NOTES ON HOMALOPTERID FISHES IN THE COLLECTIONS OF CERTAIN AMERICAN MUSEUMS.

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INTRODUCTION.

In 1932, when I[1] published a monograph on the remarkable torrential fishes of the family Homalopteridae, I had an opportunity to examine the material preserved in a number of European museums but, with the exception of a few specimens received through the courtesy of Dr. J. T. Nichols of the American Museum of Natural History, the rich collections of the American museums had not been studied. Further, since the publication of the above-mentioned monograph, several new genera and species have been described of which representative material is only available in the American museums. Since 1941, I have been deeply interested in the distribution of this remarkable group of fishes but without the background of a sound knowledge of their systematics, zoogeographical studies would have lost much of their force. In September-October 1949, an opportunity occurred to examine this rich and valuable material when as one of India's Delegate to the United Nations Scientific Conference on the Conservation and Utilization of Resources at Lake Success I was permitted by the Government of India to spend in the U. S. A. my two months' leave on the termination of the Conference. Thus I was able to visit several universities, Natural History Museums and centres of fisheries research where I was deeply impressed by the kindnesses and courtesies I received from all with whomsoever I came in contact. For my studies on the Homalopterid fishes, I am specially indebted to Dr. J. T. Nichols, American Museum of Natural History; Dr. Henry B. Bigelow and Dr. W C. Schroeder of the Museum of Comparative Zoology, Harvard, Cambridge Mass.; Dr. Henry W Fowler of the Academy of Natural Sciences, Philadelphia; Dr. Leonard P. Schultz of the U. S. National Museum, Washington D. C.; Dr. G. S. Myers of the Natural History Museum, Stanford University, Stanford and Dr. Reeve M. Bailey and Dr. Robert R. Miller of the Museum of Zoology, University of Michigan, Ann Arbor. As I could spend only a very short time at each place, special facilities of work on holidays and after working hours were provided to me and very often the officers in charge of the collections sacrified their holidays to help me in my studies. I am very grateful to them for all these favours, for otherwise it would not have been possible to do so much work within such a short time.

The authorities of the five museums mentioned above very kindly presented to the Zoological Survey of India duplicates of some of the

[1] Hora, S. L., Classification, Bionomics and Evolution of Homalopterid Fishes. *Mem. Ind. Mus.* XII, pp. 263-330, pls. x-xii (1932).

species represented in their collections. With the addition of these specimens, our collection at Calcutta will become the finest collection of the family in the world. A few specimens have also been received for study and return. While the systematic treatment of the family is deferred till all the material is received, it seems desirable to record some of the outstanding results obtained by the examination of the material available in the American Museums.

POLYPHYLETC ORIGIN OF THE FAMILY AND NOMENCLATORIAL CHANGES.

In 1932, I (*op. cit.*) advanced the view that the Homalopteridae consists of two distinct sections which can be readily distinguished externally by the character of the fin rays—in the Homalopterinae at least 2, but generally more, of the anterior rays of the pelvic and pectoral fins are simple, whereas in the Gastromyzoninae only one anterior ray of these fins is simple. This outward distinction is supported by a number of osteological characters. This view was supported by Smith [1] in his taxonomic studies on the fishes of Siam and by Ramaswami [2] after a detailed study of the skull of *Balitora brucei* Gray, *Bhavania australis* (Jerdon) and *Gastromyzon borneensis* Günther. In view of the above, phylogenetically it is not a sound classification to lump together Homalopterinae derived from the Cyprinidae and Gastromyzoninae derived from the Cobitidae into a single family Homalopteridae. Three lines of approach towards the solution of this problem were discussed with the American ichthyologists. These were :—

1. To create a separate Order or Sub-Order of the Cyprinoidea or to raise the status of the sub-families to the family rank. Though this solved the taxonomic position but such an arrangement obscured the phylogenetic relationships of the Homalopterid fishes.
2. The two sub-families of the Homalopteridae should be placed under Cyprinidae and Cobitidae from which they have been respectively derived and the family name Homalopteridae should be suppressed. This procedure no doubt cleared up the phylogeny of these fishes but obscured the taxonomic value of the characters that distinguish them. For instance, there is less difference between the Cyprinidae and the Cobitidae than will be between the Cyprinidae and the Homalopterinae, or the Cobitidae and the Gastromyzoninae.
3. The two sub-families should be raised to the family rank and along with the Cyprinidae and the Cobitidae kept in the order Cyprinoidea. This suggestion found favour with almost all the ichthyologist with whom this question was specifically discussed.

