CONTRIBUTIONS TO THE KNOWLEDGE OF THE GENUS *MEGALOBRAMA* (*PISCES, CYPRINIDAE*)

BY

PETRU BĂNĂRESCU

Sinibrama Wu, 1939 is considered a subgenus of *Megalobrama*; it contains two species: *M. macrops* with four subspecies and *M. changi*, which bears some similarity with *Hemiculter* and especially with *Ancherythroculter*. *M. melrosei* Nichols & Pope is a synonym of *M. macrops affinis* (Vaillant), *Megalobrama* Dybowski 1872 s. str. includes two species; *M. hoffmanni* is a synonym of *M. terminalis*; *M. amblycephala* Yih is the species usually recorded as *M. bramula* (Valenciennes) whose nominal status is doubtful, the original description being inadequate and based on a painting. A probable hybrid between *M. macrops affinis* and *M. terminalis* is described.

The genus ***Megalobrama***, as understood by J. T. Nichols [5], L. S. Berg [1], G. V. Nikolski [6], includes deep-bodied bream-like East Asian carps similar to *Parabramis* but with the abdominal keel restricted to the postventral region. Hs. W. Wu [7] splits this genus, ascribing the species with slightly shorter anal fin and bipartite air-bladder to a distinct genus, *Sinibrama*; this view was adopted also by H.w. Chang [2] and Hs. W. Wu & others [8].

The delimitation of the genera within the Cultrinae is difficult and rather arbitrary, while the species are in general well-differentiated; by splitting the genera too much, one runs the risk of having too many genera, most of them monotypic or containing quite few and closely related species. I consider therefore that *Sinibrama* deserves only subgeneric rank.

Megalobrama as here understood differs from *Erythroculter* and *Ancherythroculter* in its deeper body (yet the extreme values may overlap), terminal mouth with equally long jaws (as against superior mouth with prominent lower jaw), stronger and more hooked pharyngeal teeth with better developed grinding surface.

A review of the Chinese species of ***Megalobrama*** and *Sinibrama* was recently published by Yih and Wu (in Wu & oth., [[8]]); the North

REV. ROUM. BIOL.-ZOOLOGIE, TOME 15, Nº 3, p. 133–139, BUCAREST, 1970

Vietnam forms were not taken into consideration. The study of the available specimens led me to a conclusion somewhat different from his.

Specimens examined: some 220, belonging to the following collections: Academy of Natural Sciences of Philadelphia (A.N.S.P.), American Museum of Natural History, New York (A.M.N.H.), British Museum of Natural History, London (B.M.N.H.), Institutul de Biologie "Tr. Săvulescu", București (I.B.T.S.), Museum National d'Histoire Naturelle, Paris (M.N.H.N.), Field Museum of Natural History, Chicago (F.M.N.H.), Naturhistorisches Museum, Wien (N.M.W.), United States National Museum, Washington (U.S.N.M.), Stanford University, Zoological collections (S.U.), Zoologisches Museum der Humboldt Universität, Berlin (Z.M.B.), Zoologisches Staatsinstitut und Museum, Hamburg (H.Z.S.).

SYSTEMATIC ACCOUNT

Subgenus *Sinibrama* Wu, 1939

Yih and Wu recognize four Chinese species of *Sinibrama*: *wui* with two subspecies — *wui* "*typus*" (right name: *wui wui*) from the Upper Yangtze and *wui polylepis* from Hsinkinag drainage in Kweichow—, then *macrops* from Taiwan, Fukien and Chekiang, *melrosei* from Hainan and *changi* from the Upper Yangtze. A sixth nominal form, usually considered as distinct species, is "*Chanodichthys*" *affinis* from North Vietnam. The ranges of all these forms, except *changi* which occurs sympatrically with *wui* are representative and their distinguishing characters are slight and only statistical: the values of scales number, anal rays and body proportions overlap; I therefore consider them subspecies of a single species, *Megalobrama* (*Sinibrama*) *macrops* (Günther, 1968).

1) M. (Sinibrama) macrops (Günther, 1868)

Figs 1—4

Specimens examined:

From Taiwan (Formosa):

— Syntypes of *Chanodichthys macrops*: B.M.N.H., 1865, 5.2. 15—19, leg. Swinhoe, 5 spec., 87.5—182.0 mm st. length; the longest specimen (No. 1865, 5. 2. 15) is declared lectotype;

— F.M.N.H. 59109, Tamusui R., Taiwan, 2 spec., 163 and 145 mm;

— I.B.T.S. 1338, Keelung, N. Taiwan, 1 spec., 127 o. mm.

