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Adult Form of the Stromateoid Fish, *Nomeus gronovii*, from the North Pacific

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In June 1985, a single specimen of a large nomeid fish was collected off Choshi, Pacific coast of central Japan by a bottom trawler. Externally it appeared similar to fishes of the genus *Cubiceps*, but was distinguished from them by having forty-one vertebrae instead of thirty to thirty-three. The specimen has the same number of vertebrae, dorsal fin rays and anal fin rays as *Nomeus gronovii* and *Psenes pellucidus*, but it differs from *P. pellucidus* in lacking soft, flabby musculature, long knifelike teeth in the lower jaw (Haedrich, 1967) and the fairly narrow band of scales on the head running forward only as far as the eyes (Haedrich, 1972). Most characters of the present material correspond to those of *N. gronovii*, although it has a long pectoral fin and a short pelvic fin.

Nomeus gronovii has been known as a small fish (less than 20 cm in standard length) with black blotches on the body and a fan-like large pelvic fin (e.g. Masuda *et al.*, 1984). Only one larger individual, presumably adult (225 mm SL), has been recorded from the Caribbean Sea (Haedrich, 1967). According to the description, the relative length of the pectoral fin increases and that of the pelvic fin decreases markedly with growth. The body color is uniform dark brown.

Although the body color of the present material is different form Haedrich's material, the characteristic length of both pectoral and pelvic fins corresponds to that of the large material of Haedrich. The ovaries of the present material are small and not ripe, but the egg granules are recognized. Haedrich (1967) mentioned that the 150 mm SL specimens appeared to be adults but none were ripe and the 225 mm SL specimen appeared to be a mature male. According to his account, we consider that the body size of the present material (242.1 mm SL) has fully attained that of adult. Consequently, we identified the Choshi specimen as an adult of *Nomeus gronovii*. This is the first record of the adult form from North Pacific.

In the following sections, we describe the morphological characteristics of the present material and some morphological changes with growth in *N. gronovii*.

Materials

Materials of *Nomeus gronovii* of the following institutions were used for the measurements and radiographs. BMNH (British Museum [Natural History]) 1900.11.6 (1 specimen, 86.6 mm in SL, False Bay, South Africa), 1920.12.22 (5, 25.4–40.3 mm, Tobago, Lesser Antilles, Caribbean Sea), 1922.3.26 (1, 45.2 mm, Barbados, Lesser Antilles, Caribbean Sea), 1979.8.28 (2, 30.3, 44.0 mm, 2 miles off Sangiang Point, Gambia), unregistered (1, 109.5 mm, Mediterranean Sea); FMNH (Field Museum of Natural History) 46857 (1, 114.2 mm, Florida, inshore reefs off Angelfish Creek, South of Biscayne Bay, Mar.–Apr., 1950), 87602 (1, 226.4 mm, Delaware, Sta. 13, 37°25′N, 25°55′W, dipnet and longline, night light, ca. 21:00, May 13, 1963); FUMT-P (Department of Fisheries, University Museum, University of Tokyo) 10391 (1, 242.1 mm, off Choshi, Pacific coast of central Japan, 200–1000 m depth, bottom trawl, June, 1985), 9903 (1, 67.2 mm, Shimizu harbor, Suruga Bay, Japan, hand net, May 24, 1982), 10392 (1, 64.5 mm, Chichijima I., Ogasawara Is., Japan, July 1981); ZUMT (Department of Zoology, University Museum, University of Tokyo) 5848 (1, 95.0 mm, off Jogashima I., Sagami Bay, Japan, Aug. 5, 1907), 10176 (1, 103.0 mm, Shizuoka, Suruga Bay, Japan), 39700–39701 (2, 71.4, 59.2 mm, Tokyo Bay, Japan, May 19, 1941).

Description

The following description is based on the single specimen (SL 242.1 mm) taken off Choshi, Pacific coast of central Japan (Fig. 1A). Material conditions are as follows: Scales fully lost, only scale pockets remain. Snout area broken.

D XI-I, 27; A II, 26; P_1 21; P_2 I, 5; vertebrae 41; branchiostegals 6. Lateral line scales (scale pockets) 57 (left), 58 (right); gill rakers 7+1+16 (left, upper+angle+lower), 10+1+16 (right).

Body elongate. Musculature firm. Caudal peduncle broad and slightly tapered.

