

# First Record of the Crested Hairtail, *Tentoriceps cristatus* (Perciformes: Trichiuridae) from Korea

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**ABSTRACT** One specimen (619.0 mm in standard length) of *Tentoriceps cristatus*, belonging to the family Trichiuridae, was newly collected in the coastal waters of Jeju Island by the bottom trawl. This species was characterized by the following morphological traits: round dorsal profile of head (vs. straight for the similar species, *Eupleurogrammus muticus*); pelvic fin locating below the 12th dorsal fin ray (vs. 15th~17th); V, 131 dorsal fin rays; 11 pectoral fin rays; 1 pelvic fin ray changed to be a scale-like process; II anal fin rays (second one is changed to be a scale-like process). We suggest the Korean names, "Tu-gu-gal-chi-sok" and "Tu-gu-gal-chi" for the genus and species, respectively.

**Key words** : First record, crested hairtail, *Tentoriceps cristatus*, Trichiuridae, Jeju Island

## INTRODUCTION

The cutlassfishes (family Trichiuridae), which comprise 3 subfamilies and 10 genera with 39 species, are distributed in tropical and temperate seas worldwide (Nelson, 2006). Characters of this family include very elongate and strongly compressed body, lower jaw protruding than upper jaw, fang-like teeth on both jaws, and dorsal fin extremely long with spines and soft rays (Nelson, 2006). Among 39 trichiurid fish species, 13 species in 8 genera have been reported from Japan (Nakabo, 2013) and 5 species in 5 genera from Korea up to the present (Kim *et al.*, 2012).

The crested hairtail (*Tentoriceps cristatus*), which was collected from the Red Sea, originally reported as a new species, *Trichiurus cistatus*, by Klunzinger (1884). Then, this species is now known to distribute in Indo-West Pacific ocean including East China Sea, Japan, Philippines and North Australia (Eschmeyer, 2013). Recently, one specimen of *T. cristatus* was caught from the bottom trawl in the coastal waters of Jeju Island on 30 November 2013. Here, we describe the morphological characters of *T. cristatus* as an addition to the list of Korean fishes.

## MATERIALS AND METHODS

After a partial tissue was isolated from the specimen of *T. cristatus* to extract genomic DNA, the specimen was fixed in 10% formalin and then preserved in 70% ethanol. Counts and measurements followed the method of Hubbs and Lagler (1964). The present specimen was deposited at Fish Genetic and Breeding Lab., Jeju National University (JNU), Korea.

Molecular identification of the specimen was conducted by using the DNA sequences (651 bp) of mitochondrial cytochrome c oxidase subunit I (COI). Genomic DNA extraction and PCR were performed according to Tzeng and Chiu (2012). The DNA sequence of the COI gene obtained from the present specimen were compared to that of *T. cristatus* (JN990844) deposited at the National Center for Biological Information databases (NCBI). The genetic distance between them was calculated using the program MEGA 5 (Tamura *et al.*, 2011).

### Genus *Tentoriceps* Whitley, 1948

(New Korean name: Tu-gu-gal-chi-sok)

*Tentoriceps* Whitley, 1948: 94 (type species: *Trichiurus cistatus* Klunzinger, 1884).

Caudal fin absent and pelvic fin modified into a scale-like process. Pectoral fin is not reaching lateral line due to its short and anal fin starts below 47th to 50th soft dorsal fin ray. And only one species of the genus *Tentori-*

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Fig. 1. *Tentoriceps cristatus*, JNU-1174. 619.0 mm SL, Jeju Island, Korea.

Table 1. Comparison of morphological characters of *Tentoriceps cristatus*

Morphological characters	Present study	Klunzinger (1884)	Senta (1975)
Number of specimens	1	9	50
Total length (mm)	619.0	?~418.5	283.0~633.0
Counts			
Dorsal fin rays	V, 131	120(?)	V, 126~144
Anal fin rays	II	—	II, 82~91
Pectoral fin rays	11	—	—
Pelvic fin rays	I	I	I
Gill rakers	3+9	—	2~6+7~11
Vertebrae	49+112=161	—	45~48+105~117=152~164

*ceps* has been recognized worldwide so far (Nakamura and Parin, 1993; Nakabo, 2013).

***Tentoriceps cristatus* (Klunzinger, 1884)**

(New Korean name: Tu-gu-gal-chi)

(Fig. 1; Table 1)

*Trichiurus cristatus* Klunzinger, 1884: 120 (type locality: Kosseir, Red Sea coast of Egypt).

*Tentoriceps cristatus* Nakamura, 1984: 228 (Japan); Mohsin and Ambak, 1996: 527 (Malaysia); Randall and Lim, 2000: 643 (South China sea); Hutchins, 2001: (Australia).

**Material examined.** JNU-1174, one specimen, 619.0 mm in SL, bottom trawl, off Jeju Island, 33° 20' 51" N, 127° 37' 18" E, 30 November 2013.

**Description.** Table 1 lists the measurements of the morphological traits of the specimen. Measurements as a percentage of SL are as follows: head length 9.1; body depth 4.3; predorsal fin length 5.8; prepectoral fin length 8.1; prepelvic fin length 11.8; preanus length 33.4; snout length 3.7; eye diameter 1.4; upper jaw 4.2; interorbital length 1.0. Measurements as a percentage of head length: snout length 40.6; eye diameter 15.0; upper jaw 45.8; interorbital length 11.1.

