye in head, 5.6 or 5.7 (specimen 53 mm. standard length). Dorsal rays, 10; anal, 7; scales, about 72.

Subgenus Liniparhomaloptera Fang

SYSTEMATIC ACCOUNT

Homaloptera disparis (Lin)


Description:—Depth in length, 5.8; head, 5.2; eye in head, 8 (specimen 52 mm. standard length). Dorsal rays, 10; anal, 7; scales, about 70.

Three pairs of snout and one of larger maxillary barbels; a rostral groove before the mouth; paired fins with a single unbranched anterior ray.

Subgenus Homaloptera Van Hasselt


Homaloptera sinensis (Sauvage and Dabry de Thiersant)


Psilorhynchus sinensis and abbreviata, Hora, 1932, Mem. Indian Mus., Calcutta, XII, pp. 300, 301.

Description:—Depth in length to base of caudal, 7 to 8; head, 5.1; eye in head, 7 (specimens about 70 mm. standard length). Dorsal rays, 10 or 11; anal, 7; scales, about 65 or 75.

Genus Lepturichthys Regan


Slender, depressed, bottom loaches with lower surface flat, paired fins broad and rounded, in a horizontal plane. The peduncle is long and slender, making about one-third of the head and body length, its least depth about equal to the diameter of the small eye. Mouth small, transverse, on the lower side of the head. Lips fringed, papilllose, 2 or more rows of barblets before and behind, as well as 2 or 3 pairs of short barbels about the mouth. Caudal well forked. One or two species in the valley of the Yangtze, rather uncommon.

Lepturichthys fimbriata (Günther)


The key to the races of Lepturichthys fimbriata which follows is from Hora (1932, p. 293).

KEY TO CHINESE Lepturichthys fimbriata

1. Greater part of dorsal surface of head and body smooth; low keels on scales in tail region and some scales on anterior part of body provided with spinous projections at their ends .................................................. see 2
Entire dorsal surface of head and body covered with wart-like spinous processes; larger scales in front of dorsal with 3 or 4 warts on their distal borders ........... *nicholsi*  
2. Seven anterior simple rays in pectoral; longest ray of dorsal shorter than head ... *fimbriata*  
Nine anterior simple rays in pectoral; longest ray of dorsal much longer than head *güntheri*

**Lepturichthys fimbriata fimbriata** (Günther)


**Description:**—Depth in length to base of caudal, 12.6; head, 6.3; eye in head, 6.4 (specimen 101 mm. standard length). Dorsal rays, 11; anal, 7; scales, about 82 (pores).

**Lepturichthys fimbriata güntheri** Hora

*Lepturichthys güntheri* Hora, 1932, Mem. Indian Mus., Calcutta, XII, p. 295, Pl. x, fig. 7. Mountain streams running into the Min River, Szechwan.


**Description:**—Depth in length to base of caudal, 11.1 to 11.8; head, 6.2 to 6.9; eye in head, 6.6 to 7.8 (specimens 96 to 100 mm. standard length). Dorsal rays, 11; anal, 7; scales, about 88 (pores).

**Lepturichthys fimbriata nicholsi** Hora

Plate VIII, figure 4

*Lepturichthys nicholsi* Hora, 1932, Mem. Indian Mus., Calcutta, XII, p. 297, Pl. x, fig. 8, Pl. xii, fig. 3. Tungting Lake, Hunan.


**Locality of Material:**—Specimens examined from Tungting Lake, Hunan.

**Description:**—Depth in length to base of caudal, 10.4 to 11.2; head, 5.9 to 6.1; eye in head, 5 to 6.3 (specimens 58 to 73 mm. standard length). Dorsal rays, 9 to 11; anal, 6 or 7; scales, about 145 (total).

**Remarks:**—The largest secured at Tungting Lake was under 4 inches long. Each Chinese shrimp fisherman has a sort of drag-net which he drags down stream along the lake bottom all day. Dozens of these fishermen were at work, and daily for about a month we examined the bottoms of their boats for rare fish, as many small fish are taken along with the shrimp. The present species was secured in this way. It was never seen in numbers, and often many boats would be searched without a single one being found (C. H. Pope, field notes).

**Genus Praeformosania** Fang


This genus is intermediate between *Vanmanenia*, here considered a subgenus of *Homaloptera*, and *Crossostoma*. It has 7 rostral barbels, the 3 additional ones,
according to Fang, secondary modifications of the rostral lobe. Some individuals of one of his species (*P. intermedia*) even have barbels more as in *Vanmanenia*. Through species of *Crossostoma* which approach *Praeformosania* (such as *C. fascicu-{
cauda* in China, placed in the genus *Formosania*, here not considered worth even subgeneric recognition) there is a natural series of intermediates between *Homalooptera stenosoma* and *Crossostoma davidi*.

**Key to Chinese *Praeformosania***

Distance from the vent to the anal ⅔ that from the vent to the ventral axil .... *pingchowensis*

Distance from the vent to the anal ⅔ that from the vent to the ventral axil ..... *intermedia*

Distance from the vent to the anal but slightly less than that from the vent to the ventral axil ............. *lineata*

*Praeformosania pingchowensis* Fang

*Praeformosania pingchowensis* Fang, 1935, *Sinensia*, VI, p. 72, Figs. 3c, 9. Pingchow-hsien, southern Kweichow, mountain streams tributary to the Si-Kiang or West River.

*Description:*—Depth in length to base of caudal, 6.7 to 6.9; head, 4.6 to 4.8; eye in head, 6.3 to 6.6 (specimens 79 to 88 mm. standard length). Dorsal rays, 10; anal, 7; scales, approximately 101 to 102. Somewhat mottled, the fins barred.

*Praeformosania intermedia* Fang

*Praeformosania intermedia* Fang, 1935, *Sinensia*, VI, p. 75, Fig. 10. Tu-yuen-hsien, southern Kweichow, mountain streams running into Tungting Lake.

*Description:*—Depth in length to base of caudal, 5.5 to 7.3; head, 4.3 to 4.8; eye in head, 4.4 to 6.4 (specimens 50 to 61 mm. standard length). Dorsal rays, 10 to 11; anal, 7 to 8; scales, approximately 97 to 102. Color much as in *pingchowensis*.

*Praeformosania lineata* Fang

*Praeformosania lineata* Fang, 1935, *Sinensia*, VI, p. 78, Fig. 11. Kwang-Lau, Ling-yuen-hsien, northwestern Kwangsi.

*Description:*—Depth in length to base of caudal, 5.6 or 5.7; head, 4.8 or 4.9; eye in head, 7 (specimen 68 mm. standard length). Dorsal rays, 10; anal, 7; scales, approximately 92 pores. Body and peduncle with 2 dark brownish dorsolateral stripes from head to caudal base at each side.

**Genus *Crossostoma* Sauvage**


Moderately elongate, small, bottom loaches with a fringe of some 13 barbels before the small, inferior, transverse, curved mouth. Apparently common in Fu-
kien, China, where three rather unlike but seemingly closely related forms are known, one of which parallels a Formosan fish.

Head depressed, body compressed; flattened below as far back as the ventrals. Pectorals somewhat expanded. Fine scales evident, and lateral line complete. The eye small, with a free rim. A pair of barbels at the end of the maxillaries, in addition to those before the mouth. No spine below the eye. Caudal obliquely truncate or notched.

**Key to Chinese Crossostoma**

1. Mouth relatively large (its width in head, less than 3); barbels hanging freely, the longest about equal to eye in length. Usually marked with large irregular dark blotches .................................................. *davidi*
   
   Mouth small (its width in head, 3 or more); barbels reduced in size and distinctness .......................................................... see 2

2. Maxillary barbel about equal to eye in length; caudal slightly lunate; caudal crossed by about 4 black bands\(^1\) .................................................. *fascicauda*
   
   Maxillary barbel \(\frac{1}{2}\) or less than \(\frac{1}{2}\) length of eye .................................................. see 3

3. Caudal forked for about \(\frac{3}{4}\) of its length; irregular isolated dark blotches on body and upper and lower caudal margins .................................................. *stigmata*
   
   Caudal obliquely truncate, its margin little if at all concave; dorsal and paired fins with blackish borders .................................................. *fangi*

**Crossostoma davidi** Sauvage

*Figure 120*


**Locality of Material:**—Specimens examined from Chungan Hsien and Yen-ping, Fukien; up to 89 mm. standard length.

**Description:**—Depth in length to base of caudal, 6.4; head, 4.4; eye in head,

\(^1\) *Crossostoma tinkhami* apparently comes here. Caudal with 2 or 3 blackish cross bands.
6 (specimen of 65 mm. standard length). Dorsal rays, 10; anal, 8; scales, about 120.

**Crossostoma fascicau**da Nichols

*Figure 121*

_Crossostoma fascicau**da** Nichols, 1926, Amer. Mus. Novitates, No. 224, p. 2, Fig. 2. Fuching Hsien, Fukien.

_Description:_—Depth in length to base of caudal, 6; head, 4.1; eye in head, 7.2 (specimen of 81 mm. standard length). Dorsal rays, 11; anal, 8; scales, about 95.

![Fish illustration](image)

**Fig. 121. Crossostoma fascicau**da Nichols. Type. 81 mm. standard length.

**Remarks:**—We have many specimens referred to this form but not typical of it, as well as many specimens of *Crossostoma davidi*, from Chungan Hsien, north-western Fukien. A majority of these Chungan Hsien *C. fascicau**da** are much like Fuching Hsien *C. fascicau**da** and quite unlike *C. davidi*, but a small minority are intermediate between these two forms.

**Crossostoma tinkhami** Herre


_Description:_—Depth in length, 6.6 to 6; head, 4; eye in head, 6.4 to 7.2, in snout, 4 (specimens 36 to 66 mm. long). Dorsal rays, 10; anal, 7; scales, 93 or 94.

Caudal emarginate to lunate; a double row of 6 + 5 barbels on snout, the outermost 2 larger, as large as another pair at angle of mouth. Blackish above, whitish below; dorsal and caudal with 2 or 3, anal with a single blackish cross band.

**Crossostoma stigmata** Nichols

*Figure 122*

_Crossostoma stigmata** Nichols, 1926, Amer. Mus. Novitates, No. 224, p. 4, Fig. 3. Fukien.
_Formosania stigmata**, Fang, 1935, Sinensia, VI, p. 85, Fig. 14. Yenping, Fukien.
**Crossostoma stigmata** Nichols. Type. 53 mm. standard length.

*Description:*—Depth in length to base of caudal, 6; head, 4.5; eye in head, about 4 (specimen of 53 mm. standard length). Dorsal rays, 10; anal, 8; scales, about 90.

**Crossostoma fangi** Nichols

*Figure 123*

*Crossostoma fangi* Nichols, 1931, Lingnan Sci. Jour., Canton, X, p. 263, Fig. Near Canton.  
*Pseudogastromyzon fangi*, Fang, 1934, Sinensia, IV, p. 46, Fig. 2.

*Fig. 123. Crossostoma fangi* Nichols. Cotype. 54 mm. standard length.

*Description:*—Depth in length to base of caudal, 5.4 to 5.5; head, 5; eye in head, 5.4 (specimens 52 and 54 mm. standard length). Dorsal rays, 10 or 11; anal, 7; scales, about 95 behind pectoral axil.

**Genus Hemimyzon** Regan


Small, short-bodied, bottom loaches, flattened below, approaching *Gastromyzon* in form and fins, but less specialized in that direction. Ventrals with 9 to 15 rays, not united.
VENTRAL surface of head and body flat, the bases of the expanded pectorals confluent with same; the ventrals similarly expanded, overlapped by the free ends of the pectorals. Head depressed; tail compressed. Mouth inferior, small, transverse.

An extralimital species (from Formosa) representing the subgenus Hemimyzon has ventral with 15 rays, caudal forked. A species from Fukien representing the subgenus Pseudogastromyzon has ventral with 9 to 11 rays, caudal obliquely truncate.

