

by Robert L. Humphreys, Jr.

Valid name *Seriola dumerili* (Risso 1810) (Fig. 58)
Synonymy *Caranx dumerili* Risso 1810
Seriola purpurescens Temminck and Schlegel 1844
Seriola dumerili Weber and De Beaufort 1931
 (from Lindberg and Krasnyukova 1971)

Common and vernacular names Greater amberjack; yellowtail; kahala

Distribution

Widely distributed in the NWHI from Middle Bank to Kure Atoll. Usually inhabits the inner reef as well as the outer slopes of the island shelf. Shows considerable vertical mobility ranging from the surface to 247 m.

Distinguishing characteristics

D. I, VII, I, 30-31; A. II, I, 19-21 (Jordan and Evermann 1905; Lindberg and Krasnyukova 1971). Body elongated, oval in cross-section. Head conical in profile, eye moderate, mouth large, oblique. Maximum depth at midbody, tapering posteriorly to a short, narrow caudal peduncle. Broad bands of villiform teeth cover jaws, palatines, tongue, and vomer.

Dorsal fin composed of short spinous anterior portion followed by a long, low soft dorsal which is higher anteriorly; anal similar to soft dorsal, preceding spines short. Pectorals short; pelvics inserted posterior to and longer than pectorals; caudal strongly forked (Jordan and Evermann 1905).

Body covered with small cycloid scales; no enlarged scutes along lateral line. Scales not present on opercle, snout, and top of head.

In life predominantly yellow and brown with occasional greenish patches. A thick, prominent yellow stripe extends from maxillary to the eye, then posteriorly from eye, crossing above pectorals to caudal peduncle.

Data from NMFS cruises showed mean lengths and weights of 75.1 cm and 7.24 kg for males and 78.2 cm and 7.79 kg for females. Maximum length was 106.0 cm in males and 149.4 cm in females.

Greater amberjack can be distinguished from its congener, *S. lalandei*, by the presence of 15 or fewer gill rakers on the first lower gill arch, <33 second dorsal rays, maxillary extending back to mideye, and 150-175 transverse scale rows (Gosline and Brock 1960; Lindberg and Krasnyukova 1971).

Life history

Based on samples from the Hawaiian Archipelago, size at maturity in females is 54 cm FL (Kikkawa and Everson 1984). Spawning occurs throughout the year with a peak in April. Fecundity estimates range from 1.3 to 4.0 million eggs for fish 83.0 to 118.6 cm FL.

In Hawaii, as elsewhere in the world, the greater amberjack has been implicated in numerous cases of ciguatera.¹² No relationship

between size and ciguatoxicity among fish in the Hawaiian Archipelago has been found (Kimura et al. 1982). These findings dispute the commonly held notion in Hawaii of higher probability of ciguatoxin in greater amberjack >9.1 kg. The proportion of toxic fish in the NWHI is similar to that for fish around the main islands.

Ciguatoxin is believed to be transmitted through the food chain and to accumulate more among higher predators such as the greater amberjack. *Decapterus* sp. is the primary component in the diet of the greater amberjack caught in the main islands (Humphreys and Kramer 1984). However, ciguatoxic fish in the size group 4.00-8.99 kg has a lower *Decapterus* and higher bottom-associated prey content than the complementary nonciguatoxic group. These results indicate that a shift toward bottom-associated prey may be responsible for the transmission of ciguatoxin up the food chain.

There are dietary differences between greater amberjack sampled from the NWHI and the main islands. Octopus and bottom-associated prey are the predominant dietary components in the NWHI whereas *Decapterus* and water column-associated prey are predominant in the main islands. In both areas there is a dietary increase of *Decapterus* and water column-associated prey with increasing predator size.

The following growth rate of greater amberjack was determined using a freely fitted von Bertalanffy growth equation of:

$$L_t = 149.3(1 - e^{-0.314(t - 0.0420)}),$$

where L = fork length (cm) expressed as a function of time t in years (see footnote 10). This equation projects a length of 37.5 cm at 1 year, 67.5 cm at 2 years, and 89.6 cm at 3 years.

