

List of specimens of the families Coryphaenidae and Menidae (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 Coryphaenidae and Menidae deposited in the Department of Zoology, The University Museum, The University of Tokyo is provided. No types are known for the families in the collection. Both valid coryphaenid species and *Mene maculata* (Bloch & Schneider, 1801), the sole extant species of Menidae, are represented.

Introduction

The dorados or dolphinfishes (family Coryphaenidae) include two species, *Coryphaena equiselis* Linnaeus, 1758 and *Coryphaena hippurus* Linnaeus, 1758, the former differing from the latter in having the dorsal fin with usually 55 or fewer fin rays (vs. usually 56 or more in *C. hippurus*), lateral-line scales 200 or fewer (vs. 200 or more), vertebrae 33 (vs. 31), greatest body depth in adults > 25% of standard length (vs. < 25%), and tongue tooth patch broad and trapezoidal (vs. small and oval). Both species are distributed in warm seas worldwide, including Japan (Gibbs and Collette 1959; Collette 1999, 2002, 2016; Senou 2013a), and are important for fisheries due to their large body, reaching to 1 m or more. This is particularly so in Hawaii, coryphaenids being called “Mahi-mahi” and traded at high prices (Collette 2002, 2016; Chiang et al. 2014; Kawama 2017a; Koeda 2018, 2019a, 2020). The family is diagnosed by a long dorsal fin originating on the nape and continuing almost to the caudal fin, the dorsal and anal fins without spines, a deeply forked caudal fin and well-developed pelvic fin, and both jaws with numerous fine teeth (Collette 1999, 2002, 2016).

The family Menidae includes a single recent species, *Mene maculata* (Bloch & Schneider, 1801) (Woodland 2001), although numerous fossil species are known (Friedman and Johnson 2005). The family is characterized by a strongly compressed and very deep body, with a sharp-edged ventral margin, small, protrusible vertical mouth, and the anal fin with a long base, and short fin rays and membrane (Woodland 2001). *Mene maculata* is widely distributed in the Indo-West Pacific from the eastern coast of Africa to Japan and Vanuatu, and marketed in

subtropical and tropical regions, including Japan (Woodland 2001; Matsunuma 2013, 2018; Chiang et al. 2014; Kawama 2017b; Hata 2018, 2020; Koeda 2019b).

Both families have been frequently included in Carangiformes in recent years (e.g., Girard et al. 2020), Coryphaenidae having been determined as a sister group of Rachycentridae in several recent studies (Betancur-R et al. 2017; Rabosky et al. 2018; Girard et al. 2020). In contrast, the phylogenetic position of Menidae is uncertain, the family having been hypothesized as a sister group of various groups, including Polynemidae (Mirande 2016), Lactariidae (Betancur-R et al. 2017), and Xiphioidea (Istiophoridae + Xiphiidae) (Rabosky et al. 2018; Girard et al. 2020). Conversely, Betancur-R et al. (2017) considered Menidae as *incertae sedis* at the ordinal level.

During an ongoing survey of the fish collection deposited in The Department of Zoology, The University Museum, The University of Tokyo (ZUMT), specimens of the above two families, collected from various areas, were found. A list of the specimens is provided herein.

Materials and Methods

Specimens of Coryphaenidae and Menidae in the Department of Zoology, The University Museum, The University of Tokyo (abbreviated as ZUMT) were identified following Gibbs and Collette (1959), Collette (1999, 2002, 2016), and Senou (2013a), and Woodland (2001) and Senou (2013b), respectively. Each specimen lot contained a single specimen. Parentheses following registration numbers include [(standard length (in mm), collection locality, collection date, and collector)]. The collection year and collector for some specimens was estimated by following Koeda et al. (2022). Remarks are given where applicable. Collection data of specimens are omitted when matching those of immediately following specimens. The ZUMT specimens listed herein were stored in Room 406 (specimen storage room) in the museum building, mostly in shelved bottles, although 32 coryphaenid specimens larger than 200 mm SL were stored in a glass tank (labelled “Coryphaenidae”; glass lid sealed with a silicon adhesive) in Room 406 (as of Mar. 2022). Although some of the ZUMT specimens collected by Dr. Tokiharu Abe (most with collection data missing) had not been registered into the ZUMT collection, they are listed herein together with their ZUMT ABE number (number with underbar written on specimen label), in the hope that Dr. Abe’s catalog books with collection data will be rediscovered in the future.

