

New Genus and Species of the Family Stichaeidae from Hokkaido, Japan

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Abstract Specimens of a new genus and species of the stichaeid fish, *Leptostichaeus pumilus*, were collected from the Okhotsk Sea off Hokkaido in Japan. The present new genus and species clearly differs from all the other genera and species of the stichaeid fishes in the following characters: 3 or 4 pectoral fin rays; 10 or fewer caudal principal rays; 79–82 dorsal spines; no pelvic fin; last interneural spine supporting a single dorsal spine; infraorbital, occipital and lateral line canals absent; moderate size of dorsal spine shorter than eye diameter; membranes of dorsal and anal fins widely connected with caudal fin; a large black spot divided by a yellow band present just above gill cover.

Recently, 3 specimens of a slender and colorful stichaeid fish were captured by beam-trawl from depths between 62 and 99 meters at the points of the Soya Straits at the southwestern Okhotsk Sea. Although this species seems to be similar to the pholidid fishes in appearance, it is recognized as the stichaeid fish (*sensu* Makushok, 1958), because of lacking the diagnostic internal characters of the family Pholididae given by Makushok (1958) and Yatsu (1981). However, this species differs extremely from all known genera in the family Stichaeidae, especially in the numbers of the dorsal, pectoral and caudal fin rays, and further in the patterns of the cephalic sensory system. Consequently, this species is given a new generic name, *Leptostichaeus*, and described as a new species, *Leptostichaeus pumilus*.

Materials and methods

Type specimens are deposited in the Laboratory of Marine Zoology, Faculty of Fisheries, Hokkaido University (HUMZ). Vertebrae and vertical fins were observed and counted on the basis of the radiographs. The count of pectoral fin rays was made on the left side. The urostyle was counted as the last vertebra. The count of caudal fin rays follows Yatsu (1981). Measurements follow Hubbs and Lagler (1958) except for the following portions: body depth, the body depth at the origin of dorsal fin; length of pectoral fin, the length of the longest ray. Counts of cephalic sensory pores follow Makushok (1958). Cephalic sensory pores are abbreviated as follows: NP, nasal pores; IOP,

interorbital pore; POBP, postorbital pores; OCP, occipital pore; IP, infraorbital pore; POP, preopercular pores; MP, mandibular pores. Counts for the holotype are followed in parentheses by those for the paratypes.

Comparative materials. BCPM (British Columbia Provincial Museum) 974–509: 10 specimens of *Phytichthys chirus*, 51°27'10"N, 127°42'36"W, off mouth of Kilaquaek Channel, British Columbia, Canada, 20 Aug. 1974. FFMU (Faculty of Fisheries, Mie University) 4494: Holotype of *Eulophias owashii*, off Owase, Mie Prefecture, Japan, Nov. 1952.

Leptostichaeus gen. nov.

(New Japanese name: Obi-ginpo-zoku)

Type species. *Leptostichaeus pumilus* sp. nov.

Diagnosis. Pectoral fin rays 3–4. Caudal fin rays 2–3+5+4–5+0–1. Dorsal fin rays LXXIX–LXXXII. Last interneural spine supporting a single dorsal spine. Infraorbital, occipital and lateral line canals absent. Moderate size of dorsal spine shorter than eye diameter. Membranes of dorsal and anal fins widely connected with caudal fin. A large black spot divided by a yellow band present just above upper margin of gill cover.

Etymology. The generic name is a combination of the Greek, *lepto* (meaning “slender”), and *stichaeus* (type genus of the family Stichaeidae).

Remarks. From observations of the cleared and stained specimen and the radiographs of other specimens, the present new genus is included in the family Stichaeidae (*sensu* Makushok, 1958), since it possesses the following internal characters:

Table 1. Comparison of meristics of *Leptostichaeus* gen. nov. and 8 subfamilies. Meristic ranges of the taxon are inferred from the data of Okada and Suzuki (1954), Makushok (1958), Hart (1973), Yatsu *et al.* (1978) and the comparative materials (shown in the asterisk). The subfamily Xiphisterinae is divided into genera because of the wide range of dorsal fin rays.