From Fukien (Minkiang drainage):

— H.Z.S. 11173, no local., 2 spec., 98.0 and 101.2 mm;

— A.M.N.H. 10234, near Yenping, Sept. 1920, 3 spec., 142—158 mm;

— A.M.N.H. 10377, same locality, 1926: 32 spec., 49.5—125.0 mm;

— A.M.N.H. 11058, Chung Hsien, 12 spec., 89.0—155.5 mm.

From Chekiang:
S.U. 32475, Tsien Tang R., 2 spec., 108—122 mm.
From North Vietnam:
— Holotype of *Chanodichthys affinis*, M.N.H.N. 9247, 102.0 mm;
— I.B.T.S. 622, Boi R., 1 spec., 86.0 mm:
From Hainan Island:
— Holotype of *Megalobrama melrosei*, A.M.N.H. 8378 Nodoa, 66.0 mm;
— A.M.N.H. 10965, Nodoa, 84 spec. (10 measured: 86.0—110 mm);
— A.M.N.H. 10980, no locality, 2 spec., 87.0—93.1 mm;
— A.M.N.H. 10978, no locality, 3 spec., 49.1—56.2 mm;
— N.M.W. 9759, Kangkong R., 1 spec., 75.1 mm.

The comparative study of the available specimens showed but little differences between them. The number of branched anal rays is practically the same:

20—22, rarely 19 or 23 in Hainan specimens (M = 21.13 ±0.17 in 30 specimens from Nodoa);
21—23 in the specimens from Taiwan (M = 21.8 ± 0.29);
21 in the avialable North Vietnam and Chekiang specimens;
20—23, rarely 19 or 24 in the specimens from Fukien (M = 21.13 ± ± 0.21 in the specimens from Yenping, 21.59±0.30 in those from Chung Hsien).

Gill rakers: 10—12 in Taiwan, 11—13 (rarely 14) in Fukien, 10—12, rarely 13 in Hainan specimens.

The number of scales in lateral line is more variable:
55—61 in Taiwan specimens (M = 59.0±0.53);
56—61 in Fukien specimens (M = 58.07±0.22 in Yenping, 58.65± ± 0.33 in Chung-Hsien ones);
48—55 in 40 specimens from Nodoa, Hainan (M = 53.40±0.16);
49—54 in other specimens from Hainan;
49 on both sides in the two specimens from North Vietnam;
59—60 in the two specimens from Tsien Tang R., Chekiang.

The body proportions are shown in Table 1. One remarks that most values are practically the same in all populations examined; the head and the eye are slightly larger, the snout on the contrary slightly shorter in the specimens from Hainan and Vietnam than in those from Taiwan and Fukien; but the stronger differences concern the caudal peduncle (longer in Hainan and Vietnam populations) and the pelvic-anal distance (longer in Taiwan and Fukien populations).

The general conclusion is that the specimens from Taiwan, Fukien and Chekiang, on the one hand, those from North Vietnam and Hainan, on the other, agree both in scales number and in body proportions; the nominal subspecies, *M. macrops macrops*, described from Taiwan Island occurs also in the mainland adjacent provinces Fukien and Chekiang, while *M. melrosei*, described from Hainan Island, is a synonym of *M. macrops affinis* from North Vietnam.

According to the available data in the literature, the upper Yangtze subspecies, *M. macrops wui*, has 21—24 branched anal rays, a deeper body than *macrops macrops* and *m. affinis* (depth 32.3—33.8%) and 53—56 scales (like *m. affinis*). The Hsikiang subspecies, *M. macrops*

