

The Deepsea Ophidiid Fish Genus *Lamprogrammus*, a Senior Synonym of *Bassobythites*, with Notes on the Synonymy and Distribution of *L. brunswigi*

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Abstract *Bassobythites* Brauer is a junior synonym of *Lamprogrammus* Alcock. *L. macropterus* Smith and Radcliffe is a junior synonym of *L. brunswigi* Brauer. *L. brunswigi* is diagnosed by having: a basibranchial tooth patch; the postero-dorsal margin of the maxillary free or nearly so; a relatively well-developed opercular spine in larger examples. Known distribution is circumtropical except for the eastern Pacific, at trawled depths of 800–1600 m.

A single, dark, ophidiid fish, nearly a meter in length and lacking ventral fins, which was trawled from bathyal depths in the Indian Ocean by the research vessel VALDIVIA, served as the basis for the genus and species *Bassobythites brunswigi* Brauer, 1906, described in the family Zoarcidae. A second large specimen, also from bathyal depths in the Indian Ocean, was reported by J. R. Norman (1939) and classified in Brotulidae. *Bassobythites* was placed in Ophidiidae by Cohen and Nielsen (1978), who described similarities with the genus *Lamprogrammus* Alcock, 1891, and in fact referred to *Bassobythites* a second species, *Lamprogrammus macropterus* Smith and Radcliffe (*in* Radcliffe, 1913).

Over the past several years we have taken data from a total of 23 specimens identified as *Bassobythites*, captured in the tropical Atlantic, Indian and Pacific Oceans and ranging in standard length from 139 to 1030 mm, including re-examination of published specimens, examination of previously unreported ones, and literature accounts. Studying these fishes has raised the questions of how many species they represent and whether they should be classified in a genus distinct from *Lamprogrammus*.

Materials and methods

The following abbreviations are used in Table 2

and in the list of study material. Bernice P. Bishop Museum (BPBM), British Museum (Natural History) (BMNH), Los Angeles County Museum of Natural History (LACM), Museum Kaoshung City Fisheries Corporation (MKCFC), South African Museum (SAM), Shanghai Fisheries University (SFU), Shirshov Institute of Oceanology (IOM), University of Miami Marine Laboratory (UMML), University of Puerto Rico, Mayagüez (UPR), U.S. National Museum of Natural History (USNM), Zoological Museum Berlin (ZMB), Zoological Museum Moscow University (ZMMU), Zoological Survey of India (ZSI).

Lamprogrammus brunswigi. Western Atlantic: USNM 227655, 11°14'N, 75°21'W, 1317 m; USNM 292590, 19 km S of Cabo Rojo, Puerto Rico, floating on surface over 3000 m; UPR 3763, off Arecibo, Puerto Rico, floating on surface; Eastern Atlantic: ZMMU 15113, 6°28'S, 11°08.4'E, 1000–1050 m; USNM 304909, probably Gulf of Guinea; UMML 21673 and 22325, 4°13'N, 4°27'E, 1280–1317 m; Indian Ocean: ZMB 17799, holotype *Bassobythites brunswigi*, 6°18'8''N, 49°32'5''E, 1079 m; BMNH 1939.5.24.1451, 4°47'30''N, 72°45'18''E, 914–1463 m; ZMMU P-15083, 11°24'S, 88°50'E, 1500–1600 m; ZMMU P-15150, 3°46'N, 95°00'E, 800–875 m; Pacific: USNM 74146, 5°35'S, 122°20'E, 1022 m; USNM 099242, 0°56'30''S, 128°05'E; BPBM 28811, outside of Majuro Atoll, Marshall Islands, floating at surface; LACM 45134 (formerly BPBM 28913), Oahu, Hawaiian Ids., 32 km off Halaiwa, floating at surface.

