CONTRIBUTIONS TO THE SYSTEMATICS OF THE GENUS *OXYGASTER* (*PISCES, CYPRINIDAE*) WITH DESCRIPTION OF A NEW SUBSPECIES

BY

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Oxygaster anomalurus v. Hass. is an invariable species. *Chela siamensis* Günth. and *Ch. johorensis* Steind. are synonyms of *Ox. oxygastroides* (Bleeker). An eastward increase of the number of anal rays occurs in *O. oxygastroides*. The North Borneo specimens belong to a new subsp. *O. oxygastroides ingerkongi*, with 30—33 branched anal rays as against 24—29 in the nominal subspecies.

The generic name *Oxygaster* v. Hasselt, 1823 was revived by Fowler [4] and Smith [8] for the fishes formerly ascribed to *Chela* (this being the right name for the genus formerly known as *Laubuca* or *Cachius*), in which the dorsal scales extend to the interorbital space or even in front of the eye. Most subsequent authors accepted *Oxygaster* as valid genus, except Inger & Kong [6] who remarked that in some *Ox. anomalurus* the dorsal scales do not reach quite to the interorbital space. But *Oxygaster* differs from *Chela* also in other characters : a much larger size, a symphiseal knob, the head axis oblique as compared with the body axis, the anterior part of the abdominal keel hard. I recognize therefore *Oxygaster* as distinct genus and consider it closer to *Macrochirichthys*, *Pseudoxygaster* and *Pelecus* than to *Chela*. Its generic characters are less marked in the apparently more primitive *O. anomalurus*, better marked in the more specialized *O. oxygastroides* and *O. hypophthalmus*.

Three rather well-known species occur in Sumatra, Borneo and Java : *O. oxygastroides*, *O. hypophthalmus* and *O. anomalurus* ; a fourth one, *johorensis* was described by Steindachner [9] and recorded later on by Duncker [3] and Menon [7] from Malaya, while Smith [8] recognized 5 species in Thailand : the wide ranging *anomalurus* and *oxygastroides* and the endemic *maculicauda*, *siamensis* and *pointoni*.

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MATERIAL

Some 340 specimens were examined; they belong to the following collections: British Museum (BMNH); Inst. Biologie "Tr. Săvulescu" Bucureşti (IBTS); Zoolog. Staatsinstitut u. Museum, Hamburg (HZS); Museum National d'Hist. Naturelle, Paris (MNHN); Museo Storia Naturale Genova (MSNG); Naturhistorisches Museum Wien (NMW); Senckenberg Museum, Frankfurt (SMF); University of Michigan, Museum of Zoology (UMMZ); United States National Museum (USNM); Stanford University, Zoological Museum (SU); Zool. Institut Akademii Nauk, Leningrad (ZIAN); Zoologisches Museum, Berlin (ZMB).

1. **Oxygaster anomalurus** v. Hasselt, 1823

Specimens examined: UMMZ 15559 (8 spec.), Sumatra; HZS 8491 (7), Kwala Pilah, Malaya; HZS 8490 (2), Kwala Lumpur; MSNG 9105 (1), Sarawak; MNHN B 94 (1), Java; MNHN 84109 (1) Malaya; MNHN 91424 (2) & 91425, Borneo; SU 34665 (2) Kota Tinggi, Malaya IBTS 906 (1) Soekadana, Lampong, formerly RMNH 5000.

D 3/7; A 2/(26)n 27—30; L. lat. (47) 49 $\frac{10-13}{2-2^1/_2}$ 60; Sp. br. 12—17.

There is great similarity in body proportions and anal rays number between the specimens examined; e. g. the mean number of branched anal rays is 28.1 $\pm$ 0.46 in the specimens from Sumatra and 28.2 $\pm$ 0.38 in those from Kwala Lumpur and Kwala Pilah. The number of scales seems more variable; 49—55 in Sumatra and West Malaya specimens, 55—59 in other Malayan specimens, 47—60 in Borneo specimens; but in many specimens most scales were lost and their number could not be exactly determined.