**Key to Chinese Hemimyzon**

Pectoral, 21; ventral, 10; scales, about 90; narrow, pale, somewhat oblique bars on flanks .................................................. *zebroidus*

Pectoral, 18; ventral, 9; scales, about 70; a dark spot on the caudal base .......... *myersi*

Subgenus Pseudogastromyzon Nichols


*Hemimyzon zebroidus* Nichols

Figure 124

*Hemimyzon zebroidus* Nichols, 1925, Amer. Mus. Novitates, No. 167, p. 1, Fig. 1. Near Yenping, Fukien.


Locality of Material:—Specimens examined from Chungan Hsien, Fuching Hsien, and Yenping, Fukien.

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**Fig. 124. Hemimyzon zebroidus** Nichols. Type. 63 mm. standard length.
Description:—Depth in length to base of caudal, 6; head, 4.4; eye in head, 5 (specimen of 63 mm. standard length). Dorsal rays, 9 or 10; anal, 8; scales, about 90.

Hemimyzon myersi (Herre)

_Pseudogastromyzon myersi_ Herre, 1932, Lingnan Sci. Jour., Canton, XI, p. 430, Fig. 1. Hong Kong Island.

Description:—Depth in length, 8.1; head, 4.4 or 4.5; eye in head, 4.3 (specimen 29 mm. long). Dorsal rays, 9; anal, 6; scales, about 70.

Genus _Gastromyzon_ Günther


Small, short-bodied, bottom loaches, flattened below. The ventrals with 18 to 23 rays, united to form a suctorial disk. Several East Indian species; a few in southern China.

Ventral surface of head and body flat; the bases of the pectorals united with the lower surface of the body to form an oval disk; the ventrals so united to form a circular disk, overlapped by the free ends of the pectorals behind their axils. Head and body before dorsal depressed, evenly convex above; peduncle compressed. Mouth inferior, small, semicircular, transverse.

**Key to Chinese _Gastromyzon_**

1. Caudal obliquely emarginate; scales, about 70 or 75 .................................................. see 2
   Caudal obliquely truncate; scales, 110 to 120 ............................................................. see 3
   Caudal obliquely emarginate; scales, about 137 ..................................................... _szechuanensis_

2. Vent overlapped by ventrals. Color plain, little spotted; dorsal and caudal barred .......................................................... _leveretti_
   Vent just at posterior border of ventrals. Body with distinct close-spaced black spots; paired fins with black and white margins ............................................................. _kweichowensis_

3. Vent behind posterior border of ventrals; without noticeable cross bars on body ............................................................. _pingi_
   Vent at posterior border of ventrals; color pale with about 15 more or less perfect, narrow, dark cross bars ............................................................. _zebroidus_

_Gastromyzon leveretti_ Nichols and Pope


_Gastromyzon leveretti leveretti_ Nichols and Pope

Figure 125

**Gastromyzon leveretti leveretti** Nichols and Pope. Type. 50 mm. without caudal.

*Description:*—Depth in length to base of caudal, 5.6; head, 4; eye in head, 5 (specimen of 50 mm. standard length). Dorsal rays, 10; anal, 9; scales, about 75.

**Gastromyzon leveretti kweichowensis** Fang

*Gastromyzon leveretti kweichowensis* Fang, 1931, Sinensia, II, p. 41, Fig. 1. San-ho-hsien, Kweichow.

*Description:*—Depth in length to base of caudal, 5.4; head, 4 or 4.1; eye in head, 6.3 (specimen 54 mm. standard length). Dorsal rays, 10 (first 2 simple); anal, 6 (first 2 simple); scales, about 70.

*Remarks:*—Found in mountain streams together with *Sinogastromyzon san-hoensis*.

**Gastromyzon pingi** Fang


**Gastromyzon pingi pingi** Fang


*Description:*—Depth in length to base of caudal, 5.5 or 5.6; head, 4.5; eye in head, 6.4 (specimen 61 mm. standard length). Dorsal rays, 8; anal, 6; scales, 119.

**Gastromyzon pingi zebroidus** Fang


*Description:*—Depth in length to base of caudal, 5.4; head, 4 or 4.1; eye in head, 5.9 (specimen 54 mm. long). Dorsal rays, 8; anal, 6 or 7; scales, 112.

**Gastromyzon szechuanensis** Fang


THE FRESH-WATER FISHES OF CHINA

Description:—Depth in length to base of caudal, 5.2; head, 4.9; eye in head, 7.7 or 7.8 (specimen 73 mm. standard length). Dorsal rays, 10; anal, 6; scales, 137.

Genus Sinogastromyzon Fang

Sinogastromyzon Fang, 1930, Sinensia, I, p. 35. Type: Sinogastromyzon wui Fang.

This genus resembles Gastromyzon but differs from it in the following particulars. The ventrals are completely and evenly united behind, whereas in Gastromyzon there is a notch between them; the gill cleft is elongate on the side of the head; there is no dermal flap above the ventrals, and there are two small barbels instead of one at the angle of the mouth.

Key to Chinese Sinogastromyzon

1. Dorsal side of muscular bases of pectoral and ventral fins and area before ventral origin without scales; 2 simple anal rays or a spine of 2 coalescent rays Pectoral and ventral bases and area above and before origin of ventral scaly; anal with a strong, laterally grooved spine, of 2 coalescent anterior simple rays .................................................. see 2

2. Anal with 2 simple rays; side of body covered by free portion of pectoral partly scaly; scales keeled .......................................................... szechuanensis

3. Side of body before ventral origin and below the line drawn from it to posterior insertion of pectoral, naked; scales, about 6.1 .......................................................... intermedius

4. Scales, about 62 .................................................................................. sanhoensis

Sinogastromyzon wui Fang

Sinogastromyzon wui Fang, 1930, Sinensia, I, p. 36, Pl. II, figs. 3-4. Kwangsi.

Description:—Depth in length to base of caudal, 6 or 6.1; head, 4.3 or 4.4; eye in head, 4.7 or 4.8 (specimen 91 mm. standard length). Dorsal rays, 10; anal, I, 5; scales, 63.

PLATE IX

Fig. 1. Barbatula stoliczkai (Steindachner). 78 mm. standard length. Mai Tai Chao, Shansi.

Fig. 2. Misgurnus mizolepis mizolepis Günther. 167 mm. standard length. Tungting Lake.

Fig. 3. Cobitis taenia sinensis Sauvage and Dabry de Thiersant. 47 mm. standard length. Tungting Lake.

Fig. 4. Gobius cliffordpopei Nichols. Type. 34 mm. standard length. Tungting Lake.
Sinogastromyzon szechuanensis Fang


*Description:*—Depth in length to base of caudal, 7.4; head, 4.9; eye in head, 5.8 (specimen 71 mm. standard length). Dorsal rays, 10; anal, 7; scales, 64.

Sinogastromyzon hsiashiensis Fang

*Sinogastromyzon hsiashiensis* Fang, 1931, Sinensia, II, p. 48, Fig. 3. Mountain stream, Hsia-shih, Ma-ha-hsien, Kweichow, altitude about 1200 feet; tributary of an affluent of Tungting Lake.

*Description:*—Depth in length to base of caudal, 5.9; head, 4.5; eye in head, 5.4 (specimen 65 mm. standard length). Dorsal rays, 10 (first 2 simple); anal, 7; scales, 57.

Sinogastromyzon intermedius Fang

*Sinogastromyzon intermedius* Fang, 1931, Sinensia, II, p. 54, Fig. 7. Tung-kwei, Lungchow, southwestern Kwangsi.

*Description:*—Depth in length to base of caudal, 6; head, 3.7 or 3.8; eye in head, 5.9 (specimen 60 mm. standard length). Dorsal rays, 10 (first 2 simple); anal, 6 (I, 5); scales, 61.

Sinogastromyzon sanhoensis Fang

*Sinogastromyzon sanhoensis* Fang, 1931, Sinensia, II, p. 56, Fig. 9. San-ho-hsien, south Kweichow.

*Description:*—Depth in length to base of caudal, 6.4; head, 4.9; eye in head, 5.6 or 5.7 (specimen 81 mm. standard length). Dorsal rays, 10 (first 2 simple); anal, 6 (I, 5); scales, 53.

Family CYPRINODONTIDAE

TOOTH-CARPS

Small fishes with a single, short, soft-rayed back fin rather posterior in position; the ventrals inserted well behind the pectorals, the mouth usually small, more or less transverse, and directed somewhat upwards; with small teeth; the caudal usually more or less rounded, head flattened, eye large, scales moderate, smooth.

This family and its allies are characteristic of lowland fresh waters and brackish estuaries, though some species are found in the sea. They form an appreciable factor, though not a large one, of the fresh-water faunas of southern Asia and of Africa, but are poorly represented in China.
THE FRESH-WATER FISHES OF CHINA

Genus Aplocheilus McClelland


Small, compressed, large-eyed, fresh-water, minnow-like fishes of the Old World, with a single, small, spineless, posteriorly placed, dorsal fin; the mouth small, transverse, with projecting lower jaw; the teeth small, pointed in a narrow band on the jaws. Anal fin longer than the dorsal, unmodified. Ventral present.

The subgenus Oryzias includes one or two species characteristic of large islands not far from the coast of China. They have premaxillaries not protractile; orbital rim adnate or with a very slight fold; gill membranes narrowly joined under the hind margin of the eye, free from the isthmus; caudal truncate or slightly emarginate. There is also a species of the Indian subgenus Panchax, Aplocheilus rubropunctatus Steindachner, probably erroneously recorded from China (Rendahl, 1928, p. 176).

Key to Chinese Aplocheilus

1. No teeth on vomer; anal, with 17 to 25 rays; no cross bands. Caudal truncate or slightly emarginate ................................................................. see 2
   Anal rays, 17 to 20 .......................................................... latipes
   Anal rays, about 25 .......................................................... curvinotus

Subgenus Oryzias Jordan and Snyder


Aplocheilus latipes (Temminck and Schlegel)

Poecilia latipes Temminck and Schlegel, 1846, in Siebold, Fauna Japonica, Pisces, p. 224, Pl. ciii, fig. 5. Japan.

Locality of Material:—Specimens examined from Shantung; up to 29 mm. standard length.

Description:—Depth in length to base of caudal, 3.5 to 3.9; head, 3.5 to 4; eye in head, 2.7 to 3 (specimens 20 to 29 mm. standard length). Dorsal rays, 6; anal, 16 to 20; scales, 29 to 32.

Aplocheilus curvinotus Nichols and Pope

Figure 126

Aplocheilus curvinotus Nichols and Pope, 1927, Bull. Amer. Mus. Nat. Hist., LIV, p. 380, Fig. 43. Hainan.
SYSTEMATIC ACCOUNT

Description:—Depth in length to base of caudal, 3.4; head, 3.4; eye in head, 2.6 (specimen of 23 mm. standard length). Dorsal rays, 6; anal, 25; scales, about 35.

Fig. 126. Aplocheilus curvinotus Nichols and Pope. Type. 23 mm. without caudal.

Family HEMIRAMPHIDAE
HALFBEAKS

Slender, active, marine, surface fishes, with the upper jaw short, the lower prolonged beyond it, toothless and spear-like. The halfbeaks have presumably been derived from the young of the needlefishes (Belonidae), which, in varying degree, pass through a half-beak condition, doubtless correlated with feeding habits.

Genus Hyporhamphus Gill


Slender, actively free swimming, marine, shore, or estuarine fishes, wherein the upper jaw is short, the lower jaw ends in a long spear-like prolongation and is toothed only at the base. Numerous species, representatives in all warm seas, a few only distinctively fresh-water.

Dorsal and anal fins low, alike in size and relative position; ventrals small, inserted about midway between gill opening and caudal base, considerably in advance of the dorsal; caudal fin more or less forked, its lobes equal. Scales rather large, deciduous. Teeth small, tricuspid. Gill rakers long and slender. Air bladder large and simple. Sides with a silvery band. Food mostly green algae.