Taxa	Dorsal	Anal	Pectoral	Pelvic	Caudal (Principal)	Vertebrae (Total)
<i>Leptostichaeus</i> gen. nov.	LXXIX-LXXXII	I-II, 52-56	3-4	0	5+4-5	84-87
Stichaeinae	XXXVII-LVI	I-II, 24-43, 0-III	14-18	I, 3-5	6-7+6-7	43-61
Chirolophinae	LI-LXVI	I, 36-50	13-15	I, 2-4	6-7+7-9	57-71
Lumpeninae	LII-LXXVI	I-V, 36-53	12-16	I, 2-3	6-7+6-7	61-85
Opisthocentrinae	XLII-LXV	I-II, 24-49	12-21	0 or I, 3	6-8+6-7	53-72
Alectriinae	LVI-LXIV	I, 39-46	8-10	0	6-7+6-7	61-69
Azygopterinae	CV-CVII	I, 63-64	0	0	3+3	110-113
Eulophiinae	CXXI-CXXVII, 12-13	I, 75-102*	7*	0	7-10 (total)	133*
Xiphisterinae:						
<i>Cebidichthys</i>	XXII-XXV, 40-43	II, 39-42	10-12	0	—	69-74
<i>Dictyosoma</i>	XLVIII-LIX, 6-13	II, 40-45	9-13	0-I	6-7+6-7	66-72
<i>Xiphister</i>	LXVII-LXXVI	I, 49-55	11-12	0	6+6	75-81
<i>Phytichthys</i>	LXX-LXXVII	II-III, 46-50	13-15*	0	6+7	76-79

Table 2. Comparison of infraorbital, occipital and lateral line canals of *Leptostichaeus* gen. nov. and 8 subfamilies *sensu* Makushok (1958).

Taxa	Infraorbital	Occipital	Lateral line
<i>Leptostichaeus</i> gen. nov.	absent	absent	absent
Stichaeinae	present	present	present
Chirolophinae	present	present	rudimental
Lumpeninae	absent	absent	absent
Opisthocentrinae	present	present	absent
Alectriinae	present	present	absent
Azygopterinae	present	present	absent
Eulophiinae	present	present	absent
Xiphisterinae	present	present	present

pleural ribs present, and the first one inserted on the third abdominal vertebra; frontals not fused with each other; hemonephrapophysis absent; last interhaemal spine supporting two rays; caudal procurent rays not branched and reduced in number as shown in the diagnosis; 6 branchiostegal rays; reduction of pyloric caeca (absent).

Makushok (1958) divided the family Stichaeidae into 8 subfamilies, which are entirely distinguished from one another by the conditions of the meristics and the sensory canal system. The meristics for the new genus fall outside those known for every stichaeid subfamily, and among them the condition of pectoral fin rays is unique and intermediate between the subfamily Azygopterinae and other subfamilies (Table 1). Except for the

characteristics of the pectoral and caudal fin rays, this new genus is relatively similar to the genera *Xiphister* and *Phytichthys* in the subfamily Xiphisterinae (Table 1). However, the latter two genera have a well-developed sensory canal system and are clearly distinguished from the new genus in the presence of infraorbital, occipital and lateral line canals (Table 2). In the comparison of the sensory canal system, the new genus seems to be more similar to the subfamily Lumpeninae rather than other subfamilies (Table 2). An additional similarity between them is also found in the condition of the last interneural spine which supports a single dorsal spine, though they are quite different from each other in meristics (Table 1).