2. **Oxygaster oxygastroides oxygastroides** (Bleeker, 1852)

Synonyms: *Leuciscus oxygastroides* Bleeker, 1852; *Chela ox.*, Bleeker, 1860; Weber & de Beaufort, 1916 (partim); *Chela megalolepis* Günther, 1868; *Ch. siamensis* Günther, 1868; *Chela johorensis* Steindachner, 1870; Duncker, 1904; *Oxyg. oxygastroides* + *O. siamensis*, Fowler, 1935; Smith, 1945; *Ox. johorensis* + *Ox. oxygastroides*, Menon, 1954.

Specimens examined:

From Mekong and Menam drainage: ZMB 7528 (1), Bangkok, Menam dr.; IBTS 1080 (3), Bangkok; USNM 103292 (2), Bangpakong R., Central Thailand; BMNH 1894. 10. 8. 138—140 (2), same locality, specimens determined *Ch. siamensis*; ZIAN 11255 (1), Pak-peo, Thailand; MNHN 5085 (1) & A 5057 (2), Thailand, all three specimens determined *Paralaubuca siamensis* (in the same series were some *Paralaubuca typus*); MNHN 3932, (1), lower Mekong, Cochinchina; USNM 103291 (1), Mekong Rajburi, Thailand.

From West Malaya (Bengal Sea drainage): HZS 9492, 9493, 9495, 9494, 9496 & 9497, 240 specimens in all, from four localities (see Table 1).

From Sumatra: UMMZ 155258 (20), Moesi R.; UMMZ 70689 (2), Djambi, Hari R. drainage; NMW 52140 (1), Laut Tador.