The genus Hyporhamphus occurs in shallow water coastwise. One species is well established in Chinese fresh waters, and others (not included here) very likely enter the mouths of rivers to some extent.

Hyporhamphus sinensis (Günther)


Locality of Material:—Specimens examined from Tungting Lake, Hunan.
**Description:**—Depth in length (from tip of upper jaw) to base of caudal, 10.8; head (from tip of upper jaw), 4.5; eye in head, 4 (specimen of 70 mm. standard length). Dorsal rays, 15 to 17; anal, 15 to 20; scales, about 55.

**Remarks:**—Called “chen-yü” at Tungting Lake, where it is one of the common fish of the lake but too small to be of economic importance. Though sometimes larger, the average size seems to be about 6 inches. It may be picked out in any large mixture of small fry; and taking a place at random, half-an-hour’s fishing with a small one-man Chinese dip net netted half a dozen specimens. It has a silver stripe on the side (C. H. Pope, field notes).

**Family GASTEROSTEIDAE**

**STICKLEBACKS**

Very small fishes, with the first dorsal of more or less isolated spines. Pelvic bones fused, the ventral with a strong spine. Snout not excessively elongate. Skin naked or covered with thin bony plates. Peduncle with or without a keel. Gill membranes united in a free fold across the isthmus. Pectoral and caudal fins rounded.

Boreal and north temperate forms; one species recorded from China, rare.

**Genus Pygosteus Gill**


Sticklebacks with 7 to 12 dorsal spines, directed more or less to the sides in a zigzag manner. A representative species of this genus will be found in the fresh waters of most north temperate or boreal regions, also entering the sea.

**Pygosteus pungitius** (Linnaeus)


**Pygosteus pungitius sinensis** (Guichenot)


**Description:**—Depth in length to base of caudal, 4.2 to 5.4; head, 3.3 to 4.7; eye in head, 2.5 to 3.7. Dorsal rays, VII to IX, 8 to 11; anal, I, 8 to 10; anterior part of body with vertical bony plates, caudal peduncle with a well-developed lateral keel.
SYSTEMATIC ACCOUNT

Family OPHICEPHALIDAE

SNAKE-HEADS

The snake-heads possess accessory breathing organs, as do the related labyrinth fishes, but of a simpler character, a pair of simple cavities, pouches of the pharynx, lined with a thickened, puckered, vascular membrane. They are extremely tenacious of life, survive for considerable periods out of water, and can make some progress on land by the aid of rowing movement of the pectoral fins. They inhabit sluggish streams, ponds, and marshes, and when these latter dry up frequently remain in a torpid state in the mud until the rains come again.

Most belong to the genus *Ophicephalus*, and all are closely related to it.

Genus *Ophicephalus* Bloch


Elongate, more or less cylindrical, large-mouthed fishes of moderate size, with an undifferentiated dorsal fin running the length of the back, a similar anal fin along the posterior portion of the body below, caudal rounded, ventral fins present. Mouth terminal, or usually the lower jaw projecting. Scales small or of moderate size. Abundant, represented by a number of usually closely related species in Asia, Africa, and the East Indies, particularly in the tropics.

**Key to Chinese *Ophicephalus***

1. Head not especially broad, interorbital in its length, 4 or more ........................................ see 2
   Head broad, interorbital in its length, 3 to 3.5; dorsal rays, less than 40; anal, less than 25; scales, 40 to 45 ............................... *gachua*
2. Dorsal rays, about 30; anal, less than 25; scales, about 40 ............................... *punctatus*
   Dorsal rays, 40 or more; anal, more than 25; scales, more than 50 ............................... see 3
3. Fins not spotted with white (except sometimes posteriorly in *striatus*), no ocellus on base of caudal in adult ................................................................. *marulius*
   Vertical fins irregularly spotted with white and usually an ocellus on the base of the caudal fin ................................................................. see 4
4. Scales, 55 to 60; dorsal rays, 40 to 46 ............................... *argus*
   Scales, 62 to 67; dorsal rays, 49 to 52; several faintly ocellated blotches above the posterior part of the lateral line ............................... *striatus*
5. Scales on top of the head rather large, 8 or 10 series between the orbit and pre-opercular angle; vertical dark marks on the lower sides ............................... *aspilotus*
   Scales on top of the head rather large; greenish olive, darker on head and back, unmarked ....................................................... *maculatus*
Ophicephalus argus Cantor


Locality of Material:—Specimens examined from Yunnan; Anhwei; Hokou, Kiangsi; up to 184 mm. standard length.

Description:—Depth in length to base of caudal, 5.6; head, 3.1; eye in head, 8 (specimen of 182 mm. standard length). Dorsal rays, 49 to 52; anal, 32 to 33; scales, 62 to 67.

Ophicephalus striatus Bloch


Locality of Material:—South China (fide Gee).

Description:—Depth in total length, nearly 7; head, 3.7 or 3.8. Dorsal rays, 40 to 45; anal, 26 or 27; scales, about 57.
**SYSTEMATIC ACCOUNT**

**Ophicephalus aspilotus** Sauvage and Dabry de Thiersant


*Description:*—Depth in length, 7; head, about 2.3; eye in head, 5. Dorsal rays, 45; anal, 30; scales, 60.

**Ophicephalus punctatus** Bloch


*Description:*—Depth in length, 6; head, 3.6 or 3.7. Dorsal rays, 29 to 31; anal, 20 to 22; scales, about 40.

**Ophicephalus gachua** Hamilton-Buchanan

Figures 128, 129 and Plate X, figure 3

*Ophicephalus gachua* Hamilton-Buchanan, 1822, Fishes in Ganges, p. 68, Pl. xxi, fig. 21. Ganges River.

*Locality of Material:*—Specimens examined from near Canton; Hainan Island.

![Fig. 128. Ophicephalus gachua Hamilton-Buchanan. 120 mm. without caudal.](image)

![Fig. 129. Ophicephalus gachua Hamilton-Buchanan. 100 mm. standard length.](image)

*Description:*—Depth in length to base of caudal, 5.5; head, 3.2; eye in head, 5.3 (specimen of 50 mm. standard length). Dorsal rays, 32 to 37; anal, 21 to 23; scales, 40 to 45.
Ophicephalus marulius Hamilton-Buchanan

Locality of Material:—Generally credited to China.

Description:—Depth in total length, 7; head, 4. Dorsal rays, 49 to 55; anal, 31 to 36; scales, about 60.

Genus Channa Scopoli


An elongate, more or less cylindrical, large-mouthed fish of moderate size, with an undifferentiated dorsal fin running the length of the back, a similar anal fin along the posterior portion of the body below, caudal rounded, ventrals absent; scales rather small. Apparently a single species, perhaps with differentiable forms, abundant in southeastern Asia. Differs from Ophicephalus by the absence of ventral fins.

Channa asiatica (Linnaeus)

Locality of Material:—Swatow (fide Gee). Specimens examined from Tungting Lake, Hunan; Anhwei; Fukien; near Canton; Hainan Island; up to 255 mm. long.

Description:—Depth in length to base of caudal, 6.2; head, 3.3; eye in head, 5.2 (specimen of 87 mm. standard length). Dorsal rays, about 46; anal, about 28; scales, about 60.

Remarks:—Called "hua-t'sai-yü" at Tungting Lake. It was never seen for sale on the streets, nor was it seen in any of the fishermen's boats. An old fellow
brought in 5 in water and said he caught them at some distance—perhaps in a mountain stream (C. H. Pope, field notes).

Family OSPHRONEMIDAE
GOURAMIS AND PARADISE FISHES

Small, brightly colored fishes of sluggish south Asiatic and East Indian fresh waters. They have an accessory air-breathing apparatus above the gills on either side of the head, a more or less rosette-like structure made up of shelly plates richly supplied with fine blood vessels. The related climbing perches have a similar structure, from which these two families get the name labyrinth fishes, with which the snake-heads are sometimes included.

Various species of labyrinth fishes construct a floating nest or raft of mucus-coated bubbles, beneath which the eggs and larvae adhere until able to shift for themselves, meanwhile being sedulously guarded by one or both parents.

Genus Macropodus Lacepède


Small, highly colored labyrinth fishes (with a cavity above the third or upper portion of the first branchial arch, containing an elaborate apparatus consisting of thin laminae of bone, covered by a vascular mucous membrane, and employed as an auxiliary organ of respiration) of the fresh waters of southern and eastern Asia and adjacent islands. They build a floating nest of bubbles and are frequently kept in balanced aquaria under the name of paradise fish. A few varied but puzzling species.

Rather short-bodied, compressed. Eye rather large, mouth small. Dorsal and anal rather long, evenly continuous, of spines and rays, the spines more numerous than the rays. Scales of moderate size, ctenoid. Lateral line interrupted or absent. Ventral I, 5. No teeth on the palate.

Key to Chinese Macropodus

Caudal rounded or acuminate; cross bands faint or absent .......................... chinensis
Caudal concave behind, its corners produced; about 8 narrow, vertical, blackish bands on body .......................... viridiauratus

Macropodus chinensis (Bloch)

Chaetodon chinensis Bloch, 1790, Ausl. Fische (and Ichthyologie), IV, p. 5, Pl. ccxvii, fig. 1.
Macropodus chinensis, Myers, 1926, Copeia, No. 150, p. 99.
**Locality of Material:**—Ningpo; Shanghai; Chihli (fide Gee).
Specimens examined from Tungting Lake, Hunan; Anhwei; Shantung.

**Description:**—Depth in length to base of caudal, 2.5 to 2.7; head, 2.9; eye in head, 4 to 4.5 (specimens of 43 to 49 mm. standard length). Dorsal rays, XIV to XVII, 7 to 8; anal, XVIII to XX, 10 to 12; scales, 26 to 31.

*Macropodus viridiauratus* Lacépède

*Figure 131*


**Locality of Material:**—Specimens examined from Fukien; Lung T'au Shaan and near Canton, Kwangtung; Hainan Island.

*Fig. 131. Macropodus viridiauratus* Lacépède. 36 mm. without caudal.

**Description:**—Depth in length to base of caudal, 2.8; head, 2.8; eye in head, 3.9 (specimen of 36 mm. standard length). Dorsal rays, XIII to XV, 6 to 8; anal, XVII to XVIII, 15 to 16; scales, about 35.

**Remarks:**—Four specimens from Hokou, Kiangsi, referable to this form are not typical of it, and may be that it varies into the preceding, northward. They measure 40 to 47 mm. standard length; depth, 2.5 to 2.8; head, 2.9 to 3.1; eye, 4 to 4.5; dorsal, XI to XIV, 6 to 8; anal, XVII to XX, 11 to 14; scales, 29 to 30; caudal fork varying in depth and color bands in strength.

**Genus Osphronemus** Lacépède


Short-bodied, compressed labyrinth fishes with a short posterior dorsal fin, a
long anal fin with fewer spines than rays, ventral with a spine and 5 differentiated rays, of which the first is filamentous, the others more or less rudimentary. A few species in tropical Asia, one recorded from China.

No teeth on the palate. Scales of moderate size, ctenoid. Lateral line, when present, uninterrupted.

Osphronemus goramy Lacépède


Locality of Material:—Generally credited to China.
Description:—Depth in length to base of caudal, about 2.6; head, about 3.3; eye in head, about 4.4. Dorsal rays, XI to XIV, 11 to 12; anal, IX to XII, 19 to 21; scales, 30 to 38.
Remarks:—A food fish commonly introduced in the tropical Orient.

Family ANABANTIDAE

CLIMBING PERCHES

The climbing perches are classified in a single genus, Anabas, sometimes included in the preceding family (to which the name Anabantidae then applies).

Genus Anabas Cuvier


Small or rather small, usually dull-colored, fusiform labyrinth fishes found in the fresh waters and estuaries of India and the Malay region, and represented by numerous closely related species in the fresh waters of Africa.