Results

The deposition of 40 ZUMT and five ZUMT ABE specimens of the two coryphaenid species, and 12 ZUMT and seven ZUMT ABE specimens of *Mene maculata* in the ZUMT fish collection were confirmed. No types are known for the families in the collection. Some coryphaenid specimens are thought to have been stored in formalin for a considerable period since their collection, and it was noted that their muscle tissues, including the caudal peduncle, had become extremely brittle. Currently, all of the specimens recorded here are stored in ethanol.

In total, 49 and 12 specimens were registered as “*Coryphaena*” or “Shiira” (シイラ, Japanese name for coryphaenid fishes) and “*Mene*” or “Ginkagami” (ギンカガミ, Japanese name for *Mene maculata*) in the ZUMT ledgers, respectively (up to ZUMT 61611), indicating a loss of registered specimens from the collection of 18.4% and 8.3%, respectively.

Specimens added to the ZUMT collection after ZUMT 61612 had remained unregistered until the present time. These included 11.1% and 5.3%, respectively, of the total specimens of each family. All have now been registered.

Species accounts

Family Coryphaenidae シイラ科 *Coryphaena equiselis* Linnaeus, 1758 エビスシイラ

JAPAN

ZUMT 38872 (approx. 342.9 mm, caudal fin detached; probably collected from Shimane Prefecture)
ZUMT 46601 (182.6 mm), ZUMT 46602 (170.2 mm; Hachijo-jima Island, Izu Islands)
ZUMT 55545 [323.0 mm; obtained from Chinen Fisheries Cooperative Association, Nanjo City, Okinawa-jima Island, Ryukyu Islands; 15 Sept. 1986; coll. by H. Senou]

NEW GUINEA

ZUMT 63146 (136.2 mm; New Guinea; coll. by T. Abe)

INDIAN OCEAN

ZUMT 49056 [79.7 mm; approx. 300 km southeast of Seychelles (9°09'S, 58°00'E) (stomach content of *Xiphias gladius* Linnaeus, 1758); 23 Feb. 1955; coll. by Y. Tomiyama]

LOCALITY UNKNOWN

ZUMT 63055 [121.5 mm; locality unknown (same as ZUMT ABE 56-193; labelled as “St. 7”); 22 June 1931; from stomach of *Katsuwonus pelamis* (Linnaeus, 1758)
ZUMT ABE 60-1058 (290.2 mm; no data)

Remarks: Hata and Koeda (2022) reported ZUMT 46601 and 46602, collected from Hachijo-jima Island, as the first records of *C. equiselis* from the Izu Islands.

Coryphaena hippurus Linnaeus, 1758 シイラ

JAPAN

ZUMT 4344 (239.7 mm), ZUMT 4345 (242.3 mm), ZUMT 6725 (262.3 mm), ZUMT 6726 (241.3 mm), ZUMT 6728 (268.8 mm; obtained at Tokyo Market, Tokyo Met.)
ZUMT 14773 (352.5 mm; Yaeyama Islands, Ryukyu Archipelago; coll. by H. Yashiro)
ZUMT 16510 (398.1 mm; Ishinomaki City, Miyagi Pref.; 10 Oct. 1925; coll. by G. Toba)
ZUMT 23890 (289.6 mm; Taniyama, Kagoshima City, Kagoshima Pref.)
ZUMT 24230 (299.3 mm; probably from Fukuoka Pref.; coll. by personnel at Fukuoka Prefectural Fisheries Experimental Station)

