

# Redescription of the Tape Blenny *Neozoarces pulcher* (Neozoarcidae) from Korea

By Hyuck Joon Kwun\*

National Marine Biodiversity Institute of Korea, Seocheon 33662, Republic of Korea

**ABSTRACT** *Neozoarces pulcher*, the Tape Blenny, is limitedly distributed in cold waters of the northwestern Pacific. Although *N. pulcher* has been known to occur on the coast of Hamgyeong-do in Korea, it has never been described on the basis of a voucher specimen collected from the Korean Peninsula. Recently, *N. pulcher* was collected from the coast of Goseong-gun, Gangwon-do of middle East Sea, and a morphological description is provided here for the first time. This species is characterized by the presence of a dermal flap on top of the snout, 43 spines and 57 soft rays on the dorsal fin, a single spine and 81 soft rays on the anal fin, 10 pectoral fin rays, and 100 vertebrae. This specimen confirms that, the species occurs south of Hamgyeong-do.

**Key words:** Stichaeidae, Neozoarcidae, redescription, *Neozoarces pulcher*, East Sea

## INTRODUCTION

The genus *Neozoarces* Steindachner, 1880, belongs to the family Neozoarcidae (sensu Radchenko *et al.*, 2012), is distributed in cold waters of the northwestern Pacific, and is limited to Korea, Japan, and Russia (Mecklenburg and Sheiko, 2004; Nelson *et al.*, 2016). The genus contains only two species: *Neozoarces pulcher* Steindachner, 1880 and *Neozoarces steindachneri* Jordan and Snyder, 1902 (Fricke *et al.*, 2024). In Korea, Mori (1952) was the first to record *N. pulcher* from the coast of Hamgyeong-do, North Korea. Subsequently, Chyung (1977), Kim and Kang (1991) and Kim *et al.* (2005) documented the species' distribution in the East Sea of Korea, but *N. pulcher* has never been collected south of Hamgyeong-do and its morphology has not been described on the basis of voucher specimens.

During the coastal fish survey of East Sea in 2017, a single specimen of the genus *Neozoarces* was collected on the coast of the East Sea, south of Hamgyeong-do for the first time and was identified as *N. pulcher* based on its morphology, which was only on the Korean fish list. In this study,

a morphological description of the specimen is provided and the taxonomy of the genus is reviewed.

## MATERIALS AND METHODS

A single specimen of *N. pulcher* was collected from Machajin beach of Gangwon-do, northernmost coast of the middle East Sea, with a hand net in August 2017. The specimen was preserved as a whole body in 99% ethanol. Counts and measurements follow Hubbs *et al.* (2004), and measurements were obtained to the nearest 0.1 mm using a digital Vernier caliper. Fins and vertebrae were counted using an M100 radiograph (Softex, Japan). Terminology of cephalic sensory pores follow Makushok (1961). The specimen has been deposited at the National Marine Biodiversity Institute of Korea, Marine Fish Diversity (MFD).

## RESULTS

**Neozoarcidae Jordan and Snyder, 1902**  
(New Korean name: Eol-ruk-ga-si-chi-gwa)

Neozoarcidae Jordan and Snyder, 1902: 478. Type genus *Neozoarces* Steindachner, 1880.

저자 직위: 권혁준(선임연구원)

\*Corresponding author: Hyuck Joon Kwun Tel: 82-41-950-0843,

Fax: 82-41-950-0841, E-mail: kwunhj@hotmail.com



**Fig. 1.** *Neozarces pulcher*, MFD-1131, 54.7 mm (TL), Goseong-gun, Gangwon-do, Korea.

**Description.** Dermal flap present or absent on top of snout. Dorsal fin composed of spiny and soft rayed portions. Caudal fin slightly pointed and connected smoothly to posterior portion of dorsal and anal fins. Pelvic fin absent.

**Distribution.** Korea, Japan, China, and Russia (Mecklenburg and Sheiko, 2004; Kimura and Sato, 2007).

**Remarks.** The family contains two genera (*Neozarces*, *Zoarchias*) and ten species (Mecklenburg and Sheiko, 2004; Kimura and Sato, 2007).