Short or rather long-bodied, usually compressed behind, little compressed in front. Eye rather large, mouth moderate. Dorsal and anal rather long, evenly continuous, of spines and rays, the dorsal spines more numerous than, and the anal about equaling, the rays in number. Scales of moderate size, ctenoid. Lateral line interrupted. Opercles and preorbital serrate. Teeth on the palate.

Anabas scandens (Daldorff)

Locality of Material:—Haiho [Hoihow], Hainan (Oshima, 1926, p. 21).

Description:—Depth in total length (with caudal), 3 to 4; head, 3.5 to 3.7; eye in head, 4.5 to 5. Dorsal rays, XVII to XVIII, 8 to 10; anal, IX to X, 9 to 11; scales, 28 to 32.

Remarks:—When in the water the climbing perch frequently comes to the surface to breathe, and it will suffocate if deprived of this access to atmospheric air. It often comes out of water at night and after showers, to travel from pond to pond or to feed. In traveling overland it grips the ground with its spiniferous gill covers and pushes with pectoral fins and tail. Its tree climbing powers are presumably mythical, perhaps credited to it from instances of specimens left in the trees by predatory birds. It sometimes aestivates in the mud of dried swamps, ponds, or streams.

Not plentiful or generally distributed in China, where it has perhaps been introduced by the natives.

Family AMBASSIDAE

AMBASSIDS

Genus Ambassis Cuvier and Valenciennes


Small Indian and East Indian perch-like fishes, with the body elevated, compressed, more or less diaphanous. Lower limb of preopercle with a double serrated edge, opercle without prominent spine. A forwardly directed recumbent spine in front of the dorsal. Spinous and soft dorsals distinct or with slight connection at the base. Dorsal with VII spines, anal with III. Caudal well forked. Mouth oblique, the lower jaw projecting. Scales smooth, rather small, frequently deciduous. Common, a number of species recognized typically marine, but some species found only in fresh water and others entering fresh water freely, as is presumably the case with the single form here recorded.

Ambassis gymnocephalus (Lacépède)

Lutjanus gymnocephalus Lacépède, 1802, Hist. Nat. Poissons, III, Pl. xxiii, fig. 3. Sumatra.

Locality of Material:—Kachek River, Hainan (Oshima, 1926, p. 19).

Specimen examined from Kwangtung.

Description:—Depth in total length (with caudal), 3.5; head, 4 to 4.5; eye in head, 2.5 to 3. Dorsal rays, VII–I, 9 or 10; anal, III, 8 to 10; scales, 27 to 29.
SYSTEMATIC ACCOUNT

Family SERRANIDAE

SEA BASSES

A large family of conventional, modern, spiny-rayed, perch-like fishes, mostly marine, but with some genera and species equally at home in fresh water, and others which pertain exclusively thereto. Those, the occurrence of which in fresh water may be considered fortuitous (as *Epinephelus susuki*, Nichols, 1928, p. 52), are excluded from consideration here.

Genus *Lates* Cuvier and Valenciennes


Large, tropical, fresh-water and estuarine basses of Africa and Asia; few species, one found in the mouths of rivers in the Indian Ocean recorded from Hainan Island.

Spinous and soft dorsal fins separate. Scales rough, of moderate or small size. Caudal rounded. Three anal spines. Mouth large, oblique; eye far forward. Teeth villiform. Preorbital and shoulder bone serrated; preopercle with strong spines at its angle, and denticulated along its horizontal border.

Pseudobranchiae well developed. Ventral fins without a scaly flap at their base. Upper corner of operculum with 1 or 2 more or less obscure, flattened spines. Ventral rays, I, 5.

*Lates calcarifer* (Bloch)


*Locality of Material:*—Kachek River, Hainan (Oshima, 1926, p. 20).

*Description:*—Depth in total length (with caudal), 3.5 to 3.7; head, 3.7 to 4; eye in head, 5 to 6. Dorsal rays, VII or VIII–I, 10 to 12; anal, III, 8 to 9; scales, 52 to 60.

Genus *Lateolabrax* Bleeker


A spotted estuarine bass of eastern Asia, reaching a large size and running into both fresh and salt water.

Spinous and soft dorsal fins separate, narrowly joined at the base. Caudal emarginate. Scales small and rough. Three anal spines. Teeth fine. Mouth large, the lower jaw projecting. Opercle with a well-developed spine; upper limb of preopercle finely serrate, its corner and lower limb with several antrorose spines.

Pseudobranchiae well developed. Ventral fins without a scaly flap at their base. Ventral rays, I, 5.
THE FRESH-WATER FISHES OF CHINA

Lateolabrax japonicus (Cuvier and Valenciennes)


Locality of Material:—Ningpo; Shanghai; Chinwangtao (fide Gee).
Specimens examined from Fukien and from near Canton.

Description:—Depth in length to base of caudal, 3.7; head, 3; eye in head, 4.6 (specimen of 161 mm. standard length). Dorsal rays, XI or XII—II or II, 12 to 14; anal, III, 8 or 9; scales, 100 to 115.

Genus Siniperca Gill


More or less short-bodied and compressed Chinese fresh-water perches, usually spotted and blotched with black on body and fins. Known as Mandarin fish. Abundant in China, with several differentiable forms, one extending northeastward into the basin of the Amur River.

A single dorsal fin, its rays, XI to XIII, 10 to 15; anal, III, 7 to 10. Ventral placed beneath or a little behind the pectoral; pectoral and caudal rounded. Scales small, cycloid (70 to 180, rarely under 100); the opercle scaled, and the lateral line complete. Small teeth present on jaws, vomer, and palatines, none on the tongue. Usually there are also somewhat larger, more or less canine teeth in the jaws. Mouth large, lower jaw projecting. Maxillary not hidden under the preorbital, with a supplementary bone. Preorbital serrate, operculum ending in a spine.

Key to Chinese Siniperca

1. Depth (in standard length), 4.5 or more (at about 150 mm.); gill rakers rudimentary; dorsal rays, XIII, 10 or 11; scales, about 130 ............... roulei

   Depth, 3.5 or less (at lengths up to 190 mm.); gill rakers, 4 to 6; dorsal rays, XI to XIII, 10 to 15; scales, 100 to 180. Without pale, wavy, lengthwise streaks .................................................. see 2

   Depth, 2.9 to 3.4 (at 100 to 175 mm.); gill rakers, usually 7; dorsal rays, XIII, 12 (rarely 11); scales, 80 to 119. Color dusky, with darker blotches, and pale, wavy, lengthwise streaks ........................................... undulata

   Depth, 2.6 to 3 (at 50 to 125 mm.); gill rakers, about 7; dorsal spines, XIII (rarely XII); scales, 70 to 85 ................................................................. see 3

2. Dorsal, XIII, 10 to 13; scales, 100 to 150; eye smaller (5 or 6 in head) and back not elevated; depth, 2.8 to 3.5 (at 50 to 150 mm.); more finely mottled, spots forming rings on sides ....................................................... scherzeri

   Dorsal, XII, 12 or 13; scales, 120 to 140; otherwise much like the preceding Dorsal, XII (rarely XI or XIII), 13 to 15; scales, 145 to 180; eye larger, 4 to 5.5 in head (at 80 to 190 mm.); back more or less elevated; depth, 2.7 at 80 mm. to 3.3 at 194 mm.; spots on sides rarely forming rings ........ chuatsi
3. Dorsal soft rays, 10 (rarely 11). Middle anal spine elongate and lapping well past the 3d when depressed .......................................................... obscura
Dorsal soft rays, about 14 ......................................................... yunkiansensis

Subgenus Acroperca Myers

*Acroperca* Myers, 1933, *Hong Kong Nat.*, IV, p. 76. Type: *Siniperca roulei* Wu.

**Siniperca roulei** Wu


*Locality of Material*:—Specimens examined from Chungan Hsien, Kienyang, and Yenping, Fukien.

![Am.Mus.9674.](image)

**Fig. 132. Siniperca roulei** Wu. *Type of Siniperca elongata* Nichols.

*Description*:—Depth in length to base of caudal, 4.5 to 4.8; head, 2.9; eye in head, 4.6 to 5.5 (specimens 147 to 156 mm. standard length). Dorsal rays, XIII, 10 or 11; anal, III, 7; scales, about 120 or 130.

Subgenus *Siniperca* Gill


**Siniperca scherzeri** Steindachner


**Key to Chinese Siniperca scherzeri**

Nape not elevated; lower jaw strongly projecting .............................................. scherzeri
Nape not elevated; jaws subequal, or lower slightly projecting .......................... chu
Nape appreciably elevated; lower jaw moderately or little projecting .................. kwangsiensis
Siniperca scherzeri scherzeri Steindachner

Figure 133


Locality of Material:—Specimens examined from Tungting Lake, Hunan; Hokou, Kiangsi (inseparable but not typical); Chungan Hsien, Kienyang, and Yenping, Fukien; up to 220 mm. standard length.

Description:—Depth in length to base of caudal, 3.4 to 3.5; head, 2.6; eye in head, 6 to 6.2 (specimens of 134 to 145 mm. standard length). Dorsal rays, XIII, 10 to 13; anal, III, 9; scales, 100 to 150.

Siniperca scherzeri chui Fang and Chong

Siniperca chui Fang and Chong, 1932, Sinensia, II, p. 174, Fig. 10. Chungking, Szechwan.

Description:—Depth in length to base of caudal, 3.4 to 3.8; head, 2.4 to 2.7; eye in head, 5.1 to 5.4 (specimens 76 to 147 mm. standard length). Dorsal rays, XIII, 13; anal, III, 8 to 10; scales, 113 to 122.

Siniperca scherzeri kwangsiensis Fang and Chong

Siniperca kwangsiensis Fang and Chong, 1932, Sinensia, II, p. 177, Fig. 11. Southwestern border of Kwangsi.

Description:—Depth in length to base of caudal, 3.5 to 3.9; head, 2.4 to 2.9; eye in head, 4.8 to 5 (specimens 110 to 169 mm. standard length). Dorsal rays, XIII, 12 to 13; anal, III, 9 or 10; scales, 101 to 109.

Siniperca chuantsi (Basilewski)


Locality of Material:—Specimens examined from Ningkwo, Anhwei; Hokou, Kiangsi; up to 190 mm. standard length.
Description:—Depth in length to base of caudal, 3.2 to 3.6; head, 2.6 to 2.9; eye in head, 4.7 to 6.1 (specimens 66 to 190 mm. standard length). Dorsal rays, XII, 12 or 13; anal, III, 8 or 9; scales, 120 to 140.

Siniperca chuatsi (Basilewski)

Fig. 134


Siniperca chuatsi multilepis Fang and Chong, 1932, Sinensia, II, p. 160, Fig. 5. Nanking.

Siniperca chuatsi bergi Fang and Chong, 1932, ibid., p. 163, Fig. 6. Shao-shing, Chekiang.

? Siniperca knerii, Fang and Chong, 1932, ibid., Fig. 7. Chungking, Szechwan. Looks like chuatsi, fin count of chuatsi.

Locality of Material:—Specimens examined from Tungting Lake, Hunan; Ningkwo, Anhwei; Kienning and near Yenping, Fukien; near Canton; up to 194 mm. standard length.

Description:—Depth in length to base of caudal, 2.7 (at 80 mm.) to 3.3 (at 194 mm.); head, 2.3 to 2.6; eye in head, 4 to 5.5 (at 80 to 190 mm.). Dorsal rays, XII (rarely XI or XIII), 13 to 15; anal, III, 9 or 10; scales, 145 to 180.

Remarks:—Called "kuei-yü" at Tungting Lake, where it reaches a length of some 500 mm., is prized for its fine, boneless flesh, and is caught by the Chinese in various ways. It is caught by the lake fishermen and is sold (large and small) in great numbers and at a high price in all the markets. This fish will live in a very little water for weeks, even if the water is not changed (C. H. Pope, field notes).