There are in South-east Asia at least two other hill-stream genera *Psilorhynchus* McClelland and *Gyrinocheilus* Vaillant, which have been

[1] Smith, H. M. The Fresh-water Fishes of Siam, or Thailand. *Bull. U. S. Nat Mus.*, No. 188, p. 272 (1945).

[2] Ramaswami, L. S. The Homalopterid Skull. *Proc. Zool. Soc. London* CXVIII, pp. 515-538 (1948).

invariably associated with the Homalopteridae, but I [1] have separated each one of them into a separate family. It is desirable to undertake osteological studies of these genera with a view to ascertain their phylogeny. Till this is done, it is perhaps necessary to retain them into separate families under the order Cyprinoidea.

LIST OF THE MATERIAL IN THE AMERICAN MUSEUM OF NATURAL HISTORY, NEW YORK.

Family HOMALOPTERIDAE.

Homaloptera heterolepis Web. & de Beauf.

9263. Lake Tawar, Sumatra. *One specimen.* Received in exchange from the Zoologisch Museum, Amsterdam.

Homaloptera amphisquamata Web. & de Beauf.

9275. Las Borus River, discharging from Lake Kawar, Karo Plateau, Sumatra. *Four specimens.* Received in exchange from the Zoologisch Museum, Amsterdam.

Bhavania australis (Jerdon).

13943. India (probably from Mysore, S. India). *One specimen.* Presented by Dr. B. S. Bhimachar of the Mysore University.

Lepturichthys nicholsi Hora.

10303. Tungting Lake, Hunan. C. H. Pope. *One specimen.*
10335. Huping, Tungting Lake, Hunan. C. H. Pope. *Ten specimens.*
10550. Huping, Tungting Lake, Hunan. C. H. Pope. *One specimen.*

These specimens are registered as *Lepturichthys fimbriata* Günther but are referrable to my species *L. nicholsi* (*Mem. Ind. Mus.* XII, p. 297, pl. x, fig. 8 and pl. xii, fig. 3, 1932). The species was characterized by the "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" The description was based on two specimens received as presentation from the American Museum of Natural History. An examination of 12 more specimens from the type-locality and of the type-series has convinced me that this is a distinct species and not *L. fimbriata* Gthr.

Through the courtesy of Dr. J. T. Nichols, three more specimens of this species have now been received for the collection of the Zoological Survey of India.

Hemimyzon formosanum (Boulenger).

10312. Karoton, Formosa. H. Sauter. *Ten specimens.*

Previously I had examined only the type-specimen of this species in the collection of the British Museum. The species is quite characteristic as was noted in my monograph of 1932 (page 299). Through the courtesy of Dr. J. T. Nichols, two specimens of this species have been received for the collection of the Zoological Survey of India.

[1] Hora, S. L., *Rec. Ind. Mus.* XXVII, pp. 457-460 (1925).

Family GASTROMYZONIDAE.

Crossostoma davidi Sauvage.

10236. Fukien. H. R. Caldwell. *Seven specimens.*
10317. Fukien. H. R. Caldwell. *Two specimens.*
10318. Fukien. H. R. Caldwell. *One specimen.*

Considerable difficulty was experienced in separating this species from *Crossostoma fascicauda* Nichols, for the character of the rostral barbels, on which they had been separated, did not hold good when large series of specimens were studied. In some specimens, the barbels were found reduced to short stumps. The following characters were, however, found useful for separating the two species :—

Colouration.—In *C. davidi*, the body and the fins are uniformly coloured without bands or any other type of markings, whereas in *C. fascicauda*, as the name indicates, the body and the caudal fin are banded or, in young specimens, spotted.

Extent of pelvic fins.—In this species, the pelvics just reach the anal opening, except in very young specimens when they may extend beyond, whereas in *C. fascicauda* they invariably extend considerably beyond the anal opening.

Size of eyes.—The eyes are relatively smaller in *C. davidi* as compared with those in *C. fascicauda.*

Position and size of rostral barbels.—In *C. davidi*, the rostral barbels are longer and more regularly arranged, though the number and arrangement in the two species is the same. In *C. davidi*, maxillary and rostral barbels are sometimes furcate towards the end.

