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Records of the Pelagic Armorhead, *Pentaceros richardsoni*, from Hachijo Island and the Ogasawara Islands

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Previous records of the pelagic armorhead, *Pentaceros richardsoni* Smith, in Japanese waters are only from Hachijo Island and off Amatsu, Chiba Pref. (Abe, 1957). Since information on the species is meager, we present in this paper morphological notes based on four specimens collected from Hachijo Island and the Ogasawara Islands, and discussion on the distribution. The Hachijo specimens have slender bodies, whereas the one from Ogasawara is high-bodied.

We followed Follett and Dempster (1963) in the generic arrangement: uniting *Pseudopentaceros* and *Quinquarius* with the genus *Pentaceros*.

Material and methods

Four specimens were examined in the present study: two males, 250.0 mm and 270.0 mm in standard length (SL), and one female, 270.0 mm SL, all collected at 33°30′N, 129°50′E, north off Hachijo Island, on June 23, 1976, by hook and line, MTUF 21775~

Table 1. Counts and proportional measurements (% of SL) of *P. richardsoni*. Bars indicate that measurings were impossible.

Body form	High-bodied	Slender		
Catalog number	TUFO 872	MTUF 21775	MTUF 21776	MTUF 21777
Sex	♀	♂	♂	♀
Standard length (mm)	230.0	250.0	270.0	270.0
Body depth	35.2	32.4	33.6	32.2
Head length	33.9	34.4	33.8	34.8
Snout length	12.6	13.1	12.2	13.3
Eye diameter	8.3	8.4	8.7	8.1
Upper jaw length	10.2	10.9	10.7	10.7
Interorbital width	10.9	10.4	10.4	10.4
Caudal peduncle depth	9.1	8.3	8.8	8.6
Pectoral length	(33.3 right)	30.3	30.1	30.7
Pelvic length	(22.1 right)	21.2	21.1	20.7
Pelvic spine length	20.2	18.1	18.7	19.1
Width between pelvic origins	9.1	8.4	8.5	8.1
Dorsal spinous base length	40.9	39.2	38.6	39.8
Dorsal soft base length	10.9	11.2	11.9	12.5
Anal base length	15.2	15.4	15.9	16.3
Longest (3rd-4th) D. spine length	18.2	17.3	17.8	17.8
Longest (1st-2nd) A. spine length	8.7	9.3	9.6	—
Longest (2nd-3rd) D. soft ray length	11.7	12.3	12.2	10.7
Longest (2nd-3rd) A. soft ray length	—	11.3	11.1	10.3
Dorsal fin rays	XIV, 9	XIV, 9	XIV, 9	XIV, 9
Anal fin rays	IV, 7	IV, 8	IV, 8	IV, 8
Pectoral fin rays	18	17	18	17
Pored scales in lateral line	75	73	70	67
Scales above lateral line	14	13	14	12
Scales below lateral line	43	40	40	40
Predorsal scales	15	14	14	13
Gill rakers	7+17	8+17	8+17	7+17
Vertebrae	12+13	12+13	12+13	12+13

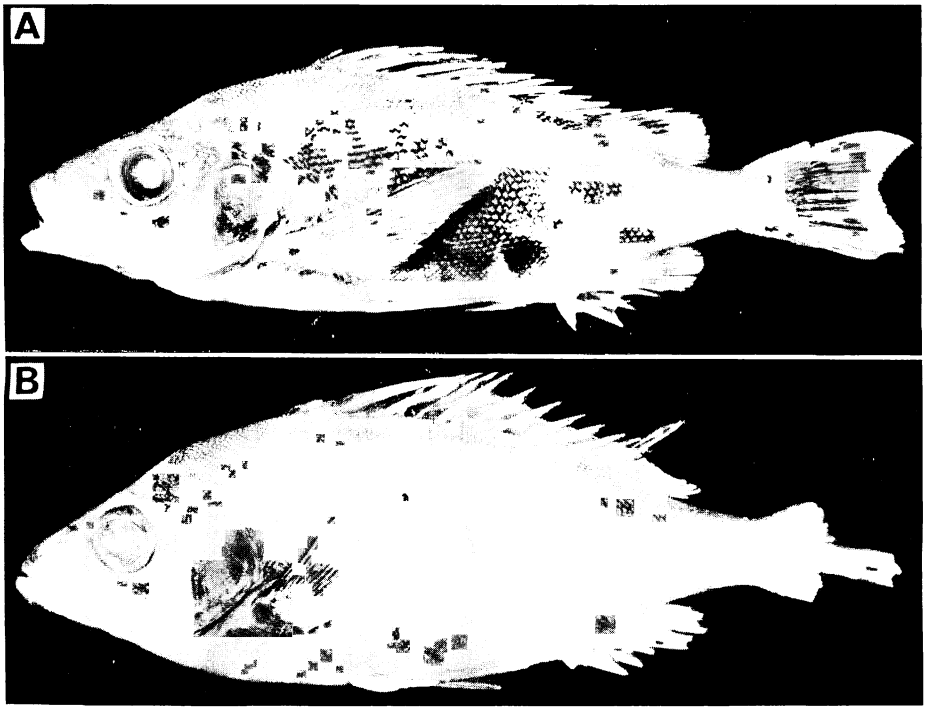

Fig. 1. *Pentaceros richardsoni*. A, slender form MTUF 21776, 270.0 mm in standard length, from Hachijo Island; B, high-bodied form TUFO 872, 230.0 mm in standard length, from the Ogasawara Islands.

