by Robert L. Humphreys, Jr.

Valid name *Pristipomoides filamentosus* (Cuvier and Valenciennes 1830) (Fig. 64)

Synonymy
Serranus filamentosus Cuvier and Valenciennes 1830
Chaetopterus microlepis Bleeker 1869
Aprion (Aprion) microlepis Bleeker 1876-77
Aprion microdon Steindachner 1876
Aphareus roseus Castelnau 1879
Bowersia violescens Jordan and Evermann 1904
Apsilus microdon Jordan and Evermann 1905
Aprion filamentosus Gilchrist and Thompson 1909
Aprion microlepis Ogilby 1916
Aprion roseus McCulloch 1917
Pristipomoides filamentosus Barnard 1927
Pristipomoides violescens Jordan and Jordan 1927
Pristipomoides sieboldii Fowler 1928
Pristipomoides microlepis Fowler 1928
Pristipomoides microdon Fowler 1931
Aprion kanekonis Tanaka 1935
Aprion (Pristipomoides) microlepis Weber and De Beaufort 1936
Pristipomoides argyrogrammiscus Smith 1937
Pristipomoides filamentosus roseus Abe and Takashima 1956 (from Kami 1973)

Common and vernacular names Pink snapper; opakapaka

Distribution

Inhabits the outer reef slopes of the islands and banks in the Hawaiian Archipelago. Found in the NWHI from Nihoa to Ladd Seamount on NMFS surveys in depths ranging from 27 to 328 m. Although not caught at NMFS sampling stations at Midway, known to occur there.[18]

Occurs in shallower water in the more northern islands and atolls in the NWHI (based on the maximum capture depth of 328 m at Necker Island, 201 m at Northampton Seamounts, and 108 m at Ladd Seamount). No apparent seasonal variation in distribution (Ralston 1981). Migrates into shallow water at night (based on trap and pot catches during NMFS surveys).

Distinguishing characteristics

D. X, 11; A. III, 8; Pl. II, 12, II; P2, I, 5; Gr. 22-26; LLps. 55-65. Body elongate, somewhat laterally compressed. Distinguishable from its three congeners in Hawaii, *P. auricilla*, *P. sieboldii*, and *P. zonatus*, by the V-shape pattern of the vomerine (Gosline and Brock 1960; Kami 1973).

Broad bands of villiform teeth on jaws, palatine, tongue, and vomer. Outer row of teeth in upper and lower jaws canine, increasing in size near the symphysis (Jordan and Evermann 1905; Kami 1973).

Dorsal fin continuous, unnotched, last dorsal ray elongate. Origin of anal fin under base of third or fourth dorsal ray; last anal ray elongate, similar to last dorsal ray. Pelvic fins thoracic, pointed; when extended, tip of pectoral aligns with base of 10th dorsal spine. Caudal bifurcate, lobes usually equal.

Scales ctenoid, moderate. Scales not present on anterior portion of head including jaws, dorsal, and anal fins; small scales present on caudal. Lateral line complete, extending across upper half of body. Seven to eight rows of scales between origin of dorsal fin and lateral line; 14-16 rows between lateral line and origin of anal fin (Jordan and Evermann 1905; Lindberg and Krasyukova 1971; Kami 1973).

In life, rosy, with violet shades, becoming pale ventrally. Dorsal, anal, and caudal fins a combination of red and yellow hues with lavender margins; pelvic fins white (Jordan and Evermann 1905). No evidence of sexual dichromatism apparent from NMFS studies in the NWHI; however, differences occur in pigmentation of large adults collected from Guam (Kami 1973). Anal fin membranes of females clear, those in males dusky with orange and yellow hues at the anterior and posterior extremities.

Size data of opakapaka collected by NMFS reveal a mean length and weight of 53.8 cm FL and 3.06 kg, respectively. Maximum length and weight were 77.9 cm and 8.00 kg, respectively.

Life history

Size and age at maturity are similar between sexes (Ralston 1981). Testicular and ovarian weights increased greatly in fish from 30-35 cm to 35-40 cm. The age at maturity in both sexes is approximately 2 to 3 years (Ralston 1981; Uchiyama and Tagami 1984). A preliminary gonadal study showed heterogeneous egg development within the ovaries (Kikkawa 1980). A comparison of monthly mean gonadal-somatic indices revealed a single spawning period each year from June through December; spawning peaks in August (Kikkawa

[18]Ralston, S., Fishery Biologist, Southwest Fish. Cent. Honolulu Lab., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96822-2396, pers. commun. 1983.