Through the courtesy of Dr. J. T. Nichols, two specimens of this species have been received for the collection of the Zoological Survey of India.

Crossostoma fascicauda Nichols.

8475. Fuching Hsien, Fukien. C. H. Pope, 1925. *Type-specimen.*
8476. Fukien. H. R. Caldwell. *Type-specimen* of *C. stigmata* Nichols.
10282. Near Yenping, Fukien. H. R. Caldwell. *Several specimens.*
10283. Fuching Hsien, Fukien. C. H. Pope. *One specimen.*
10291. Chungan Hsien, Fukien. C. H. Pope. *Thirteen specimens.*
10537. Near Yenping, Fukien. H. R. Caldwell. *Three specimens.*
11064. Fukien. C. H. Pope. *Several specimens.*
11099. Chungan Hsien, Fukien. *Several specimens.*
11152. Chungan Hsien, Fukien. *Two specimens.*
13618. Min River, China. T. H. Cheng. *One specimen.*
11630. Yenping, Fukien. C. H. Pope. *Three specimens.*
11633. Yenping, Fukien. C. H. Pope. *Ten specimens.*

The type of *C. stigmata* represents a young specimen which is partly shrivelled up and is consequently slender in build. The markings on the body are speckled and this appears to me only a juvenile character. After a detailed study of a large number of specimens, I am not in a position to regard *C. stigmata* as a distinct species from *C. fascicauda.*

Several specimens hitherto referred to *C. davidi* have now been assigned to *C. fascicauda* for the reasons explained above under *C. davidi.* For lack of time in the U. S. A. and now for lack of material, it is not

possible for me to go into greater details regarding the systematics of these two species but such a study will be of very great interest.

Through the courtesy of Dr. J. T. Nichols, twelve specimens of this species have now been received for the collection of the Zoological Survey of India.

Vanmanenia caldwelli (Nichols).

8413. Near Yenping, Fukien, China. H. R. Caldwell. *Type-specimen.*
11138. Chungan Hsien, Fukien. *Several specimens.*
11654. Yenping, Fukien. C. H. Pope. *Four specimens.*

In my monograph on the Homalopteridae, it was stated on page 310 :—

> " Without an examination of the specimen or a neat drawing of the ventral surface of the head it is difficult to be certain of the generic position of *Homaloptera caldwelli*, but it seems likely that it may be congeneric with *Vanmanenia stenosoma*. The species was found near Yenping, Fukien (China) and is so far known from a single specimen ".

Having examined a number of specimens of this species, including the type, I am now convinced that it is referrable to my genus *Vanmanenia.*

Through the courtesy of Dr. J. T. Nichols, six specimens of this species have now been received for the collection of the Zoological Survey of India.

Pseudogastromyzon fasciatus (Sauvage).

8392. Near Yenping, Fukien. H. R. Caldwell. *Type-specimen.*
10285. Fuching Hsien, Fukien. C. H. Pope. *Eight specimens.*
10286. Chungan Hsien, Fukien. C. H. Pope. *Several specimens.*
10294. Near Yenping, Fukien. H. R. Caldwell. *Several specimens.*
10315. Near Yenping, Fukien. H. R. Caldwell. *Several specimens.*
10538. Chungan Hsien, Fukein. C. H. Pope. *One specimen.*
11054. Chungan Hsien, Fukien. C. H. Pope. *Several specimens.*
11139. Chungan Hsien, Fukien. C. H. Pope. *Several specimens.*
11148. Yenping, Fukien. C. H. Pope. *One specimen.*
11157. Chungan Hsien, Fukien. C. H. Pope. *One specimen.*

All these specimens are registered as *Pseudogastromyzon zebroidus* Nichols but it has already been shown that this species is synonymous with *P. fasciatus.* The American Museum of Natural History had already presented four specimens of this species to the Zoological Survey of India and, through the courtesy of Dr. J. T. Nichols, 26 more specimens have now been added to our collection.

Pseudogastromyzon fangi (Nichols).

9687. Near Canton, Kwangtung. W. E. Hoffmann. *Co-type* of *Crossostoma fangi* Nichols.
11664. Canton, Kwangtung. W. E. Hoffmann. *Two specimens*, labelled as *Crossostoma fangi.*

In 1933, Fang (*Sinensia* IV, pp. 39-50) rightly assigned this species to the genus *Pseudogastromyzon.* I have now verified this determination and agree with Fang's conclusions.

Beaufortia pingi (Fang).

