

**Identification of a Species of *Coilia*
(Engraulidae) Distributed
in Ariake Sound**

Toru Takita

(Received February 13, 1978)

In Japan, reliable records of *Coilia* are confined to Ariake Sound in western Kyushu and rivers which flow into the sound. Two species of the genus, *C. mystus* (Linnaeus, 1758) and *C. ectenes* Jordan et Seale, 1905, have been previously recorded from Ariake Sound (Yoshida, 1935; Uchida and Tsukahara, 1955) and the Yabe and Chikugo Rivers (Tsukahara, 1951). However, Takita (1967a, b) has reported that only one species of the genus inhabits Ariake Sound including the lower Chikugo River. Its characters differ from either of the two species reported earlier, but species identification was not confirmed.

In this study, the type specimens of *C. nasus* and *C. ectenes* were re-examined, and the former was compared with the characters of *C. mystus* and *C. ectenes*, confirming that the species in Ariake Sound is *C. nasus*. The occurrence of *C. nasus* in China, Korea, and adjacent waters is also reviewed here.

Coilia nasus Temminck et Schlegel, 1846

Japanese name: Etsu (proposed by
Jordan and Herre, 1906)

Coilia nasus Temminck and Schlegel, 1846: 243,
pl. 109, fig. 4.

Coilia nasus; Ishikawa and Matsuura, 1897: 9,
list (Chikugo, Ariake Sound); Jordan, Tanaka,
and Snyder, 1913: 39, list (Kiusiu); Izuka and
Matsuura, 1920: 183, list (Chikugo).

Coilia mystus (not of Linnaeus, 1758); Tanaka,
1931: 9, synonymization of *C. nasus* to *C.*
mystus without explanation (Ariake Sound
with Yatsushiro Sound); Tanaka, 1933: 39,
list (Ariake Sound); Tsukahara, 1951: 290,
brief note on the occurrence (Chikugo and
Yabe Rivers); Uchida and Tsukahara, 1955:
295, list (Ariake Sound); Matsubara, 1955:
197, key (southern Japan).

Coilia ectenes (not of Jordan and Seale, 1905);
Jordan and Hubbs, 1925: 122, counts and
measurements of a single specimen (Fukuoka);

Yoshida, 1935: 788~789, fig. 8, drawings and
myomere counts of the postlarvae (Ariake
Sound); Ikeda, 1937: 108~109, fig. 1, list and
a photograph (Chikugo River); Tsukahara,
1951: 290, list (Chikugo and Yabe Rivers);
Uchida and Tsukahara, 1955: 295, list (Ariake
Sound); Matsubara, 1955: 197, key (Chikugo
River).

Negative synonyms:

Coilia nasus (not of Temminck and Schlegel,
1846); Jordan and Starks, 1906: 516 (Port
Arthur and Manchuria); Jordan and Herre,
1906: 640 (China and Korea); Fowler, 1924:
373~374 (Ningkwu); Fowler, 1931: 207
(Hong Kong, Amoy, Newchwang, Kiating,
Ningpo, Kiukiang, Shanghai, Tientsin); Wu,
1929: 25~26 (Amoy); Tchang, 1938: 325~327
(Peitaiho, Tangku, Chefoo, Yingko, Tung-
chow, Tientsin, Nanking, Kuangkiang, Hunan,
Wuchang, Kwangtung); Wang, 1958: 89
(Chan Jiang).

Coilia nasus Temminck and Schlegel, 1846 was
originally described based on a fish from Japan.
Meristic characters of type specimens of *C. nasus*
(Cat. No. 3367a (lectotype) and 3367b (para-
type)) in the Museum of Natural History at
Leiden and specimens of *Coilia* from Ariake
Sound (Takita, 1967a) were compared (Table 1).
The characters of the type specimens of *C. nasus*
in this table are based on a re-examination by
Dr. M. Boeseman on the request of the author.
All the counts of the fish from Ariake Sound
correspond with those of the type specimens.
Since there are no other waters in Japan where

Table 1. Meristic characters of type specimens
of *Coilia nasus* and *Coilia* from Ariake
Sound. Numbers in parentheses show
the mean counts.

	Type <i>C. nasus</i>		The fish from Ariake Sound
	Lectotype	Paratype	
Standard length (mm)	255	255	204~368
Gill-rakers	—	—	17~19+ 21~25
Anal fin rays	84 or 85	85 or 86	81~97 (89)
Scales	75	76	70~79 (75)
Scutes	47	46	40~52 (46)
Vertebrae including urostyle	75	76	71~81 (76)

Coilia is known, it is almost certain that the type specimens were caught in Ariake Sound.

Some early records of *C. mystus* in Japan (Jordan and Seale, 1926; Tanaka, 1931) are due to the synonymization of *C. nasus* with *C. mystus*. *C. nasus* from Ariake Sound corresponds to the original description of *C. mystus* in the number of anal fin rays, but nothing else in the original description can confirm the identity. According to most of the descriptions of *C. mystus* collected from China and Korea (Jordan and Seale, 1926; Fowler, 1931; Yoshida, 1935; Chyung, 1961; Wang, 1963; Cheng et al., 1964; Anonymous, 1976), these two species do not correspond in the numbers of scales, scutes, and vertebrae, suggesting that they are two different species. Confusion between *C. nasus* and *C. mystus* in Japan seems to be partly due to the identification of *Coilia* specimens using only anal fin ray counts.