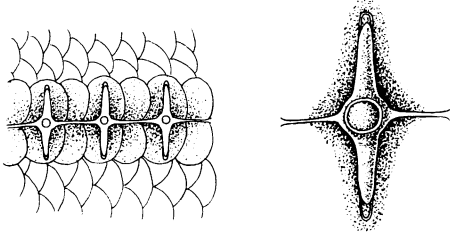


Fig. 1. Lateral line scales and neuromasts of *Lamprogrammus illustris*. Drawn from Garman (1899: p. 34, Figs. 4, 5) by Tina Ross.

- Lamprogrammus exutus*: USNM 296853 (3); SAM 28465; SAM 29016 (2); USNM 195896; USNM uncat. (2).
Lamprogrammus fragilis: ZSI 13171, holotype; IOM uncat. (3).
Lamprogrammus illustris: LACM 30155-26; LACM 9581-18; LACM 30020-18.
Lamprogrammus niger: USNM 99216; USNM 210623 (25); USNM 296854 (6); ZSI 13048-9, types; BMNH 96.9.11.5.

Methods follow Cohen and Nielsen (1978).

Is *Bassobythites* distinct from *Lamprogrammus* ?

Three genera of ophidiid fishes, *Lamprogrammus*, *Bassobythites*, and *Hypopleuron* Smith and Radcliffe, 1913, were noted by Cohen and Nielsen (1978) as having the same kind of distinctive lateral line, “vertically oriented, spindle-shaped neuromasts, each of which is mounted on a large, vertically elongate scale” (Fig. 1). Similarities of the lateral lines of *Hypopleuron* and *Lamprogrammus* were noted by Smith and Radcliffe (*in* Radcliffe, 1913). We interpret this character as a synapomorphy. *Hypopleuron* is here excluded from further consideration because it differs from the other two genera in having greatly expanded parapophyses (see Radcliffe, 1913: pl. 14), ventral fins, a canine tooth in each jaw, only three developed gill rakers, and 22 precaudal centra (Cohen and Nielsen, 1978).

Bassobythites and *Lamprogrammus* further resemble each other in lacking ventral fins, having 12 to 14 precaudal vertebrae, granular teeth only, and at least 10 developed gill rakers. None of these character states is unique to the two nominal genera.

States for three characters in the six species referred to *Lamprogrammus* and *Bassobythites* by Cohen and Nielsen (1978) are summarized in Table 1. Presence or absence of an elongate patch of tiny granular basibranchial teeth is easily determined. On the basis of this character alone, *L. niger* and *L. illustris* (Nybelin, 1957 treated *niger* as a senior synonym of *illustris*) might be considered a distinct genus. The dorsal section of the posterior part of the maxillary is strongly sheathed in *L. niger*, *illustris*, *fragilis*, and *exutus*; it is free or only slightly covered in *brunswigi* and *macropterus*. On the basis of this character alone, *brunswigi* and *macropterus* might be considered a distinct genus. The state of the opercle spine is less equivocal; in *L. niger* and *illustris* it is slender, flexible, and sharp pointed; in *fragilis* and *exutus* it is a flattened, membranous, flap-like structure; in small specimens of *brunswigi* it is a flexible, pointed spine; in medium-sized *brunswigi* it is stronger; and in the largest *brunswigi* it is a prominent structure (Fig. 2). On the holotype of *L. macropterus* (509 mm SL) the spine is apparently broken off on the left side and on the right side is somewhat flattened and intermediate in condition. On the basis of a combination of basibranchial tooth patch, maxillary, and opercle spine characters, *L. fragilis* and *L. exutus* might be considered one of three distinct genera. Thus, these six nominal species could be classified in three genera, two genera (two different ways) or in a single genus. Because relationships are not obvious, we follow the latter course, which results in the following synonymy.