Body extremely elongate, tapering to a point, compressed and covered by scaleless; dorsal profile of head steeply convex, curved from tip of mouth to origin of dorsal fin; head small; ineterorbital space convex; eye somewhat large and situating at middle part of head; nostrils positioning in front of eye; mouth large, slightly oblique, end of upper jaw extending below posterior part of eye, lower jaw more projecting than upper jaw, 3 pairs

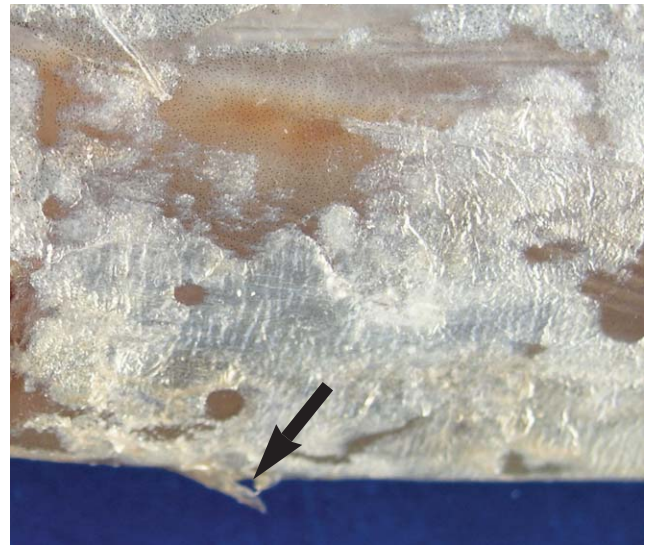


Fig. 2. The arrow indicates a scale-like process of the pelvic fin.

of fangs at tip of upper jaw, 9 small canines on lateral side of upper jaw; 2 pairs of fang in anterior part of lower jaw, 10 small teeth on lateral side of lower jaw; vomer toothless; margin of subopercle convex; dorsal fin single and starts above behind of preopercle, extending to near end of body; pectoral fin small, rounded and not reaching lateral line; pelvic fin inserting below 12th dorsal fin with a small scale-like spine (Fig. 2); origin of anal fin starts below about 48th dorsal fin ray, first anal fin is very short and second one is scale-like spine; anus locating in front of anal fin base; caudal fin absent.

**Color when fresh.** Body uniformly silver white; head

and interorbital region dark; tip of both jaws black; dorsal fin base and its terminal part black; pectoral and pelvic fin white.

**Color after preservation.** Coloration in 70% alcohol is very similar to that of fresh specimen.

**Distribution.** Known from Indo-West Pacific ocean: Red Sea, Mozambique Channel to northern and southeastern Australia, Tasman Sea, Philippines, South China Sea, East China Sea, southern Japan (Nakamura and Parin, 1993; Eschmeyer, 2013) and Korea (present study).

**Remarks.** The morphological characteristics of the present specimen agreed well with those of *Tentoriceps cristatus* by having the interorbital convex, pectoral fin short and not reaching at lateral line, pelvic fin present but changed to a scale-like process and caudal fin absent (Senta, 1975; Nakamura and Parin, 1993; Nakabo, 2002). Also, the meristic characters of the present specimen were compared with those of *T. cristatus* previously reported by other researcher (Table 1) although several taxonomically important meristic characters of type specimen were not examined by Klunzinger (1884). The result indicated they appeared to be well matched with each other except the number of vertebrae before anus (49 in the present study vs. 45~48 in Senta, 1975). Such an exception is likely to be due to intra-specific variation in the number of vertebrae before anus. Another thing we want to mention is that the anal fin rays of the present specimen were not countable because its anal fin completely buried in the skin, which is also reported in Nakamura and Parin (1993). In addition, we adopted molecular identification method based on COI DNA sequences to make sure of the accurate species identification. The result indicated that COI sequence of present specimen was almost identical (99.7%) to that of *T. cristatus* from NCBI (data not shown). On the other hand, among 5 trichiurid fish species occurred in Korean waters, *T. cristatus* is morphologically similar in its body shape to *Eupleurogrammus muticus*. However, the former can be distinguished from the latter by dorsal profile of head (round vs. straight for *E. muticus*) and position of pelvic fin (below 9th~12th dorsal fin ray vs. 15th~17th for *E. muticus*) (Nakamura and Parin, 1993; Nakabo, 2002). When the Korean name for *T. cristatus* was given, we used “Tu-gu-gal-chi” which was previously suggested by Yamada *et al.* (2009) without a real specimen collected from Korean waters.

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## 한국산 갈치과 어류 1 미기록종, *Tentoriceps cristatus*

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**요 약** : 갈치과에 속하는 *Tentoriceps cristatus* 1개체 (표준체장 619.0 mm)가 제주도 주변해역에서 저층트롤로 처음으로 채집되었다. 이종은 머리의 외곽이 둥근 점(유사종 분장어는 직선을 이룸), 배지느러미는 등지느러미 12번째 기조 밑에 위치하는 점(유사종 분장어는 15~17번째 기조 밑에 위치), 등지느러미 기조수가 V, 131개, 가슴지느러미 기조수가 11개, 배지느러미가 비늘형태로 변형된 점, 그리고 뒷지느러미의 극조수가 2개(2번째 극조는 비늘모양으로 변형됨)인 점이 특징이다. 본 종의 속명과 종명은 “투구갈치속”과 “투구갈치”로 각각 명명하였다.

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**찾아보기 낱말** : 미기록종, 갈치과, 투구갈치, 제주도