Coilia ectenes was originally described with an error in the number of anal fin ray counts (Jordan and Starks, 1906; Jordan and Hubbs, 1925), and the number of scales in the original description is inaccurate. On the request of the author, the holotype of *C. ectenes* (Cat. No. 52077) in the U. S. National Museum was re-examined by Mr. Robert H. Kanazawa of the museum as follows. Anal fin rays, 110; scales, unable to count, most of the scales missing; scutes, 48; vertebrae, 78; gill-rakers, 18/24. Comparison of the characters between *C. nasus* and *C. ectenes* reveals a difference in the anal fin ray counts, but no other differences were found.

In descriptions of *C. ectenes* from China and Korea, only that from Korea by Yoshida (1935) includes statistical results, giving the frequency distribution of every count. The number of specimens examined and the mean value and standard deviation of each count of *C. ectenes* were calculated from Yoshida's graphs and com-

pared statistically (t-test) with *C. nasus* from Ariake Sound (Table 2). Although there are large overlaps in the counts of vertebrae, scales, and scutes, the difference is statistically significant at the 99% confidence. The correspondence of the two species in anal fin ray counts is very small.

Although the difference between *C. nasus* and *C. ectenes* is small, and morphological and biogeographical examinations of many specimens from China and Korea are still needed to determine their specific status, these two species are regarded to be different in this paper.

Coilia ectenes from Fukuoka (Jordan and Hubbs, 1925), which is near Ariake Sound, was identified by the examination of only one specimen, and its anal fin ray count is just in the critical range where the counts of *C. ectenes* and *C. nasus* overlap each other. The postlarvae of *C. ectenes* from Ariake Sound reported by Yoshida (1935) were identified on the basis of myomere count, but myomere count without statistical comparison could not have shown a difference from *C. nasus*. These records of *C. ectenes* in Japan might be a mistaken identification of *C. nasus* of Ariake Sound.

Many papers have recorded *C. nasus* from China and Korea. However, most of them did not explain on what basis the identification was made. As far as the author knows, a fish referable to *C. nasus* has not been described from China and Korea. Some of the fish from China and Korea identified as *C. nasus* (Jordan and Starks, 1906; Jordan and Herre, 1906; Fowler, 1931; Wu, 1929; Tchang, 1938; Wang, 1958) correspond to *C. mystus*, and some others (Fowler, 1924; Tchang, 1938) to *C. ectenes* in their morphological characters. Because of the brief and incomplete original description of *C. nasus*, *Coilia* from China and Korea were identified as this species, resulting in the broaden-

Table 2. Meristic characters of *C. nasus* from Ariake Sound (Takita, 1967a) and *C. ectenes* from Korea (Yoshida, 1935).

	<i>C. nasus</i>				<i>C. ectenes</i>				Probability of having the same mean
	n	Range	Mean	SD	n	Range	Mean	SD	
Anal fin rays	137	81~97	89.10	3.16	110	91~112	102.02	3.98	P<0.001
Scales	89	70~79	74.63	1.72	110	71~78	73.96	1.71	P<0.01
Scutes	92	40~52	46.28	2.36	109	46~55	49.32	2.24	P<0.001
Vertebrae	166	71~81	76.31	1.36	110	75~82	78.47	1.35	P<0.001

ing of the distribution of *C. nasus* outside Japan.

Acknowledgments

The author wishes to express his sincere gratitude to Dr. M. Boeseman of Rijksmuseum van Natuurlijke Historie, Leiden, and Mr. Robert H. Kanazawa of the U.S. National Museum of Natural History, for their examinations of the type specimens. Thanks are due to Dr. Yoshiaki Tominaga of the University Museum of the University of Tokyo and Tetsushi Senta of the Fisheries Experimental Station, the Faculty of Fisheries, Nagasaki University, for their kind review of the manuscript and for copies of literature. Thanks are also due to Dr. P. J. P. Whitehead of the British Museum, London, for his advice and for copies of literature. Dr. Yoshio Tomoda of the National Science Museum, Tokyo, assisted in obtaining copies of literature. Mr. Kokun Hai of the Fisheries Laboratory, the Faculty of Agriculture, Kyushu University, and Mr. Shuzo Kishida of the Seikai Regional Fisheries Research Laboratory assisted in reading literature in Korean and Chinese, respectively.

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(Note: Titles in parentheses are originally given in Japanese or Chinese, and put into English by the author.)

(Faculty of Fisheries, Nagasaki University, 1-14, Bunkyo-machi, Nagasaki 852, Japan)

有明海産エツの同定

田北 徹

従来 *Coilia* sp. としていた有明海産エツの形態を, *Coilia nasus* Temminck et Schlegel, 1846, *C. mystus* (Linnaeus, 1758) および *C. ectenes* Jordan et Seale, 1905 の原記載, これら3種として報告されているその他の記載, および *C. nasus*, *C. ectenes* の模式標本と比較し, 次の結論に達した.

有明海産エツは *C. nasus* (和名, エツ)である. これは *C. mystus* とは形態的に明らかに異なる. *C. nasus* は, 形態上 *C. ectenes* に近いが, 臀鰭条数を初めとする計測値に若干の違いが認められる. これまで大陸から *C. nasus* として報告されているものの中に, 形態が本種に完全に合致するものは認められなかった.

(852 長崎市文教町 1-14 長崎大学水産学部)