***Lamprogrammus* Alcock, 1891**

Lamprogrammus Alcock *in* Wood-Mason and Alcock,

Table 1. Character states in six nominal *Lamprogrammus* species

Species	Basibranchial teeth	Maxillary	Opercle spine
<i>L. niger</i>	(-)	sheathed	weak
<i>L. illustris</i>	(-)	sheathed	weak
<i>L. fragilis</i>	(+)	sheathed	weak
<i>L. exutus</i>	(+)	sheathed	weak
<i>L. brunswigi</i>	(+)	free	stronger
<i>L. macropterus</i>	(+)	free	stronger

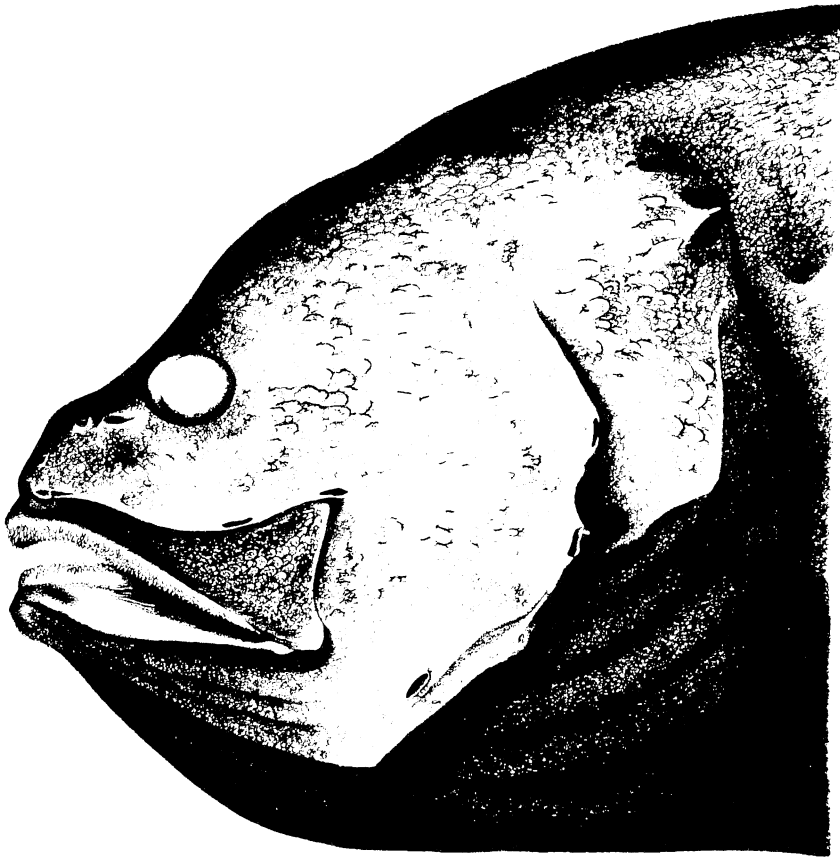


Fig. 2. *Lamprogrammus brunswigi*, BMNH 1939.5. 24.1451, head length 201 mm. Drawn by Sharon Chambers.

1891: 32 (type species by monotypy *Lamprogrammus niger* Alcock).

Bassobythites Brauer, 1906: 307 (type species by monotypy *Bassobythites brunswigi*).

What is the taxonomic status of *L. brunswigi* and *L. macropterus*?

Data from 23 specimens of *Lamprogrammus* which are characterized in Table 1 as *L. brunswigi* and *L. macropterus* are presented in Table 2. Their known geographical distribution (Fig. 3) is circum-tropical with the exception of the eastern Pacific. An Indo-Pacific population is apparently continuously distributed from East Africa to the Hawaiian Islands and is separated from a tropical Atlantic population. This disjunction is used as one basis for comparing our material.

Counts of total gill rakers, pectoral fin rays, anal

fin rays, and precaudal and total vertebrae are summarized in Table 3. Data are too few and overlap is too prevalent to recognize differences on the basis of counts; although, gill raker counts suggest geographical differentiation. The original description of *L. brunswigi* gives a pectoral fin ray count of 34; however, Brauer (1906) counted some of the lateral halves as separate rays. The true count is 20.