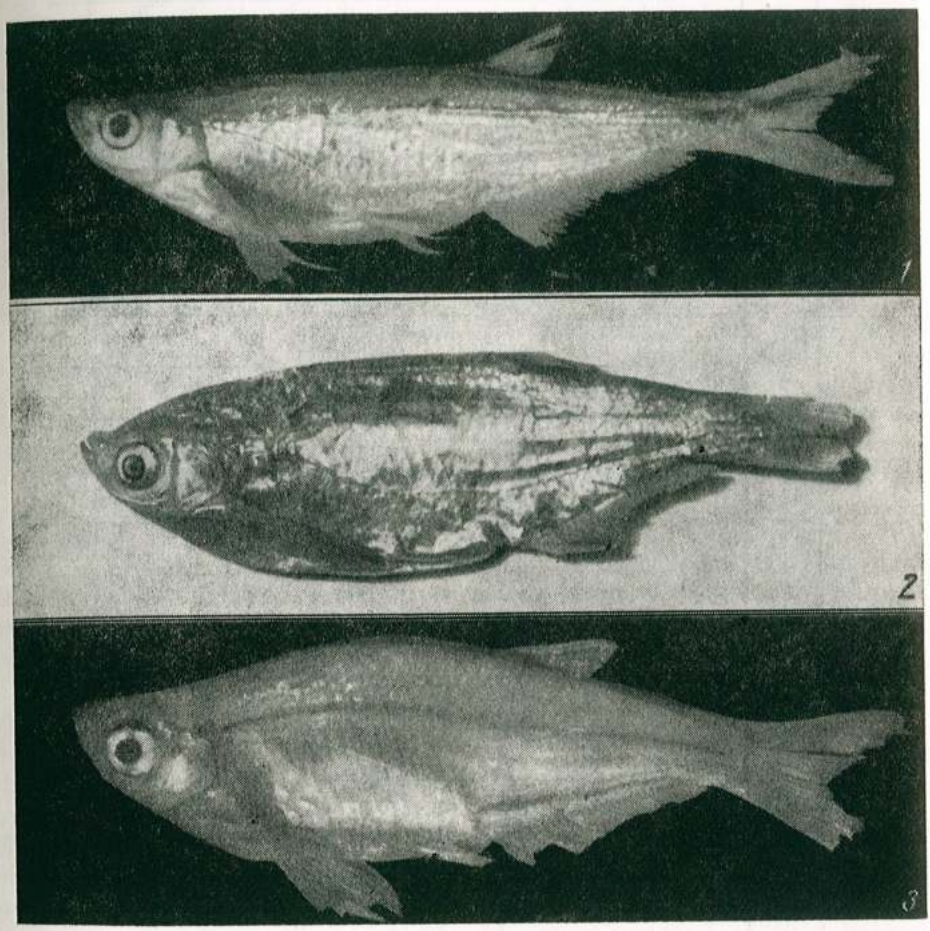

PLATE I Fig. 1. — *Oxygaster anomalurus* V. Hasselt. HZS 8491, Kwala Lumpur, Malaya.
Fig. 2. — *Oxygaster oxygastroides oxygastroides* (Bleeker) (*"Chela siamensis"*). BMNH 1891. 10.8.138. Bangkapong R., Thailand.
Fig. 3. — *Oxygaster oxygastroides oxygastroides* (Bleeker) (*"Chela johorensis"*). HZS 9493, Kwala Lumpur, Batu Road, Malaya.

From Borneo: SU 32806 (1), Sarawak; ZMB 6536 (1); MNHN 91430 & 91433 (2); MNHN 91426 (1); all 4 specimens labelled Borneo, probably from West Borneo.

No locality: ZIAN 36190 (1).

D 3/7; A 2/(22) 23—28 (—30); L. lat. 38—44 (—46); Sp. br. 12 12—17.

Table 1

		n	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	M ± m	
Mekong — Menam		15	—	—	—	—	—	—	8	4	2	1	—	—	—	—	—	26.75±0.24	0.930
Malaya	Kwala Lumpur Sungai Batu	7	—	—	—	1	3	3	—	—	—	—	—	—	—	—	—	24.30±0.27	0.700
	Kwala Lumpur Batu Rood	207	(1)	—	8	41	49	59	40	9	—	—	—	—	—	—	—	24.42±0.01	1.244
	Kwala Pitah Kwala Selai	13	—	—	—	2	—	7	2	1	1	—	—	—	—	—	—	25.20±0.36	1.310
	Serembar Kwala Pilah	13	—	—	—	—	4	3	4	2	—	—	—	—	—	—	—	25.30±0.30	1.065
Moesi R., Sumatra		20	—	—	—	—	2	1	4	7	5	1	—	—	—	—	—	26.75±0.29	1.303
Djambi, Sumatra		2	—	—	—	—	—	—	—	—	1	—	1	—	—	—	—	29.0 —	—
South (?) Borneo		4	—	—	—	—	—	—	—	2	2	—	—	—	—	—	—	27.5 —	—
Sarawac, Borneo		1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	27.0 —	—
N. Borneo	Bo R.	7												1	1	4	1	32.7 —	—
	Batoc Pangal	3	—	—	—	—	—	—	—	—	—	—	1	2	—	—	—	30.6 —	—
	Tawao	13	—	—	—	—	—	—	—	—	—	—	—	2	7	4	—	32.2±0.18	0.664

The most variable character is the number of branched anal rays. As shown in Table 1, the lowest values occur in the Bengal Sea drainage of Malaya : 22—28, rarely 29 (in an anomalous specimen 20), M = 24.40 ±0.27—25.30±0.30 ; the specimens from Mekong, Bangpakong and Menam drainages in Thailand and Cochinchina are identical with those from Moesi R. in Sumatra (M = 26.75 ± 0.24 and 26.75 ± 0.29) ; in the few available specimens from (probably westen) Borneo the number is slightly higher ; in four specimens from Kapuwas R., West Borneo (R.M.N.H. 7762, 7761, 7760), there are 27 and 28 branched anal rays (Dr. M. Boesman *in litt.*), while in those from Celebes Sea drainage and Macassar straight drainage in East Borneo, further described as a new subspecies the number is much higher : 30—33. The similarity between the Mekong-Menam, Moesi and Kapuwas rivers is probably a consequence of the fact that these rivers were connected during the Ice Age, as the sea level was much lower. Malaya is, geographically, intermediate between Thailand and Sumatra ; but the available Malayan specimens are from Bengal Sea drainage of West Malaya, which was not connected to the Mekong-Moesi-Kapuwas drainage ; the East Malayan specimens may agree with the Mekong-Moesi ones. Considering the flowing direction of the rivers, there is a regular increase of the number of rays from the West towards the East.