Two dorsal fins slightly separated. First dorsal fin originating a little behind insertion of the pectoral fin. The longest spine about the same length as the longest soft ray. Anterior rays of the second dorsal fin the longest, those that follow shorter and subequal. Anal fin originating under about 5th dorsal soft ray. The first spine about

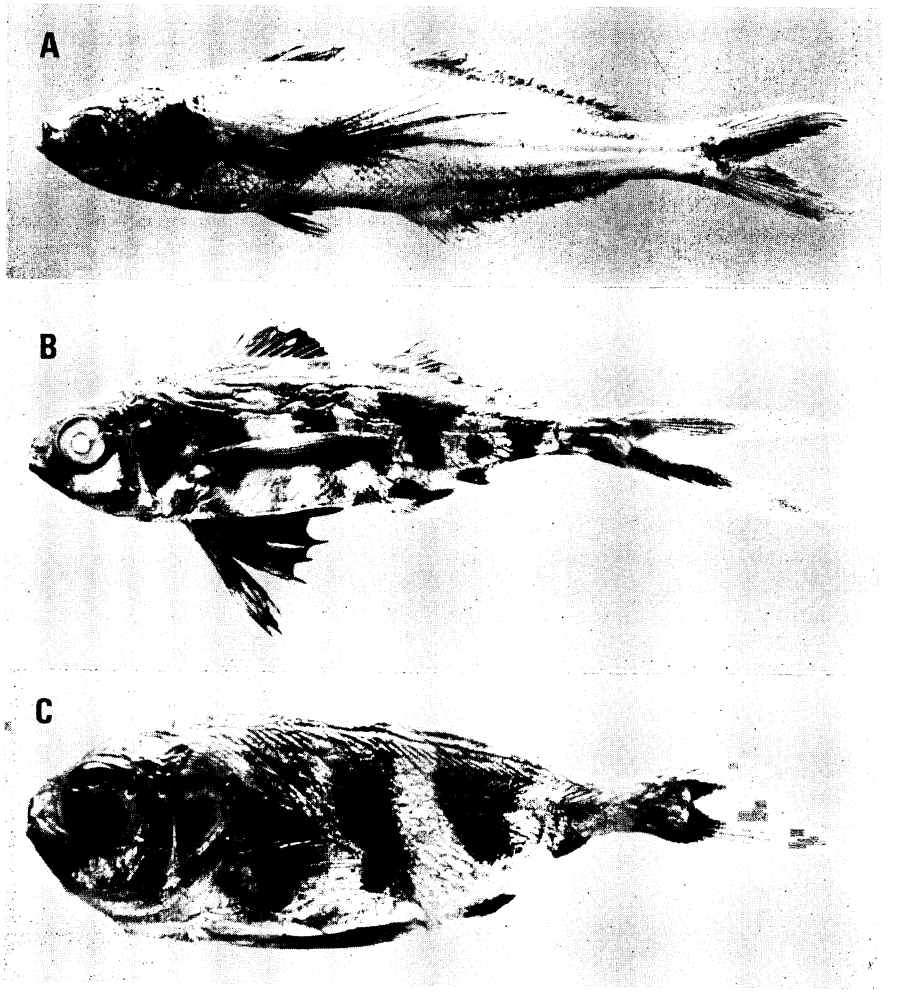

Fig. 1. *Nomeus gronovii*. A. FUMT-P 10391, 242.1 mm in standard length, off Pacific coast of Japan; B. FUMT-P 9903, 67.2 mm, Pacific coast of Japan; C. BMNH 1920.12.22, 25.4 mm, Caribbean Sea.

half the length of the second. Anteriormost rays longest, those that follow shorter and subequal. Pectoral fin long and reaching under the 18–19th dorsal soft ray. Its length about 45% of standard length. Insertion of pectoral fin anterior to that of pelvic fin. Pelvic fin short, about 12% of standard length and not reaching the anus. Its innermost ray the longest, attached to the abdomen by a membrane and folding into a deep groove reaching the anus. Size of caudal fin moderate and deeply forked.

Anus at mid-body, in a deep slit.

Eye moderate, its diameter nearly equal to the upper jaw length. Posterior tip of the maxillary ending before the eye.

A single row of small recurved teeth on the maxillary, dentary, palatine and vomer. Palatine and vomer teeth somewhat larger than those on both jaws. Tongue without teeth.

