

First Occurrence of a Psychrolutid, *Psychrolutes pustulosus* (Scorpaeniformes), in the Southern East Sea, Korea

By Jeong-Ho Park, Sergei Solomatov¹, Pavel Kalchugin¹, Byoung-Sun Yoon, Myoung Ho Sohn and Jin-Koo Kim^{2,*}

East Sea Fisheries Research Institute, NFRDI, Haean-ro 1194, Gangneung, Gangwon-do 25435, Korea

¹Pacific Research Fishery Center, Shevchenko Alley 4, Vladivostok 690091, Russia

²Department of Marine Biology, Pukyong National University, Yongso-ro 45, Nam-gu, Busan 48513, Korea

ABSTRACT Three specimens (56.7~92.4 mm in standard length) of the small psychrolutid *Psychrolutes pustulosus* (Schmidt, 1937) were collected by bottom trawl in the coastal waters off Pohang, the southern East Sea, Korea. This species is characterized by large cephalic pores, no markings on the body or fins, no spines on the head, and no notch between the spiny and soft-rayed dorsal fin. We describe specimens the southernmost distribution in the world, and compare them with two congeneric species from Russia. We thus present the first record of *Psychrolutes pustulosus* (Schmidt, 1937) within the Korean fish fauna and propose the new Korean name “Min-mu-nui-mul-su-bae-gi” for this species.

Key words: Psychrolutidae, *Psychrolutes pustulosus*, new Korean record, East Sea

INTRODUCTION

The psychrolutid fishes are benthic dwellers on soft bottoms, mostly deeper than 300 meters in depth. Among these genera, the genus *Psychrolutes* Günther, 1861, is characterized by 14~17 pectoral fin rays, a large head, a partly hidden dorsal fin spine, and small skin papillae (Stein and Bond, 1978; Fricke, 1986; Nazarkin *et al.*, 2014), and includes more than 12 species throughout the world (Froese and Pauly, 2015). In Korea, this genus includes only one species, *Psychrolutes paradoxus* Günther, 1861 (Kim *et al.*, 2005), which is very rare and poorly studied.

Psychrolutes pustulosus was described as a new species by Schmidt (1937) although originally placed in the genus *Gilbertidia* Berg, 1898. Yabe *et al.* (1995) then reported the species in Japanese waters, based on a single specimen. Recently, Nazarkin *et al.* (2014) conducted a comprehensive study of both its external morphology and

internal osteology in samples from the Tatar Strait and Okhotsk Sea.

Recently, we collected two unique psychrolutid specimens resembling *P. paradoxus* during a demersal fisheries survey conducted by the TINRO-Center in Peter the Great Bay, Russia. A month later, we collected three psychrolutid specimens, similar to those collected in Russia, at a depth of 373 m in the coastal waters off Pohang, southern East Sea, Korea. They were identified as *Psychrolutes pustulosus* (Schmidt, 1937) and we describe them here as the first record of this species in Korea.

MATERIALS AND METHODS

Our counts and measurements follow those of Nakabo (2002) and Nazarkin *et al.* (2014). Each body part, except those of the Russian specimens, was measured to the nearest 0.1 mm using digital Vernier calipers. The cephalic and lateral line pores were counted with a stereomicroscope (SZX 10, Olympus, Japan). The bottom temperature and salinity at the sampling location were measured

*Corresponding author: Jin-Koo Kim Tel: 82-51-629-5927, Fax: 82-51-629-5931, E-mail: taengko@hanmail.net

with CTD (SBE 9, Seabird, USA). The specimens have been deposited at the TINRO-Center, Russia, and the Fisheries Resources Laboratory at the East Sea Fisheries Research Institute (ESFRI) of Korea.

RESULTS AND DISCUSSION

Family Psychrolutidae

Genus *Psychrolutes* Günther, 1861

Psychrolutes pustulosus (Schmidt, 1937)

(New Korean name: Min-mu-nui-mul-su-bae-gi)

(Fig. 1; Table 1)

Gilbertidia pustulosa Schmidt, 1937: 280 (type locality: Okhotsk Sea); Nakabo and Kai in Nakabo, 2013: 1191 (Japan).