9692. Kwangsi, China. *One specimen* (? Co-type). Exchange. Received from the Metropolitan Museum of Natural History, Nanking.

Beaufortia leveretti (Nichols & Pope).

8366. Nodoa, Hainan. C. H. Pope. *Type-specimen.*
10281. Nodoa, Hainan. C. H. Pope. *Fourteen specimens.*
10545. Nodoa, Hainan. C. H. Pope. *Two specimens.*

All these specimens are registered as *Gastromyzon leveretti*, but with this species as the Genotype I erected the genus *Beaufortia* for four Chinese species. Dr. J. T. Nichols has now presented to the Zoological Survey of India three specimens of *B. leveretti.*

An Account of the material in the Museum of Comparative Zoology at Harvard, Cambridge Mass.

On the 23rd September 1949, I was able to pay a very brief visit to the Museum of Comparative Zoology at Harvard which is famous for its rich zoological collection. There is no mention in literature, however, of any Homalopterid material having been deposited there. It was a great surprise, therefore, when Dr. W C. Shroeder brought out a big tray full of bottles containing the material kept under this family. Though I had a look at every specimen, it was not possible to examine them critically. The collection comprises hundreds of specimens and was made by Mr. John A. Griswold (now of the Philadelphia Zoological Society) at Mount Kina Balu, British North Borneo. It comprised of 3 species, *Protomyzon whiteheadi* (Vaillant), *Gastromyzon borneensis* Günther and *Glaniopsis hanitshi* Boulenger. The great value of this collection will be evident from the fact that *P. whiteheadi* was hitherto known from 2 adult and 5 young poorly preserved specimens in the Paris Museum while *G. hanitshi* is represented in the British Museum by 2 specimens only.

As pointed out by Pellegrin and Fang [1], it was ascertained that the gill-openings in *Protomyzon* are restricted above the bases of the pectoral fins and do not extend to the ventral surface.

Arrangement has been made to get this material to Calcutta for a thorough study and report.

List of the material in the Museum of the Academy of Sciences, Philadelphia Pa.

Family : HOMALOPTERIDAE.

Homaloptera wassinki Bleeker.

68718-32: Baram, Borneo. Wistar Inst. Anatomy. *Fifteen specimens.*

The specimens were collected by Dr. W H. Tunmest in 1898 and are in a poor state of preservation. Through the courtesy of Dr. H. W Fowler, the Zoological Survey of India has been presented with 2 specimens in exchange.

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[1] Pellegrin, J. and Fang, P. W., A new Homalopterid, *Paraprotomyzon multifasciatus*, from eastern Szechuan. *Sinensia* VI, pp. 99-107, figs. 2 (1935).

Homaloptera sexmaculata Fowler.

56374-81. Chieng Mai, N. Siam. *Eight specimens : Paratypes.*
56402. Chieng Mai, N. Siam. *Type* of *H. septemmaculata* Fowler.
56403. Chieng Mai, N. Siam. *Paratype* of *H. septemmaculata* Fowler.
56405-8. Chieng Mai, N. Siam. *Four specimens* labelled as *H. septemmaculata.*
60140, Chieng Mai, N. Siam. *One specimen* labelled as *H. septemmaculata.*

In 1945, Smith[1] doubted the validity of *H. septemmaculata* as a distinct species from *H. sexmaculata,* and after an examination of the type material of both the species, I am unable to regard them as distinct. Through the courtesy of Dr. H. W Fowler, the Zoological Survey of India has received 2 specimens of *H. sexmaculata* and 1 specimen of *H. septemmaculata.*

Homaloptera smithi Hora.

56409. Bua Yai, E. Siam. *One specimen.*
56410. Bua Yai, E. Siam. *One specimen.*
56511-19. Chantaboon, S. E. Siam. *Nine specimens.*
56475-506. Cheng Mai, N. Siam. *Thirty-two specimens.*

Through the courtesy of Dr. H. W Fowler, the Zoological Survey of India, has reeived three specimens from the Academy's collection in exchange.

Homaloptera ulmeri Fowler.

68700. Sumatra. *One specimen : Type.*
68701-12. Sumatra. *Thirteen specimens : Paratypes.*

Through the kindness of Dr. H. W Fowler, the Zoological Survey of India has received two specimens of this species.

Homaloptera vanderbilti Fowler.

