

PARASQUALIDUS MAII, A NEW GENUS AND SPECIES OF CYPRINID FISH (TELEOSTEI: CYPRINIDAE) FROM CENTRAL VIET NAM

Atsushi Doi

*Center for Ecological Research, Kyoto University, Otsuka, Hirano, Kamitanakami, Otsu, Shiga 520-2113, Japan.
Email: a_doi@ecology.kyoto-u.ac.jp*

ABSTRACT. - A new genus and new species of Gobioninae (Cyprinidae), *Parasqualidus maii*, is described from four specimens collected in a small stream at Da Nang, central Viet Nam. The genus *Parasqualidus* is easily differentiated from any other genera of Gobioninae by having a unique cephalic lateral line system, i.e., absence of supratemporal and preoperculomandibular canals. On the other hand, the genus *Parasqualidus* is similar to the genus *Squalidus* in having lips without fringes, two rows of pharyngeal teeth, thorax covered by scales and a bipartite first anal pterygiophore.

KEY WORDS. - *Parasqualidus maii*, Cyprinidae, Viet Nam

INTRODUCTION

Four small cyprinid specimens were collected from a small stream at Da Nang, central Viet Nam. These specimens are classified into the subfamily Gobioninae by having an inferior mouth, six branched anal fin rays, two tooth rows on pharyngeal bone, an anus in advance of the origin of anal fin, the posterior margin of the parietals wedged by the supraoccipital bone and a deep concavity on each lateral edge of the frontal (Bănărescu & Nalbant, 1973; Hosoya, 1986). These specimens, however, are easily distinguished from other genera of Gobioninae by the pattern of cephalic lateral line system. They are here described as a new genus and new species.

METHODS

Methods of counts and measurements followed Doi & Taki (1994). Vertebral counts and its terminology follows Doi & Kottelat (1998). Osteological characters were observed on a cleared and stained specimen following Potthoff (1984) and soft x-ray photographs. Terminology of cephalic lateral line system follows Hosoya (1986) and Hosoya & Jeon (1989). The type specimens are deposited at the Department of Zoology, National Science Museum,

Tokyo (NSMT).

***Parasqualidus*, new genus**

Type species. - *Parasqualidus maii*, new species.

Diagnosis. - Body size small. Mouth inferior, small. No barbels. Lips thin, without fringes. Large tubercles present on both sides of snout. Head covered by numerous rows of enlarged cephalic cutaneous papillae. Cephalic lateral line system incomplete: supratemporal and preoperculomandibular canals absent, supraorbital canal separated from lateral line and infraorbital canals present on only 2-5 infraorbitals. A large fontanel present, surrounded by frontals, parietals and supraoccipital. Two rows of teeth present on pharyngeal bone, its formula 0, 2, 5 - 5, 2, 0. Lateral line complete. Scales large, 35 - 36 pored scales in lateral line. A pore presents on the posterior margin of each scales. Scales present on thorax. 5 - 6 scales present between vent and the origin of anal fin. Hypural 1 not fused to the parhypural. First anal pterygiophore bipartite.

Etymology. - The generic name, *Parasqualidus*, is derived from its close resemblance to the genus *Squalidus*. Masculine.

***Parasqualidus maii*, new species**

(Figs. 1-10)

Material examined. - Holotype -- NSMT-P 58547, 33.8 mm SL, Vugia River, near Ha Tan, Da Nang, central Viet Nam, 31 Aug.1997.

Paratypes - NSMT-P 58548, 2 ex., 32.9 and 36.0 mm SL, same data as holotype; NSMT-P 58549, 1 ex., 37.0 mm

SL, same data as holotype (cleared and stained specimen).

Diagnosis. - As for genus.

Description. - Counts and measurements of holotype are followed by those of paratypes in parentheses. All the counts and measurements were given in Tables 1 and 2.



Fig. 1. *Parasqualidus maii*, NSMT-P 58548, Paratype, 32.9 mm SL, central Viet Nam: Vugia River, near Ha Tan, Da Nang.

Table 1. Meristic characters of *Parasqualidus maii*.