Because of distinctive characters mentioned

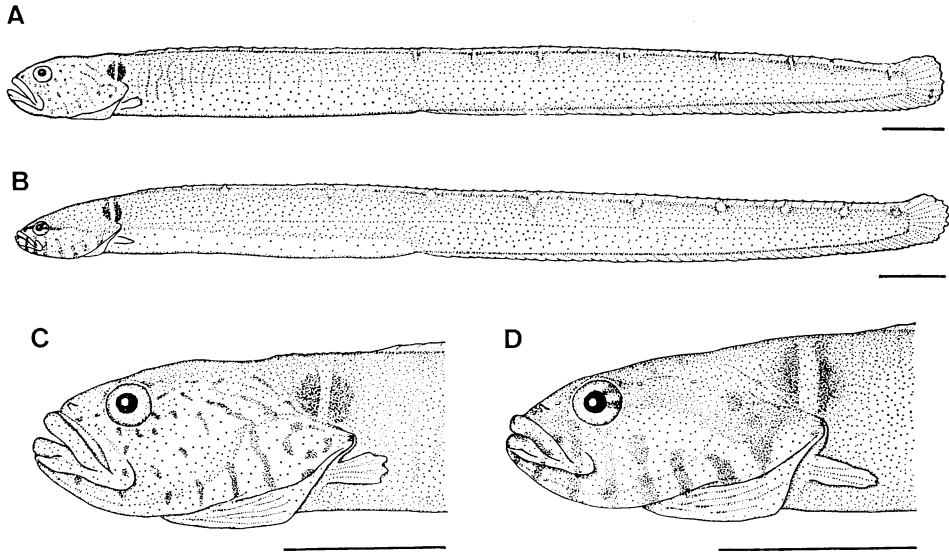


Fig. 1. *Leptostichaeus pumilus* gen. et sp. nov. A and C, holotype, HUMZ 98032, male. B and D, paratype, HUMZ 98033, female. Scales indicate 5 mm.

above, the present new genus cannot be included in any subfamily *sensu* Makushok (1958). Under these circumstances, I hesitate to make a decision on the systematic position of this new genus in the family Stichaeidae until the phylogenetic relationships among stichaeid fishes are made clear in the future.

Leptostichaeus pumilus sp. nov.
(New Japanese name: Obi-ginpo)
(Figs. 1-3)

Holotype. HUMZ 98032, male, 73.8 mm SL, 45°22.20'N, 142°31.88'E, off Yamagaru, Sarufutsu, Hokkaido, depth 70 m, 29 June 1983.

Paratypes. HUMZ 97256 (cleared and stained), male, 68.7 mm SL, 45°10'-30'N, 142°35'-45'E, off Sarufutsu, Hokkaido, depth 62-99 m, 27 June-1 July 1982; HUMZ 98033, female, 71.6 mm SL, 45°22.20'N, 142°31.88'E, off Yamagaru, Sarufutsu, Hokkaido, depth 70 m, 29 June 1983.

Diagnosis. See the diagnosis of the genus.

Description. Meristics: Dorsal fin rays LXXXI (LXXIX-LXXXII in paratypes); anal fin rays II, 54 (I, 52-56); pectoral fin rays 4 (3-4); pelvic fin rays 0; caudal fin rays 3+5+4+1 (2+5+4-5+0-1); vertebrae 29+57=86 (28-29+55-59=84-87).

Cephalic sensory pores: NP 2; IOP 1; POBP 2 (2-3); OCP 0; IP 0; POP 4; MP 3. Pores are arranged in a single row (paratypes same as holo-

type and shown in Fig. 2).

Proportional measurements are shown in Table 3.

Head and body compressed. Both jaws covered with fleshy lips, and slant slightly upward. Upper lip not fused to snout anteriorly. Lower lip slightly produced, and more broadened and doubled anteriorly (Fig. 1 C, D). Posterior end of upper jaw reaching a vertical through posterior margin of pupil (middle of eye in female of paratype). Anterior nostril in a short tube, its length shorter than pupil diameter; posterior nostril invisible. Gill membranes united with each other and widely free from isthmus. Upper margin of gill cover widely connected with temporal region and forming a siphon.

Dorsal spines very short, equally stout and slightly increasing in size posteriorly. Length of moderate dorsal spine shorter than eye diameter. Last interneural spine supporting a single dorsal spine. Membranes of dorsal fin not incised and widely connected with anterior half of caudal fin. First anal spine short and rigid; a second one slender and weak (absent in paratypes); subsequently numerous simple soft rays present. Last interhaemal spine supporting two anal fin rays. Membranes of anal fin not incised anteriorly but slightly serrated posteriorly, and perfectly confluent with caudal fin. Pectoral fin tiny, the middle two rays

Table 3. Proportional measurements in *Leptostichaeus pumilus* gen. et sp. nov. as a percent of standard length. Parentheses show the percent of head length.