Small Siniperca, at standard lengths less than 50 or 55 mm., tend to have the lower jaw very prognathous, anterior profile of head and back slanting, and the specific characters more or less obscured. Thus a specimen of S. scherzeri of 47 mm. from Hokou has depth, 2.8, back elevated, eye, 4 in head, but is obviously this species, fitting in a series of same of 50, 64, 69, 111 mm. and larger, and with
dorsal, XIII, 12. Another small specimen of 54 mm. with the general locality Fukien is puzzling (depth, 3.4, back only slightly elevated, eye, 4, dorsal, XII, 14). Fin count seems almost the only character to place it with *S. chuatsi*, but from comparison with a fish of that species of 56 mm. from Ningkwo (depth, 2.8, back elevated) it seems probable that it is such. On the other hand, *S. obscura* down to 49 mm. are very like those of larger size.

**Siniperca undulata** Fang and Chong

*Siniperca undulata* Fang and Chong, 1934, *Sinensia*, II, p. 188, Fig. 14. Tushan-hsien, Kweichow.

*Description:*—Depth in length to base of caudal, 2.9 to 3.4; head, 2.5 to 2.6; eye in head, 4 to 4.9 (specimens 102 to 173 mm. standard length). Dorsal rays, XIII, 12 (rarely 11); anal, III, 9 (rarely 8 or 10); scales, 80 to 119.

**Siniperca obscura** Nichols

*Figure 135*


*Description:*—Depth in length to base of caudal, 2.6 to 2.9; head, 2.8 to 2.9; eye in head, 3.8 to 5 (specimens 49 to 81 mm. standard length). Dorsal rays, XIII (rarely XII), 10; anal, III, 8 (rarely 7); scales, 73 to 85.

Fig. 135. *Siniperca obscura* Nichols. Type. 81 mm. standard length.

*Remarks:*—A good series of this form is to hand from the type locality, and single (55 and 50 mm.) specimens from Yungtai Hsien and Yenping, Fukien, seem to be referable to it, though with somewhat higher scale count (90 or 100).
SYSTEMATIC ACCOUNT

Siniperca yunkiansensis (Lin)


Description:—Depth in length to base of caudal, 3; head, 2.7; eye in head, 5.7 (specimen 124 mm. standard length). Dorsal rays, XIII, 14; anal, III, 11; scales, 70 to 78. Color in formalin dark, uniform.

Genus Coreoperca Herzenstein


Small, compressed, rather short-bodied, fresh-water, perch-like fishes. One species from North Korea and one from Hainan.

Scales rather small (50 to 80), cycloid, concentrically striated; lateral line complete, its tubes straight, occupying the greater length of the scale. Mouth large, protracile; maxillary exposed, with a supplemental bone; villiform teeth in jaws and on vomer and palatines; no canines and no teeth on the tongue. Head partly scaleless. Preopercle serrated, with a few antrorse spines on the lower border; opercle with 2 spines. Gill membranes separate; 7 branchiostegals; pseudobranchiae present. Dorsal fins confluent, XIV or XV, 11 to 17, the spinous portion much longer than the soft; anal short, III, 7 to 12; caudal rounded. Pectoral symmetrical; ventral with a strong spine and 5 branched rays, the last of which is connected with the belly by a membrane.

Key to Chinese Coreoperca

Dorsal with about 12 soft rays; anal, about 7; scales, about 50 ............... herzi
Dorsal with 14 to 17 soft rays; anal, 11 to 12; scales, 70 to 80 ............... whiteheadi

Coreoperca herzi Herzenstein


Locality of Material:—North China (Reeves, 1927, p. 9); Fang and Chong (1932, p. 144) do not credit this Chinese reference.

Description:—Depth in length to base of caudal, 3.2; head, 2.7 or 2.8; eye in head, 4.2 or 4.3 (specimens up to 85 mm. long). Dorsal rays, XIV, 12; anal, III, 7; scales, 50.

Coreoperca whiteheadi Boulenger

Figure 136 and Plate X, figure 1


Siniperca whiteheadi, Fang and Chong, 1932, Sinensia, II, p. 144. Coreoperca is certainly close to Siniperca and perhaps rightly synonymized with it.
THE FRESH-WATER FISHES OF CHINA

Locality of Material:—Tien-mu-san, Chekiang (Chu, 1932.2, p. 194, Fig. 35). Specimens examined from Hainan.

Fig. 136. Coreoperca whiteheadi Boulenger. 97 mm. without caudal.

Description:—Depth in length to base of caudal, 2.6; head, 2.3; eye in head, 4 (specimen of 68 mm. standard length). Dorsal rays, XIV or XV, 14 to 17; anal, III, 11 or 12; scales, 70 to 80.

Remarks:—It seems rather doubtful how closely related this species is to the preceding; both are close to Siniperca.

Family TETRAODONTIDAE

SWELL-FISHES

One of the plectognath series of families of sluggish, small-mouthed, marine fishes. This series is perhaps the most specialized phylum of the percoid stem.

There are many species of swell-fishes in most warm and warm temperate seas, and a few are found exclusively in fresh water.

Genus Tetraodon Linnaeus


Fishes of sluggish habits inhabiting warm seas, little compressed, the snout blunt; noted for the ability to inflate with water or air and thus assume a subspherical form. A few species in tropical or subtropical fresh waters.

Skin scaleless, usually more or less prickly. Mouth small, terminal, the jaws forming a sort of beak, which in each jaw is divided by a median suture. Spinous dorsal and ventral fins lacking; soft dorsal and anal similar, opposite, short and rounded; caudal rounded. Nostril on each side with a bifid tentacle without distinct opening.
SYSTEMATIC ACCOUNT

Tetraodon ocellatus Linnaeus


*Locality of Material:*—Pei Ho; Tientsin (*fide* Gee).

Specimens examined from Anhwei; Fukien; near Canton.

*Description:*—Depth in length to base of caudal, 4; head, 3; eye in head, 4.7 (specimen of 102 mm. standard length). Dorsal rays, about 14; anal, about 12; back to some extent, and particularly breast and belly, with small spines, sunk in the skin so that the accompanying small papillae alone are obvious.

Family COTTIDAE

SCULPINS

A large and varied family of northern, marine, bottom fishes, characteristically with large, spiny heads. One of the few fresh-water genera is generally distributed and circumpolar.

Genus Cottus Linnaeus


Small sculpins living at the bottom of shallow, northern, fresh waters. Very variable, and many species or races have been described, but they are not markedly different one from the other.

A small, simple spine at the angle of the preopercle, and a few spines only elsewhere on the head. Isthmus wide, the gill membranes not forming a fold across it. Skin smooth or with feeble prickles. Dorsal fins contiguous, the first of a few slender spines. Ventrals with 4 soft rays and a concealed spine. Teeth on jaws, vomer, and sometimes palatines.

Head large, broad, and more or less depressed. Mouth large, the upper jaw protractile. A bony stay across the cheek. Caudal rounded.

*Cottus poecilopus* Heckel


*Locality of Material:*—North China (*fide* Gee, as *C. gobio*). China would be south of the general range of this fish, but it presumably occurs there as a straggler.

*Description:*—Depth in total length (with caudal), 5.8 to 7; head, 3.8 to 4.5; eye in head, 4 to 5.8 (specimens of 71 to 118 mm. total, 59 to 100 mm. standard length). Dorsal rays, VIII to IX–17 to 19; anal, 13 to 15.
THE FRESH-WATER FISHES OF CHINA

Genus Trachidermus Heckel


Close to Cottus; head with crests (ridges); palatine teeth present.

Trachidermus fasciatus Heckel


Centridermichthys ansatus Richardson, 1845, Zool. Voyage "Sulphur," Ichthyology, p. 74, Pl. LIV, figs. 6-10.

Locality of Material:—Mouth of Yangtze; Nanking; Soochow; Fengtien, Hulutao; Shan-hai-kuan, Chihli; Pei-Hai-To; Shan-Hien, Kiangsu; Sungkiang (Chu, 1931, p. 148).

Description:—Depth in length to base of caudal, 5; head, 2.7; eye in head, 7.5 (specimen about 115 mm. long). Dorsal rays, VIII–19; anal, 17.

Family GOBIIDAE

GOBIES

Among the most abundant small, marine, bottom fishes of warm seas, entering brackish and fresh waters rather freely, with a number of fresh-water species and relatively few exclusively fresh-water genera.

The Eleotrinae (with ventral fins separate) and Gobiinae (with ventral fins united) are frequently given full family rank.

Subfamily ELEOTRINAE

Genus Eleotris Gronow


Rather small, carnivorous, bottom fishes, with dorsal fins separate, the first of a few weak flexible spines, caudal more or less rounded, ventrals close together, not united; body covered with small or smallish scales; preopercle with a concealed spine; isthmus wide, gill openings extending no farther forward than posterior angle of preopercle. Cosmopolitan, many marine species in warm shore waters, some entering fresh water freely and others confined to fresh water.

Teeth weak, none on the vomer. Orbital rim adnate. Ventral rays, I, 5; soft dorsal and anal similar. Mouth moderate or large.

Key to Chinese Fresh-Water Eleotris

1. More slender (depth, 5 or more in standard length); lower jaw well projecting; scales, about 38 to 48 ........................ see 2
### SYSTEMATIC ACCOUNT

<table>
<thead>
<tr>
<th>Deeper, the back usually elevated</th>
<th>see 4</th>
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</thead>
<tbody>
<tr>
<td>2. First dorsal with VIII rays; scales, about 38; 2 large black spots on the peduncle</td>
<td>davidi</td>
</tr>
<tr>
<td>First dorsal with VI rays; scales, 45 to 48</td>
<td>see 3</td>
</tr>
<tr>
<td>3. Head smaller, about ( \frac{3}{4} ) the length; scales, about 48</td>
<td>oxycephala</td>
</tr>
<tr>
<td>Head larger, about ( \frac{3}{4} ) the length; scales, about 45 or 46</td>
<td>balia</td>
</tr>
<tr>
<td>4. Scales, 60 to 78. Color dusky</td>
<td>fusca</td>
</tr>
<tr>
<td>Scales, 40 to 50; interorbital scaled; eye small. Mottled, spotted, and blotched</td>
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</tr>
<tr>
<td>Scales, 33; interorbital narrow and scaleless; eye in head, 5. Broad, indistinct cross bands</td>
<td>xanthi</td>
</tr>
</tbody>
</table>

**Eleotris davidi** Sauvage and Dabry de Thiersant


_Description:_—Depth in length, 6.5; head long; eye in head, 5. Dorsal rays, VIII–I, 9; anal, 8; scales, 38.

**Eleotris balia** Jordan and Seale

_Eleotris balia_ Jordan and Seale, 1906, Proc. U. S. Nat. Mus., XXIX, p. 526, Fig. 6. China, probably Hong Kong.

_Locality of Material:_—Specimens examined from Fukien; Naam Kong, Kwangtung.

_Description:_—Depth in length to base of caudal, 5 to 5.5; head, 3 to 3.1; eye in head, 5.1 to 6 (specimens of 82 and 102 mm. standard length). Dorsal rays, VI–9 to 10; anal, 9 to 10; scales, about 45 or 46.

**Eleotris oxycephala** Temminck and Schlegel

_Eleotris oxycephala_ Temminck and Schlegel, 1845, in Siebold, Fauna Japonica, Pisces, p. 149, Pl. lxxvii, figs. 4, 5. Japan.

_Locality of Material:_—Hainan (Oshima, 1926, p. 21).

_Description:_—Depth in length, 6; head, 4; eye in head, 5.5. Dorsal rays, VI–9; anal, 9; scales, 48.

A specimen so identified, examined from near Canton, has standard length, 63 mm.; head, 3.6; scales, 48 or more.