Table 1

		Megalobrama macrops affinis					*Megalobrama macrops macrops*		
		Hainan Island			North Vietnam		Taiwan Isl.	Fukien	Chekiang
		Nodoa	no local.	Kang-kong R.	Type sp.	Boi R.	several local.	Yenping	Tsien-Tang R.
Stand. length, mm		86.0–111.0	49.0–93.0	75.1	102.0	86.0	87.2–182.0	99.0–158.0	108.0–122.0
in % of standard length	body depth	29.0–32.5 (30.92)	23.0–30.2	28.1	32.4	29.6	30.6–33.8	28.7–33.3 (30.16)	28.8–30.2
	caudal ped.	16.0–18.6 (17.37)	16.7–19.6	16.6	17.6	17.5	14.6–17.1	13.6–17.0 (15.14)	15.6–15.8
	least depth	9.7–10.9 (10.24)	8.5– 9.3	8.3	10.0	10.2	9.4–10.1	9.8–10.8 (10.30)	10.7–10.9
	predorsal	48.0–51.2 (49.44)	46.5–50.5	51.6	51.0	49.6	46.5–51.5	48.2–51.8 (50.06)	50.2–50.8
	preanal	61.0–64.0 (62.47)	60.5–64.5	61.1	61.0	61.6	61.5–66.0	59.8–66.5 (63.24)	63.5–64.7
	P–V dist.	20.2–24.2 (22.10)	18.0–21.0	20.7	21.1	21.8	22.8–25.9	20.8–25.2 (22.56)	22.3–23.6
	V–A dist.	16.3–19.4 (17.71)	15.2–17.8	16.6	17.6	16.3	21.4–23.6	17.3–21.8 (19.24)	20.2–20.4
	pectoral	18.8–22.4 (20.23)	18.9–21.3	21.3	20.6	20.9	19.3–20.6	19.8–21.8 (20.55)	19.6–20.8
	pelvic	14.7–16.6 (15.48)	14.3–19.3	16.6	16.6	15.5	14.5–16.0	15.1–17.1 (16.32)	16.0–16.9
	D-spine height	17.7–24.4 (19.22)	16.4–19.6	17.7	18.1	—	18.7–21.4	20.2–22.4 (21.21)	19.6–20.4
	D-height	19.4–26.2 (24.55)	20.0–24.0	21.3	21.1	—	20.0–22.5	20.9–23.8 (22.68)	22.0–22.2
	head length	24.3–27.4 (26.21)	25.8–28.4	25.9	25.3	25.6	22.4–25.0	23.8–26.2 (24.73)	24.4–24.6
	snout	5.8–7.1 (6.43)	6.0– 7.2	6.8	6.1	6.1	5.6–7.2	6.3– 8.3 (6.89)	6.5–6.8
	eye diam.	8.2–10.4 (9.02)	8.6–10.6	9.7	10.3	9.3	7.2– 8.6	7.9–9.7 (8.88)	8.2
in % of head	snout	22.8–27.2 (24.53)	21.8–26.2	26.6	23.6	24.2	24.8–28.6	25.6–30.8 (27.07)	26.7–27.4
	eye diam.	32.6–39.0 (34.47)	33.4–37.4	35.8	40.1	36.3	30.9–36.4	33.6–38.2 (36.0)	33.3–33.5

Body proportions in *Megalobrama macrops*

polylepis, has 22—24 anal rays (like *wui*), a deep body (depth 29.4—34.0%) but 56—59 scales, like the nominal subspecies.

2) **Megalobrama (Sinibrama) changi** (Chang, 1944).

Fig. 5

Specimens examined: F.M.N.H. 51130, Min R. at Kiating, Szechwan; 11 spec., 98.5—125.0 mm standard length.

D III 7; A 2/(16) 17—19; L. lat. 51 $\frac{9}{4}$ 56; Sp. br. (11) 12—14; D. phar. 5.4.2—2.4.4., 4.4.2—2.4.5 or 4.4.2—2.4.4.

In % of standard length: body depth 24.5—29.2% (M = 26.7); caudal peduncle length 17.1—21.9% (19—15); least depth 9.3—11.6% (10.92); predorsal distance 47.7—55.7% (50.14); preanal 61.8 — 66.2% (64.02); preventral 43.6—48.6% (46.58); distance from pectoral to pelvic origin 22.3—24.8% (24.15); from pelvic to anal origin 16.7—22.4% (20.05); length of pectoral 17.0—20.4% (19.05); base of anal 17.3—21.7% (19.8); head length 23.2—24.6% (23.86); snout length 5.0—7.0% (6.25); eye diameter 6.7—7.9% (7.30); in % of head: snout 24.6—28.6% (26.28); eye diameter 27.6—34.0% (30.66); eye 75.0—97.0% (87.4) of interorbital width.

Lateral line slightly more decurved than in *M. macrops*.

Back brownish (in preserved specimens), body sides silvery. Minute blackish spots, grouped in a longitudinal stripe, on lateral line scales.