68688 Sumatra. *One specimen : Type.*
68689-99. Sumatra. *Eleven specimens : Paratypes.*

This species is not very different from *H. ulmeri* but the head is distinctly broader in *H. vanderbilti.* Through the courtesy of Dr. H. W Fowler, the Zoological Survey of India has received two specimens of this species.

Homaloptera ripleyi Fowler.

68713, Sumatra. *One specimen : Type.*

The only specimen of this species is not in a good state of preservation so the characters could not be made out. I have, therefore, kept it under the genus *Homaloptera* for the time being but propose to discuss the systematic position of *Homalopterula* Fowler sometime later.

Altogether 100 specimens belonging to 7 species were examined and, with the exception of the last species, exchange material of all the other species has been obtained for detailed study. I was at Philadelphia for a couple of days and had only a few hours to study the collection. As a large number of species have been described under the genus *Homaloptera* and its subgenera, it was not possible to determine the precise relationships of the various species.

[1] Smith, H. M., The Freshwater fishes of Siam or Thailand. *Bull. U. S. Nat. Mus.* 188. p. 275 (1945).

LIST OF THE MATERIAL IN THE U. S. NATIONAL MUSEUM, WASHINGTON D. C.

Family HOMALOPTERIDAE.

Homaloptera amphisquamata Web. & de Beauf.

111716. Sumatra, Lake Parapat, Toba. National Geographic=Smithsonian Exped. *Five specimens.*

Homaloptera bilineata Blyth.

44773. Meetan, Burma. L. Fea. *One specimen.*

Homaloptera lineata Smith.

119488. N. Siam, Mekong at Chiengsen Kao. H. G. Deigman. *One sepcimen Type.*
119489. N. Siam, Mekong, at Chiengsen Kao. H. G. Deigman. *One specimen : Paratype.*

Homaloptera smithi Hora.

119459. Siam. H. M. Smith. *One specimen.*
109821, Peninsular Siam. H. M. Smith. *Six specimens : Paratypes.*
107941. N. Siam, Menam Ping Chiengmai. H. G. Deigman. (Natives). *One specimen : Paratype.*

Homaoptera zollingeri Bleeker.

109747. Meping River, Siam. H. G. Deigman. *One specimen.*

Balitoropsis bartschi Smith.

107963. Peninsular Siam, Waterfall stream, Kao chong, Tzang. H. M. Smith. *Type.*

The chief distinguishing features of this genus and species are, (i) presence of horny tubercles on the snout, (ii) the *Botia*-like arrangement of the rostral barbels instead of *Nemachilus*-like disposition, and (iii) the structure of the mouth and the associated parts.

Balitora brucei burmanicus Hora.

44808. Mount Mooleyit. L. Fea. *Six specimens.*

Lepturichthys guentheri Hora.

86672. Yashan, Szechuan. D. C. Graham. *One specimen.*
101619. Chengtu, Szechuan. D. C. Graham. *One specimen.*
91714. Zachow, W. China. D. C. Graham. *Two specimens.*

The two specimens from Zachow are greatly damaged and, therefore, the specific characters could not be determined with certainty.

Lepturichthys guentheri was described from two specimens preserved in the collection of the British Museum. They were collected from the Min River, Szechuan. The additional material of this species recorded from other localities in Szechuen is, therefore, of great interest.

Lepturichthys nicholsi Hora.

88072. Tatsienlu, N. China. D. C. Graham. *One specimen.*

In his review of my monograph on the Homalopteridae, Myers (*Copeia*, No. 2, p. 109, 1933) stated :

" Of the Chinese *Lepturichthys*, a single species of which has been known, two new forms are diagnosed by Dr. Hora. One of these (*L. nicholsi*) is defined by the presence of ' wart-like spiny processes ' over the dorsal surface of the head and body. While *L. nicholsi* is perhaps valid, a specimen of this type in the National Museum strongly indicates that the ' processes ' may be nothing more than nuptial tubercles ".

In all probability, Myers referred to the specimen registered under No. 88072. Having examined a dozen similar specimens, besides the 2 of the type-series, I feel convinced that the wart-like processes are not nuptial tubercles but constitute a good taxonomic character to separate this species from the other two known so far.

HEMIMYZON sp.

A specimen (No. 87614) registered sa " *Gastromyzon* from stomach of *Siniperca* " was found to belong to *Hemimyzon* but it is so much lacerated that specific determination was not possible. Several species of *Siniperca* are found in mountain streams but live in pools. It seems probable that the specimen of *Hemimyzon* must have strayed into the pool and there became a prey of *Siniperca*.