The type locality of the species is not determined. Alfred [1] revised the type material and designed a lectotype and two paratypes from Bleeker's specimens ; but the exact locality is not known ; the specimens are either from Kusan R. at Prabukarta, Borneo, or from Moesi R., Sumatra, or from Djakarta, Java. These three specimens have 23, 28 and 29 branched anal rays, agreeing thus to the available specimens from Thailand, Sumatra and West Borneo at my disposal. According to Dr. M. Boeseman (*in litt.*) one of the paratypes has 31 branched anal rays ; probably this specimen is from Prabukarta on Kusan R. (South Borneo, between Mahakkan and Barito rivers), the other being from Djakarta, Moesi River or Sambas (West Borneo). I propose Moesi River as *terra typica restricta*.

The description of *Chela siamensis* by Günther [5] agrees with *O. oxygastroides* (A 2/82 ; L. lat. 43 ; depth 33% of st. length), except in the dorsal insertion slightly in advance of the anal insertion. The two British Museum specimens examined, labelled *Ch. siamensis*, were typical *oxygastroides*, with A 2/27—28, L. lat. 42—44, dorsal inserted slightly behind anal. Fowler [4] mentions a specimen of *O. siamensis* with exceptionally large scales (35 in lateral line, as against at least 38 in normal *oxygastroides*) and dorsal inserted apparently slightly in advance of anal ; (according to the figure) ; but he figures also a specimen of *O. oxygastroides* and in this one too the dorsal seems to be inserted in advance of the anal.

In all specimens examined the dorsal was inserted behind the anal, in some well behind, in others only slightly behind ; the predorsal distance was either longer or shorter than the preanal. I think therefore that both Günther's and Fowler's "*siamensis*" were extreme (to a certain degree even aberrant) *oxygastroides* specimens.

Ch. johorensis too is a synonym of *O. oxygastroides*. The original description of this species by Steindachner [9] is rather vague but agrees

with that of *oxygastroides*; the type specimen cannot be found (Dr. P. Kähsbauer *in litt.*) The more than 200 Malayan specimens examined (the same which were identified by Duncker [3] with *johorensis*) were *oxygastroides*, with statistically less anal rays. Although the difference between these specimens and those from Mekong and Moesi R. drainages is statistically significant, the overlap between the extreme values is too large to recognize the West Malayan specimens as subspecifically distinct (less than 50% from these specimens differ from all specimens from Mekong-Moesi).

3. **Oxygaster oxygastroides ingerkongi** nova subsp.

Syn. *Chela oxygastroides* (not exactly of Bleeker), Weber & Beaufort, 1916 (partim : Bo R., Batoc Pangal); Inger & Kong, 1962 (North Borneo : Tawao and other localities).

Holotypus : USNM 135, Tawao on Tawao R., North Borneo, 4° 15' N, 118° E, Sept. 1909, "Albatross" Exped., 78.0 mm st. length.

Paratypes : same series, 13 specimens, 60—77 mm.

RMNH 7626, Bo River, Mahakkan R. drainage, East Borneo, 115° E, 1° N., leg. Nieuwenhuis, 5 specimens.

I. B. T. S. 905 (formerly R. M. N. H. 7626), same locality, 2 spec., 133 and 134 mm.

R. M. N. H. 9913, Bata Bangal, lower Mahakkan R., 117° E, 30'S, one specimen,

UMMZ 70665, same locality, 2 spec., 65 and 79 mm.

Diagnosis. A subspecies of *Oxygaster oxygastroides* with 30—34 branched anal rays.

