

# 琉球大学学術リポジトリ

## 沖縄島初記録の絶滅危惧種カタクチイワシ科魚類オ オイワシ *Thrissina baelama*

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## First voucher specimen of the endangered species *Thrissina baelama* (Teleostei: Clupeiformes: Engraulidae) from Okinawa-jima Island, Ryukyu Archipelago, Japan

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**Abstract.** A specimen of the engraulid fish, *Thrissina baelama*, collected from Okinawa-jima Island, Ryukyu Archipelago in 1936, was discovered in the fish collection of the Department of Zoology, the University Museum, University of Tokyo. Because the species has been generally reported only from south of the Miyako Islands in the Ryukyu Archipelago (except for a single non specimen-based record from Okinawa-jima Island), the present specimen represents the first reliable record of the species from Okinawa-jima Island.

### Introduction

*Thrissina baelama* (Fabricius, 1775) is a small species of anchovy (maximum 15 cm standard length), widely distributed in the Indo-West Pacific, and used as a baitfish in the tropical Pacific (Whitehead et al. 1988; Wongratana et al. 1999). However, Japanese records of *T. baelama* have been limited to the Ogasawara and Ryukyu Islands (Aonuma & Yagishita 2013; Yoshigou 2014), the species being designated as a “Critically Endangered Species” in the Red List of threatened marine fishes in Japan by the Ministry of the Environment (Ministry of the Environment Government of Japan 2017; Kimura 2018). During a recent examination of the fish collection in the Department of Zoology, the University Museum, University of Tokyo, a single specimen of *T. baelama* collected in 1936 at Okinawa-jima Island, Ryukyu Archipelago, was discovered. The specimen represents the first reliable record of the species from the island and is described herein in detail.

Counts and proportional measurements shown in Table 1 followed Hata & Motomura (2019). All measurements were made with digital calipers to the nearest 0.1 mm. Abbreviations: SL (standard length), OMNH (Osaka Museum of Natural History), ZUMT (Department of Zoology, University Museum, University of Tokyo, Tokyo, Japan). Although the

genus *Thrissina* has been treated as *Thryssa* (e.g., Whitehead et al. 1988; Wongratana et al. 1999; Aonuma & Yagishita 2013), the generic name *Thrissina* is applied for the genus following Kottelat (2013) in this study. The authorship of *T. baelama* follows Fricke (2008).

### Results and Discussion

#### *Thrissina baelama* (Fabricius, 1775)

Standard Japanese name: O-iwashi (Fig. 1; Table 1)

**Material examined.** ZUMT 39727, 40.3 mm SL, Okinawa-jima Island, Ryukyu Archipelago, Japan, 8 July 1936, coll. by S. Inuo.

**Description.** Body strongly compressed laterally, greatest depth at dorsal-fin origin. Dorsal profile of head and body gently elevated from snout tip to dorsal-fin origin, gradually lowering to uppermost point of caudal-fin base. Ventral profile of body dropping from snout tip to just below pelvic-fin insertion, thereafter parallel with body axis to anal-fin origin, gently rising to end of anal-fin base, and parallel with body axis to lowermost point of caudal-fin base. Abdomen covered by 6 and 8 sharp needle-like scutes from isthmus to pelvic-fin insertion, and pelvic-fin insertion to anus, respectively. Anus just anterior to anal-fin origin. Caudal peduncle compressed laterally, its depth greater than orbit diameter. Pectoral-fin insertion slightly anterior to posterior tip of opercle. Uppermost ray of pectoral fin unbranched, not filamentous. Other pectoral-fin rays branched. Posterior tip of pectoral fin pointed, reaching just short of pelvic-fin insertion. Upper, lower, and posterior margins of pectoral fin nearly straight. Pelvic-fin insertion anterior to dorsal-fin origin. Posterior tip of depressed pelvic fin just reaching to vertical through 7th dorsal-fin ray origin. Anteriormost ray of pelvic fin unbranched, other rays branched. Dorsal-fin origin anterior to



Fig. 1. (A) Lateral and (B) dorsal views of preserved specimen of *Thrissina baelama*, ZUMT 39727, 40.3 mm SL, Okinawa-jima Island, Ryukyu Archipelago, Japan.

