

First record of the Pacific bluefin tuna *Thunnus orientalis* (Temminck & Schlegel, 1844) from the coast off Sur, Sultanate of Oman

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Abstract— A single specimen of the Pacific bluefin tuna *Thunnus orientalis* was caught on 11 May 2017 in a long-line operated about 40 nautical miles off the coast of Sur atconfluent of Sea of Oman and Arabian Sea coast of Oman. This first record of its occurrence indicates the extension of distributional range of the species to the Arabian Sea coast of Oman.

Keywords— coast off Sur, Pacific Bluefin, Arabian Sea.

I. INTRODUCTION

Oman has a very long coastline of 3165 km with connections to three seas namely the Arabian Gulf, the Gulf of Oman and the Arabian Sea. The country has rich fish biodiversity (Al-Jufaily *et al.*, 2010). The biodiversity of fish fauna of Omani coasts had been reported by several earlier workers (Boulenger, 1887; Steindachner, 1902; Regan, 1905; Norman, 1939; White & Barwani, 1971; Randall, 1995; Al-Abdessalaam, 1995; Fouda *et al.*, 1997). In addition, there is scope for inclusion of several new species and new records to the list of known species of Omani fishes (McKoy *et al.*, 2009; Jawad & Al-Mamry, 2009). As the result, a number of new records of fish species were reported from the Sea of Oman and Arabian Sea off Oman from recent studies (Jawad & Al-Mamry, 2009; Jayabalan *et al.*, 2010; Al-Jufaily *et al.*, 2010; Jawad *et al.* 2014).

Fishes of the genus *Thunnus*(Perciformes: Scombridae) are represented by eight species namely albacore, *T.*

alalunga (Bonnaterre, 1788), southern bluefin tuna, *T. maccoyii* (Castelnau, 1872), bigeye tuna, *T. obesus* (Lowe, 1839), Pacific bluefin tuna, *T. orientalis* (Temminck & Schlegel, 1844), Atlantic bluefin tuna, *T. thynnus* (Linnaeus, 1758), yellowfin tuna, *T. albacares* (Bonnaterre, 1788), blackfin tuna, *T. atlanticus* (Lesson, 1831) and longtail tuna, *T. tonggol* (Bleeker, 1851) from world oceans (Froese & Pauly, 2009. Godsil, & Byers, 1945; Collette & Nauen 1983). Of these, Pacific bluefin tuna, *T. orientalis* is a commercially valuable species and is widely distributed in the Pacific Ocean (Froese & Pauly, 2009) and seasonally inhabiting subarctic, temperate, and tropical waters in the North Pacific Ocean as well as temperate waters in the Southern Hemisphere around Australia and New Zealand (Collette *et al.*, 2014).

Pacific bluefin tuna grows to a maximum weight of ~650 kg, a total length of ~300 cm and age of at least 20 years and it is the second largest species of tuna, after the Atlantic bluefin tuna (*Thunnus thynnus*) (Collette and Nauen, 1983; Kitagawa *et al.*, 2007; Collette *et al.*, 2014). Pacific blue fin tuna is highly prized in the Japanese sashimi markets and during 2014 about 17,076 t of fish were landed; however, *T. orientalis* is reported as 'Vulnerable' under IUCN red list of species (Collette *et al.*, 2014).

(Collette and Nauen, 1983; Foreman and Ishizuka, 1990; Bayliff, 1994)



Fig.1: Map of Sultanate of Oman

From the Omani waters so far only three species such as *T. tonggol*, *T. albacares* and *T. obesus* are known (Godsil & Byers, 1945; Collette *et al.*, 2001; Randall, 1995; Froese & Pauly, 2011). In the present report, the occurrence of single specimen of Pacific Bluefin tuna *T. orientalis* off the coast of Suratconfluent of Sea of Oman and Arabian Sea coast of Oman (Fig.1) is recorded for the first time.

SYSTEMATICS

Order: PERCIFORMES

Family: SCOMBRIDAE

Genus: *Thunnus*

Species: *orientalis*



Fig.2: Specimen of *T. orientalis* collected from Oman

II. MATERIAL EXAMINED

One specimen, Fig. 2, is 250 cm total length (TL), (204 cm standard length- SL; 224 cm fork length- FL); caught by long line; 11 May 2017. Atconfluent of Sea of Omanand Arabian Sea coast of Oman. It is difficult to say precisely because the fisherman did not have GPS (global positioning system).

The sample was brought to the Marine science laboratory at the Marine Science and Fisheries Centre, Ministry of Agriculture and Fisheries Wealth, Sultanate of Oman for analysis. After weighing, the morphometric and meristic characters of the fish were recorded following standard procedures (John & Schaefer, 1949). Then, the fish was cut

open to identify the sex, maturity stage of the gonad and feeding intensity. The liver and air bladder structure were observed. Otoliths were extracted from head for subsequent age analysis. The muscle tissue was collected for genetic analysis. The fish sample was buried to preserve and display the bones in the museum.