**Eleotris xanthi** Günther


_Description:_—Depth in length to base of caudal, 4; head, 3.5; eye in head, 5 (specimen about 65 mm. long). Dorsal rays, VI–I, 9; anal, 8; scales, 33.
THE FRESH-WATER FISHES OF CHINA

Eleotris fusca (Bloch and Schneider)

Poecilia fusca Bloch and Schneider, 1801, Syst. Ichthyologiae, p. 453.  

Locality of Material:—Coasts and rivers from Africa to Malay (authors).

Description:—Depth in length, 4 to 4.7; head, 3 to 3.3; eye in head, 4.5 (young) to 7. Dorsal rays, VI–I, 8; anal, I, 8; scales, 60 to 78.

Genus Philypnus Cuvier and Valenciennes


Rather small, carnivorous, bottom fishes with smallish ctenoid scales; dorsal fins separate, the first of a few weak flexible spines, caudal rounded or acuminate. Ventral fins close together, separate; preopercle spineless; gill openings wide, to under hind margin at least, and usually front part of eye. A few species here and there in tropical rivers around the world.

Teeth weak, present on vomer. Orbital rim adnate. Ventral rays, I, 5; soft dorsal and anal similar. Mouth moderate or large, the lower jaw projecting.

Key to Chinese Fresh-Water Philypnus

Depth, about 4.8; head, 3.8; eye in head, 4.6; width of head almost twice in its length (at 102 mm. standard length) .......................................................... chalmersi

Depth, about 4; head, 2.7; eye in head, 6.8 (at 115 mm. standard length). Width of head about 2/3 its length (at 65 to 135 mm.) .......................................................... potamophilus

Philypnus chalmersi Nichols and Pope

Figure 137 and Plate X, figure 4

Philypnus chalmersi Nichols and Pope, 1927, Bull. Amer. Mus. Nat. Hist., LIV, p. 390, Fig. 50. Hainan.

Description:—Depth in length to base of caudal, 4.8; head, 3.8; eye in head, 4.6 (specimen of 102 mm. standard length). Dorsal rays, VIII–13; anal, 10; scales, 42.

Fig. 137. Philypnus chalmersi Nichols and Pope. Type. 102 mm. without caudal.
Remarks:—Related to *Philypnus potamophilus* but quite a different fish. *P. potamophilus* is presumably distinct from *Eleotris obscura* of Japan, type of *Odontobutis* Bleeker. The three have similar pores on the head and would presumably all belong in *Odontobutis* if that genus were recognized.

*Odontobutis wui* Chen (Chen, J. T. F., 1934, p. 36, Fig. 1) is presumably of salt- or brackish-water origin.

*Philypnus potamophilus* (Günther)

Figure 138 and Plate X, figure 5


*Odontobutis obscura*, Chu, 1932, Fishes of the West Lake, p. 54, Figs. 38, 39.

Locality of Material:—Shanghai (*fide* Gee).

Specimens examined from Tungting Lake, Hunan; Anhwei; Yungtai Hsien, Fukien.

![Fig. 138. Philypnus potamophilus (Günther). 135 mm. standard length.](image)

Description:—Depth in length to base of caudal, 4; head, 2.7; eye in head, 6.8 (specimen of 115 mm. standard length). Dorsal rays, VI to VIII–10 or 11; anal, 9; scales, 40 to 50.

Remarks:—Called “t’u-han-pa” at Tungting Lake, where it is said to be very good eating, and is fairly common. For days one would not be seen in the many baskets of fish for sale on the streets of Yochow, and then again one large tub or basket would contain half a dozen (C. H. Pope, field notes).

Genus *Micropercops* Fowler and Bean


Small, darter-like, fresh-water gobies allied to *Philypnus*, with the ventral fins separate; nape scaled, sides of the head more or less scaleless, and no preoper-
cicular spine. Gill opening extending forward to under center of eye. First dorsal with (V) VII to IX spines; scales, 30 to 40.

Dorsal fins separate; caudal rounded. Ventral rays, I, 5. Second dorsal and anal similar, apposed, the anal somewhat the shorter. Mouth moderate, oblique, the lower jaw projecting. Teeth weak, in bands in jaws, apparently lacking on the vomer.

**Key to Chinese Micropercops**

1. Dorsal, VII–11; scales, 36. Regular, close-spaced, dark cross bands ............................. _cinctus_
   Dorsal, V to VII–12 or 13; scales, 30 or 31. Cross bands more or less in pairs ......... _swinhonis_
   Dorsal, VIII or IX–11 or 12; scales, 33 to 41. Cross marks somewhat obscure and irregular, not distinctly paired .................................................. see 2

2. Scales, 33 to 37 .................................................................
   Scales, about 41 .................................................................

_Micropercops cinctus_ (Dabry de Thiersant)

_Philipus cinctus_ Dabry de Thiersant, 1872, Pisciculture et Pêche en Chine, p. 179, Pl. xxxvii, fig. 3. Mountains of Kiangsi.

**Description:**—Depth in length to base of caudal, 5.3; head, less than 4; eye large, about 4 in head. Dorsal rays, VII–11; anal, 9; scales, 36.

_Micropercops swinhonis_ (Günther)

**Figure 139**


**Locality of Material:**—Specimens examined from Anhwei; one (so identified) from Tsinan, Shantung; up to 50 mm. standard length.

**Description:**—Depth in length to base of caudal, 3.5; head, 3.1; eye in head,
3.3 (specimen of 26 mm. standard length). Dorsal rays, V to VII–12 or 13; anal, 9; scales, about 30.

**Micropercops dabryi** Fowler and Bean

*Micropercops dabryi* Fowler and Bean, 1920, Proc. U. S. Nat. Mus., LVIII, p. 319, Fig. 2. Soochow.

**Micropercops dabryi dabryi** Fowler and Bean

*Micropercops dabryi* Fowler and Bean, 1920, Proc. U. S. Nat. Mus., LVIII, p. 319, Fig. 2. Soochow.

**Description:**—Depth in length, 4.4; head, 3.1; eye in head, 3.7 or 3.8. Dorsal rays, IX–12; anal, 8; scales, 41.

**Micropercops dabryi borealis** Nichols

Figure 140

*Micropercops dabryi borealis* Nichols, 1930, Amer. Mus. Novitates, No. 402, p. 3, Fig. 2. Tsinan, Shantung.

**Description:**—Depth in length to base of caudal, 3.6 to 4.4; head, 3.3 to 3.6; eye in head, 3.7 to 4.6 (specimens 32 to 48 mm. standard length). Dorsal rays, VIII or IX–11 or 12; anal, 9 or 10; scales, 33 to 37.

![Figure 140](image)

**Remarks:**—Whereas *Micropercops* is described as having the sides of the head without scales, specimens of the present form examined have the opercle distinctly scaled and traces of scales visible on the preopercle, a character readily appreciable in those of 40 mm. or more standard length, and which was very likely overlooked in the single small specimen of *dabryi* examined by Fowler and Bean. It seems, furthermore, that the relationship between *borealis* and *Eleotris swinhonis* Günther, with more fully scaled head, is so close that what might be considered an aberrant specimen in our series of the former from Tsinan is probably better referred to the latter. It is quite likely that the two are only racially distinct, but we may with equal right assume that *swinhonis* occurs occasionally in the range of *borealis*. As for retention of *Micropercops* for these dwarf forms, it is convenient to do so even if the head scalation character does not hold.
THE FRESH-WATER FISHES OF CHINA

Subfamily GOBIINAE
Genus Gobius Linnaeus


Small, bottom fishes with an anterior dorsal fin of VI to VIII flexible spines, a second dorsal of upwards of 9 soft rays, removed from it and similar to the anal, the ventral fins united. Among the most abundant shore fishes in the warm seas of the world and represented by a great many marine species. Various of the marine species enter estuaries, some more and some less; and several of the subgenera have fresh- or brackish-water species.

Body entirely covered with more or less ctenoid scales. Teeth conical. Caudal rounded or acuminate. Interorbital narrow, the cheeks gibbous.

Several upper rays of pectoral not exerted as hair-like threads. Anterior nostrils not extended into barbel-like tubes. No bony crest on the neck. Preopercle without a spine.

In the subgenus Glossogobius the mouth is large, lower jaw projecting, front of tongue with teeth. In the subgenus Rhinogobius the mouth is smaller, jaws about equal, or lower included; dorsal and anal with only about 9 soft rays, and scales comparatively large, 30 or 35.

**Key to Chinese Fresh-Water Gobius**

1. Dorsal with 9 to 11 soft rays .......................................................... see 2
dorsal with 16 soft rays; scales, about 50 ........................................... clarki
2. Scales, 25 to 35 ................................................................. see 5
scales, 38 to 42; lower jaw included; a large basal black spot on posterior part of first dorsal .................................................. myxodermus
scales, about 44; mouth terminal; 2 longitudinal bands on body, most distinct behind .................................................. bivittatus
scales, 50 to 55 .................................................................................. see 8
3. Lower jaw with 2 canine teeth. Scales, 27 to 30 .............................. caninus
lower jaw without distinct canines ..................................................... see 4
4. Lower jaw decidedly projecting .................................................. see 5
jaws subequal .................................................................................. see 5
5. Dark longitudinal stripes, and about 4 dark blotches on the sides, a dark stripe from the eye downward and forward to the mouth ............................................ giuris
brownish, without bold markings .................................................. brunneus
6. Lower jaw distinctly included; scales, about 32 ............................... giurinus
lower jaw very slightly included; head and back somewhat elevated, depth 4.3 to 5; scales, 30 to 32 ............................................... hadropterus
jaws variously subequal, head and back not elevated, depth, 5 to 5.7; caudal usually with 5 to 8 sharp dark cross bars ........................................... leavelli
lower jaw slightly projecting; scales more or less lacking before the dorsal, 30 to 35 .................................................. see 7
7. Scales, 30 to 32; color dusky or mottled, tending toward a narrow streak posteriorly in the middle of side .......................................................... davidi
Scales, 34 or 35; color spotted, and a row of irregular lateral blotches ......... cheni
Scales, about 30; roundish dark blotches on the side, 3 dark bands across rounded caudal .......................................................... aevivaregia
Jaws equal or the lower slightly projecting; scales, about 28, head scaleless before the dorsal; broad black cross bands posteriorly .................... cliffordpopei
8. Lower jaw included .......................................................... grammeponus
Lower jaw very slightly projecting ................................................... hainanensis

Subgenus Glossogobius Gill


Gobius giuris Hamilton-Buchanan

Figure 141


Locality of Material:—West Africa to east Asia, entering fresh waters (authors); Pei Ho; Tientsin (fide Gee). Yangtze at Hankow (Kreyenberg and Pappenheim, 1909, p. 23).

Specimens examined from Fukien and near Canton.

Description:—Depth in length to base of caudal, 6; head, 3.2; eye in head, 5 (specimen of 113 mm. standard length). Dorsal rays, VI–9 or 10; anal, 9 or 10; scales, 30 to 35.

Gobius brunneus Temminck and Schlegel

Gobius brunneus Temminck and Schlegel, 1845, in Siebold, Fauna Japonica, Pisces, p. 142, Pl. LXXIV, fig. 2. Japan.

Locality of Material:—Hainan (Oshima, 1926, p. 21).

Description:—Depth in total length (with caudal), about 6; head, 4 plus; eye in head, 6.7. Dorsal rays, VI–10; anal, 8; scales, about 32.
Gobius caninus Cuvier and Valenciennes


**Locality of Material:**—Amoy (Günther, 1861, Cat. Fishes Brit. Mus., III, p. 38).

**Description:**—Depth in length, 5.5 to 6; head, 4.5 to 4.8; eye in head, about 4. Dorsal rays, VI–9 or 10; anal, 9 or 10; scales, 27 to 30.

Gobius grammepomus Bleeker


**Locality of Material:**—Hainan (Oshima, 1926, p. 21).

**Description:**—Depth in length, 5.5 to 7.5; head, 4 to 4.7; eye in head, 4 to 5. Dorsal rays, VI–10 or 11; anal, 10 or 11; scales, 50 to 55.