図 1. オオイワシ *Thrissina baelama* (ZUMT 39727, 標準体長 40.3 mm, 沖縄島) の体側面 (A) と体背面 (B).

posterior end of pelvic-fin insertion. Anterior three rays unbranched. Single spine-like scute located just anterior to dorsal-fin origin. Anal-fin origin posterior to posteriormost point of dorsal-fin base. Caudal fin forked. Upper and lower margins of caudal fin nearly straight. Head compressed. Snout length much shorter than orbit diameter. Snout tip rounded, approximately level with center of eye. Eye round, covered with adipose eyelid; positioned laterally on head, dorsal to horizontal through pectoral-fin insertion, visible in dorsal and ventral views. Pupil round. Orbit elliptical. Nostrils close to each other, in front of anterior margin of orbit and above body axis. Both nostrils elongated transversely. Posterior margin of preopercle convex, smooth. Subopercle with rounded posterior margin. Opercular membrane without serrations. Pseudobranchial filaments present, exposed. Interorbital space flat. Mouth large, inferior, below body axis, extending backward beyond posterior margin of eye. Mandible slender, shorter than maxilla. Maxilla short, its posterior tip pointed, slightly beyond anterior margin of preopercle. Supramaxilla double. First and second supramaxillae elongated longitudinally. Small conical teeth in single row on both jaws and palatine. Several conical teeth on vomer. Small conical teeth patch on pterygoid. Several rows of conical teeth on upper edges of basihyal and basibranchial. No teeth on dorsal surface of hyoid. Gill rakers long, slender, bearing similarly-sized serrae. Gill membranes on each side joined distally, most isthmus muscle exposed, not covered by gill membrane. Scales absent on head and fins. Scales on body completely lacking, except for scutes on dorsum and abdomen.

Color of preserved specimen (Fig. 1): Body uniformly pale, melanophores densely scattered on dorsum and upper lateral surface of body. Paired dark patches on parietal region. All fins semi-transparent. Melanophores scattered along fin rays of dorsal and caudal fins. White vertical band on snout. No dark markings in mouth except for several dark blotches on lateral surface of hyoid arch.

**Distribution.** *Thrissina baelama* is widely distributed in the Indo-West Pacific from the eastern coast of Africa to Japan, Tonga, and the northern coast of Australia (Kishinouye 1911; Nelson 1982; Whitehead et al. 1988; Wongratana et al. 1999). In Japanese waters, the species has been reported from the Ogasawara and Ryukyu islands (see Remarks).

**Remarks.** The Okinawan specimen examined in this study was assignable to the genus *Thrissina*, conforming to the definitions of Whitehead et al. (1988) and Wongratana et al. (1999) (as *Thryssa*) in having the abdomen covered with keeled prepelvic and postpelvic scutes, a spine-like scute on the dorsal fin origin, dorsal and anal fins with 15 and 33 rays, respectively, double supramaxillae, the uppermost pectoral-fin ray not extended as a filament, and fine conical teeth on both jaws. Moreover, the specimen was further identified on the basis of the following combination of characters, closely matching the diagnostic features of *Thrissina baelama* given by Nelson (1982), Whitehead et al. (1988), and Wongratana et al. (1999): short maxilla, its posterior tip pointed, slightly beyond anterior margin of preopercle; no distinct markings on body lateral surface;  $6 + 8 = 14$  keeled scutes on abdomen; elongated first supramaxilla; asperities

Table 1. Counts and measurements of a specimen of *Thrissina baelama* (ZUMT 39727) from Okinawa-jima Island, Ryukyu Archipelago, Japan.表 1. 沖縄島産オオイワシ *Thrissina baelama* (ZUMT 39727) の計数・計測形質.