	Holotype	Paratypes		
	NSMT-P 58547	NSMT-P 58548	NSMT-P 58548	NSMT-P 58549
Simple dorsal fin rays	3	3	3	3
Branched dorsal fin rays	7	7	7	7
Simple anal fin rays	3	3	3	3
Branched anal fin rays	6	6	6	6
Lateral line scales	33	34	34	34
Scales on caudal fin	2	2	2	2
Total lateral line scales	35	36	36	36
Predorsal scales	10	12	10	11
Scales above lateral line to origin of dorsal fin	3.5	3.5	3.5	3.5
Scales below lateral line to origin of anal fin	2.5	3.5	2.5	2.5
Scales below lateral line to insertion of pelvic fin	2.5	2.5	2.5	2.5
Circumpeduncular scales	10	10	10	10
Scales between vent and origin of anal fin	5	6	6	5
Predorsal vertebrae	9	9	9	8
Preanal vertebrae	21	21	21	21
Abdominal vertebrae	17	17	17	17
Caudal vertebrae	17	17	17	17
Total vertebrae	34	34	34	34

Table 2. Measurements in mm of *Parasqualidus maii*.

	Holotype		Paratypes	
	NSMT-P 58547	NSMT-P 58548	NSMT-P 58548	NSMT-P 58548
Standard length	33.8	32.9	36.0	
Head length	8.9	8.6	9.5	
Head depth	5.8	5.6	6.0	
Head width	5.3	5.0	5.2	
Body depth	7.8	8.1	8.6	
Body width	4.5	4.7	4.6	
Caudal peduncle length	5.4	6.3	7.1	
Caudal peduncle depth	3.8	3.8	4.1	
Predorsal length	16.1	15.8	16.9	
Preanal length	26.0	24.7	26.6	
Prepelvic length	16.4	16.1	17.4	
Length of last simple dorsal fin ray	9.0	8.9	9.3	
Length of last simple anal fin ray	6.1	5.9	6.1	
Pectoral fin length	6.4	6.0	7.1	
Pelvic fin length	6.8	6.7	6.4	
Length of upper lobe of caudal fin	9.7	9.4	10.5	
Length of lower lobe of caudal fin	9.9	10.3	9.9	
Snout length	3.0	2.8	3.2	
Orbit diameter	3.2	3.0	3.4	
Postorbital length	3.6	3.5	4.0	
Interorbital width	2.7	2.9	3.2	

Simple dorsal fin rays 3 (3); branched dorsal fin rays 7 (7); simple anal fin rays 3 (3); branched anal fin rays 6 (6); lateral line scales 33 (34) + scales on caudal fin 2 (2) = total lateral line scales 35(36); predorsal scales 10 (10-12); scales above lateral line to origin of dorsal fin 3.5(3.5); scales below lateral line to origin of anal fin 2.5 (2.5-3.5); scales below lateral line to insertion of pelvic fin 2.5 (2.5); circumpeduncular scales 10 (10); predorsal vertebrae 9 (9); preanal vertebrae 21 (21); abdominal vertebrae 17 (17) + caudal vertebrae 17 (17) = total vertebrae 34 (34).

Body elongated, somewhat compressed, greatest depth at origin of dorsal; its depth 4.1 (4.2-4.3) in SL, its width 7.1 (7.5-7.8) in SL. Caudal peduncle compressed, long, its length 5.3 (5.1-6.3) in SL; its depth 8.7 (8.9) in SL; its length 164.5 (142.1-175.3) % of the depth. Lateral line complete. Scales large. Thorax covered by scales. A single pore present on each scale in lateral line series, its position at the posterior margin of scale (Fig. 2).

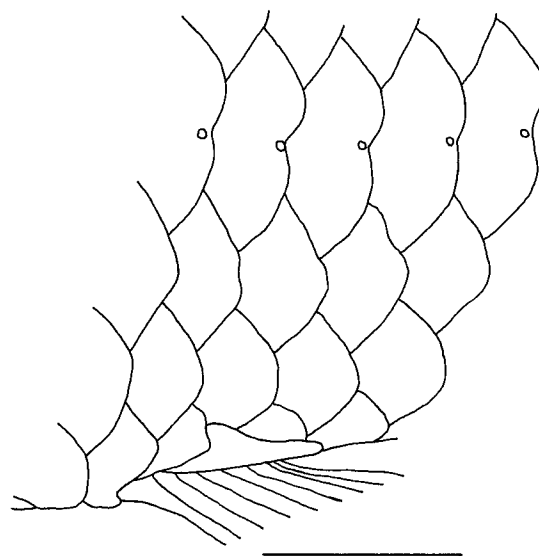


Fig. 2. Positions of pores on lateral line scales of *Parasqualidus maii*, NSMT-P 58547; 33.8 mm SL. Scale bar 2 mm