21777; one female, 230.0 mm SL, at 26～28°N, 141～143°E, Ogasawara Islands, Jan. 20～Feb. 7, 1973, by hook and line, TUFO 872.

The abbreviations MTUF and TUFO refer to the Museum of Tokyo University of Fisheries, and Tokyo University of Fisheries, Ogasawara collection, respectively.

Counts and measurements were mostly made according to the methods of Hubbs and Lagler (1947). Vertebral counts were taken from radiographs, counting the urostylar vertebra as one. Coloration was observed on formalin specimens.

Description

The meristic counts and proportional measurements for the specimens are shown in Table 1.

The specimens TUFO 872 and MTUF 21777 had unripe eggs in their ovaries. The body cavity of the specimen TUFO 872 was filled with fat-like substance. Testes were poorly developed in the specimens MTUF 21775 and 21776.

Body slender in the Hachijo specimens (Fig. 1, A), while higher in the Ogasawara specimen (Fig. 1, B). Bones of head and pectoral girdle, with well-developed radial striae on their surface, and not covered by skin. Interorbital space broad, slightly convex. Lower margin of preorbital, whole margin of preopercle and upper margin of orbit with fine serrations. Five small pores present on preorbital, four on preopercle and four on lower jaw, the anterior two being small. Anterior nostril small, with a flap on its posterior margin, close to posterior one. Maxillary extending beyond below posterior nostril but not reaching below the eye. Interpelvic space flat, and becomes narrower toward isthmus. Abdomen with keel from pelvic to anus.

Each of the dorsal and anal spines has a striated surface on one side, and can be bent alternatively toward left and right and accommodated in a groove on dorsal side of body, with striated surface up and smooth surface down in the groove. Anterior bases

of third to seventh dorsal spines and of second and third anal spines swollen, their anterior margins bluntly serrated. Pectoral long, reaching above anus. Pelvic not reaching anus. Pelvic spine large, with longitudinal striae. Caudal slightly folked.

A band of villiform teeth present on both jaws. Vomerine teeth rhombus. Palatine and tongue without teeth. Scales cycloid, those on side of body imbricated, those on cheek, breast and abdomen juxtaposed. Lateral line abruptly ascending in anterior part of the body to below base of second dorsal spine and then running in parallel with dorsal line.

Body brownish, paler on ventral side. Spinous dorsal, anal, and membranes of pelvic dark brown. Pectoral and caudal paler. Each scale on body with a pale central spot. Membrane of abdominal cavity blackish.

Discussion

Pentaceros richardsoni occurs widely in the Indo-Pacific; records have been made from South Africa (Günther, 1859; Barnard, 1927; Smith, 1964), New Zealand (Graham, 1953), Cape Horn (Steindachner, 1866 as *P. knerii*), Japan (Abe, 1957), Aleutian Islands (Welander et al., 1957; Honma and Mizusawa, 1969), northern Central Pacific (Chikuni, 1971; Sakiura, 1972; Sasaki, 1974), and west off North America (Clemens and Wilby, 1961; Follett and Dempster, 1963; Hart, 1973).

All these records were based on a small number of specimens except those from Japan and from nothern Central Pacific.

There is also an unpublished record by Tokyo Metropolitan Fisheries Experiment Station on 236 specimens ranging from 206.0 to 383.0 mm in folk length, which were caught by hook and line off Hachijo Island at 33°32'N, 141°50'E and 33°16'N, 142°12'E in the period from August 23, 1971 to May 20, 1974.

It has been known that there are two forms of individuals in *P. richardsoni* from the North Pacific i.e., slender and high-bodied forms, and some individuals of the latter form show meshed color pattern (Sasaki, 1974).

These two forms are observed also in Hachijo specimens; those reported by Abe (1957) represent the high-bodied form, whereas the specimens presently examined are of the slender form. The Ogasawara specimen at hand is high-bodied without meshed color pattern.

On the basis of considerable amount of catch from south of Tokyo (Abe, 1957; Tomiyama and Abe, 1958) and fishing for this species conducted off Hachijo Island (personal communication to Follett and Dempster from Abe, 1961), Follett and Dempster (1963) postulated that the center of abundance of *P. richardsoni* is in the vicinity of southern Japan from where the fish are carried to the northeast Pacific by the North Pacific current system.

Juveniles of this species, however, have not been found around Japan. Rather, juveniles have been recorded from the Aleutian Islands and in the seamounts near Midway Island (Honma and Mizusawa, 1969; Sakiura, 1972).

The occurrence of juveniles as well as the abundance of the adults in northern Central Pacific is not in favor of Follett and Dempster's (1963) view. More data are necessary for determining whether the southern Japanese population is derived from other area or spawns around the place where the specimens were taken.

Acknowledgments

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伊豆八丈島と小笠原諸島から得られたクサカリツボダイについて

座間　彰・浅井ミノル・安田富士郎

八丈島から3個体，小笠原諸島から1個体のクサカリツボダイ（体長 230.0～270.0 mm）が採集された．八丈島産の標本は体高の低い痩型で，小笠原諸島産のものは体高の高い肥満型であった．この報告は本邦で Abe (1957) に次いで2度目の記録で，本種は本邦では千葉県沖から小笠原諸島にかけて分布することが明らかになった．

(座間・安田：108 東京都港区港南 4-5-7 東京水産大学魚類学講座；浅井：100-15 東京都八丈島八丈町三根　東京都水産試験場)