Scatter diagrams of selected measurements on fishes identified as Atlantic or Indo-Pacific are presented in Figs. 4, 5, 6, and 7. Head length versus standard length (Fig. 4) indicates that in specimens larger than 800 mm, Indo-Pacific fishes have relatively larger heads. Plots of eye diameter against head length (Fig. 5), snout against head length (Fig. 6), and upper jaw against head length (Fig. 7) do not obviously demonstrate geographical differences.

We interpret the above data as representing a

Table 2. Distribution, measurements in mm, and counts for *Lamprogrammus* with a free maxillary.

Specimen	Locality	SL	HL	Upper jaw	Snout	Eye (Horizontal)	Gill rakers (Total)	Pectoral rays	Anal rays	Vertebrae	
										Precaudal	Total
USNM 99242	Moluccas	139	27.4	15.5	6.2	6.4	4+1+12=17	21	92	13	69
ZMMU P-15150	Eastern Indian Ocean	146	28.7	16.8	7.0	5.6	4+1+14=19	21	108	14	70
ZMMU P-15150	Eastern Indian Ocean	152	32.6	18.0	7.1	6.4	4+1+14=19	—	—	14	—
ZMMU P-15150	Eastern Indian Ocean	167	31.3	16.3	—	—	4+1+13=18	21	105	13	71
ZMMU P-15150	Eastern Indian Ocean	173	37.2	20.9	9.0	6.8	4+1+13=18	22	101	13	69
ZMMU P-15150	Eastern Indian Ocean	190	41.5	22.3	—	—	4+1+14=19	20	108	14	70
ZMMU 15113	Gulf of Guinea	437+	91.2	49.4	24.5	13.0	4+1+11=16	22	—	13	—
USNM 304909	? Gulf of Guinea	442	82.5	45.2	22.8	13.3	3+1+11=15	22	96	13	71
USNM 74146 ¹	Banda Sea	509	108	59.6	30.5	15.1	4+1+12=17	19	103	13	69
UMML 21673	Gulf of Guinea	555+	118	68.2	35.8	15.2	4+1+12=17	22	—	14	—
SFU ²	East China Sea	732	—	—	—	—	—	21	—	—	—
MKCFC ³	Formosa Strait	805+	225	113	67	28	5+14=19	20	—	—	—
ZMMU P-15083 ⁴	Eastern Indian Ocean	826	197	95.8	48.7	21.5	—	22	99	—	—
ZMMU ⁴	Eastern Atlantic	845	191	97.2	58.3	24.5	—	22	94	—	—
BMNH 1939.5.24.1451	Western Indian Ocean	845	201	97.6	47.5	23.7	4+12=16	19	101	13	68
ZMB 17799 ⁵	Western Indian Ocean	895	214	113	55	23	4+12=16	20	98	—	—
MKCFC ³	Formosa Strait	906	—	—	—	—	—	21	—	—	—
BPBM 28811	Marshall Islands	925+	210	110	54.0	28.0	3+1+14=18	19	—	14	—
USNM 227655	Caribbean, Colombia	937	193	107	61.5	24.7	4+1+12=17	21	94	13	71
USNM 292590	Puerto Rico	937	205	105	54.3	25.3	3+1+13=17	21	94	13	71
BPBM 28913	Hawaiian Islands	950	237	129	67.7	27.4	3+1+13=17	21	100	13	70
UMML 22325	Gulf of Guinea	978	207	110	60.6	24.5	2+1+13=16	21	107	14	69
UPR 3763	Puerto Rico	1030	215	118	58.7	25.6	—	21	—	14	69

¹Holotype of *L. macropterus*. ²Data from Xu and Wang, 1988. ³Data from Yang and Nakamura, 1973. ⁴Data from Shcherbachev, 1980. ⁵Holotype of *B. brunswigi*.

