

REVISION OF THE GENUS *NEMATABRAMIS*  
(PISCES, CYPRINIDAE)

BY

PETRU BĂNĂRESCU

A large number of specimens, including the holo-, para- and syntypes of all species and subspecies of *Nematabramis* were examined; lectotypes are designed for *N. everetti* and *N. steindachneri*. *N. steindachneri* and *N. alestes borneensis* are considered subspecies of *N. everetti*. The values of *everetti* overlap with those of *steindachneri* and of *borneensis*, those of *borneensis* with those of *alestes*, while *everetti* and *alestes* occur sympatrically in NE Kalimantan without hybridization. It is suggested that *borneensis* formerly lived within the range of *everetti* from where it colonized Palawan and Mindanao; *everetti* may be a recent form which replaced *borneensis* in north-eastern Kalimantan.

*Nematabramis* Boulenger 1894 (= *Mearnsella* Seale & Bean, 1907) is a genus of small to medium-sized minnows, whose range is restricted to the northern half of Kalimantan (= Borneo) Island and to Palawan and Mindanao islands, Philippines. Because of the presence of a ventral keel between anal fin and throat, the genus was included by Weber a. De Beaufort [6] within the "Abramidinae" (as accepted at present, the East- and South-East genera of so-called abramidin minnows actually represent a distinct subfamily, Cultrinae). Yet the presence of a very long rostral barbel; of breeding tubercles and of well-developed coloured stripes, as well as the strong resemblance with the South-Asian genus *Esomus* demonstrate that this genus belongs to the Danioninae.

Three species and one subspecies are at present ascribed to this genus: *N. everetti* Boulenger 1894 [1], *N. steindachneri* Popta 1905 [3], *N. alestes* (Seale & Bean, 1907) [5] and *N. alestes borneensis* Inger & Chin, 1962 [2]. (A fourth nominal species, *N. verrecundus* Herre, 1924 proved long ago to be a synonym of *alestes*). *N. everetti* and *N. steindachneri* were described after several syntypes and no lectotypes were designed. No critical comparison of the four nominal species and subspecies was hitherto published.

REV. ROUM. BIOL.-ZOOLOGIE, TOME 16, N° 2, P. 103-111, BUCAREST, 1971

## Material

Some 300 specimens, including all types and paratypes were examined; they belong to the following collections: British Museum, Natural History, London (B.M.N.H.), Field Museum of Natural History, Chicago (F.M.N.H.), Rijksmuseum van Natuurlijke Historie, Leiden (R.M.N.H.), United States National Museum, Washington (U.S.N.M.) and Zoologisch Museum, Amsterdam (Z.M.A.). Tables I—III show the result of the comparison of the available specimens.

## SYSTEMATIC ACCOUNT

1. *Nematabramis everetti everetti* Boulenger, 1894

## Specimens examined:

Syntypes of *N. everetti*: B.M.N.H. 1893. 5. 30. 61—62, Bongon R. northern extremity of Kalimantan Isl., 2 specimens, 89.0 and 93.0 mm; the smallest one (1893. 5. 30, 61), whose pharyngeal bones were removed (quite probably by Boulenger when describing the species) is here declared lectotype, the largest is paralectotype (Two other syntypes proved to belong to the subspecies *N. ev. borneensis*).

U.S.N.M. 138 365, Tawao R., NE Kalimantan, 42 spec., 39.0—78.0 mm st. length (10 measured: 69.0—85.2 mm)

U.S.N.M. 138 366, Silimpon R., NE Kalimantan, 218 spec., (10 measured: 57.2—73.8 mm).

B.M.N.H. 1938, 12. 1. 39—42, Balung R., Tawao, NE Kalimantan, 4 spec., 70.0—78.0 mm.

B.M.N.H. 1938. 12. 1. 43—36, Javan R., North Kalimantan, 4 spec., 63.0—77.5 mm.

B.M.N.H. 1938. 12.1.36—38, Kimbutan R., North Kalimantan, 3 spec., 70.0—78 mm.

B.M.N.H. 1938. 12. 1. 47—48, Kabili R., North Kalimantan, 2 spec., 69 and 84 mm.

Z.M.A. 110—112, Kalimantan (no locality!), 6 spec., 36.5—60.5 mm.