Description : D 3/7; A 2/30 — 33; L. lat. 41 $\frac{7-8}{2^1/_2-3}$ 44; D. phar. 2.4.4—5.4.2 or 2.4.5—4.4.2, etc.

Depth 24.4—33.1% of standard length (25.6% in the holotype); caudal peduncle length 11—14%; least depth 8—10%; predorsal distance 57.0—61.5%; preanal 55—63%; preventral 42.5—51.0%; distance from pectoral to pelvic origin 18.6—25.8%; from pelvic to anal origin 11.1—17.9%; head length 20.5—24.7%; snout 5.5—6.5%; eye diameter 6.6—8.0% of standard length and 100—120% of interorbital width.

Derivatio nominis : this new subspecies is named after both Robert F. Inger and Chin Phui Kong, who first gave an adequate description of the North Borneo specimens of *Oxygaster oxygastroides.*

4. **Oxygaster hypophthalmus** (Bleeker, 1860)

Specimens examined : ZMB 12343 (3), South-East Borneo; NMW 52129 (1), Kwanton R.; MNHN 91432 (1), Borneo.

D 3/7; A 2/31—33; L. lat. 60 $\frac{11-13}{3-4}$ 64; Sp. br. 17.

The available specimens agree with the description of this species by Bleeker [2] and Weber & Beaufort [10].

5. **Oxygaster pointoni** (Fowler)

This species is known only after the type specimen. According to the original description and a photograph of the type specimens, kindly presented us by Dr. Böhlke, this fish is an *Oxygaster*, apparently more similar

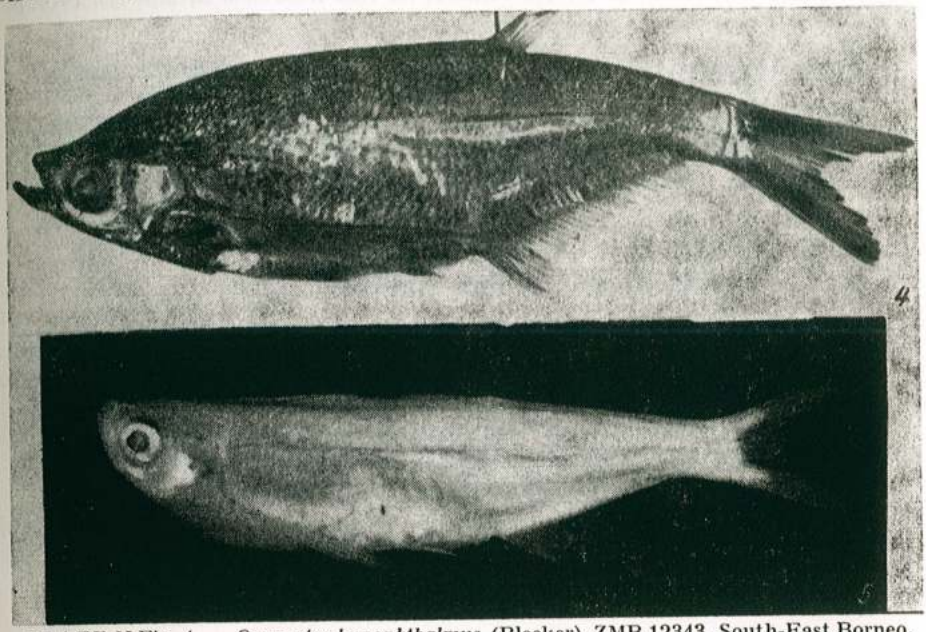

PLATE II Fig. 4. — *Oxygaster hypophthalmus* (Bleeker). ZMB 12343. South-East Borneo.
Fig. 5. —*Oxygaster pointoni* (Fowler). Type specimen, ANSP 57456, Chiengmai, Thailand, Courtesy of Dr. J. E. Böhlke.

to *O. anomalura*, but with dorsal inserted slightly in advance of the anal (according to both description and photograph), 27 anal branched anal rays and some 36 scales.

I have no information of the last species of the genus, *O. maculicauda* from Thailand.

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