	Holotype		Paratypes	
	HUMZ 98032		HUMZ 97256	
Sex	Male		Male	Female
Standard length (mm)	73.8		68.7	71.6
Length of dorsal fin base	85.5 (650.5)		86.9 (635.1)	86.6 (720.9)
Length of anal fin base	53.0 (403.1)		56.0 (409.6)	55.0 (458.1)
Preanal length	46.5 (353.6)		42.9 (313.8)	46.1 (383.7)
Predorsal length	13.6 (103.1)		13.7 (100.0)	12.3 (102.3)
Head length	13.1 (100.0)		13.7 (100.0)	12.0 (100.0)
Body depth	7.0 (53.6)		7.3 (53.2)	6.6 (54.7)
Depth of caudal peduncle	2.6 (19.6)		2.6 (19.1)	2.7 (22.1)
Length of pectoral fin	3.4 (25.8)		2.8 (20.2)	2.7 (22.1)
Length of caudal fin	4.1 (30.9)		4.4 (31.9)	5.3 (44.2)
Snout length	2.7 (20.6)		2.6 (19.1)	2.2 (18.6)
Length of upper jaw	5.3 (40.2)		5.1 (37.2)	4.1 (33.7)
Eye diameter	2.2 (16.5)		2.5 (18.1)	2.4 (19.8)
Interorbital width	0.8 (6.2)		1.2 (8.5)	0.8 (7.0)
Postorbital length of head	8.9 (68.0)		8.7 (63.8)	7.8 (65.1)

branched (all simple in paratypes). Pelvic fin absent. Caudal fin square and its posterior margin incised (rounded in female of paratype).

Head and all fins scaleless. Scales on body minute, cycloid and interspaced. Moderate scale diameter smaller than half of pupil diameter. Scales on proximal body slightly larger than distal body, and finally almost absent on belly and posterior caudal portion (paratypes same as holotype and shown in Fig. 3). Ossified lateral line canal absent. Lateral pit organs invisible.

Teeth on both jaws, prevomer and palatine conical and stout, not numerous. Teeth on upper jaw arranged in double row anteriorly and in a single row posteriorly; anterior inner teeth small. Teeth on lower jaw arranged almost in a single row and irregular in size. Prevomer with a small patch of only a few teeth. Teeth on palatine arranged in a single row.

Coloration. Male in life based on holotype: Ground color of head bright red; irregular blue lines and dots radiating from eye to lower lateral head; a large black spot divided by a yellow band present just above upper margin of gill cover; ground color of vertical fins and body red and slightly darkened posteriorly; vertical blue bands present on anterior body; a series of faint white dots present along back of body; pectoral fin white; posterior margin of caudal fin transparent.

Male paratype about same as holotype.

Female in life based on paratype: Ground color of head and body light brown; lower half of head and lower lateral body whitish; broad vertical bands on ventrolateral surface of head brown; a large black spot divided by a yellow band present just above upper margin of gill cover; white spots with brown margins present along back of body at intervals; pectoral fin white; posterior margins of anal and caudal fins transparent.

In preservation: Ground color of head and body almost white; the black spot above the upper margin of gill cover remains; blue markings on head in males change to black; vertical brown bands on ventrolateral head and brown region on upper half of head in female remain (Fig. 1).

Etymology. The specific name is the Latin, *pumilus* (meaning "dwarfish"), which refers to its small body.

Remarks. In coloration, the present new species has a characteristic marking above the gill cover just like species of the genus *Dictyosoma* and *Cebidichthys*. However other colorations of this new species are exceedingly variable (Fig. 1). In addition to the differences of the color pattern, the male shows a tendency to have a larger head and upper jaw, and smaller caudal fin than those of the female (Fig. 1 and