D 3/(9) 10—13; A 2/(15) 15—17 (18); L. lat.  $36 \frac{7-8}{1}$  39.

The body is deeper than in the other forms of the genus (Table III and Fig. 5); as in most species, the body depth has a positive allometry and it is evident, from Fig. 5, that *ev. everetti* specimens are statistically deeper than the specimens of the same size belonging to the three other taxa. *N. everetti everetti* has the longest barbel within the genus (Table III: barbels 30—45%, rarely 22.6—28 or up to 52.5% of st. length, as against 24.1—26.4% in *steindachneri*, 23—27, rarely up to 43.5% in *borneensis* and 13—24% in *alestes*); the barbels usually reach well beyond middle of pectoral fin. The number of dorsal rays is greater than in the other subspecies and species (Table I).

A few irregular, more or less vertical blotches are present on the anterior part of body sides in most specimens; a vague longitudinal stripe is usually present in the posterior body half, in a few specimens also anteriorly.

The range of this subspecies includes the northern and north-eastern part of Kalimantan (rivers flowing into Sulu and Celebes seas), from Bongon R. to Tawao R. and probably slightly further south.

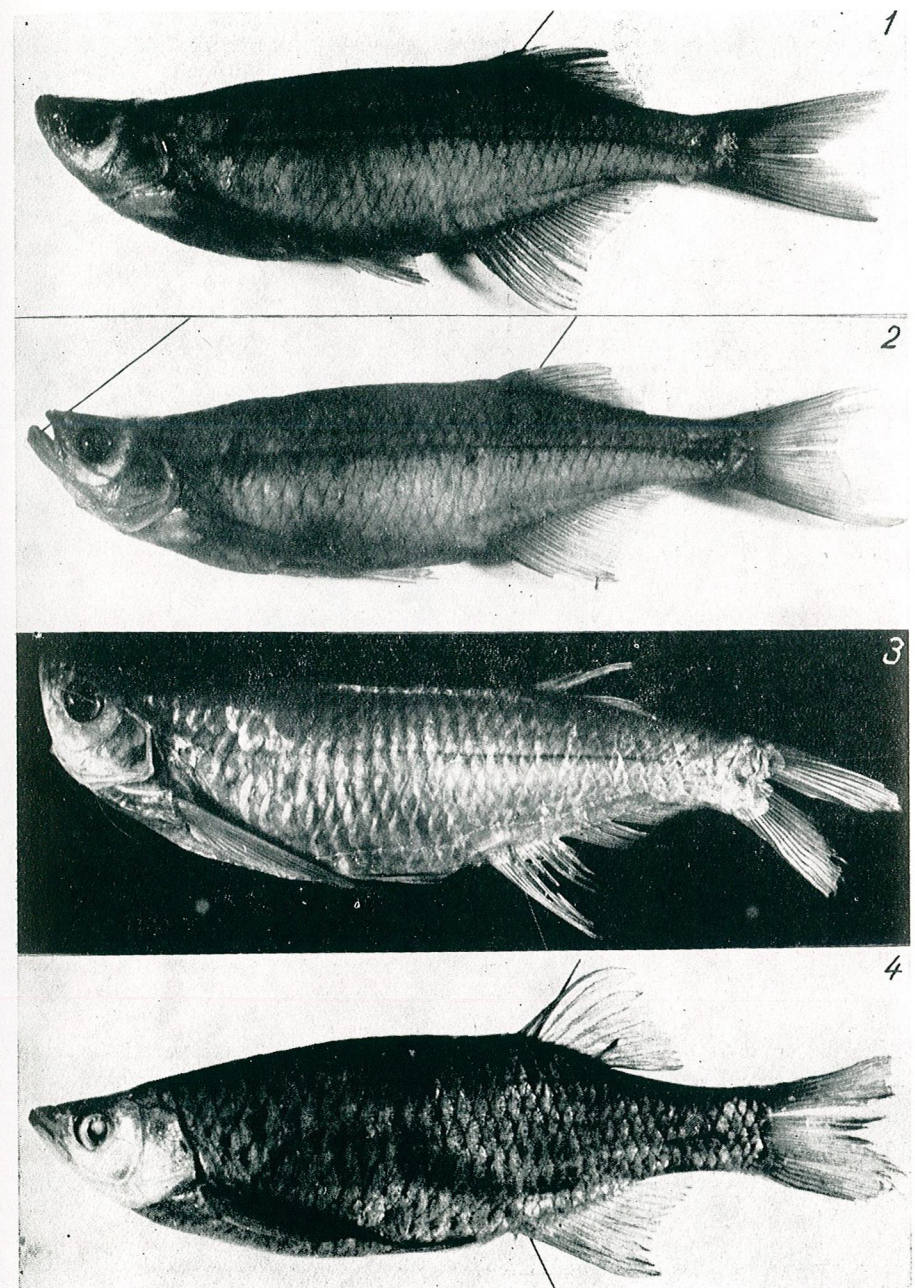


Fig. 1. — *Nematabramis everetti steindachneri* Popta. Lectotype, R.M.N.H. 7628. Kajan R.  
 Fig. 2. — *N. everetti steindachneri* Popta. Paralectotype. Kajan R.  
 Fig. 3. — *N. everetti borneensis* INGER & CHIN, R.M.N.H. 10986. Balingian R., Sarawak.  
 Fig. 4. — *Nematabramis alestes* (SEALE & BEAN). U.S.N.M. 190109. Iwahing R., Palawan.

2. *Nematabramis everetti steindachneri* Popta, 1905, Fig. 1, 2.

Specimens examined: syntypes of *N. steindachneri*, R.M.N.H. 7628, Kahan R., eastern slope of central Kalimantan, 4 spec., 102.0–112.0 mm; one of them, 108.0 mm (Fig. 1) is here declared lectotype; it retained its original catalogue number.

D 3/9–10; A 2/16–17; L. lat.  $37 \frac{6\frac{1}{2}}{1}$  39.

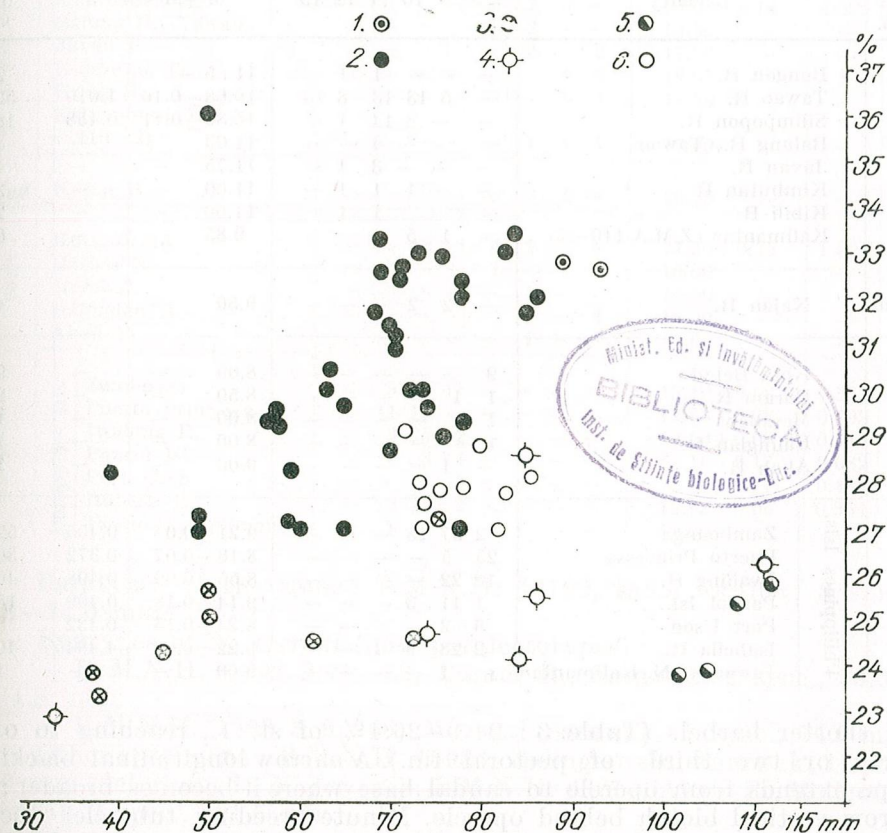


Fig. 5. — Value of body depth in *Nematabramis* in correlation with standard length. 1. *N. everetti everetti*, Bongon R.; 2. *N. ev. everetti*, other localities; 3. *N. everetti borneensis*, holo- and paratypes; 4. *N. everetti borneensis*, other specimens (including Barah and Merabah paralectotypes of *N. everetti*); 5. *N. everetti steindachneri*. 6. *N. alestes*, Zamboanga, Mindanao.