In its general habitus, rather low body, eyes smaller than the interorbital width, this species differs sharply from *M. macrops* and bears some similarity with *Hemiculter*, especially with the Upper Yangtze *H. liui*, in which the abdominal keel is postventral and the lateral line slightly decurved. Yet in all available *Hemiculter* species the postorbital bones are broad, while in *changi* they are narrow, as in the other *Megalobrama* species. *M. changi* is close also to the species of the Upper Yangtze genus *Ancherythroculter* Yih & Wu; yet in number of anal rays, gill rakers and in the shape of scales it remains closer to *Megalobrama*.

Subgenus ***Megalobrama*** Dybowsky, 1872

This subgenus too contains two species.

3) **Megalobrama** (s. str.) **terminalis** (Richardson, 1845).

Fig. 6

Specimens examined:

M.N.H.N. 34141, Yangtze, 1 spec., 125.2 mm;

M.N.H.N. 34131, Yangtze, 1 spec., 150.0 mm;

M.N.H.N. 34137, Szechwan, holotype of *Parosteobrama pellegrini*, 1 spec., 148.0 mm;

B.M.N.H. 1851, 12.27 191, "China", 1 spec., 78.0 mm;

Lake Kaing-tze-Kiang, Hupeh, 2 spec., 112.0—113.0 mm;
Nucet, Romania (introduced from the Yangtze at Wu-chang), 5 spec., 83.0—120.0 mm;
U.S.N.M. 130086, "China", 3 spec., 172.0—242.0 mm;
U.S.N.M. 91733, Suifu, 1 spec., 204.0 mm;
U.S.N.M. 130680, Canton, 1 spec., 114.0 mm;
U.S.N.M. 86060, "China", 1 spec., 130.0 mm;
U.S.N.M. 94871, Canton, 1 spec., 138.0 mm;
U.S.N.M. 117780, Foochow, 1 spec., 116.5 mm;
U.S.N.M. 87186, China, 1 spec., 209.0 mm;
U.S.N.M. 86987, Foochow, 4 spec., 76.0—122.0 mm;
S.U. 25708, Canton, 2 spec., 99.0—112.0 mm, determ. *M. hoffmanni*;
A.M.N.H. 12934, Kwantung, 1 spec., 197.0 mm, determ. *M. macrostoma*. (a manuscript name);
A.M.N.H. 15612, Kwantung, 2 spec., 95.0—181.0 mm.

D III 7; A 3/25—29; L. lat. 52—59; Sp. br. 15—20.

Body rhomboidal; depth 34.5—45.5% of standard length; caudal peduncle 12.7—15.9%; least depth 9.5—11.8%; least depth 62.0—97.0% of caudal peduncle length. Snout compressed and covered by a well développed horny sheath.

By comparing the Kwantung specimens, including the two ones (S.U. 25708) determined by Herre himself as *M. hoffmanni*, with *M. terminalis* from the Yangtze and the Amur drainage, I did not find any differences. L. S. Berg [1] and J. T. Nichols [5] have already suggested that *hoffmanni* may be a synonym of *terminalis*. Yih & Wu (in Hs. W. Wu & others, [8]) accept *hoffmanni* as distinct species, yet most values (number of scales, rays, body proportions) they indicate for *hoffmanni* are included within the variation range of the same values in *terminalis*.

4) **Megalobrama** (s. str.) **amblycephala** Yih, 1955.

Fig. 7

Specimens examined:
B.M.N.H. 1936. 10.19. 21. Hankow, 1 spec., 116.0 mm;
B.M.N.H. 1891. 1. 31. 29. Shanghai, 1 spec., 212.0 mm;
H.Z.S. 1816, Shanghai, 1 spec., 278.0 mm;
M.N.H.N. 3963, Wu-chang, Hupeh, 1 spec., 185.0 mm;
M.N.H.N. 07293, North Vietnam, 1 spec., 239.0 mm;
M.N.H.N. 2706, Ningpo, Chekiang, 1 spec., 316.0 mm;
M.N.H.N. 5046, Yangtze, 1 spec., 172.3 mm;
M.N.H.N. 91622, Shanghai, 1 spec., 350.0 mm;
A.M.N.H. 10972, Ningkwo, Anhwei, 1 spec., 149.0 mm;
A.M.N.H. 12190, Tungting Lake, Hunan, 2 spec., 148.0—155.2 mm;

D III 7; A 2/ 23—30; L. lat. 50—58; Sp. br. 12—19.