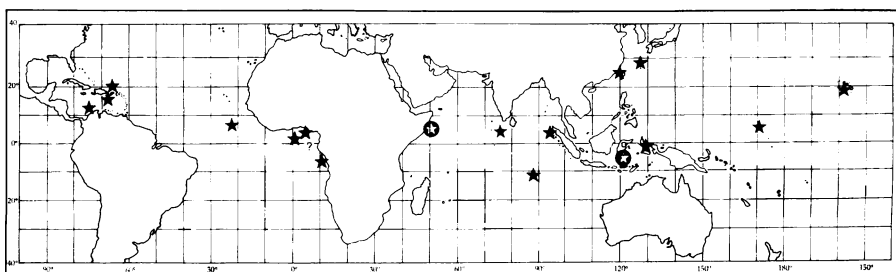


Fig. 3. Geographical distribution of *Lamprogrammus brunswigi*. Circled star in western Indian Ocean is type locality of *L. brunswigi*. Circled star in Banda Sea is type locality of *L. macropterus*.

single species with perhaps minimal geographical differentiation. The holotypes of two named species, *L. brunswigi* and *L. macropterus*, both from the Indo-Pacific, are represented in our study material; hence, the name *L. macropterus* becomes a junior synonym of *L. brunswigi*. The synonymy that we presently recognize is as follows.

***Lamprogrammus brunswigi* (Brauer, 1906)**

Bassobythites brunswigi Brauer, 1906: 307 (original description).

Lamprogrammus macropterus Smith and Radcliffe in Radcliffe, 1913: 163 (original description).

Bassobythites macropterus, Cohen and Nielsen, 1978: 26 (generic reassignment).

Ontogenetic variation is also evident. We have

Table 3. Counts on *Lamprogrammus* with a free maxillary.

	Total gill rakers				
	15	16	17	18	19
Atlantic	1	2	3		
Indo-Pacific		2 ¹	3 ²	3	4

	Pectoral rays			
	19	20	21	22
Atlantic			4	4
Indo-Pacific	3 ²	3 ¹	6	2

	Anal rays																
	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108
Atlantic			3		1												1
Indo-Pacific	1						1 ¹	1	1	2		1 ²		1			2

	Vertebrae					
	Precaudal		Total			
	13	14	68	69	70	71
Atlantic	4	3		2		3
Indo-Pacific	6 ²	4	1	3 ²	3	1

¹Holotype *L. brunswigi*. ²Holotype *L. macropterus*.

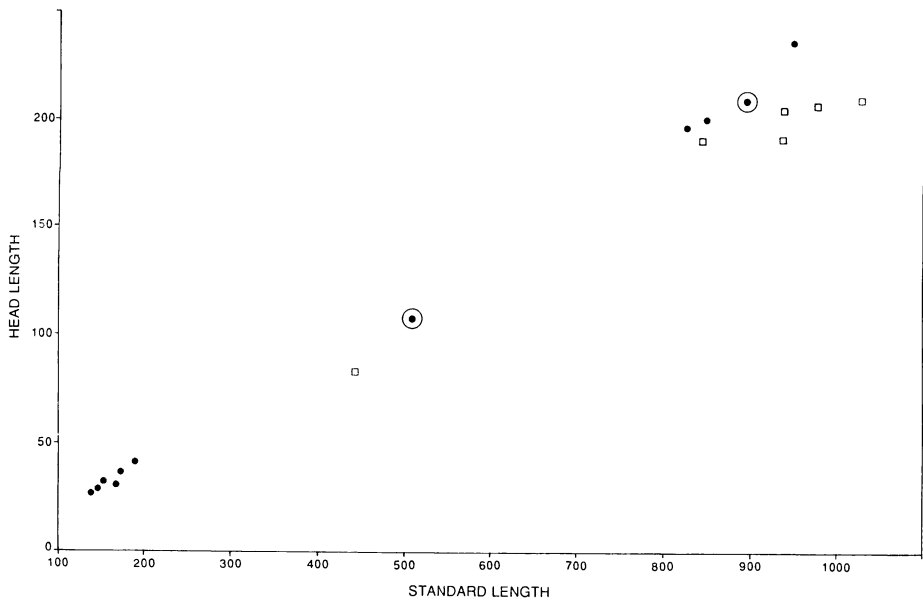


Fig. 4. Scatter diagram of head length versus standard length in *Lamprogrammus brunswigi*. Dots are Indo-Pacific specimens; squares are Atlantic specimens; lower dot in a circle is holotype of *L. macropterus*; upper dot in a circle is holotype of *L. brunswigi*.