Sinogastromyzon wui Fang.

87615. Szechuan, China. D. C. Graham. *One specimen.*

Family GASTROMYZONIDAE.

Crossostoma fascicauda Nichols.

85985. China. Sowerby. *One specimen.*

Pseudogastromyzon fasciatus (Sauvage).

86021. China. Sowerby. *Four specimens.*

Beaufortia pingi (Fang).

89373. Yachow, Szechuan. D. C. Graham. *34 specimens.*.

Gastromyzon borneensis Günther.

101301. Bongon River, N. Borneo. R. M. Little. *One specimen.*

LIST OF MATERIAL IN THE NATURAL HISTORY MUSEUM, STANFORD UNIVERSITY, STANFORD.

The Natural History Museum of the Stanford University contains the most representative collection of the Homalopterid fishes in the variety of species represented but not in numbers. As most of the specimens are correctly identified, I shall give a running list of the species and brief comments on certain forms will be given at the end.

Family Homalopteridae.

Name of the species.	Locality and Donor.	Registered Nos. and No. of specimens.
1. *Homaloptera* (*Neohomaloptera*) *johorensis* Herre.	Simpang Rengam, Johore, Malaya. A. W. C. T. Herre.	**39840,** *Type.* **39841,** *Paratype.*
2. *Homaloptera montana* Herre.	Puthutotam Estate, Valparai Post Office, Anamallai, S. India. A. W. C. T. Herre.	**39871,** *Holotype.*
3. *Homaloptera orthogoniata* Vaillant.	Tapah Fisheries Station, Perak, F. M. States.	**39390,** *four specimens* (of which 1 to Dr. Hora).
4. *Homaloptera rupicola* (Prashad & Mukerji).	Sankha Stream, Myitkyna Dist., N. Burma. B. N. Chopra, Coll.	**28726,** *Paratype* (cotype).
5. *Homaloptera tweediei* Herre.	Mawai Dist., Jahore, Malaya	**33102,** *Holotype.* **33103,** *Paratype.* *2 specimens ;* **39842** (not a type). *1 specimen.*
6. *Homaloptera wassinki* Blkr.	Saribas, Sarawak, Borneo	**32600,** *1 specimen.*
7. *Travancoria jonesi* Hora	Puthutotam Estate, Valparai P. O., Anamalli Hills, S. India. Travancore. A. W. C. T. Herre.	**41610,** *1 specimen.*
8. *Bhavania australis* (Jerdon).	Kallar, 30 miles N. E. of Trivandrum, S. India, Travancore. A. W. C. T. Herre.	**41609,** *ten specimens* (of which 4 sent to Dr. Hora).
9. *Balitora brucei brucei* Gray.	Tang-siang Stream, Cherrapunji, Assam. S. L. Hora.	**27500,** *1 specimen.*
10. *Sinohomaloptera hoffmanni* Herre.	Cheung Kon T'suen, Hainan, China.	**33002,** *Type ;* **33003,** *Paratype.*
11. *Sinohomaloptera yaotanensis* Fang.	China. Fang Coll.	**27503,** *1 specimen.*
12. *Hemimyzon formosanum* (Blgr.).	Taiko R., Formosa. M. Oshima.	**23151,** *1 specimen.*
13. *Sinogastromyzon sanhoensis* Fang.	China	**27502,** *1 specimen.*

I have not included in the above list *Homaloptera hingi* Herre (**29086** Type and Paratypes) from Hong Kong, which is referrable to the Cobitid genus *Nemachilus* (*vide* Hora, *Rec. Ind. Mus.* XXXVII, p. 37, 1935).

In this collection, there are also 28 specimens (**31811, 24304, 31812, 31813**) from Hainan, China, registered as *Homatula fasciolata* (Nichols & Pope). They are also referrable to the genus *Nemachilus*, as I had already surmised in my monograph on page 281.

The specimens of *Homaloptera* (*Neohomaloptera*) *johorensis* Herre are short and stumpy in their general build ; the barbels are longer than is usual in the species of *Homaloptera* and the lips and jaws are of the *Nemachilus*-type. As the fins are damaged, I was not able to ascertain the typical Homalopteran characters.