Head large, covered by numerous rows of enlarged cephalic cutaneous papillae (Fig. 3); its length 3.8 (3.8) in SL, its depth 5.9 (5.8-6.0) in SL. Snout pointed. Large tubercles present on both sides of snout (Fig. 4). Cephalic lateral line system incomplete: supratemporal and preoperculomandibular canals entirely lacking, but pit-organs only present; supraorbital canal not connected with lateral line (Fig. 5). A large fontanel present, surrounded by frontals, parietals and supraoccipital. Mouth small, inferior; projecting anteroventrally when opened (Fig. 6). Both lips thin, without fringes. Tow to three

rows of enlarged cephalic cutaneous papillae present on lower lip. Barbels absent. Eye large, orbit diameter 107.1 (105.0-106.3) % of snout length. Two rows of teeth present on pharyngeal bone, its formula 0, 2, 5 - 5, 2, 0 (Fig. 7).

Origin of dorsal fin slightly anterior to midpoint of body, situated above 11th (10-11th) lateral line scale. Predorsal length 2.1 (2.1) in SL. Origin of pelvic fin slightly posterior to origin of dorsal fin, situated below 12th (12th) lateral line scales and 1st to 2nd branched dorsal fin rays. Prepelvic length 2.0 (2.1) in SL. Origin of anal fin under 23rd lateral line scale. Preanal length 1.3 (1.3-1.4) in SL. Last simple dorsal and anal fin rays segmented and not osseous. Length of last simple dorsal fin ray 3.7 (3.8-3.9) in SL. Length of last simple anal fin ray 5.6 (5.5-5.9) in SL. Pectoral fin shorter than pelvic fin; pectoral fin length 5.5 (5.1-5.3) in SL, pelvic fin length 4.9 (5.0-5.7) in SL. Caudal fin moderately large; length of the upper

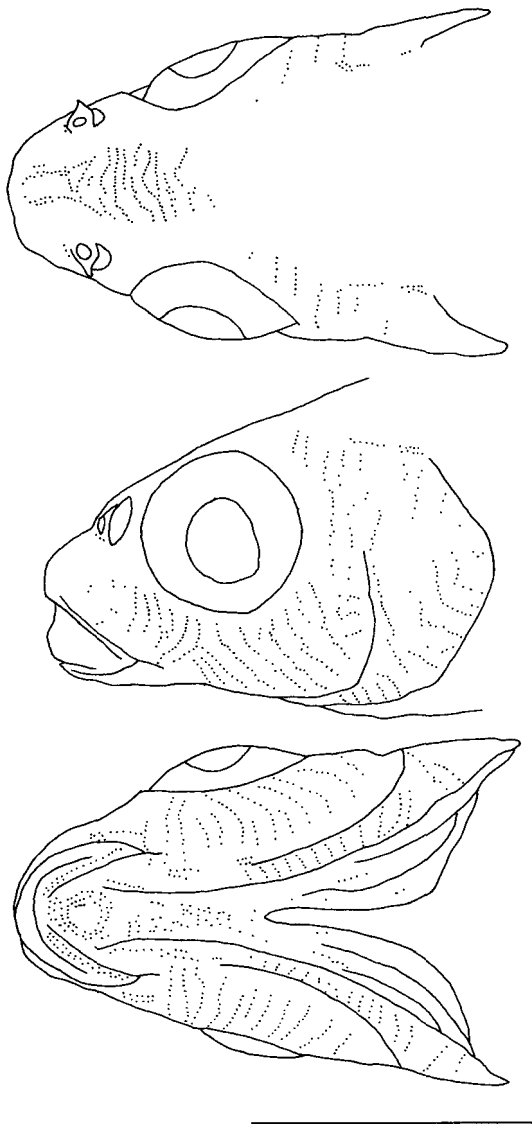


Fig. 3. Enlarged cephalic cutaneous papillae on head of *Parasqualidus maii*, NSMT-P 58547, 33.8 mm SL. Scale bar 5 mm.

