

by James H. Uchiyama

Valid name *Thunnus obesus* (Lowe 1839) (Fig. 75)
Synonymy *Thynnus obesus* Lowe 1839
Thynnus sibi Temminck and Schlegel 1844
Orcynus sibi Kitahara 1897
Thunnus sibi Jordan and Snyder 1901
Germo sibi Jordan and Snyder 1901
Thunnus mebachi Kishinouye 1915
Parathunnus mebachi Kishinouye 1923
Parathunnus sibi Jordan and Hubbs 1925
Parathunnus obesus Jordan and Evermann 1926
Thunnus obesus Fraser-Brunner 1950
Parathunnus obesus mebachi Jones and Silas 1960
Thunnus obesus sibi Jones and Silas 1963
Thunnus obesus mebachi Jones and Silas 1964
 (from Gibbs and Collette 1967)

Common and vernacular names Bigeye tuna; poo-nui; mebachi shibi

Distribution

Occurs throughout the Hawaiian Archipelago, however, caught only at Ladd and Nero Seamounts and Raita Bank in NWHI during NMFS surveys. Young bigeye tuna (<20 kg) usually associated with shallow banks. Large individuals believed to inhabit deeper waters between 150 and 200 m (Hanamoto 1976).

Distinguishing characteristics

D. XIV, 15; A. 14 (Godsil and Byers 1944); Gr. 23-31 (Gibbs and Collette 1967). Body fusiform, slightly compressed laterally; dorsal fins separated by a narrow interspace; caudal fin lunate; pectoral fins extend past the anterior edge of second dorsal; two interpelvic processes between pelvic fins; second dorsal and anal fins only slightly higher than first dorsal; 8-10 dorsal, 7-10 anal finlets. Head conical with a terminal mouth which extends back to vertical axis through eye. Head and eye proportionally large. Head length nearly equal to body depth in young, less than equal in older individuals. Body covered with small scales; indistinct corselet. Ventral surface of liver striated. Keel well developed on caudal peduncle and extends to caudal fin where it is surrounded by two small keels (Gibbs and Collette 1967; Fischer and Whitehead 1974).

In life, dark blue to black dorsally, silvery white ventrally. Iridescent greenish-yellow patch present from eye to above base of pectoral; second dorsal and anal fins light yellow; finlets bright yellow with black edges (Gibbs and Collette 1967).

Life history

The species is heterosexual and has no external characteristics to distinguish males from females. In Hawaiian and central Pacific waters, females attain sexual maturity and spawn at 14-20 kg (Yuen 1955). The spawning area of the species is between lat. 12°N-12°S and long. 120°E-110°W (Kikawa 1962). Spawning occurs throughout the year in the equatorial region, but peaks from April through

September (Kikawa 1962). Fecundity estimates for a single spawn range from 2.9 to 6.3 million eggs for fish 39 to 107 kg (Yuen 1955).

Newly hatched larvae are 1.5 mm in total length (Kume 1962). Growth is rapid but sexually dimorphic. Males attain a size of 23.7 kg in 2 years, 46.3 kg in 3 years, 66.7 kg in 4 years, and 115.3 kg in 7 years. For females, the sizes attained were 23.9 kg in 2 years, 45.7 kg in 3 years, 64.0 kg in 4 years, and 103.8 kg in 7 years (Shomura and Keala 1963).

Bigeye tuna feeds opportunistically on fishes, squids, other molluscs, and crustaceans. Small individuals (<140 cm FL) consume a larger proportion by volume of crustaceans and fishes and a smaller proportion of molluscs than large individuals (>140 cm) (King and Ikehara 1956).

The length-weight relationship of bigeye tuna is:

$$W = 8.071 \times 10^{-5} L^{2.90182},$$

where W = weight (lb) and L = fork length (cm) (Nakamura and Uchiyama 1966).

Gear and catch

In the Hawaiian fishery, bigeye tuna annual landings in 1961-79 varied widely from 77,064 to 553,744 kg and averaged 280,141 kg. Most of the fish were caught around the main islands by longline vessels; however, since 1971, the ika-shibi fishery using handline has developed significantly and contributed a large proportion to the statewide landings.

In the NWHI the species is caught primarily by Japanese longliners and baitboats, which produced an estimated 1,510 and 734 MT, respectively, from within the FCZ around the Hawaiian Islands in 1977 (Yong and Wetherall 1980).

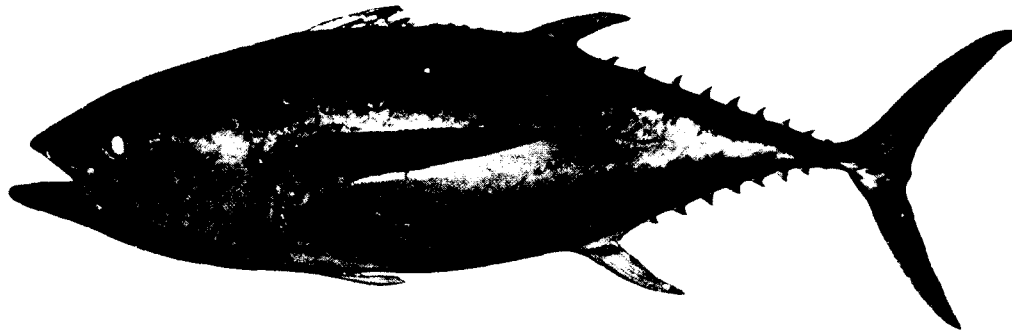


Figure 75.—*Thunnus obesus*.