Psychrolutes pustulosus: Yabe *et al.*, 1995: 200, figs. 1-2 (Hokkaido, Japan); Nazarkin *et al.*, 2014: 177, figs. 1-4 (key, description, Peter the Great Bay and Okhotsk Sea, Russia).

Materials examined. ESFRI 2070-2072, three specimens, 56.7~92.4 mm in standard length (SL), 36°15.30' N, 129°47.64'E → 36°16.88'N, 129°47.94'E, 0.83°C, 34.09 psu, Pohang, southern East Sea, 373 m depth, 19 September 2014, R/V Tamgu 20, bottom trawl, collected by J.H. Park.

Comparative materials examined. No registered number, one specimen, 76 mm in SL, male, 42°23'N, 131°38'

E, 0.56°C, 34.08 psu, Peter the Great Bay, Russia, 645 m depth, 11 July 2014, R/V Buhoro, bottom trawl, collected by S. Solomatov; no registered number, one specimen, 75 mm in SL, female, 42°23'N, 131°29'E, 0.98°C, 34.06 psu, Peter the Great Bay, Russia, 350 m depth, 2 August 2014, R/V Buhoro, bottom trawl, collected by S. Solomatov and J.H. Park.

Description. Meristic characters are shown in Table 1. Measurements in percentage SL: body depth 17.9~22.0; body width 32.6~34.7; head length 36.8~41.1; postor-

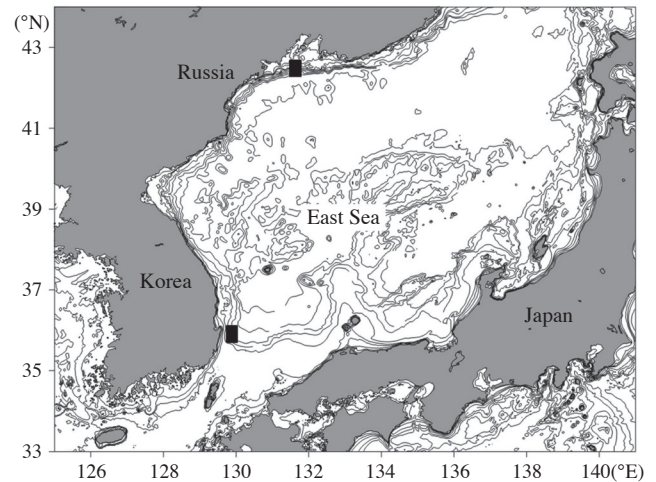


Fig. 1. Map showing the sampling areas (black rectangle) for *Psychrolutes pustulosus* off Pohang, southern East Sea, Korea, and Peter the Great Bay, Russia.

Table 1. Comparison of the meristic characters of *Psychrolutes pustulosus*

	Present study		Yabe <i>et al.</i> (1995)	Nazarkin <i>et al.</i> (2014)
	Korea	Russia		
Number of specimens	3	2	1	39
Total length (mm)	65.7~109.7	—		
Standard length (mm)	56.7~92.4	75~76	76.3	27.8~84.8
Counts				
Dorsal fin rays	VIII~IX, 18~19	IX, 17~18	VI, 21	VI~IX, 17~20
Anal fin rays	15~16	15~16	16	14~16
Caudal fin rays	22	22	23	—
Pectoral fin rays	15~16	15~16	17	14~17
Pelvic fin rays	—	—	I, 3	—
Vertebrae	—	33	34	32~34
Pores				
Lateral line	10 (n=2)	10~11	11	8~12
Infraorbital	7 (n=2)	—	7	6~8
Supraorbital	4 (n=2)	—	4	2~4
Postorbital s	3~5 (n=2)	—	5	1~5
Preoperculo-mandibular	7 (n=2)	—	9	8~9
Coronal	1 (n=2)	—	1	0~1
Temporal	0 (n=2)	—	—	0~3

“—” represents no data.