In comparing *steindachneri* with *everetti*, Popta [4] mentions following characters of the first named: a lower body, a different coloration, the relative position of the dorsal and anal fins, and only  $6 \frac{1}{2}$  scales between dorsal origin and lateral line. Actually the anal fin is in all *Nematabramis* opposite to the dorsal, its origin lying slightly before, slightly behind or exactly under vertical from dorsal origin. It is quite evident from figure 5 that the body is much lower in *steindachneri* than in all other

*Nematabramis*. *N. e. steindachneri* differs from the nominal subspecies also in having fewer dorsal rays (in this character it is intermediate between *N. ev. everetti* and *N. ev. borneensis*, approaching rather *N. alestes* (Table 1)

Table 1

Number of branched dorsal rays in <i>Nematabramis</i>											
Sp. & ssp.	Locality	8	9	10	11	12	13	M±m	σ	n	
ev. everetti	Bongon R.	—	—	—	1	1	—	11:5 —	—	2	
	Tawao R.	—	5	13	13	8	13	10.68±0.16	1.010	52	
	Silimpopon R.	—	—	3	14	1	—	10.89±0.11	0.458	18	
	Balung R., Tawao	—	—	—	4	—	—	11.00	—	4	
	Javan R.	—	—	—	3	1	—	11.75	—	4	
	Kimbutan R.	—	—	1	1	1	—	11.00	—	3	
	Kibili R.	—	—	—	1	1	—	11.50	—	2	
	Kalimantan (Z.M.A.110-2)	—	1	5	—	—	—	9.85	—	6	
steind	Kajan R.	—	2	2	—	—	—	9.50	—	4	
ev. borneensis	Kota Belud	9	—	—	—	—	—	8.00	—	9	
	Baram R.	1	1	—	—	—	—	8.50	—	2	
	Merabah	1	—	—	—	—	—	8.00	—	1	
	Balingian R.	1	—	—	—	—	—	8.00	—	1	
	Akah R.	—	1	—	—	—	—	9.00	—	1	
N. alestes	Philippines Isls.	Zamboanga	2	37	13	—	—	—	9.21±0.07	0.495	52
		Puerto Princessa	25	5	—	—	—	—	8.16±0.07	0.372	30
		Iwahing R.	18	22	—	—	—	—	8.55±0.08	0.498	40
		Pancol Isl.	1	11	3	—	—	—	9.14±0.13	0.499	15
		Port Uson	6	2	—	—	—	—	8.24±0.15	0.432	8
		Isabella R.	2	28	9	1	—	—	9.22±0.08	4.494	40
		Tawao R., N. Kalimantan	—	1	—	—	—	—	9.00	—	1

and shorter barbels (Table 3: 24.1—26.4% of st. 1., reaching to one fourth or two thirds of pectoral fin.). A narrow longitudinal blackish stripe extends from opercle to caudal base where it becomes broader; a narrow vertical blotch behind opercle. Minute breeding tubercles occur on dorsal scales in front of dorsal fin, on sides and on lower face of lower jaw and on the base of first dorsal rays. Breeding tubercles were not recorded in other forms of *Nematabramis*, but may occur in all.

Range: Kajan R., perhaps also other river drainages on the eastern slope of Central Kalimantan.

### 3. *Nematabramis everetti borneensis* Inger & Chin, 1962, Fig. 3.

Specimens examined:

Holotype of *N. alestes borneensis*, F.M.N.H. 44791, Kota Belud, western slope of North Kalimantan, 75.5 mm. st. length.