Now that I have examined the type and only specimen of *Homaloptera montana* Herre from the Anamallai Hills in South India, it is well to refer here to the great significance of this find in zoogeographical studies. Fishes of this genus are found in Upper and Lower Burma, Siam, Malaya Peninsula, Sumatra, Java and Borneo but none had so

far been known from further west. I[1] had, however, pointed out that the South Indian genera *Bhavania* and *Travancoria* are evolved from *Homaloptera*. The discovery of *H. montana* from South India has not only confirmed this view but has shown that at least one member of *Homaloptera* has retained its generic characteristics, though it has become differentiated specifically.

The type-specimen, which is partially desiccated and has damaged fins on one side, needs to be more carefully studied and figured. Unfortunately, I had no time for this work but Dr. G. S. Myers promised to send it along with the other exchange material for further investigation.

In general appearance, the form of *Sinohomaloptera yaotanensis* reminds one of *Balitora* but the former possesses more unbranched rays in the paired fins and two barbels at each corner of the mouth. In *S. hoffmanni*, the second barbel at the corner of the mouth is like an elongated papilla and the general form is *Homaloptera*-like thus showing a stage in the evolution of *Sinohomaloptera* from *Homaloptera*-like ancestors.

Family GASTROMYZONIDAE.

Name of species.	Locality and Donor.	Registered Nos. and No. of specimens.
1. *Crossostoma fascicauda* Nichols (=*C. stigmata* Nichols; also =*C. tinkhami* Herre).	Loh Fan Shan, Kwangtung, China. E. R. Tinkham.	**32582,** *two specimens.*
		29084, *paratype* of *C. tinkhami* Herre.
		32583, *1 specimen.*
2. *Vanmanenia stenosoma* (Blgr.).	Tsien Tang R., Chekiang, China. A. W. C. T. Herre.	**32859,** *1 specimen.*
	Tai Au Hong, S. W. of Sung Wu, S. Kiangsi, China. J. L. Gressitt.	**39645,** *1 specimen.*
3. *Formosania lucustre* (Steind.)=*F. gilberti* Oshima.	Tamusui R., Formosa	**23120,** Co-type of *F. gilberti.*
4. *Linparhomaloptera disparis* (Lin).	Creek above Pok Fulam Reservoir, Hong Kong.	**32589,** *34 specimens.* (10 of which sent to Dr. Hora.)
	White Cloud Mt. Canton, China.	**30981,** *paratypes* of *Parhomaloptera disparis* Lin, *4 specimens* (1 to Dr. Hora.)
	Ting Wu, Kwangtung Province, China.	**32588,** *two specimens.*
5. *Pseudogastromyzon fasciatus* (Sauvage).	Kwangtung Prov., China. W. E. Hoffmann.	**29085,** Co-type of *C. fangi* Nichols.
	Tai Au Hong, S. W. of Sung Wu, alt. 520 meters, S. Kiangsi. J. L. Gressitt.	**39644,** *3 specimens.*
	Hong San, S. Kiangsi, S. China, alt. 900 meters. J. L. Gressitt.	**39643,** *3 specimens.*
6. *Pseudogastromyzon myersi Herre.*	Hong Kong, China. W. E. Hoffmann.	**25731,** *Holotype.*
	Creek above Aberdeen, Hong Kong Island, China. A. W. C. T. Herre, Coll.	**39606,** *2 specimens.*

[1] Hora, S. L., Homalopterid fishes from Peninsular India. *Rec. Ind. Mus.* XLIII, pp. 221-232, pl. vii (1941).

Family GASTROMYZONIDAE—*contd.*

Name of species.	Locality and Donor.	Registered Nos. and No. of specimens.
	Lung T'au Shan, Kwangtung	**33824,** *2 specimens.*
	Prov. Lan Tau Is. Kwangtung, China. A. W. C. T. Herre, Coll.	**33906.** *1 specimen.*
7. *Beaufortia leveretti* (Nichols & Pope).	Cheung Kon T' suen Hainan Is., China. A. W. C. T. Herre.	**32570.** *1 specimen.*
8. *Gastromyzon borneensis* Günther.	Bongon River, Mamdu Bay, B. N. Borneo. R. M. Little, from Raffles Museum,	**31473.** *2 specimen.* **32378,** *11 specimens.*
	Sadong River, Sarawak, Borneo. A. W. C. T. Herre.	

LIST OF MATERIAL IN THE MUSEUM OF ZOOLOGY, UNIVERSITY OF MICHIGAN, ANN ARBOR.