Standard length (SL; mm) 標準体長	40.3		
Counts 計数形質		Measurement (% SL) 計測形質	6.3
Unbranched dorsal-fin rays 背鰭不分枝軟条数	3	Head length 頭長	29.1
Branched dorsal-fin rays 背鰭分枝軟条数	12	Body depth 体高	21.8
Unbranched anal-fin rays 臀鰭不分枝軟条数	4	Predorsal-fin length 背鰭前長	49.3
Branched anal-fin rays 臀鰭分枝軟条数	29	Snout tip to pectoral-fin insertion 胸鰭前長	30.4
Unbranched pectoral-fin rays 胸鰭不分枝軟条数	1	Snout tip to pelvic-fin insertion 腹鰭前長	45.5
Branched pectoral-fin rays 胸鰭分枝軟条数	11	Preanal-fin length 臀鰭前長	64.9
Unbranched pelvic-fin rays 腹鰭不分枝軟条数	1	Dorsal-fin base length 背鰭基底長	12.2
Branched pelvic-fin rays 腹鰭分枝軟条数	6	Anal-fin base length 臀鰭基底長	26.3
Gill rakers on 1st gill arch (upper) 第1鰓弓上枝鰓耙数	14	Caudal-peduncle length 尾柄長	9.8
Gill rakers on 1st gill arch (lower) 第1鰓弓下枝鰓耙数	19	Caudal-peduncle depth 尾柄高	9.8
Gill rakers on 1st gill arch (total) 第1鰓弓総鰓耙数	33	Distance from dorsal-fin origin to pectoral-fin insertion 背鰭起部から胸鰭基底上端にかけての距離	30.3
Gill rakers on 2nd gill arch (upper) 第2鰓弓上枝鰓耙数	10	Distance from dorsal-fin origin to pelvic-fin insertion 背鰭起部から腹鰭起部にかけての距離	22.2
Gill rakers on 2nd gill arch (lower) 第2鰓弓下枝鰓耙数	19	Distance between dorsal and anal fin origins 背鰭起部から臀鰭起部にかけての距離	26.0
Gill rakers on 2nd gill arch (total) 第2鰓弓総鰓耙数	29	Distance between pectoral and pelvic fin insertions 胸鰭基底上端から腹鰭起部にかけての距離	15.3
Gill rakers on 3rd gill arch (upper) 第3鰓弓上枝鰓耙数	9	Distance from pelvic-fin insertion to anal-fin origin 胸鰭基底上端から腹鰭起部にかけての距離	19.0
Gill rakers on 3rd gill arch (lower) 第3鰓弓下枝鰓耙数	13	Orbit diameter 眼窩径	7.7
Gill rakers on 3rd gill arch (total) 第3鰓弓総鰓耙数	22	Snout length 吻長	5.0
Gill rakers on 4th gill arch (upper) 第4鰓弓上枝鰓耙数	7	Pelvic-fin length 腹鰭長	12.6
Gill rakers on 4th gill arch (lower) 第4鰓弓下枝鰓耙数	10	Maxilla length 上顎長	21.3
Gill rakers on 4th gill arch (total) 第4鰓弓総鰓耙数	17	Mandibular length 下顎長	19.6
Gill rakers on posterior face of 3rd gill arch 第3鰓弓後面上の鰓耙数	5		
Prepelvic scutes 腹鰭前方稜鱗数	6		
Postpelvic scutes 腹鰭後方稜鱗数	8		
Total pelvic scutes on ventral 体腹縁上の総稜鱗数	14		
Lateral scale rows in longitudinal series 体側縦列鱗数	35		
Transverse scales 体側横列鱗数	8		
Pseudobranchial filaments 擬鰓上の鰓弁数	20		

on anterior surface of gill rakers even; anal fin with 4 unbranched and 29 branched fin rays; a row of prepelvic scutes originating posterior to pectoral-fin insertion. Although *T. baelama* is very similar to *Thrissina encrasicholoides* (Bleeker, 1852) in sharing a short maxilla posteriorly slightly beyond the anterior margin of the preopercle, and less than 20 (total) scutes on the abdomen, the former is distinguished from the latter by a row of prepelvic scutes originating posterior to the pectoral-fin insertion (vs. one or two weakly developed scutes immediately behind the isthmus in *T. encrasicholoides*) and the anal fin with 26–31 branched rays (vs. 24–29) (Nelson 1982; Whitehead et al. 1988; Wongratana et al. 1999; Hata & Koeda 2020).

In Japanese waters, *T. baelama* has been reported only from the Ogasawara Islands (Kishinouye 1911) and the Ryukyu Archipelago. Although Doi et al.

(2015) reported the species from the Hibikinada Sea, off northern Kyushu, his specimen (OMNH-P 25893) has been re-identified as *Thrissina chefuensis* (Günther, 1874) (Hata & Nakae 2019; Hata et al. 2020). In the Ryukyu Archipelago, Senou & Suzuki (1980) reported *T. baelama* with voucher specimens from the Yaeyama Islands (Ishigaki-jima and Iriomote-jima islands). The species has subsequently been reported from Miyako-jima Island (Kanashiro & Shichijo 1995; Tachihara et al. 2002, 2003) and Ishigaki-jima Island (Kanashiro et al. 1998). However, these records are not supported by voucher specimens. Additionally, Yoshigou's (2014) review of the inland ichthyofauna of the Ryukyu Archipelago reported the species from a tidal area on Okinawa-jima Island, but neither references nor voucher specimens were provided. Therefore, the present specimen represents the first specimen-based record of *T. baelama* from this island.

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### 沖縄島初記録の絶滅危惧種カタクチイワシ科魚類オオイワシ *Thrissina baelama*

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**要旨**．東京大学総合研究博物館動物部門の所蔵標本の中に，1936年に沖縄島において採集されたカタクチイワシ科魚類オオイワシ *Thrissina baelama* 1個体が確認された．環境省版海洋生物レッドリストにおいて絶滅危惧 IA 類に指定されている本種は，その日本における記録は少なく，沖縄島における標本に基づく記録はなかった．したがって，上記の標本は本種の沖縄島における出現を確実に裏付けるものとなる．

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