Table 2  
Number of branched anal rays in *Nematabramis*

Sp. & ssp.	Locality	11	12	13	14	15	16	17	18	M±m	σ	n	
N. ev. everetti	Bongon R.	—	—	—	—	—	1	—	1	17.00	—	2	
	Tawao R.	—	—	—	1	7	12	16	4	16.37±0.15	0.966	40	
	Silimpopon R.	—	—	—	—	3	12	3	—	16.00±0.14	0.575	17	
	Balung R., Tawao	—	—	—	—	2	2	—	—	15.50	—	4	
	Javan R.	—	—	—	—	—	2	—	2	17.00	—	4	
	Kimbutan R.	—	—	—	—	—	—	—	1	2	17.67	—	3
N. ev. everetti	Kibili R.	—	—	—	—	—	—	1	1	17.50	—	2	
	Kalimantan (Z.M.A. 110-2)	—	—	—	—	—	1	4	1	17.00	—	9	
steind	Kajan R.	—	—	—	—	—	3	1	—	16.25	—	4	
N. e. borneensis	Kota Belud	—	—	2	1	4	1	—	—	14.50±0.35	1.000	8	
	Baram R.	—	—	—	—	1	—	1	—	16.00	—	2	
	Merabah	—	—	—	—	—	1	—	—	16.00	—	1	
	Balingian R.	—	—	—	—	—	—	—	1	18.00	—	1	
N. e. borneensis	Akah R.	—	—	—	—	—	1	—	—	16.00	—	1	
	N. alestes	Philippines Isls.	Zamboaga	—	5	36	11	—	—	—	13.10±0.08	0.543	52
Puerto Princessa			—	11	19	—	—	—	—	—	12.63±0.08	0.493	30
Iwahing R.			—	3	35	2	—	—	—	—	12.59±0.08	0.515	40
Pancol Isl.			—	3	8	4	—	—	—	—	13.10±0.17	0.682	15
Port Uson			—	—	5	3	—	—	—	—	13.40±0.17	0.486	8
Isabella R.			—	12	35	2	—	—	—	—	12.98±0.06	0.354	19
Tawao R., Kalimantan			—	1	—	—	—	—	—	—	12.00	—	1

Paratypes of the same: F.M.N.H. 14792, same locality, 8 spec., 37.8—74.0 mm.

Syntypes of *N. everetti* (now paralectotypes):

— B.M.N.H. 1892.2.41—42, Baram R., Sarawak, 2 spec., 33.0—84.8 mm.

— B.M.N.H. 1893.3.6.246, Merabah, Sarawak, 1 spec., 74.0 mm.

Other specimens: R.M.N.H. 10986, Balingian R., Sarawak, 1 spec., 86.0 mm (determined: *N. everetti*); F.M.N.H. 68277, Akah R., Meligong, Sarawak, 1 spec., 101.5 mm.

D 3/8(9); A 2/13—17 (18); L. lat.  $36 \frac{6\frac{1}{2}-7}{1\frac{1}{2}}$  39 (40).

Inger & Chin [2] described a new subspecies of *N. alestes* from the western slope of North Kalimantan characterized, according to them, by: D 3/8; A 2/13—16, L. lat. 34—36 (these figures proved wrong: I found 36—37 scales in the holotype, 37—39 in the paratypes), barbels longer than in the Philippines *N. alestes* yet shorter than in *everetti*.

The few other available specimens from western North Kalimantan and from Sarawak agree in number of dorsal and anal rays (Tables 1 and 2) and in body depth (Fig. 5) with the types of *borneensis*; the barbel is, in the specimen from Balingian as short as in the types, in that from Akah R. longer (31.4% of st. length), in those from Baran R. and Merabah still