ZUMT 24317 (373.0 mm; Miyazu City, Kyoto Pref.; Nov. 1931; coll. by personnel at Kyoto Prefectural Fisheries Experimental Station)
ZUMT 31282 (244.7 mm; Matsue City, Shimane Pref.)
ZUMT 39269 (approx. 196.1 mm, caudal fin detached; probably collected from Iwate Prefecture; donated by R. Chiba, Hirota Village, Iwate Prefecture)
ZUMT 40537 (466.2 mm), ZUMT 40538 (492.7 mm; Hachijo-jima Island, Izu Islands)
ZUMT 41206 (242.0 mm), ZUMT 41229 (258.9 mm), ZUMT 41271 (245.4 mm), ZUMT 41272 (246.3 mm), ZUMT 41273 (253.1 mm), ZUMT 41274 (264.3 mm), ZUMT 41275 (222.6 mm), ZUMT 41276 (241.1 mm), ZUMT 41277 (260.0 mm), ZUMT 41278 (236.4 mm; Uozu or Namerikawa City, Toyama Pref.; coll. by I. Tomiyama)
ZUMT 45334 [99.9 mm; probably collected from Chiba Pref.; coll. by M. Yosezato (Naruto Junior High School)]
ZUMT 51292 (approx. 501.7 mm, body cut; East China Sea, obtained at Fukuoka Fish Market; 24 Dec. 1959; coll. by Y. Tominaga)
ZUMT 55826 (288.3 mm; Hayase, Mihama Town, Fukui Pref.; 1 Nov. 1986; coll. by M. Aizawa et al.)
ZUMT 60814 (37.0 mm; probably Sagami Bay or Suruga Bay; 18–19 July 1990; RV *Tansei-maru*)
ZUMT 63188 (525.0 mm; Ogasawara Islands; Mar. 1913)
ZUMT ABE 9059 (90.2 mm; Osaki, Shimotsu, Kainan City, Wakayama Pref.; 19 Feb. 1953; set net)

LOCALITY UNKNOWN

ZUMT 62859 (111.1 mm), ZUMT 62860 (113.9 mm), ZUMT 62891 (170.5 mm+, head only; no data), ZUMT 62892 (324.0 mm; no data), ZUMT ABE 60-1053 (66.3 mm), ZUMT ABE 61-879 (59.3 mm), ZUMT ABE 61-986 (73.1 mm)

Family Menidae ギンカガミ科

Mene maculata (Bloch & Schneider, 1801) ギンカガミ

JAPAN

ZUMT 12766 (110.7 mm; obtained at Tokyo Fish Market, Tokyo Met.)
ZUMT 22532 (75.1 mm; Tanabe City, Wakayama Pref.)
ZUMT 24127 (95.1 mm), ZUMT 24128 (96.1 mm; Arata, Kagoshima City, Kagoshima Pref.)
ZUMT 39175 (59.0 mm; Ukitsu, Muroto City, Kochi Pref.; probably collected by S. Tanaka)
ZUMT 41017 (94.1 mm; Tatsugahama, Minoshima, Arida City, Wakayama Pref., Japan; 20 Nov. 1941; coll. by M. Inoue)
ZUMT 49976 [157.5 mm; Arikawa, Shinkamigoto Town (Nakadori-jima Island, Goto Islands), Nagasaki Pref.; 10 June 1953; coll. by I. Tomiyama]
ZUMT 50694 (49.8 mm), ZUMT 50696 (27.3 mm; Totoro, Nobeoka City, Miyazaki Pref.; 10 Sept. 1959; coll. by Y. Tominaga)
ZUMT 54125 (182.1 mm; Sakihama, Muroto City, Kochi Pref.; 20 Feb. 1976)
ZUMT ABE 10105 (27.6 mm; Manazuru Town, Kanagawa Pref.; 2 Oct. 1954)

EAST CHINA SEA

ZUMT 59865 [approx. 186.2 mm (body cut); East China Sea; coll. by Y. Tominaga]

INDONESIA

ZUMT 62625 (114.0 mm; Jakarta, Java; 5 May, 1909; coll. by K. Aoki and I. Iijima)

LOCALITY UNKNOWN

ZUMT ABE 60-1332 (84.0 mm), ZUMT ABE 61-939 (37.5 mm), ZUMT ABE 61-940 (39.2 mm), ZUMT ABE 61-1055 (106.5 mm), ZUMT ABE 61-1074 (112.8 mm), ZUMT ABE 61-1075 (38.2 mm; no data)

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