Scale pockets extending as far forward as the forehead but not reaching the nostrils. Remnants of dark brown and silvery skin present. Dark brown on dorsal region, lower side of the body above the anal fin base, axilla and the 1st dorsal, pelvic and caudal fins. Silvery on the postero-ventral area of opercle region, ventral rim of orbit region and basal region of pectoral and anal fins.

Table 1. Comparisons of characters of *Nomeus gronovii*. Data of 10 of totally 19 specimens are shown.

	FUMT-P 10391	FMNH 87602	FMNH 46857	ZUMT 10176	BMNH 1900.11.6	FUMT-P 9903	FUMT-P 10392	BMNH 1920.12.22	BMNH 1979.8.28	BMNH 1920.12.22
Fork length (mm)	268.6	250.8	127.8	113.8	97.1	76.2	70.8	44.2	35.0	28.9
Standard length (mm)	242.1	226.4	114.2	103.0	86.6	67.2	64.5	40.3	30.3	25.4
In % of SL										
Head length	27.4	28.6	29.2	26.1	27.4	30.1	29.5	32.0	33.7	33.5
Snout length	7.1	8.8	7.6	7.3	8.0	7.4	7.8	6.7	9.2	8.3
Eye diameter	6.4	6.6	6.9	6.7	6.9	8.8	10.4	11.9	12.9	13.0
Upper jaw length	6.7	6.4	6.7	6.8	6.8	7.7	7.8	9.9	10.6	10.6
Body depth	23.3	23.8	26.6	23.8	27.0	25.4	28.4	32.3	32.3	33.9
Caudal peduncle depth	8.1	8.6	8.8	8.7	8.8	6.8	7.8	7.7	8.9	8.3
Pectoral fin length	44.5	46.6	31.8	35.7	32.4	34.1	33.8	26.3	—	31.1
Pelvic fin length	12.4	12.2	24.7	21.8	24.0	25.3	26.8	31.3	38.3	33.9
Upper lobe of caudal fin	25.2	—	33.1	—	37.6	43.3	32.4	—	—	—
Lower lobe of caudal fin	27.2	—	32.1	33.2	41.6	45.2	34.4	—	31.4	—

Remarks

Changes in relative length of fins with growth were examined in 19 specimens ranging from 25.4 to 242.1 mm in standard length. Remarkable changes can be seen in both pectoral and pelvic fin length (Fig. 1). Measurements of selected characters for some of the specimens are shown in Table 1.

In smaller specimens (25.4–114.2 mm in SL), the relative length of the pectoral fin is 26.3–35.7% of SL. In the two larger specimens (226.4, 242.1 mm), however, it is 46.6 and 44.5% of SL, respectively. The posterior tip of the pectoral fin reaches under the 17–19th dorsal soft rays in the large individuals, while it reaches the 7–9th soft rays in the small ones. There is a tendency for the relative length of the pectoral fin to increase gradually with growth in the size range 25.4–114.2 mm SL.

The relative length of the pelvic fin is 21.8–38.3% of SL in the smaller specimens (25.4–114.2 mm in SL), while it is 12.2 and 12.4% in the larger ones (226.4, 242.1 mm in SL). In the smaller specimens, the posterior tip of the fin reaches the anus, but it never reaches the anus in the larger individuals. The relative length of the pelvic fin decreases with growth. The relative length of the pelvic fin is larger than that of the pectoral fin in individuals smaller than 50 mm in SL, but after 50 mm the relations is reversed.

Haedrich (1967) described that the body color of the large Caribbean individual as uniformly dark brown. However, we believe that the Choshi material may have had the same color pattern as the younger individuals, because it has some remnants of black and silvery body skin (Fig. 1A). We tried to compare the color pattern of our material with Haedrich's one deposited in the Chicago Natural History Museum (presently Field Museum of Natural History) without catalogue number, but it was not found in the museum.

The present material was collected by the bottom trawler which operated in depths between 200 and 1000 m, and it is assumed that larger individuals live in the depth as mentioned by Haedrich (1967).

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北太平洋からのエボシダイ成魚の初記録

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銚子沖の底曳網でエボシダイの成魚と思われる個体(標準体長 242.1 mm) が1個体採集された．本標本は胸鰭が非常に長く，腹鰭が短いという特徴を持つが，他の諸形質が一致することからエボシダイと同定した．本種では成長につれ胸鰭は長くなり腹鰭は短くなる傾向が認められた．本種の大型個体はこれまで大西洋からの報告しかなく，本標本は北太平洋における初記録である．

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