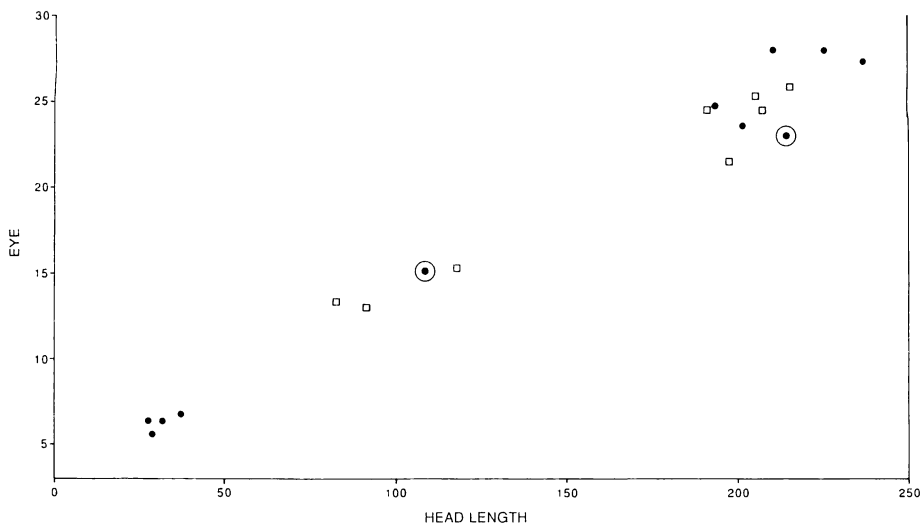


Fig. 5. Scatter diagram of eye diameter versus head length in *Lamprogrammus brunswigi*. Symbols as in Fig. 4.

previously described the stronger opercular spine in larger fish. There is a concurrent increase in the ossification of the superficial bones of the head. Specimens smaller than about 20cm have fragile, membranous bones with very thin skin (torn away in most of our specimens) and fragile, deciduous scales.

L. brunswigi larger than about 80cm have more strongly ossified headbones, thicker skin, and a distinctive squamation of more adherent, small, irregularly arranged scales overlying larger scales. Specimens that are intermediate in size are also intermediate in their degree of ossification and the nature

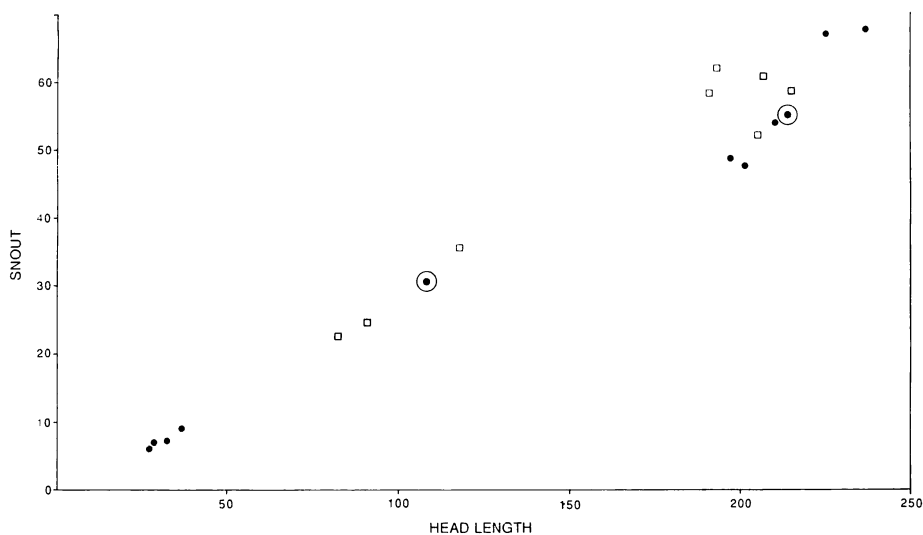


Fig. 6. Scatter diagram of snout versus head length in *Lamprogrammus brunswigi*. Symbols as in Fig. 4.