***Neozarces* Steindachner, 1880**

(Korean name: Eol-ruk-ga-si-chi-sok)

*Neozarces* Steindachner, 1880: 264. Type species *Neozarces pulcher* Steindachner, 1880.

**Description.** Dermal flap present on top of snout. Dorsal fin with more than 38 spines.

**Distribution.** Korea, Japan, and Russia (Mecklenburg and Sheiko, 2004).

**Remarks.** The genus contains two species (*N. pulcher* and *N. steindachneri*), but they may be synonymous (Mecklenburg and Sheiko, 2004).

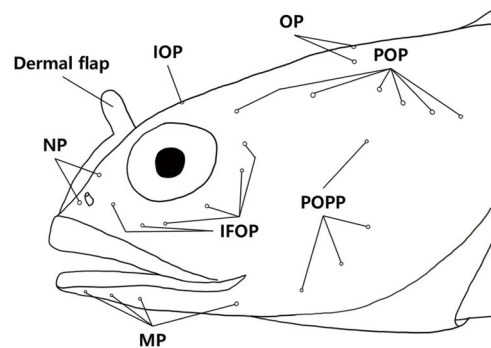
***Neozarces pulcher* Steindachner, 1880**

(Korean name: Eol-ruk-ga-si-chi)

(Figs. 1, 2; Table 1)

*Neozarces pulcher* Steindachner, 1880: 263 (type locality: Gulf of Strietok, Peter the Great Bay, East Sea, Russia); Mori, 1952: 127 (Korea); Mecklenburg and Sheiko, 2004: 24 (Korea, Russia); Kim *et al.*, 2005: 391 (East Sea, Okhotsk Sea).

**Material examined.** MFD-1131, a single specimen, 54.7 mm total length (TL), Machajin beach (38°30'48.04"N, 128°25'9.16"E), Hyeonae-myeon, Goseong-gun, Gangwon-do, Korea, 1 August 2017, hand net, approximately 1 m.



**Fig. 2.** Head and sensory system of *Neozarces pulcher*, MFD-1131. IFOP, infraorbital pores; IOP, interorbital pores; MP, mandibular pores; NP, nasal pores; OP, occipital pores; POP, postorbital pores; POPP, preopercular pores.

**Description.** Counts and measurements are provided in Table 1. Body elongated, compressed and tapering posteriorly. Head small and compressed. Snout slightly pointed, ridge and dermal flap present on top (Fig. 2). Mouth large and posterior tip of upper jaw somewhat beyond posterior margin of eye. Single pair of nostrils present and tubular. Interorbital region slightly narrow and concave. Small conical teeth on both jaws. Gill membranes continuous across and free from isthmus. Small cycloid scales embedded and scattered on body. No lateral line. Dorsal fin composed of spiny and soft rayed portions, the former longer than the latter, connected smoothly, and origin located above pectoral fin base. First soft ray of dorsal fin located behind middle of body. Origin of anal fin located in front of middle of body, just behind anus. Caudal fin slightly pointed and connected smoothly to posterior portion of dorsal and anal fins. Pectoral fins small and rounded. Pelvic fin absent. Sensory canal pores well-developed on head (Fig. 2).

**Coloration.** When fresh, head and body darkish brown mottled above and reticulated below on whitish background. Dermal flap whitish with darkish melanophores. Wide U-shaped brown markings with darker margins on dorsal

**Table 1.** Morphometric characters of *Neozarces pulcher*

	<i>Neozarces pulcher</i>			<i>Neozarces steindachneri</i>
	Present study	Steindachner (1880)	Markevich and Gnyubkina (2008)	Jordan and Snyder (1902)
Number of specimens	1	–	24	6
Total length (mm)	54.7	–	83.5~116.0	~60.0
Counts				
Dorsal fin rays	XXXXIII, 57	XXXXI, 50	–	XXXVIII, 49
Anal fin rays	I, 81	I, 75	–	I, 72
Pectoral fin rays	10	10	–	–
Vertebrae	100	–	–	–
Measurements (%TL)				
Head length	16.3	15.8~19.0	16.2~21.9	15.8
Body depth	8.8	10.5~11.1	7.7~11.4	11.1
Postorbital length	10.2	–	–	–
Predorsal length	15.5	–	–	–
Preanal length	33.1	–	25.1~57.7	–
Measurements (%HL)				
Snout length	19.1	20.0~22.2	–	20.0
Eye diameter	21.3	16.7~21.1	–	20.0
Interorbital width	12.4	–	–	13.3
Suborbital width	15.7	–	–	–
Upper jaw length	34.8	–	37.5~67.4	–
Pectoral fin length	51.7	40.0~50.0	–	57.1

fin, and narrow U-shaped markings on anal fin.