Subgenus Rhinogobius Gill


This makes a convenient group for various small related gobies entering or living in fresh waters of the Orient. As Herre (1933.2, p. 265) has pointed out, it is based on a species with aberrant ventrals and should perhaps be confined to it and others of like nature.

Gobius cheni Nichols


**Description:**—Depth in length to base of caudal, 6.8 to 7.5; head, 3.4 to 3.6; eye in head, 4.4 to 4.6 (specimens 47 to 55 mm. standard length). Dorsal rays, VI–9 or 10; anal, 8; scales, 34 or 35.

Gobius davidi Sauvage and Dabry de Thiersant


**Locality of Material:**—Specimens examined from Chungan Hsien, Fukien.

**Description:**—Depth in length to base of caudal, 5 to 7; head, 3.2 to 3.5; eye in head, 4.2 to 5.5 (specimens 36 to 54 mm. standard length). Dorsal rays, VI–9 or 10; anal, 8 or 9; scales, 30 to 32.

Gobius aestivaregia (Mori)


**Description:**—Depth in length to base of caudal, 4.8; head, 3.3 or 3.4; eye in
head, 3.7 (specimen 33 mm. total length). Dorsal rays, VI–9; anal, 9; scales, about 30 (from fig.). Lower jaw slightly projecting; nape without scales.

**Gobius cliffordpopei** Nichols

Figure 142 and Plate IX, figure 4


*Description:*—Depth in length to base of caudal, 4.7; head, 3.4; eye in head, 5 (specimen of 34 mm. standard length). Dorsal rays, VI or VII–9; anal, 8; scales, 28.

![Gobius cliffordpopei](image)

**Remarks:**—This little fish, called “lou-tou-yü” at Tungting Lake, was found only in the baskets of small fish for sale on the streets of Yochow. Here it was not uncommon and could often be picked out in numbers. It was not to be found in the shrimp catchers’ boats (C. H. Pope, field notes).

**Gobius hadropterus** (Jordan and Snyder)


_Aboma tsinanensis_ Fowler, 1930, Peking Nat. Hist. Bull., V (2), p. 30, Fig. 2. Da Ming Hu, Tsinan.


*Locality of Material:*—Specimens examined from Shantung; Anhwei; Hokou, Kiangsi; Fukien; up to 77 mm. standard length.

*Description:*—Depth in length to base of caudal, 4.3 to 5; head, 3 to 3.5; eye in head, 4.4 to 6 (specimens 49 to 77 mm. standard length). Dorsal rays, VI–9 or 10; anal, 8 to 10; scales, 30 to 32.

**Gobius leavelli** (Herre)

Figure 143


Locality of Material:—Specimens examined from Hainan.

Description:—Depth in length to base of caudal, 5 to 5.7; head, 3.2 to 4; eye in head, 3.4 to 4.8 (specimens up to 38 mm. standard length). Dorsal rays, VI–8 or 9; anal, 8; scales, about 30. Caudal broadly rounded. Usually a blackish mark at the base of the anterior dorsal rays, 6 or 8 irregular dark blotches along the side, and 5 to 8 sharp, narrow, blackish cross bars on the caudal.

Remarks:—Very similar to G. hadroptenis but more slender and with a more broadly rounded caudal.

_Gobius giurinus_ Rutter


Locality of Material:—Kachek River, Hainan (Oshima, 1926, p. 25).

Specimen examined from Fukien.

Description:—Depth in length to base of caudal, 5; head, 3.3; eye in head, 4.5 (specimen of 75 mm. standard length). Dorsal rays, VI–10; anal, 8; scales, about 32.

_Gobius myxodermus_ (Herre)


Description:—Depth in length, 4 to 5; head, 3.2 to 3.4; eye in head, 4.3 to 4.7 (specimens 20 to 32 mm. long). Dorsal rays, VI–9; anal, 8; scales, 38 to 42. No canines; scales in front of dorsal and above pectoral base minute; caudal broadly rounded.

PLATE X

Fig. 1. _Coreoperca whiteheadi_ Boulenger. 68 mm. standard length. Nooda, Hainan.
Fig. 2. _Ophicephalus maculatus_ (Lacépède). 110 mm. standard length. Nooda, Hainan.
Fig. 3. _Ophicephalus gachua_ Hamilton-Buchanan. 50 mm. standard length. Nooda, Hainan.
Fig. 4. _Philypnus chalmersi_ Nichols and Pope. 58 mm. standard length. Nooda, Hainan.
Fig. 5. _Philypnus potamophilus_ (Günther). 115 mm. standard length. Tungting Lake.
rounded; tips of first 3 dorsal spines more or less thread-like. In life, dorsals with yellow bands and other fins more or less spotted.

Remarks:—Ditches, ponds, and puddles at Wuchow.

"The fishes were observed basking in the sunshine along the water's edge, where they were quite conspicuous. They were always solitary and at the slightest alarm would dash away into deep water. Those caught were obtained by using a long handled dip net which was suddenly thrust down over the fish and then drawn out with a scraping motion along the bottom. In the mud thus secured one was almost certain to have one to several of these slimy little gobies" (Herre, ibid., p. 396).

**Gobius hainanensis** (Oshima)


*Description:*—Depth in length, 4.6; head, 3.9; eye in head, 4 (specimen 104 mm. long). Dorsal rays, VI–11; anal, 11; scales, 50.

Subgenus Tamanka Herre


**Gobius bivittatus** (Herre)


*Locality of Material:*—Tiny brook at Tai Ping. Probably inhabits small streams of the South China coast, flowing into the sea (Herre, 1932, p. 440).

*Description:*—Depth in length to base of caudal, 4.8; head, 3.4; eye in head, about 6 (specimen 29 mm. long). Dorsal rays, VI–8; anal, 8; scales, 44.

Subgenus Ctenogobius Gill


**Gobius clarki** (Evermann and Shaw)


*Description:*—Depth in length, 6.2; head, 3.6; eye in head, 5.5 (specimen 170 mm. long). Dorsal rays, VI–16; anal, 13 or 14; scales, about 50.
CHAPTER III
SUPPLEMENT
ADDITIONAL SPECIES

Genus Hilsa Regan

This genus seems to be highly anadromous, and both recognized species should be included. Fowler (1931, p. 115) gives this key for their determination:

**Key to Chinese Hilsa**

Caudal as long as head; opercle \( \frac{3}{2} \) to \( \frac{3}{4} \) as wide as deep; scales, 42 to 45, transversely 16 or 17 .................................................. **recessii**

Caudal longer than head; opercle \( \frac{1}{2} \) to \( \frac{3}{4} \) as wide as deep; scales, 40, transversely 14 or 15 .................................................. **sinensis**

**Hilsa sinensis** (Linnaeus)


*Description:*—Depth in length to base of caudal, 2.6 to 3.3; head, 3.5 to 4; eye in head, 4.3 to 7.5. Dorsal rays, 17 to 19; anal, 18 to 21; scales, 39 to 41.

Genus *Silurus* Linnaeus


Like *Parasilurus*, but with 4 instead of 2 mandibular barbels.

**Silurus wynaadensis** Day


*Description:*—Depth in length to base of caudal, 6; head, 4.7; eye in head, 8 (specimen 90 mm. standard length). Dorsal rays, 5; anal, 58 to 62. Lower jaw slightly included.

Genus *Pseudobagrus* Bleeker

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Pseudobagrus wui Miao

**Description:**—Depth in length to base of caudal, 5.2 to 5.3; head, 4.7 to 4.8; eye in head, 4.6 to 4.7 (specimen 133.5 mm. standard length). Dorsal rays, I, 7; anal, 25.

**Remarks:**—Close to *Pseudobagrus fangi* Wu. Dorsal spine equals pectoral.

Pseudobagrus changi Miao

**Description:**—Depth in length to base of caudal, 3.8; head, 3.5; eye in head, 8 (specimen 106 mm. standard length). Dorsal rays, I, 7; anal, 22.

**Remarks:**—This form seems to combine characters of *P. vachellii* and *P. fulvidraco*.

Genus Leiocassis Bleeker

Leiocassis sinyanensis Fu

**Description:**—Depth in length to base of caudal, ?12 (9.3 in fig.); head, 5.5; eye in head, 8 (specimen 188 mm. standard length). Dorsal rays, I, 7; anal, 19.

Dorsal spine half head or less (in fig.); caudal truncate; adipose decidedly shorter than anal; barbels short (none extending beyond head).

Genus Liobagrus Hilgendorf

Liobagrus kingi Tchang

**Description:**—Depth in length to base of caudal, 4.8; head, 3.5; eye in head, 13. Dorsal rays, I, 6; anal, 12.

Lower jaw slightly projecting; adipose longer than anal and low, separated by a notch from base of caudal. Color gray to yellowish on fins, marbled with black; dorsal, pectoral, and caudal more or less blackish, base and margin of dorsal, margins of pectoral and caudal yellowish.

Genus Pseudecheneis Blyth

Small, bottom catfishes of swift waters, with a broad, oval, adhesive apparatus with transverse folds on the chest. Anal fin short; anterior and posterior nostrils close together with a barbel between them; gill membranes broadly attached to isthmus, gill opening small; eye very small, superior; mouth small, inferior, the barbels small; body more or less flattened below with large pectorals and ventrals in a horizontal plane; adipose fin moderate; caudal forked or lunate.

**Pseudecheneis sulcatus** (McClelland)


*Description*:—Depth in length to base of caudal, 7.2; head, 5.5; eye in head (from fig.), about 12. Dorsal rays, I, 5; anal, 10.

**Genus Barbus** Cuvier

**Barbus** (*Lissochilichthys*) *wenchowensis* (K. F. Wang)


*Description*:—Depth in length to base of caudal, 4; head, 3.3; eye in head, 5.5; snout, 2 (specimen 155 mm. standard length). Dorsal rays, II, 8; anal, 7; scales, 38.

Last simple dorsal ray much ossified (not shown in fig.); maxillary barbel a little longer than eye. Head long and pointed; snout projecting; skin at tip of snout and lower jaw swollen and retracted; 6 narrow, dark cross bands and a very obscure lateral band.

**Genus Hemiculterella** Warpachowski

**Hemiculterella** *wui* (K. F. Wang)


*Description*:—Depth in length to base of caudal, 6; head, 4.5; eye in head, 3.3 (specimen 123 mm. standard length). Dorsal rays, 9; anal, 15; scales, 48. Abdomen rounded before ventrals and keeled behind them.

**Hemiculterella angustus** (Kimura)


*Description*:—Depth in length to base of caudal, 4.2 to 5; head, 4; eye in head, 3.8 to 4; snout, 3.8 to 4 (specimens 59 to 63 mm. standard length). Dorsal rays, 9; anal, 20; scales, 42 or 43.
SUPPLEMENT

Genus *Hemiculter* Bleeker

*Hemiculter jabouillei* Chevey


Description:—Depth in length to base of caudal, 5.6 to 5.7; head, a little less than 4; eye in head, about 4.2 (from fig.; specimens up to 200 mm. long). Dorsal rays, II, 7; anal, 16; scales, 44.

Keel whole length of abdomen, projecting lower jaw, and rather evenly decurved lateral line of figure are perhaps in error. Supposed to be related to "*Hemiculter akoensis* of Oshima from Szechuan."

Genus *Acheilognathus* Bleeker

*Acheilognathus chi* Miao


Description:—Barbel more than half length of eye. Dorsal without spines. Depth in length to base of caudal, 2.5; head, 4.4; eye in head, 3 (specimen 52 mm. standard length). Dorsal rays, 11; anal, 14; scales, 35.

Two indistinct spots near shoulder; dorsal and anal with pale cross shade and dark border.

*Acheilognathus lanchiensis* (Herre and Lin)

*Acanthorhodeus lanchiensis* Herre and Lin, 1936, Bull. Chekiang Fish. Exp. Sta., II (7), p. 17, Fig. 5. Lanchie, upper Tsien Tang River.