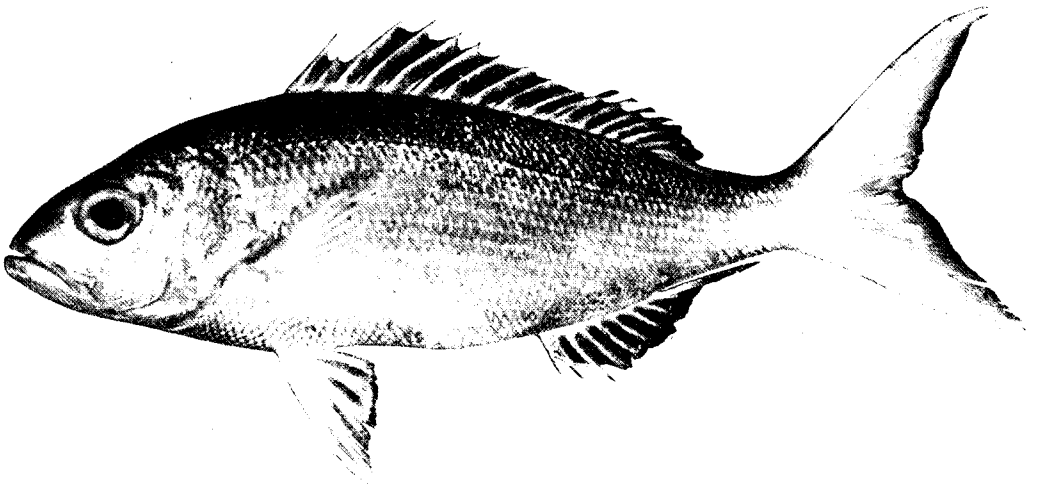

Figure 64.—*Pristipomoides filamentosus*.

1984). Fecundity estimates ranged from 478,000 to 1,461,875 eggs for fish ranging from 48.7 to 76.3 cm FL.

A preliminary analysis of spews from opakapaka in the NWHI shows *Pyrosoma* sp. as the dominant prey. Other items include fish, crustaceans, and molluscs (see footnote 18). *Pyrosoma* is also the predominant prey item of opakapaka caught at Guam (Kami 1973).

Currently there is disagreement on age and growth of opakapaka. Using annuli on the sagitta to estimate the age of opakapaka, NMFS studies indicate a von Bertalanffy growth equation as follows:

$$L_t = 97.1(1-e^{-0.31(t-0.02)}),$$

where L_t = fork length (cm) expressed as a function of t in years (see footnote 10). The projected length-age relationships are: 25.4 cm at 1 year, 44.5 cm at 2 years, 58.6 cm at 3 years, 68.8 cm at 4 years, and 76.4 cm at 5 years. Age estimates derived from whole counts of daily increments on sagittae agree well with those obtained from annuli counts.

Using increment widths as a measure of growth rate, Ralston and Miyamoto (1983) derived the following von Bertalanffy growth curve:

$$L_t = 78.0\ (1-e^{-0.146(t+1.67)}).$$

The projected length-age relationships are 25.2 cm at 1 year, 32.4 cm at 2 years, 38.6 cm at 3 years, 43.9 cm at 4 years, and 48.5 cm at 5 years. There is no significant difference in growth rate between sexes and for fish around the main islands and NWHI (Ralston 1981).

Among 452 opakapaka examined from Hawaii, the sex ratio was 50:50 (Ralston 1981). However, there is a greater number of male than female specimens collected from Guam (Kami 1973).

A functional length-weight relationship derived from 471 specimens ranging from 23.4 to 77.9 cm is:

$$W = 3.58 \times 10^{-8}\ L^{2.8806},$$

where W = weight (kg) and L = fork length (mm) (Uchiyama et al. 1984). The equation indicates that growth is allometric.

Studies on spatial homogeneity within the species habitat range provide some evidence of size-specific abundance differences with depth (Ralston 1981). Results from French Frigate Shoals and Necker Island show similar patterns of juvenile confinement to narrower depth ranges than adults. Maro Reef juveniles and adults, however, appear to occupy the same range of depths.

Catch per unit effort data indicate a higher relative abundance at Necker Island, French Frigate Shoals, and Brooks Banks than elsewhere in the NWHI (Uchiyama and Tagami 1984). Opakapaka is the dominant bottom fish species at Necker Island (44.6%), French Frigate Shoals (52.5%), and Brooks Banks (40.0%). A similar trend was noted by Moffitt (1980).

Preliminary results from electrophoretic analysis of 50 loci from opakapaka sampled throughout the Hawaiian Archipelago indicate low genetic variability; however, the results imply, but do not prove, a single stock within Hawaii because of the small sample size (Shaklee and Samollow 1980).

Gear and catch

Opakapaka is caught with deep-sea handline. Annual reported landings from the NWHI ranged between 349 and 12,828 kg and averaged 4,587 kg during 1959-77 (see footnote 14). Annual statewide landings in 1961-79 varied from 23,964 to 93,148 kg and averaged 52,683 kg. Commercially the most important bottom fish in Hawaii, opakapaka has dominated the statewide landings of bottom fish since 1948.