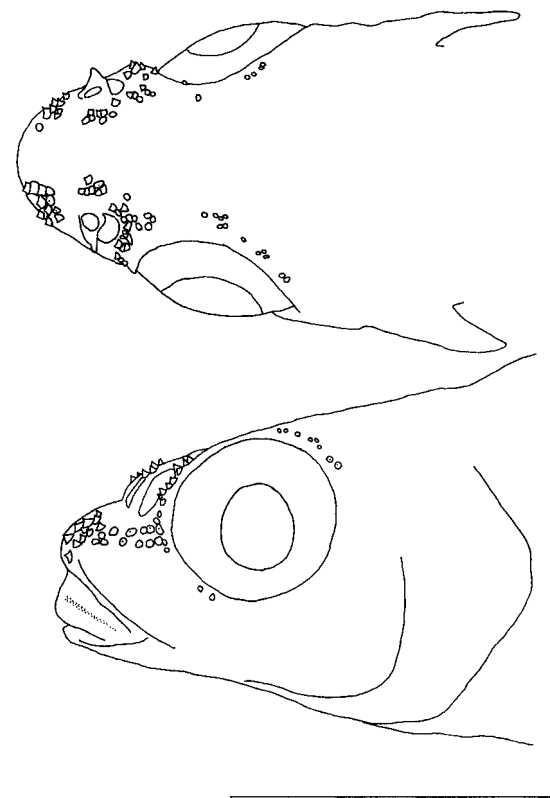


Fig. 4. Tubercles on snout of *Parasqualidus maii*, NSMT-P 58547, 33.8 mm SL. Scale bar 5 mm.

lobe 3.5 (3.4-3.5) in SL, the lower lobe 3.2 (3.4-3.6) in SL. In caudal skeleton, hypural 1 not fused to the parhypural (Fig. 8). First anal pterygiophore bipartite (Fig. 9). The coiling of intestine simple (Fig. 10).

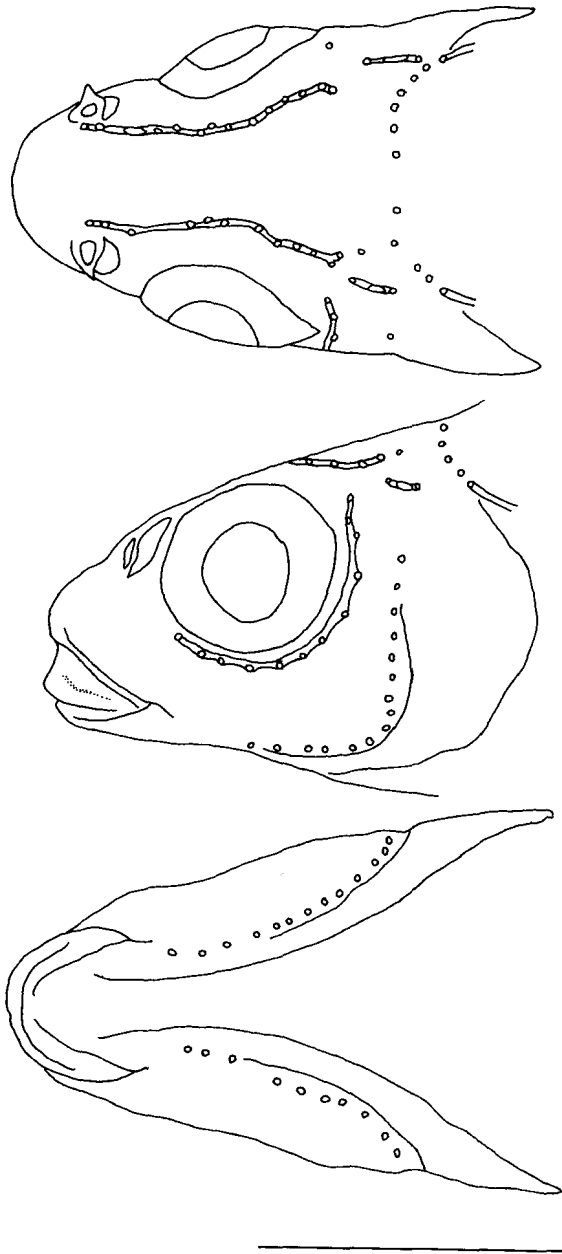


Fig. 5. Cephalic lateral line system of *Parasqualidus maii*, NSMT-P 58548, 32.9 mm SL. Scale bar 5 mm.