**Ecology.** The species lives in clumps of brown algae on the beach (approximately 1 m) (present study) or near the coast in beds of algae (Mecklenburg and Sheiko, 2004).

**Distribution.** *Neozarces pulcher* occurs on the northernmost coast of Gangwon-do (present study) and Hamgyeong-do (Mori, 1952) of Korea, and on the Russian waters of the East Sea (including Gulf of Strietok, Peter the Great Bay) and the Okhotsk Sea (Mecklenburg and Sheiko, 2004).

**Remarks.** *Neozarces pulcher* was first reported from Korea by Mori (1952) without a morphological description; subsequently, no Korean ichthyologist has provided a description based on specimens. This study confirms for the first time the occurrence of *N. pulcher* in the southern waters of Hamgyeong-do and provides a morphological description. The present specimen was easily identified as *N. pulcher* by the presence of a dermal flap on the snout, and agrees well with the original description (Steindachner, 1880).

**Taxonomic status of *Neozarces*.** Jordan and Snyder (1902) originally suggested that *Neozarces* belongs to the subfamily Neozarcaeinae in the family Blenniidae. Subsequently, Makushok (1961) moved the genus to the family Zoarcidae and Anderson (1994) placed it in the family Sti-

chaeidae, but maintained the previous subfamily. Recently, Radchenko *et al.* (2010, 2012) suggested that *Neozarces* belongs to a new family, the Neozarcaeidae based on molecular analysis; similarly, Kwun and Kim (2013) also considered that *Neozarces* can be placed within the family Neozarcaeidae. Therefore, I propose that the genus *Neozarces* should be placed within the family Neozarcaeidae following Radchenko *et al.* (2012) and Kwun and Kim (2013).

**Identification of *Neozarces pulcher*.** *Neozarces* comprises two species worldwide (Mecklenburg and Sheiko, 2004). Steindachner (1880) first described *N. pulcher* from the Russian waters of the East Sea; subsequently, Jordan and Snyder (1902) described a second species, *N. steindachneri*, from Japan. These two species differ from each other in the head length and details of the head color pattern (Jordan and Snyder, 1902). However, Mecklenburg and Sheiko (2004) considered that the two species may be synonyms, and that only *N. pulcher* is valid. Similarly, Markevich and Gnyubkina (2008) regarded the two species as representing sexual dimorphism of a single it. Therefore, I believe that the present specimen is *N. pulcher*, but genetic research is needed to clarify which species of *Neozarces* are valid.

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## 한국산 얼룩가시치과(*Neozoarcidae*) 얼룩가시치(*Neozoarces pulcher*)의 재기재

권혁준

국립해양생물자원관

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**요 약** : 얼룩가시치, *Neozoarces pulcher*는 북서태평양의 냉수역에 한정되어 분포한다. 우리나라에서는 얼룩가시치가 함경도 연안에 서식한다고 알려져 있지만, 한반도에서 채집된 확증표본에 근거한 기재는 아직까지 없다. 최근 얼룩가시치가 동해 중부의 강원도 고성군 연안에서 채집되었으며, 본 논문에 처음으로 형태기재를 제시한다. 본 종의 특징은 주둥이 위쪽 끝에 피습이 존재하며 등지느러미 가시는 43개, 줄기는 57개, 뒷지느러미 가시는 1개, 줄기는 81개, 가슴지느러미 줄기는 10개, 척추골수는 100개를 가진다. 본 표본을 근거로 이 종이 함경도 이남에 서식하는 것을 확인하였다.

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**찾아보기 낱말** : 장갱이과, 얼룩가시치과, 재기재, 얼룩가시치, 동해