Fig. 2. *Psychrolutes pustulosus*, ESFRI 2070, 92.4 mm SL, Pohang, southern East Sea, Korea. (A) Dorsal; (B) Lateral view.

bital length 19.8~26.0; snout length 10.8~12.8; upper jaw length 13.6~16.2; eye diameter 6.1~6.6; suborbital width 3.7~4.6; interorbital width 11.9~14.8; predorsal length 7.4~8.9; prepectoral length 32.5~37.9; preanal length 54.4~60.8; prepelvic length 27.1~32.0; preanus length 49.4~52.5; pectoral fin length 31.4~36.5; pelvic fin length 15.4~19.9; dorsal fin length 14.7~16.0; dorsal fin base length 56.6~67.2; anal fin length 15.8~17.7; anal fin base length 25.8~37.9.

Body depressed anteriorly and compressed posteriorly; body loose and skin soft; eye relatively large and located dorsally; snout broad and blunt; mouth terminal and oblique; both jaws projecting equally; posterior margin of the upper jaw reaching the middle of the eye; villiform teeth on both jaws, but no vomer teeth; interorbital space concave; cephalic sensory pores large; no notch on single dorsal fin, spinous part somewhat low; spines on dorsal fin long and flexible; dorsal fin base long; pectoral fin slightly large; pelvic fin small and threadlike; caudal fin rounded; anus located just before the origin of the anal fin.

Color of specimens. When fresh, overall body light brown with transparent tint; pectoral fin more reddish; belly part dark brownish. No coloration change after fixation.

Distribution. Pohang, East Sea, Korea at 373 m depth (present study), Hokkaido, Japan, at 208 m depth (Yabe *et al.*, 1995), Peter the Great Bay, and Okhotsk Sea, Russia, at 208~620 m depth (Nazarkin *et al.*, 2014).

Remarks. The present specimens were readily identified as *Psychrolutes pustulosus* (Schmidt, 1937) on the basis of their large cephalic pores and no notch between the spiny and soft-rayed dorsal fin. The meristic characters of the present specimens agree well with those of the two Russian specimens and those previously described by Yabe *et al.* (1995) and Nazarkin *et al.* (2014) (Table 1). Among the five species of Psychrolutidae occurring in Korea, *P. pustulosus* most closely resembles *P. paradoxus*, but differs in having large cephalic pores (vs. small in the latter) and no markings on the body or fins (whereas *P. paradoxus* has both).

There has been much debate about the synonymy between the genera *Gilbertidia* Berg, 1898 and *Psychrolutes* Günther 1861. Based on the comprehensive analysis of their morphological characteristics, Nazarkin *et al.* (2014) considers that *Gilbertidia* is a junior synonym of *Psychrolutes*.

We herein propose a new Korean name for this species, “Min-mu-nui-mul-su-bae-gi”.

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한국 동해 남부 해역에서 물수배기과(Psychrolutidae) 어류 1미기록종 *Psychrolutes pustulosus*

박정호 · Sergei Solomatov¹ · Pavel Kalchugin¹ · 윤병선 · 손명호 · 김진구²

국립수산과학원 동해수산연구소, ¹러시아 TINRO-Center,

²부경대학교 자원생물학과

요 약 : 썸뱅이목 물수배기과에 속하는 *Psychrolutes pustulosus* 3개체 (표준체장 56.7~92.4 mm)가 포항 해역에서 저층 트롤로 채집되었다. 이 소형종은 두부에 큰 감각공이 산재하고 몸이나 지느러미에 무늬가 없고 두부에 가시가 없으며 등지느러미 극조부와 연조부에 결각이 없이 연결되는 것이 특징이다. 이 어종을 우리나라 어류상에 최초로 포함시키고 국명으로 “민무늬물수배기”를 제안한다.

찾아보기 낱말 : 물수배기과, 민무늬물수배기, 미기록종, 동해