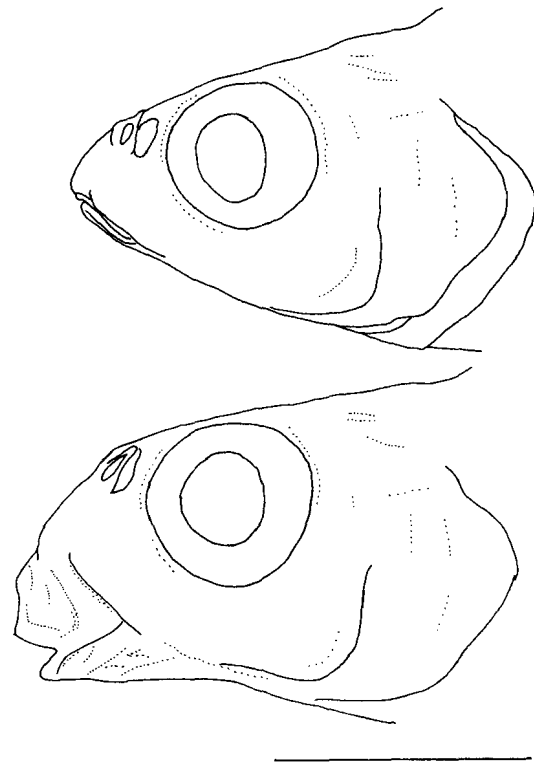


Fig. 6. Mouth of *Parasqualidus maii*, top: mouth closed, NSMT-P 58548; 32.9 mm SL; bottom: mouth opened, NSMT-P 58548, 36.0 mm SL. Scale bar 5 mm.

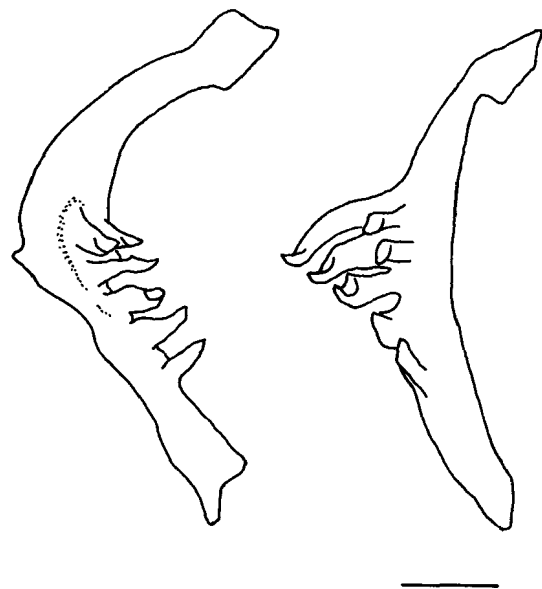


Fig. 7. Left pharyngeal bone of *Parasqualidus maii*, NSMT-P 58549, 37.0 mm SL. Left: inner view; right: frontal view. Scale bar 0.5 mm.

Color in alcohol. - Body light brown. Scales of dorsal surface with dark margin. An obscure longitudinal dark stripe on side of body. An obscure longitudinal dark stripe between anus and origin of anal fin. All fins pale.

Distribution. -- Vugia River, near Ha Tan, Da Nang, central Viet Nam.

Habitat note. - At the site of collection, the river wide was about 25 m and about 50-100 cm deep. Its bottom was covered by soft mud. *Parasqualidus maii* was collected with the cyprinids, *Puntius semifasciolatus*, *Rasborinus takakii*, *Rhodeus* sp. and the osphronemid, *Macropodus opercularis*.

Etymology. -- Named after Dr. Mai Dinh Yen, Professor of Hanoi Science University, Viet Nam. He is the renowned freshwater fish taxonomist of Viet Nam. *Parasqualidus maii* was collected with his great help.

