

## Specimens of the family Istiophoridae (Actinopterygii: Teleostei) deposited in the Department of Zoology, The University Museum, The University of Tokyo

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### Abstract

A list of specimens of Istiophoridae deposited in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) is provided. However, no specimens were found of Xiphiidae, which together with Istiophoridae comprise the superfamily Xiphioidea. Judging from the ZUMT ledger and ZUMT specimens located during this study indicated that 72.7% of istiophorid specimens originally registered in ZUMT were present, the remainder being lost. The latter includes the holotype of *Tetrapturus angustirostris* Tanaka, 1915, described from a ZUMT specimen collected from Funakata, Tateyama City, Chiba Pref.

### Introduction

The billfishes, including marlins and sailfish, in the family Istiophoridae includes at least five genera and nine species (Collette et al. 2006). Among them, four genera and five species have been recorded from Japanese waters (Nakabo and Doiuchi 2013). All species are fished and marketed circumglobally, and are also popular as sport fishing targets (Nakamura 1997a, b, 2001b, 2002, 2016; Hata and Motomura 2015). Although the family is similar to Xiphiidae (swordfishes) in sharing a maxilla extending like a sword, the former is characterized by a long pelvic fin (vs. pelvic fin absent in Xiphiidae), and two keels on the caudal peduncle (vs. a single keel) (Nakamura 2001a, b). Xiphioidea, a superfamily including Istiophoridae and Xiphiidae, has long been considered related to Scombroidei (e.g., Matsubara 1955; Johnson 1986; Nakabo and Doiuchi 2013). However, recent molecular phylogenetic studies have shown that the superfamily is more closely related to Menidae, Nematistiidae, and Carangidae (Mirande 2016; Rabosky et al. 2018; Girard et al. 2020).

During a survey of the fish collection held in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT), eight istiophorid specimens plus several additional registrations of Istiophoridae were found. A list of the specimens is provided below.

## Materials and Methods

The specimens of Istiophoridae in the Department of Zoology, The University Museum, The University of Tokyo (abbreviated as ZUMT) were identified during the present study, following Nakamura et al. (1968), Nakamura (1983, 1985, 2001b) and Nakabo and Doiuchi (2013), with the species classification following Collette et al. (2006). Each specimen-lot contained a single specimen. Parentheses following registration numbers include [(body length (in mm; measured from tip of lower jaw to end of middle caudal-fin rays); collection locality; collection date; collector (if available)]. The ZUMT specimens listed herein are stored in Room 406 (specimen storage room), in the museum building (as of Dec. 2021).

## Collection of Istiophoridae in ZUMT

Eight specimens of a single istiophorid species, *Istiophorus platypterus* (Shaw, 1792), collected widely from the Pacific coast of southern Japan and off Shimane Pref., were confirmed in the ZUMT collection. However, according to the ZUMT ledgers, 11 specimens were registered as かじき or かぢき (“Kajiki”, Japanese name for istiophorid species), or under generic names included in the family by Nakamura (1983, 1985). Therefore, more than 25% of specimens originally registered have been lost (72.7% remaining). Furthermore, because many ledger entries refer to lot numbers only (lacking species names), it is suggested that even more ZUMT specimens have been lost. Although all species in the family Istiophoridae attain up to 2 m total length, with larger individuals frequently caught and landed in Japan (Nakamura et al. 1968; Nakamura 1983, 1985, 2001b; Miura 2012; Hata 2018, 2020), all of the istiophorid specimens observed in this study were juveniles (< 70 cm body length). Although other larger individuals may not have been collected in the first place, due to physical restrictions due to their size, Tanaka’s (1915) holotype of *Tetrapturus angustirostris* Tanaka, 1915 (ZUMT 4187, 2000 mm total length) was also not found. In fact, it is highly likely that most (if not all) of the missing registered individuals were large specimens. In addition, no ZUMT specimens or ZUMT ledger registrations of examples of Xiphiidae were found.

## Species account

### Family Istiophoridae マカジキ科

#### *Istiophorus platypterus* (Shaw, 1792) バシヨウカジキ

ZUMT 4428 (98.5 mm; Uchiura, Numazu City, Shizuoka Pref., Japan; coll. by T. Aoki)

ZUMT 18644 (259.4 mm; Kashiwa-jima Island, Otsuki Town, Kochi Pref., Japan; Aug. 1928; coll. by T. Kamohara)

ZUMT 20541 (154.4 mm; Wakayama Pref., Japan; Jan. 1920)

ZUMT 26220 (339.8 mm; Goza, Shima City, Mie Pref., Japan; coll. by Y. Ozaki)

ZUMT 31182 [approx. 607 mm (cut into two pieces); Matsue City, Shimane Pref., Japan; donated by R. Yanai (Matsue High School)]

ZUMT 31668 [(215.6 mm; probably collected from Ibaraki Pref., Japan; donated by K. Tashiro (Ibaraki Prefectural Fisheries Experimental Center)]

ZUMT 40295 (112.4 mm; Misaki, Miura City, Kanagawa Pref., Japan)  
ZUMT 63357 (75.7 mm; probably collected from Misaki, Miura City, Kanagawa Pref., Japan;  
1916; coll. by K. Aoki)

### Specimens recorded in the ZUMT specimen ledger, but not found

ZUMT 3875 (as *Istiophorus* sp.; caught in Funakata, Tateyama City, Chiba Pref., Japan and  
obtained at Tokyo Market, Tokyo Met., Japan)  
ZUMT 4187 (holotype of *Tetrapturus angustirostris* Tanaka, 1915; Funakata, Tateyama City,  
Chiba Pref., Japan)  
ZUMT 5890 [as *Istiophorus orientalis* (currently regarded as a junior synonym of *I.*  
*platypterus*; Nakamura 1983, 1985), バシヨオカヂキ; Misaki, Miura City, Kanagawa  
Pref., Japan; 1894; coll. by K. Aoki]

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