Table 3  
Body proportions in *Nematabramis*

Subsp.	Locality	st. l. mm	n	in % of standard length							
				depth	least depth	caudal ped.	predorsal	head	barbel	snout	eye
<i>everetti</i>	Bongon R.	89-93	2	32.6-32.8	10.7-11.2	16.3-18.0	64.0-66.0	23.8-24.2	22.6-30.2	7.3-7.6	5.6-5.9
	Tawao R.	69-86	10	27.0-32.8	9.2-10.6	15.1-17.7	63.5-69.0	23.8-26.0	36.0-44.8	6.6-8.2	5.3-5.9
	Silimpopon R.	57.2-73.8	10	28.8-32.6	9.5-10.6	15.4-17.6	64.0-68.0	24.7-26.9	33.0-44.5	7.6-8.6	(5.52)
	others	49-78	19	(30.24)	(10.03)	(16.45)	(66.5)	(26.19)	(38.6)	(8.03)	(6.42)
	<i>steindachneri</i>	102-112	4	23.3-36.0	9.0-10.7	14.7-17.4	63.0-66.0	22.2-27.6	28.0-52.0	6.6-8.5	5.7-5.7
				23.9-25.8	8.1-8.8	16.4-17.8	61.0-64.0	22.3-23.6	24.1-26.4	6.7-7.4	4.8-5.6
<i>borneensis</i>	Kota Belud	62-76	3	24.4-27.2	9.4-9.6	18.6-19.3	64.0-66.0	23.2-24.8	20.9-24.3	6.8-8.1	5.7-6.3
	others	74-102	4	25.6-28.6	9.5-10.8	15.7-18.7	63.0-67.0	22.5-24.8	26.8-43.5	6.4-8.0	5.2-5.9
<i>alestes</i>	Zamboanga	72-89	10	27.0-29.1	9.5-11.1	15.2-19.5	63.5-67.0	21.7-24.6	13.5-19.2	6.0-7.4	5.1-5.8
	Iwahing R.	80-101	10	(27.91)	(10.65)	(18.36)	(65.0)	(23.26)	(16.31)	(6.71)	5.(31)
	Puerto Princessa	69-88	10	24.4-30.6	9.6-11.3	18.3-20.5	62.2-65.9	23.4-25.6	13.7-24.3	7.7-8.3	5.3-6.2
	Pancol Isl.	67.82	10	(27.11)	(10.66)	(19.40)	(64.07)	(24.93)	(16.41)	(8.54)	(5.68)
	Tawao R.	46	1	24.8-30.0	10.0-11.2	17.4-20.5	62.5-66.0	23.8-27.0	13.2-21.0	7.6-9.0	4.9-5.9
				(26.40)	(10.35)	(18.90)	(64.57)	(25.41)	(17.37)	(7.04)	(5.62)
				26.9-31.2	10.0-11.1	17.9-20.8	63.0-65.5	24.3-26.0	—	6.6-7.8	5.2-6.1
				(28.71)	(10.43)	(19.04)	(64.31)	(25.22)	—	(7.26)	(5.65)
				28.6	10.9	18.5	64.0	27.8	20.0	8.7	7.2

longer (38.0 and 43.5% of st. length, e.g. as in *ev. everetti*), reaching beyond middle of pectoral fin.

Short blackish vertical stripes exist on anterior part of body sides in all specimens; a longitudinal stripe only in the type specimens.

Comparatively to the other forms of the genus, *borneensis* has the smallest number of dorsal rays; in number of anal rays it is intermediate between *everetti* and *steindachneri* on the one hand, *alestes* on the other (Table 2); the body depth has intermediate values between those of *steindachneri* and of *everetti* and the same values as *alestes* (Fig. 5).

This subspecies inhabits the western (South China sea) slope of North Kalimantan and Sarawak, probably not reaching to southern Sarawak.

#### 4. *Nematabramis alestes* (Seale & Bean, 1907). Fig. 4.

Specimens examined:

From Philippines Islands:

Holotype of *Mearnsella alestes*: U.S.N.M. 57841, Zamboanga, western extremity of Mindanao, Philippines Isls., 50.0 mm st. length.

Paratype of the same: U.S.N.M. 61151, same locality, 42.8 mm.

U.S.N.M. 190112, same locality, 50 spec. (10 measured: 73-89 mm).

U.S.N.M. 190113, Malagto and Canina rivers, Puerto Princessa, eastern slope of Central Palawan Isl., Philippines, 70 spec., 35-88 mm.

U.S.N.M. 190109, Iwahing R., eastern slope of central Palawan Isl., 70 spec. (10 measured: 80-101 mm).

U.S.N.M. 190110, Malina R., Mantaquin Bay, eastern Palawan, 2 spec., 85.0 and 88.0 mm.

U.S.N.M. 190116, Pancol Isl., Palawan, 15 spec., 67.0-80.2 mm.

Examined summarily: U.S.N.M. 190114, Port Uson, Philippines Isls., 8 spec., U.S.N.M. 190111, Caiholo R., Ulugan Bay, Palawan; U.S.N.M. 190115, Isabella R. (apparently Basilan Isl., west. of Mindanao), 40 sp.