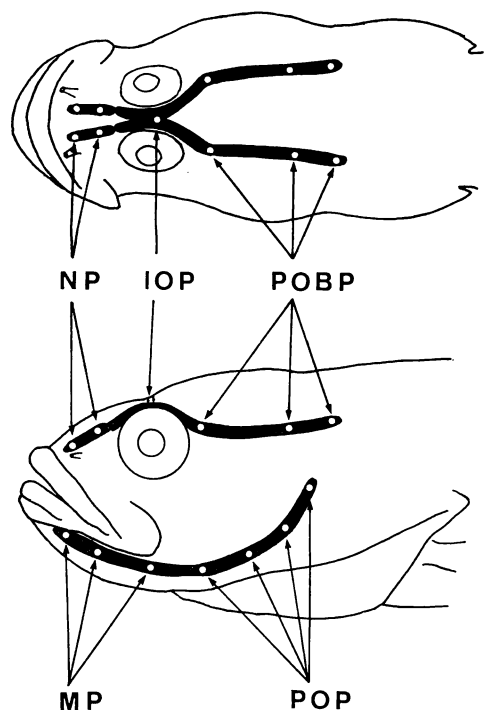


Fig. 2. Diagrams of cephalic sensory system in *Leptostichaeus pumilus* gen. et sp. nov., paratype, HUMZ 97256, male. Black bars show sensory canals. White circles in black bar show sensory pores.

Table 3). However, more numerous specimens are necessary to decide whether such differences are caused by sexual dimorphism or only individual variation.

The present new species is a dwarf amongst stichaeid fishes, judging from the possession of mature gonads in both sexes. It is interesting that the female had at most only 20 eggs in the ovary, much less than other stichaeid fishes. It is also unique that the new species was found in the calcific tube of *Sedentaria* (Polychaeta).

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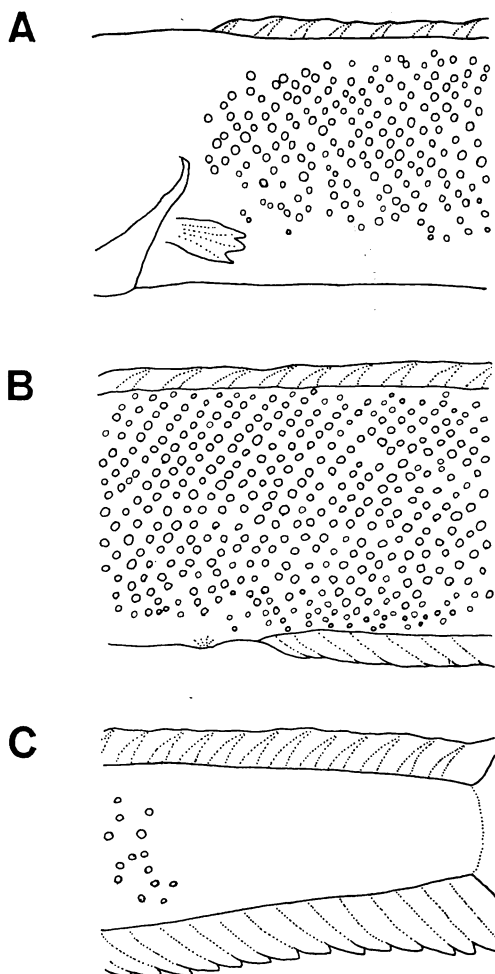


Fig. 3. Diagrams of the squamation on body in *Leptostichaeus pumilus* gen. et sp. nov., paratype, HUMZ 97256, male. A, anterior portion; B, middle portion; C, caudal portion.

parative materials. I am also indebted to Messrs. Mitsuhiro Sano, Shuichi Nishiuchi and Masayoshi Sasaki of the Hokkaido Fishery Experimental Station at Wakkanai, and Messrs. Hiranao Ashitate and Motoo Fujii of the Sarufutsumura Fishermen's Union for their cooperation in collecting the samples.

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北海道より得られたタウエガジ科の1新属新種

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北海道猿払沖より得られた3個体のタウエガジ科魚類に基づき、新属新種オビギンボ *Leptostichaeus pumilus* を記載した。

本種は背鰭棘が79~82本であること、胸鰭条が3~4本であること、腹鰭が無いこと、最後の神経間棘が1本の背鰭棘を支持すること、眼下域、後頭部および体側に感覚管を持たないことなどにより、本科の既存の属および種と明瞭に識別される。さらに、本種の色彩が個体により大きく変異すること、本種が管棲多毛類の棲管中より発見されたことにおいても、本種は本科魚類の中で特異的である。

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