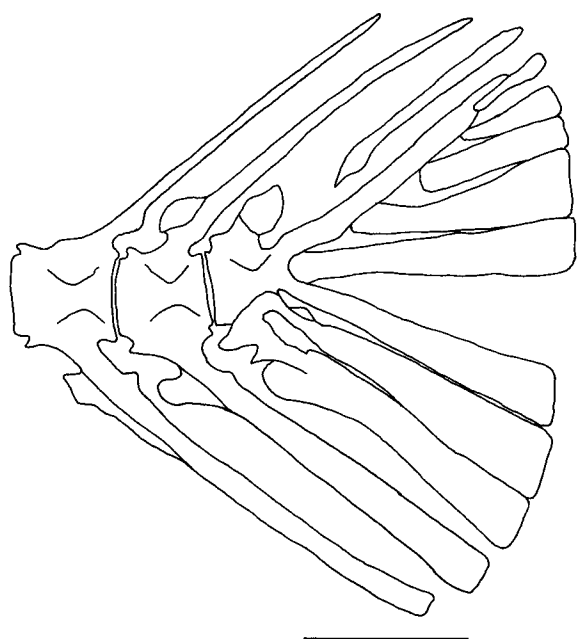


Fig. 8. Caudal skeleton of *Parasqualidus maii*, NSMT-P 58549, 37.0 mm SL. Scale bar 1 mm.

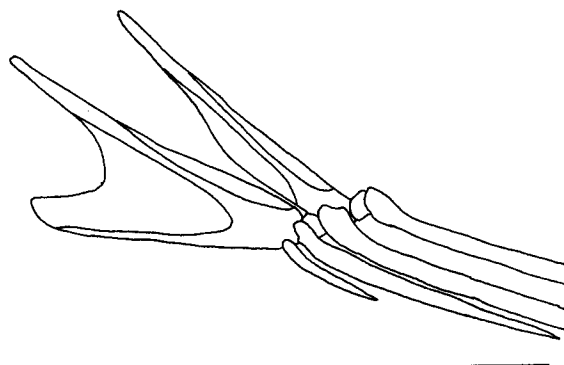


Fig. 9. First and second anal pterygiophores of *Parasqualidus maii*, NSMT-P 58549; 37.0 mm SL. Scale bar 1 mm.

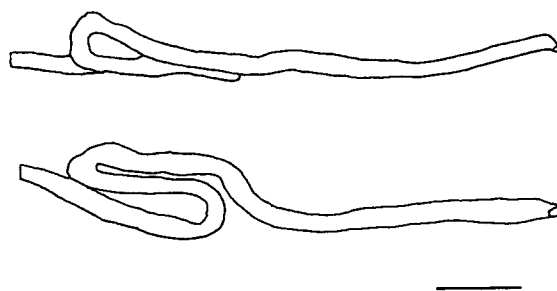


Fig. 10. Intestine of *Parasqualidus maii*, NSMT-P 58549, 37.0 mm SL. Top: lateral view; bottom: ventral view. Scale bar 2 mm.

DISCUSSION

The subfamily Gobioninae was represented by 12 genera, i.e., *Gobio* Cuvier, 1817, *Hemibarbus* Bleeker, 1859, *Pseudogobio* Bleeker, 1859, *Rhinogobio* Bleeker, 1870, *Saurogobio* Bleeker, 1870, *Squalidus* Dybowski, 1872, *Acanthogobio* Herzenstein, 1892, *Abbottina* Jordan & Fowler, 1903, *Biwia* Jordan & Fowler, 1903, *Gobiobotia* Kreyenberg, 1911, *Microphysogobio* Mori, 1933 and *Mesogobio* Bănărescu & Nalbant, 1973 (Hosoya, 1986).

The cephalic lateral line system of Gobioninae consists of supraorbital, infraorbital, preopacular, mandibular and supratemporal canals. The infraorbital canal is generally connected with the supraorbital, preopaculomandibular and supratemporal canals. This general pattern is seen in the genera *Gobio*, *Hemibarbus*, *Pseudogobio*, *Rhinogobio*, *Saurogobio*, *Squalidus*, *Acanthogobio*, *Gobiobotia* and *Mesogobio*. The most derived pattern as seen in the genus *Abbottina* shows no connections between the infraorbital canal and supraorbital and preopercular canals, absence of mandibular canal and the interruption of the infraorbital canal (Hosoya, 1986). In its lacking of the supratemporal and preoperculomandibular canals, the genus *Parasqualidus* is easily differentiated from the other gobioine genera.