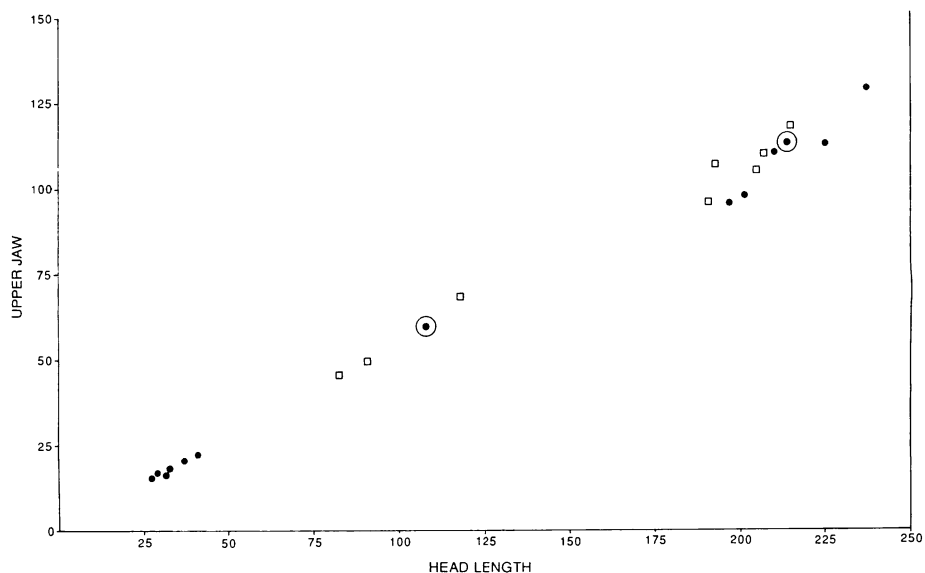


Fig. 7. Scatter diagram of upper jaw versus head length in *Lamprogrammus brunswigi*. Symbols as in Fig. 4.

of their squamation.

Lateralis pores on the head and body can be studied only on larger specimens, because the skin is missing from or torn on the others. Pores are evident in only some of the larger examples; in others they are obscured by small scales or not at all discernible. Head pores may number as many as: supratemporal 1 (with a characteristic flap on the posterior margin); lateral 1; supraorbital 1; infraorbital 7;

preoperculomandibular 5. There may be as many as 36 pores along the body. The location of some head pores is shown in Fig. 2.

Three specimens were sexed: BMNH 1939.5.24.1451, 845 mm SL, ♀; ZMB 17799, 895 mm SL, ♀; BPBM 28913, 950 mm SL, ♀. None was ripe.

Depth range of trawled specimens ranges from 800–875 m to 1500 to 1600 m. Four out of seven

specimens larger than 900 mm SL were collected floating at the surface, one in the Marshall Islands, one in the Hawaiian Islands, and two off Puerto Rico.

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アシロ科コンニャクイタチウオ属のシノニムと *L. brunswigi* のシノニムと分布

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深海性のアシロ科の *Bassobythites* は *Lamprogrammus* (コンニャクイタチウオ属) の, *L. macropterus* は *L. brunswigi* のそれぞれシノニムであることが判明した。 *L. brunswigi* は基鰓骨に1歯帯を有すること, 主上顎骨の後方背縁部がほとんどあるいは完全に露出すること, 大型個体では主鰓蓋骨棘が比較的強いことで特徴づけられる。本種は西部太平洋では北半球の温帯域にも分布するが, 熱帯地方の海域に広く分布し, その記録水深は 800-1600 m である。