Description:—Depth in length to base of caudal, 2.9 to 3; head, 3 to 4.2; eye in head, 3; barbel in eye (from fig.), 1.5 (specimens 46 to 51 mm. long). Dorsal rays, II, 9; anal, II, 8 or 9; scales, 34 to 36. The spines are figured as weak.

Genus *Abbottina* Jordan and Fowler

*Abbottina tafangensis* (K. F. Wang)


Description:—Depth in length to base of caudal, 4.6; head, 4.7; eye in head, 3.6; interorbital, 3 (specimen 78 mm. standard length). Dorsal rays, 9; anal, 7; scales, 33.

Dorsal high and convex; barbels mostly hidden; dorsal and caudal without bars.
Genus **Oreonectes** Günther

**Oreonectes sayu** Herre and Lin


**Description:**—Depth in length to base of caudal, 5.3; head, 4.1; eye in head, 6, in interorbital, 2.6 or 2.7. Snout to dorsal origin, 59.5 per cent of standard length, dorsal origin midway between caudal base and hind margin of preopercle. Dorsal rays, 8; anal, 7. A blackish stripe across caudal base.

Genus **Barbatula** Linck

**Barbatula kungessana** (Kessler)


**Description:**—Depth in length to base of caudal, 7.9 to 8.5; head, 4.8 to 5; eye in head, 7 to 8.85 (specimens 89 to 120 mm. standard length). Dorsal rays, 9 or 10; anal, 7 or 8; no evident scales.

Caudal truncate or slightly emarginate. Ventral origin about under that of dorsal. Finely marbled above, with vague dark saddle marks on the back, whitish below, lateral line pale.

**Barbatula pappenheimi** (Fang)


**Description:**—Depth in length to base of caudal, 6.7 to 7.2; head, 4.3 to 4.8; eye in head, 6.2 to 6.3. Dorsal rays, 10 to 12; anal, 7 to 8; body without scales.

Caudal forked for a little more than ½ of its length; ventral origin about under that of dorsal. Pale with dark blotches along back and narrow cross marks on caudal.

Genus **Homaloptera** Van Hasselt

Subgenus **Paraproctomyzon** Pellegrin and Fang


Probably to be regarded as a subgenus (with 14 ventral rays) of *Homaloptera* rather than of *Hemimyzon* as here understood.
Supplement

Homaloptera multifasciata (Pellegrin and Fang)

Paraprotomyzon multifasciatus Pellegrin and Fang, 1935, Sinensia, VI, p. 103, Fig. 2. Kwai-chow, eastern Szechwan.

Description:—Depth in length to base of caudal, 5.3 to 5.7; head, 4.3 to 5; eye in head, 6 to 7 (specimens 58 to 61 mm. standard length). Dorsal rays, 9; anal, 7; pectoral, i, 19; ventral, i, 14; scales, 69 to 74 (pores).

Caudal subtruncate. About 12 to 17 obliquely vertical dark bands on side.

Genus Ophicephalus Bloch

Ophicephalus argus kimurai (Shih)


Description:—Depth in length to base of caudal, 6.2 to 7; head, 3.9 to 3.2; eye in head, 6.8 to 7.8; interorbital, 5.2 to 5.5 (specimens 185 to 250 mm. standard length). Dorsal rays, 50; anal, 33; scales, 61 to 64.

“Colour white, some scales above lateral line with gray centers, bone sutures on head part dark black, paired fins white, non-paired fins grayish tipped.”

Genus Siniperca Gill

Siniperca kichuani Shih


Description:—Depth in length to base of caudal, 4 to 4.4; head, 2.7; eye in head, 5.5 to 6 (specimens 146 to 225 mm. standard length). Dorsal rays, XIII, 12 to 13; anal, III, 9; scales, 122 to 130; gill rakers, 5.

The figure shows dark blotches on the lower sides separated by narrow, pale reticulations; dorsals and caudal spotted.

Genus Gobius Linnaeus

Subgenus Rhinogobius Gill

Gobius whitleyi (Herre)

Ctenogobius whitleyi Herre, 1936, Hong Kong Nat., VII, p. 184. Hong Kong; from a brook at Sha Ting.

Description:—Depth in length, 6.1 to 6.75; head, about 3; eye in head, 4.1 to 4.4 (specimens 18 to 29 mm. long). Dorsal rays, VI–9; anal, 8; scales, 28 or 29; 10 smaller predorsal; absent on head, pectoral base, and preventral region. Caudal rounded.
Color pale, traces of cross bars and of dark blotches on the side; 2 diagonal reddish brown lines running downward and backward on lower half of preopercle; dorsals and anal dark, the latter with white marginal band, other fins more or less longitudinally marked with reddish brown.

**Gobius duospilus** (Herre)


*Description:* — Depth in length, 5; head, 3.7; eye in head, 3 (specimens 30 and 35 mm. long). Dorsal rays, VI–8; anal, 8; scales, 29 to 31.

Head, pectoral base, and prevental region scaleless. Five broad black cross bands, blending with 6 irregular spots along the side. Dorsals and caudal with transverse rows of black dots, 2 black spots on pectoral base.

**Subgenus Tamanka** Herre

**Gobius sinensis** (Herre)


*Description:* — Depth in length, 4.5; head, 3.5; eye in head, 3.5 (specimen 28 mm. long). Dorsal rays, VI–8; anal, 8; scales, 30.

Mouth inferior; head broad and depressed, the interorbital broader than in *G. hadropterus* or *G. giurinus*, flat, 3.2 in head.

**Subgenus Acanthogobius** Gill


**Gobius ommaturus** Richardson


*Description:* — Depth in length, 6.1; head, 3.4; eye in head, 5; snout, 3; interorbital, 10 (specimen 88 mm. long). Dorsal rays, VII to IX–19 or 20; anal, 16; scales, 73.

Two spots with black center and whitish border at base of caudal.

**SYNONYMS, CHANGES, AND COMMENT**

Names used in the first part of this volume are marked with an asterisk (*) when here placed in synonymy or deleted.
SUPPLEMENT

Salangichthys hyalocranius (Abbott)


Subgenus Reganisalanx Fang

Reganisalanx Fang, 1934, Sinensia, V, p. 500. Type: Reganisalanx normani Fang = Salanx cuvieri, Regan, 1908 (not of Cuvier and Valenciennes).

*Salanx, p. 25 herein.

Salanx normani (Fang)


Subgenus Salanx Cuvier

Salanx Cuvier, 1817, Règne Animal, II, p. 185. Type: Salanx cuvieri Cuvier and Valenciennes.


Salanx cuvieri Cuvier and Valenciennes


Description:—Depth in length to base of caudal, 10.4 to 10.5; head, 3.7 (specimen of about 115 mm. standard length). Dorsal rays, 12; anal, 28.

Remarks:—Salanx cuvieri is related to S. acuticeps, and may be differentiated from it as follows:

Origin of ventral nearer anal than base of pectoral; snout subequal to postorbital . . . cuvieri
Origin of ventral nearer anal than base of pectoral; snout shorter than postorbital . . . acuticeps

Anguilla mauritiana Bennett


Pseudobagrus nitidus Sauvage and Dabry de Thiersant


? Pseudobagrus fui Miao, 1934, ibid., p. 217, Fig. 45. Chinkiang.

Hemibagrus guttatus (Lacépède)


Aoria guttatus, Herre and Lin, 1936, Bull. Chekiang Fish. Exp. Sta., II (7), p. 23, Fig. 7. Tsien Tang River system.

Remarks:—The adults are usually spotted.
THE FRESH-WATER FISHES OF CHINA

Barbus nigrodorsalis (Oshima)


Barbus (Lissochilichthys) kreyenbergii (Regan)

Gymnostomus kreyenbergii Regan, 1908, Ann. Mag. Nat. Hist., (8) I, p. 109, Fig. a, Pl. iv, fig. 1. Nankancho near Tinghsiang. (Adult plain colored.)


Zacco platypus (Temminck and Schlegel)


Tanichthys albonubes Lin

Remarks:—This is an excellent aquarium fish on account of its small size (the full grown female measuring about 30 mm., male about 25 mm.), bright colors (there is a band of silver and blue along the side, a black spot at base of the caudal fin, and the dorsal fin and a patch from near the anal to the tip of the caudal are red), hardiness, and ability to thrive on almost any kind of food. It has been found to spawn in the aquarium with water temperature of 74° F., the eggs seemingly deposited one at a time, and spawning season in nature presumably lasting from spring to fall. The eggs are non-adhesive, sink, and hatch in about 2 days. The yolk sac is absorbed and the fry becomes active about 3½ days after hatching (Chen, 1936, pp. 431-437).

Varicorhinus robustus Nichols


Hemiculter dispar dispar Peters


Rhodeus sinensis Günther


Rhodeus notatus Nichols

Leucogobio polytaenia tienmusanensis Chu


_Gobio nummifer_ Boulenger


_Leptobotia fasciata_ (Dabry de Thiersant)


_Nemacheilus cheni_ Herre and Lin, 1936, Bull. Chekiang Fish. Exp. Sta., II (7), p. 20, Fig. 6. Tien Hsi River system. Described without head spine or scales.

_Misgurnus mizolepis mizolepis_ Günther


Subgenus _Paramisgurnus_ Sauvage

Peduncular keels connecting dorsal and anal with caudal.

_Misgurnus dabryanus_ (Sauvage)


_Description_:—Depth in length to base of caudal, 6.1 or 6.5; head, 5.8 or 6.5; eye in head, 4.8 (specimen 73 mm. standard length). Dorsal rays, 8 or 9; anal, 6 or 7; scales comparatively large. The "type" of _Paramisgurnus_ examined and figured by Fang suggests _Misgurnus mizolepis mizolepis_ Günther, with a more anterior dorsal origin, equidistant from head and base of caudal.

Subgenus _Mesomisgurnus_ Fang

_Mesomisgurnus_ Fang, 1935, Sinensia, VI, p. 129. Type: _Nemachilus bipartitus_ Sauvage and Dabry de Thiersant.

Differs from the subgenus _Misgurnus_ in lacking distinct peduncular keels.

_Misgurnus (Mesomisgurnus) bipartitus_ (Sauvage and Dabry de Thiersant)


_Description_:—Depth in length to base of caudal, 10.9 to 12; head, 5.7 to 6.2; caudal peduncle a little longer than or subequal to head, its depth in length, 2.75; eye in head, about 5.2 (specimens 61 to 71 mm. long). Dorsal rays, 10; anal, 8; scales very minute.

A narrow lengthwise blackish band dividing body into an upper brownish and lower whitish half.
Misgurnus (Mesomisgurnus) lividus (Sauvage and Dabry de Thiersant)


Mesomisgurnus lividus, Fang, 1935, Sinensia, VI, p. 139, Figs. 9-10.


Description:—Depth in length to base of caudal, 9 to 8.1; head, 6 to 5.8; peduncle, 6.7 to 5.8; eye in head, 5.7 (specimens 54 and 75 mm. standard length). Dorsal rays, 9; anal, 7; scales minute.

Lefua costata (Kessler)


Crossostoma stigmata Nichols

Description:—A specimen 58 mm. standard length from the Min River has irregular, more or less alternating dark blotches above and below the lateral line, occupying as much space as the paler ground color; the front of the dorsal with 2 dark cross marks; and tips of the caudal dark, in addition to 2 pairs of marginal marks, the proximal of which are connected by shading across this fin.

Aplocheilus curvinotus Nichols and Pope


Macropodus viridiauratus Lacépède


Subgenus Coreosiniperca Fang and Chong

*Coreosiniperca* Fang and Chong, 1932, Sinensia, II, pp. 137, 149. Type: *Siniperca roulei* Wu.

*Acroperca* Myers, 1933, Hong Kong Nat., IV, p. 76. Type: *Siniperca roulei* Wu. Nichols, p. 247 herein.

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