A male to female ratio of 60:40 (N = 209) was observed for specimens collected during NMFS cruises in the NWHI. A much larger sample (N = 3,989) from statewide catches shows a ratio of 52:48.¹³

The functional length-weight relationship for 181 greater amberjack ranging from 49.9 to 113.8 cm FL is:

$$W = 2.21 \times 10^{-8} L^{2.9412},$$

where W = weight (kg) and L = fork length (mm) (Uchiyama et al. 1984).

The catch rates of greater amberjack were fairly uniform from Nihoa to Pearl and Hermes Reef; however, the average size of fish caught from Gardner Pinnacles to Pearl and Hermes Reef was larger

¹²Kubota, W. 1981. Ciguatera fish poisoning cases: A summary from 1900 to December 1980. Pacific Ciguatera Workshop, Honolulu, HI, 18-20 March 1981, WP/7, 14 p.

¹³Polovina, J. J., and B. M. Ito. 1981. Analysis of data from the kahala ciguatera sampling program, April 1979 to December 1980. Pacific Ciguatera Workshop, Honolulu, HI, 18-20 March 1981, WP/1, 4 p.

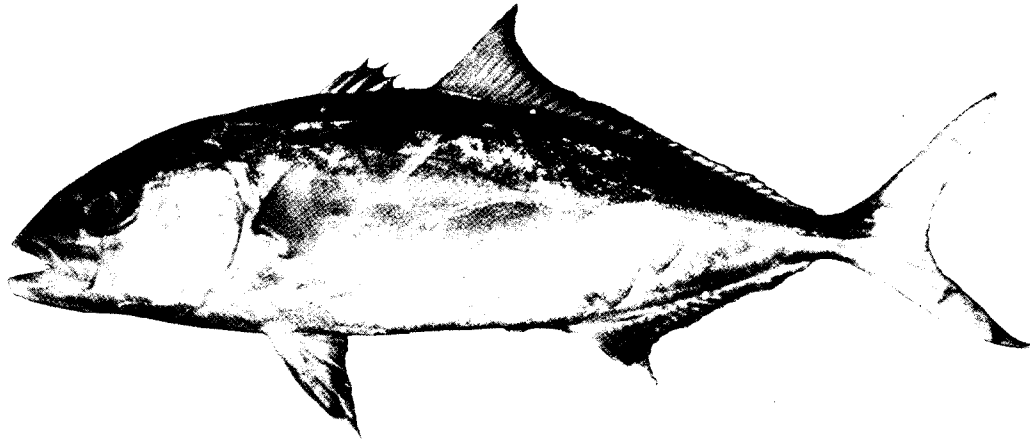


Figure 58.—*Seriola dumerili*.

than that caught from Middle Bank to St. Rogatien (Uchiyama and Tagami 1984). The catch per unit of effort was higher at night (Moffitt 1980).

The vertical mobility of the species theoretically allows it to become associated with members of the snapper-grouper complex; however, competition for bottom-related forage organisms may not be intense or may be limited because it also utilizes *Decapterus* and other water column organisms.

Gear and catch

The greater amberjack is taken mainly by deep-sea handline but also enters traps. Annual landings from the NWHI varied between 614 and 6,311 kg and averaged 3,029 kg during 1959-77.¹⁴ Statewide annual landings for 1961-79 ranged from 13,629 to 47,938 kg and averaged 33,108 kg. Because greater amberjack has been implicated in several ciguatera attacks in Hawaii, the species is generally not sold in the local markets.

¹⁴Polovina, J. J., and R. B. Moffitt. 1980. Commercial bottom handline fishing in the Northwestern Hawaiian Islands 1959-77. Southwest Fish. Cent. Honolulu Lab., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96822-2396. Admin. Rep. H-80-11, 2 p.