This species closely resembles *M. terminalis* but has a less rhomboidal and deeper body (depth 39.4—48.0% of st. length) and caudal peduncle (least depth 10.8—13.4% of st. length and 83—104% of caudal peduncle length) and the snout is less compressed and covered by a quite slight horny sheath.

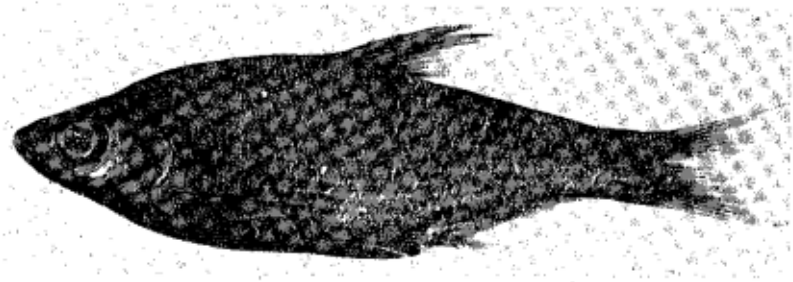

Fig. 1. — *Megalobrama macrops macrops* (Günther). Tsien-Tang R., Chekiang. S.U. 32475

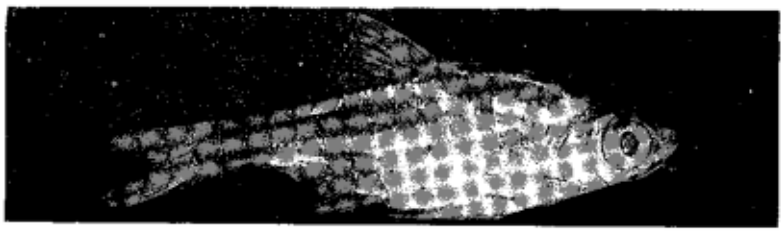

Fig. 2. — *Megalobrama macrops affinis* (Vaillant). Holotype, North Vietnam. M.N.H.N. 9247.

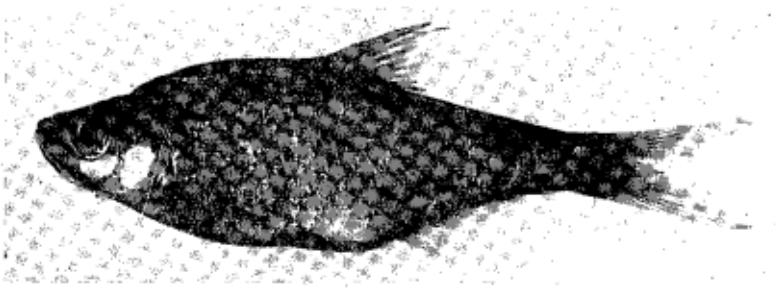

Fig. 3. — *Megalobrama macrops affinis* (Vaillant). Nodoa, Hainan. A.M.N.H. 10965.

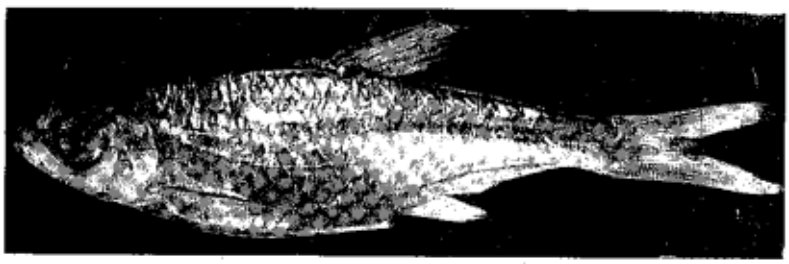

Fig. 4. — *Megalobrama macrops affinis* (Vaillant). Kangkong R., Hainan. N.M.W. 9759.

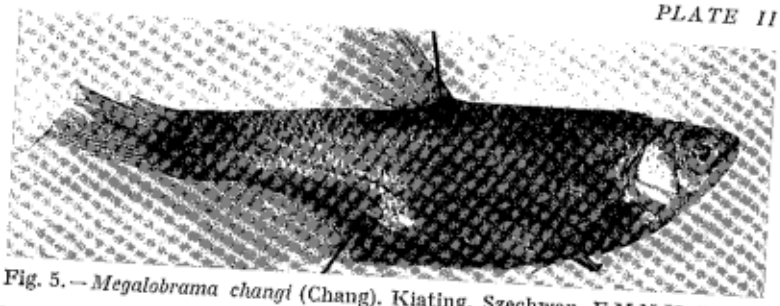

Fig. 5. — *Megalobrama changi* (Chang). Kiating, Szechwan. F.M.N.H. 51130.