From Kalimantan: out of U.S.N.M. 13865, Tawao, NE Kalimantan, 1 spec., 46.0 mm.

$$D \ 3/8-10 \ (11); \ A \ 2/11-14; \ L. \ lat. \ (34-) \ 35 \frac{6-7}{1} \ 38$$

The number of dorsal rays is slightly greater than in *borneensis* (and greater in the *alestes* specimens from Isabella R., Zamboanga and Pancol Isl. —  $M = 9.14-9.22$  — than in those from Palawan —  $M = 8.16-8.55$ ); that of anal rays is smaller than in all three subspecies of *N. everetti* ( $M = 12.6-13.1$ , as against 14.5 in *borneensis*, etc.); see Table II). The body depth is practically the same as in *borneensis* (Fig. 1);

the barbels are shorter than in three subspecies of *everetti* (their length being 13.2–24.3% of st. length) and do not reach the end of opercle.

The colour pattern is rather variable. In some populations, such as those from Iwahing R., Puerto Princessa and Isabella R. there are well marked anterior vertical bars (spots) and no, or only quite slight lateral stripes; in Caiholo R. and Port Calton populations the lateral stripes are well marked, the vertical bars being reduced, while both stripes and vertical bars are well developed in Zamboanga and Malina R. populations.

*N. alestes* was hitherto known only from Philippines Islands (Palawan and western part of Mindanao, probably Basilan Island too); yet I identified one specimen also from Tawao, NE Kalimantan, among a series of *N. ev. everetti*.

#### GENERAL CONSIDERATIONS AND CONCLUSIONS

The four taxa of *Namatabramis* have mainly representative ranges; only in Tawao, NE Kalimantan, *everetti* and *alestes* occur sympatrically. The differences between the three Kalimantan forms being only statistical, with overlap of extreme values (and probably intergradation at the limit of ranges), I consider them only as subspecies. In some characters, such as body depth, *borneensis* is intermediate between *everetti* and *steindachneri*; in other characters (number of rays) *steindachneri* is intermediate. The Philippines *N. alestes* is evidently closer to *borneensis*; yet I consider both as specifically distinct, because of the local sympatrical occurrence of *everetti* and *alestes*. A strong salt water barrier prevents at present a gene flow between *borneensis* and *alestes*, while such a gene flow probably exists between the first-named and *everetti*.

*Nematabramis* consists in a group of representative forms with partially circular distribution and overlap of the extreme forms without hybridization. It is difficult to explain the dispersal and speciation within this genus. Like all minnows and other continental Asian animals, *Nematabramis* reached the Philippines from Kalimantan. Palawan and Mindanao were colonized independently (there is no possibility of direct dispersal between both islands for primary freshwater animals) and both from the northern and north-eastern corner of Kalimantan, e.g. from the present range of *ev. everetti*. Yet from all three subspecies of *everetti*, *borneensis* is evidently closer to *alestes*, *ev. everetti* being on the contrary morphologically the most distant. One possible explanation is that the northern corner of Kalimantan was formerly inhabited by a *borneensis*-like form, which colonized (probably during an interglacial period) Palawan and Mindanao and was replaced later on by the more recent *ev. everetti*.

*Aknowledgements*: Following curators loaned specimens or facilitated study of specimens under their care: Dr. M. Boesemann, Leiden; Dr. P. J. Greenwood, London; Dr. E. Lachner, Washington; Dr. H. Nijssen, Amsterdam; Dr. L. P. Woods, Chicago. A visit in several museums from the U.S.A. and United Kingdom was financed by the Smithsonian Institution's T.F.H. Fund, at the kind proposal of Dr. E. Lachner.

#### REFERENCES

1. BOULENGER G., Ann. Mag. Nat. Hist., 1894, 6, 13, 250–251.
2. INGER R. F., CHIN PH. K., *The Fresh-water Fishes of North Borneo*. Fieldiana, Zoology, 1962, 45, 1–268.
3. POPTA C. M. L., Notes Leyden Museum, 1905, 25, 171–186.
4. — Notes Leyden Museum, 1906, 27, 1–304.
5. SEALE A., BEAN B. A., Proc. U. S. nation Mus., 1907, 33, 1568, 229–248.
6. WEBER M., BEAUFORT L. F. de. *The Fishes of the Indo-Australian Archipelago*, Leiden, E. J. Brill, 3.

Received August 8, 1970

“Traian Săvulescu” Institute of Biology,  
Department of Systematic and Evolution of Animals