Description

The fish weighed 237 kg and was a mature male. The feeding intensity was 1/2 full stomach and the food was in fully digested state. Ventral surface of liver was striated with blood vessels. Air bladder was irregular. There were 36 gill rakers in the first left gill arch (Fig. 3)



Fig.3: First gill arch- Total gill rakers- 36.

The morphometric characters (Table- 1) and meristic counts (Table- 2) of the specimen agree with the descriptions of the species *T. orientalis* which was further confirmed by the genetic analysis of mitochondrial DNA with D-Loop (NCBI. Accession No. JN631213.1).

Body: Fusiform, almost round, very robust in front and tapering towards caudal peduncle. Head lengthless than body depth. Mouth large, teeth small and conical in a single series. The first dorsal height less (10.7% of FL) than the second dorsal fin height (16.1% of FL) in the present specimen; pectoral fin short and less than head length and about 17% of FL. In *T. orientalis*, the short pectoral fin and heights of 1st and 2nd dorsal fins are considered as the

prominent morphometric characters to identify the species (Nelson, 2006).

Coloration: Lower side of belly was silvery white but no other colour pattern was visible. This might be due to the delay in bringing the specimen to the laboratory after three days. However, in fresh specimens lower sides and belly are with faint colourless transverse lines alternated with rows of faint colourless dots (Collette *et al.*, 1983; Nelson, 2006; Tamura & Takagi, 2009). The first and second dorsal fins were dark bluish with dusky yellow tips. Dorsal and anal Finlets were yellowish, base reddish-brown towards middle and tips. Median caudal keel was black.

Table.1: Important morphometric measurements of *T. orientalis*

S.No.	Morphometric measurements	cm	In FL (%)
1	Head length	57	25.4
2	Head depth	51	22.8
3	Pre-opercle length	44	19.6

4	Post orbital distance	33	14.7
5	Eye Diameter	6	2.7
6	Upper jaw length	20	8.9
7	Body depth	131	58.5
8	Girth	59	26.3
9	Distance snout to eye	19	8.5
10	Distance snout to nostril	17	7.6
11	Distance snout to 1 st dorsalfin base	66.5	29.7
12	Distance snout to 2 nd dorsalfin base	116	51.8
13	Distance between 1 st and 2 nd dorsalfin	22	9.8
14	1 st Dorsalfin length	49	21.9
15	1 st Dorsalfin height	24	10.7
16	2 nd Dorsalfin length	20	8.9
17	2 nd Dorsalfin height	36	16.1
18	Anal fin length	15	6.7
19	Anal fin height	36	16.1
20	Pectoralfin length	38	17.0
21	Caudal peduncle length	8	3.6
22	Caudalfin spread	71	31.7
23	Median keel height	5	2.2
24	Median keel length	25	11.2

Table.2: Meristic Counts of *T. orientalis*

S. No.	Meristic Counts	No.
1	1 st Dorsal fin spines	XIII
2	2 nd Dorsal fin rays	15
3	Dorsal Finlets	9
4	Pectoral fin rays	30
5	Anal fin rays?	12
6	Anal Finlets	8
7	Gill rakers	36
8	Keels	3

III. DISCUSSION

Thunnus orientalis is an epipelagic oceanic species that forms school by size and performs wide horizontal and vertical migrations and seasonally moves close to the shore (Magnuson, 1973; 1978; Kitagawa *et al.* 2007). This species is distributed in depth range of 1 to 550 m (Froese & Pauly, 2009; IUCN, 2014). The fish has great tolerance of sea-surface temperature ranging from 17°C to 23°C and be able to dive deep waters as cold as ~3°C (fish Base). It is a voracious predator feeding primarily on a variety of small schooling fishes such as anchovies, sardines, herrings, menhaden and mackerels and also on squids, crabs and other less sessile organisms (Collette and Nauen, 1983; Allain, 2005; Swada *et al.*, 2005).

The record of *T. orientalis* from the Arabian Sea coast of Oman is significant as the species has been found distributed in north and south Pacific (Ashida *et al.* 2015; Collette *et al.* 2014, Lewis, 2012; Itoh *et al.* 2003; Tanaka *et al.* 2006). Although, this species moves in schools, only single specimen was caught presently. This would lead to speculations such as incidental occurrence owing to disorientation or be linked to the ecological changes that occurred due to rise in water temperature in its distributional ranges causing a decline in prey organisms and hence, migrated to more abundant prey related regions or to unknown biotic and/or anthropogenic factors (Sharp & Dizon, 1978; Kimura *et al.*, 2010).

The species *T. orientalis* is represented by a single Pacific-wide stock that is found primarily in the North Pacific

Ocean (Kitigawa *et al.*, 2007). Hence, it may be presumed that the migration of the species from the north Pacific to the Arabian Sea coast of Oman might have occurred through the Bay of Bengal. Hence, it would be interesting to know whether the extension of the species distribution is very recent to the countries bordering the Bay of Bengal coast or already established populations are available in the region. Intensive research in this line is needed to better explain the occurrence of a solitary Pacific blue fin tuna from Oman. Tagging studies would reveal the possible routes of movement pattern of *T. orientalis* if any, from north Pacific to the western Indian Ocean.

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