Fig. 6. — *Megalobrama terminalis* (Richardson). Holotype of *Parosteobrama pellegrini* Szechwan. M.N.H.N. 34137.

Fig. 7. — *Megalobrama amblycephala* Yih. Hankow. B.M.N.H. 1936. 10.19.21.

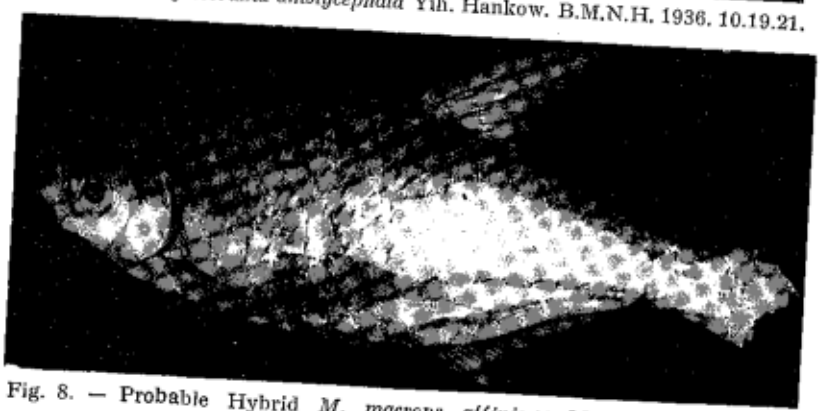

Fig. 8. — Probable Hybrid *M. macrops affinis* × *M. terminalis*. North Vietnam. M.N.H.N. 35347.

The nominal status of this species is rather difficult. *M. amblycephala* as described by Yih in 1955 and figured in Wu & others [8] is surely the species recorded by Günther [4]. Nichols [5] and other authors as *M. bramula* (Valenciennes). But the description of *Leuciscus bramula* by Valenciennes (in Cuvier & Valenciennes, [3]), is based on a Chinese painting and is so vague that it can apply to every species of *Parabramis* or *Megalobrama* as well.

Hybrid *M. macrops affinis* × *M. terminalis* (?)

One North Vietnam specimen, M.N.H.N. 35347, 140.0 mm standard length (Fig. 8) seems to be a hybrid between *M. macrops affinis* and *M. terminalis*; it has 28 branched anal rays (as terminalis), 52 scales, shape of mouth as in *macrops*, no horny sheath, eye larger than the snout (as in *macrops*) but smaller than the interorbital width (as in *terminalis*); the air-bladder was strongly damaged.

Aknowledgements

Following curators lent me specimens: M-me le Prof. M. L. Bauchot, Paris; Dr. J. Böhlke, Philadelphia; Prof. Dr. K. Deckert, Berlin: Dr. P. H. Greenwood, London; Dr. P. Kähsbauer, Viena; Dr. E. Lachner, Washington; Dr. W. Ladiges, Hamburg; Dr. D. E. R - sen, New York; Dr. L. P. Woods, Chicago. A visit in several museums from the U.S.A. and United Kingdon was financed by the Smithsonian Institution 's T.F.H. Fund, at the kind proposal of Dr. E. Lachner.

REFERENCES

1. Берг Л.С., *Рыбы пресных вод СССР и сопредельных стран*, vol. 2, Moscow—Leningrad, 1949.
2. Chang H. W., Sinensia, 1944, **15**, 27—60.
3. Cuvier G., Valenciennes A., *Histoire Naturelle des Poissons*, vol. 17, Paris, 1844.
4. Günther A., *Catalogue of the Fishes in the British Museum*, vol. 7, London, 1868.
5. Nichols J. T., *The Fresh-Water Fishes of China*, 1943, New York.
6. Никольский Г. В., *Рыбы бассейна Амура*, Moscow, 1956.
7. Wu Hs. W., Sinensia, 1939, **10**, 92—142.
8. Wu Hs. W. & others, *The Cyprinid Fishes of China*, Shanghai, The Technical Printing House (in Chinese) (*Subfam. Abramidinae* by P. L. Yih and C. K. Wu, vol. 1, 1964).

Received November 17, 1969

The "Traian Săvulescu" Institute of Biology
Department of Systematic and Evolutionary Zoology