The genus *Parasqualidus* is similar to the genus *Squalidus* by having lips without fringes, two rows of pharyngeal teeth, thorax covered by scales, horizontal and vertical plates with extended posterior edges of urohyal, bipartite first anal pterygiophore. But, the following characters clearly differentiate the genus *Parasqualidus* from the genus *Squalidus*: distinctly unique cephalic lateral line system (see above), absence of barbels (vs. presence in *Squalidus*), in the caudal skeleton the parhypural is not fused to hypural 1 (vs. fused to hypural 1), number of scales between vent and the origin of anal fin 5-6 (vs. 3 [Hosoya, 1993]), position of pore at outer posterior margin (vs. middle part) of the lateral line scales, fontanel present (vs. absent [Bănărescu & Nalbant, 1973]) and presence of tubercles on snout (vs. absence). In the genus *Squalidus*, tubercles are present on only the inner surface of pectoral fin in the spawning season (Nakamura, 1969). The fusion between the first hypural and the parhypural is recognized as a apomorphic character of the genus *Squalidus* (Hosoya, 1986; Hosoya & Jeon, 1989).

Leucogobio minor Harada, 1943, an endemic of

Hainan Island, China (Lin, 1998), is similar to *Parasqualidus maii* in having its head covered by numerous rows of enlarged cephalic cutaneous papillae, 5 scales between vent and the origin of anal fin. But, *P. maii* differs from *L. minor* in number of vertebrae (34 in *P. maii* vs. 32-33 in *L. minor* [Lim, 1998]), number of lateral line scales (35-36 vs. 34 [Harada, 1943; Lin, 1998]) and color pattern (an obscure dark stripe present on side of body vs. each lateral line scale with a distinct crescent spot [Harada, 1943]). *Leucogobio minor* was included in the genus *Gonathopogon* or *Squalidus* (Zhujiang Institute of Aquatic Science, Chinese Academy of Aquatic Science, 1986; Lin, 1998). The generic allocation of *L. minor* needs further study.

Comparative material examined. - *Abbottina rivalaris*, NSMT-P(SK) 16440, 1 ex., 105.0 mm SL, Japan, Honshu, Ibaraki Pref., Lake Kitaura at Nobekata, 23 Feb.1966; *Biwia zazara*, NSMT-P(SK) 511, 27 ex., 45.6 - 57.0 mm SL, Japan, Honshu, Shiga Pref., Lake Biwa at Hikone, 13 Jun.1951; *Gobio gobio*, NSMT-P 27648, 2 ex., 55.7 - 74.8 mm SL, Russia, 14 Jun.1974; *Gobiobotia pappenheimi*, NSMT-P 3056, 1 ex., 56.5 mm SL, China, 24 Aug.1933; *Hemibarbis barbatus*, NSMT-P 27342, 1 ex., 73.7 mm SL, Japan, Honshu, Miyagi Pref., Natori-gawa River, 20 Oct.1975; *Microphysogobio tungtingensis*, NSMT-P 46901, 1 ex., 37.5 mm SL, Russia, Primorskii, Gorniye Klyuch, Ussuri River, 26 Jul.1994; *Pseudogobio esocinus*, NSMT-P 16585, 1 ex., 65.0 mm SL, Japan, Honshu, Miyagi Pref., Hirose-gawa River, 26 Jul.1974; *Squalidus gracilis*, NSMT-P 14617, 1 ex., 47.3 mm SL, Japan, Honshu, Okayama Pref., Yoshii-gawa River system, 12 Nov.1971; *Saurogobio dabryi*, NSMT-P 46915, 1 ex., 123.9 mm SL, Russia, Amur River basin, Lake Large Sharga, 31 Jul.1994.

ACKNOWLEDGMENTS

I would like to thank K. Matsuura (National Science Museum, Tokyo) for his critical reading of the manuscript and comments. I also grateful to Mai D. Y. and Doan H. M. (Hanoi University of Science) for their cooperation in field collection and K. Hosoya (National Research Institute of Fisheries Science) for his comments.

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