Family HOMALOPTERIDAE.

Homaloptera ocellata van der Hooven.

1932. *Homaloptera ocellata,* Hora, *Mem. Ind. Mus.* XII, p. 2.

155779. Java. Hubbs & Van Arragon. *Eleven specimens.*
155780. Java. Hubbs & Van Arragon. *Two specimens.*
155661. Western Java. Buschkiel. One *specimen.*

Homaloptera gymnogaster Bleeker.

1932. *Homaloptera gymnogaster,* Hora, *Mem. Ind. Mus.* XII, p. 280.

155665. ? Sumatra. Thienamann. *Five specimens.*
155664. ? Sumatra. Thienamann. *One specimen.*
155662. ? Sumatra. Thienamann. *One specimen.*
155663. Forest brook, Soebang Pass. Sumatra. A. Thienamann. *Three specimens.*

In certain particulars, these specimens differ from the description of *Homaloptera gymnogaster,* but in view of the fact that several species of *Homaloptera* have been described from Sumatra in recent years I am not in a position yet to discuss their relationships. The fishes of this genus require revision.

H. gymnogaster is in any case insufficiently known. Weber and de Beaufort knew only of the type in the British Museum. I assigned several specimens to this species and also referred *H. lepidogaster* to its synonomy, but he did not redescribe the species.

Homaloptera wassinki Bleeker.

155660. W. Java. Lab. Binnenvisscherij. Buschkiel. *One specimen.*

Sinohomaloptera kwangsiensis Fang.

156678. Lin-Yuen-Shien, Kwangsi, S. China. *One specimen.*

The second barbel at the corner of the mouth is small and appears to be a modified papilla of the upper lip. There are only 2 simple rays in the pelvic fins of this specimen.

Hemimyzon sp.

There is one specimen of *Hemimyzon* collected by Dr. Cora D. Reeves in the Chengtu or Kiating Region of Szechuan, China. This is probably referrable to *H. abbreviata* (Günther) which is known from a single specimen collected from the Min River in Szechuan.

Sinogastromyzon sp.

A well preserved specimen referrable to the genus *Sinogastromyzon* is also present in the collection. It was collected by Dr. Cora D. Reeves in the Chengtu or Kiating Region of Szechuan, China. Its main features are :—

57 scales along the lateral line, 10-11 rows between the lateral line and the base of dorsal, 21 predorsal scales ; P. 12/12 ; V 6/12-13 ; two rows of prominent papillae on the anterior lip, the posterior lip is crenulated ; there are two barbels at each angle of the mouth.

SUMMARY OF RESULTS.

An examination of the collection in the American Museum of Natural History helped me to clear up doubts expressed by Dr. G. S. Myers about the validity of *Lepturichthys nicholsi* Hora ; to clearly define the specific limits of *Crossostoma davidi* and *C. fascicauda ;* to relegate *C. stigmata* to the synonomy of *C. fascicauda ;* to assign *Homaloptera caldwelli* to the genus *Vanmanenia* and to give up-to-date scientific names to the entire material of the family.

An examination of the material in the Museum of Comparative Zoology at Harvard revealed a large number of specimens of two hitherto little known species, *viz.*, *Protomyzon whiteheadi* and *Glaniopsis hanitschi.*

The study of the material preserved in the Museum of the Academy of Sciences, Philadelphia, has shown that *Homaloptera sexmaculata* and *H. septemmaculata* cannot be regarded as distinct species. It was further found that *H. ulmeri* and *H. vanderbilti* may prove to be conspecific when further material becomes available.

The Homalopterid material in the collection of the U. S. National Museum, Washington D. C., was reclassified and up-to-date names given to the various species represented in the collection. The record of further material of *Lepturichthys guentheri* Hora is of some interest.

Though no nomenclatorial changes were necessary for the species represented in the Natural History Museum of the Stanford University, the systematic position of the genus *Homatula* was cleared up. Zoogeographical significance of the occurrence of *Homaloptera montana* in South India has been discussed. Observations on the characters of *Sinohomaloptera* are also included.

In the Museum of Zoology, University of Michigan, Ann Arbor, the most outstanding feature is the discovery of two specimens from Szechuan belonging to the genera *Hemimyzon* and *Sinogastromyzon.* The former probably represents *H. abbreviata,* a little known species, whereas the second specimen may represent a new species of *Sinogastromyzon.*