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Record of a Bathypelagic Melamphid Fish, *Promitra* (*Melamphaes*) *cristiceps* (GILBERT) obtained from the Stomach of Salmon taken in the North Pacific Ocean

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Fortunately we had an opportunity to examine two specimens of melamphid fish which had been preserved in the Division of High Sea Salmon Investigation of Hokkaido Regional Fisheries Research Laboratory at Hakodate, Hokkaido. Both of them were obtained from the stomach of salmon which were taken from the North Pacific Ocean off the southern part of Kamchatka during the high sea salmon investigation in 1962 and 1963. We wish here to express our sincere thanks to Messrs. Jun ITO and Seiji MACHIDORI of the above-mentioned office for their kindness in giving us permission to examine those valuable specimens collected during their own research in the high sea region, for this study. Acknowledgement is made of the partial financial support of this study through a grant from the Japan Society for the Promotion of Science as part of Japan—U. S. Cooperative Science Program.

A larger specimen (97.4 mm in body length) was taken from the stomach of a chum salmon (measuring 600 mm long in fork length and 2.9 kg in body weight) which was collected on board the "Chiyo Maru", a mother ship of floating factory. According to a catch record, this chum salmon was caught in a salmon drift net by a fishing boat at 50°18′N. and 162°57′E. on May 25, 1963. Another specimen (94.4 mm in body length) also was taken from the stomach of a sockeye salmon (measuring 570 mm long in fork length and 2.6 kg in body weight) which was caught in a salmon drift-net by a research ship, "Etsuzan Maru" at 54°00′N. and 165°00′E. on May 31, 1962.

The present specimens are undoubtedly identical and belong to a single species which may be a North Pacific species, *Promitra* (*Melamphaes*) *cristiceps* (GILBERT).

According to recent comprehensive studies of the family Melamphaidae by EBELING (1962), MOSS (1962), and EBELING & WEED III (1963), this family was classified into five genera and about 45 or 46 species were recognized from the world as shown below:

Scopelogadus ..... 3 species

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Promitra ..... 12 species*
Sio ..... 1 species
Scopeloberyx..... 9 species
Melamphaes..... 19~20 species

Up to the present time, six species from four genera have been recorded from the North Pacific Ocean north of 35°N. by many authors (GILBERT 1890, 1895, 1915; JORDAN & EVERMANN, 1896; JORDAN & GILBERT, 1899; EVERMANN & GOLDSBOROUGH, 1907; TOWNSEND & NICHOLS, 1925; JORDAN, EVERMANN & CLARK, 1930; PARR, 1932; BARNHART, 1936; CHAPMAN, 1939; RASS, 1954, 1955; BIRSHUTEIN & VINOGRADOV, 1955; MARUYAMA, 1957; ARON, 1959; CLEMENS & WILBY, 1961; PARIN, 1961; EBELING, 1962; EBELING & WEED III, 1963, etc.).

Scopelogadus (*Melamphaes*) *bispinosus* (GILBERT)
Promitra (*Melamphaes*) *cristiceps* (GILBERT)=*M. nigrofulvus* from South California (?)
" " *rugosa* (CHAPMAN)
Scopeloberyx (*Melamphaes*) *nycterinus* (GILBERT)
Melamphaes lugubris GILBERT=*M. cavernosus* CHAPMAN
" *parvus* EBELING

Of which, *Poromitra cristiceps*, *P. rugosa*, *Scopeloberyx nycterinus*, and *Melamphaes lugubris* have hitherto been recorded from the northwestern Pacific, from the central part of the Bering Sea to the Pacific coasts of northern Japan. According to available data, those melamphid specimens have been caught at depths ranging from about 200 m to 1,000 m (RASS, 1955; MARUYAMA, 1957; PARIN, 1961). It is very interesting that our specimens were found in the stomachs of a chum and a sockeye salmon. This fact suggests that either the salmon can dive down into layers more than 200 m deep or that the melamphid fish can migrate toward the surface beyond a level of depth of 200 m and where they were eaten by salmon during the night.** In other words, those melamphid fish may have a considerable range in their vertical migration between day and night (MARSHALL, 1954).

* In a recent letter from Dr. EBELING, he assumes that *Malampaes cristiceps* GILBERT is a synonym for *Poromitra crassiceps* (GÜNTHER) which comprises a single, nearly cosmopolitan species. He also consideres that *M. frontosus*, *M. rugosus*, *M. nigrofulvus*, *M. atlanticus*, *M. nigriceps* etc. are junior synonyms of the latter. We take great pleasure in expressing here our heartfelt thanks to Dr. EBELING, University of California, Santa Barbara, for his kind suggestions and instructions about this family.

** The salmon drift-net fishing in the high sea region is usually operated near the surface of the water within a zone less than 10 m or so, and salmon live normally on a surface layer not deeper than 200 m.

Poromitra cristiceps (GILBERT)

Japanese name: Kabutouwo*

Figs. 1-3

Melamphaës cristiceps, GILBERT, 1890. Proc. U.S. Nat. Mus., 13(797), 60-61.
Plectromus cristiceps, JORDAN and EVERMANN, 1896. Bull. U.S. Nat. Mus., (47), 843-844.
Poromitra cristiceps, EBELING, 1962. Dana Report, (58), 18-19.

The two specimens we examined were both female with shrunken ovaries following spawing. Although found in the stomachs of salmon, they had not been digested and were in rather good condition.

The measurements and counts of our specimens were given in Table 1 together with those given by MARUYAMA (1957) based upon four specimens of *Melamphaës cristiceps* taken from off the Tohoku district (northern part of Honshu, mainland of Japan) for comparison.

Head large, long, and bluntly pointed anteriorly. Remarkable cavernous areas surrounded by membraneous ridges on head. A sharp, slender spine directed upwards and forwards exists on the middle of the snout before the frontal ridges which form a horseshore-shaped crest on the occipital region. The margins of frontal ridges have undulating serrations. Eyes large, surrounded by a raised rectangular area bordered above and below by a raised crest. There are well developed mucous canal systems along the posterior and lower margin of the orbital area and preopercular area. There is a fan-shaped striate patch on the upper posterior corner of the opercle. Opercular bones covered with four conspicuously large scales. The posterior margin of the opercular somewhat serrulated. The marginal portion of the preopercular extremely thin and flexible, its lower limb sharply serrated. There are two or three short but strong spines at the posterior angle of the cheek. Mouth wide, slightly oblique. The posterior end of the maxillary reaches to a vertical from the posterior margin of orbit. Lower jaw is included. Mandibular bones connect each other near tip and form a conspicuous median crest. The lateral margin of lower jaws from membraneous wings which unite with a similar one from the suborbital bone to overlap the mouth cleft. Scales large, deciduous, and about 25~27 in number in the longitudinal series. Lateral line absent.

Gill filament short, its length 2.69 in the diameter of orbit, but gill rakers long, wide at base, and with many short spines on the sides, 27 in number on the first gill arch. Teeth on the jaws minute, arrange in a single row. Vomer and paratine toothless. Dorsal fin rather large, its origin located between the tip of snout and base of the caudal fin. Anal fin short, originates below the middle of the dorsal fin base. The ventral fin short, inserted just below the pectoral fin, its tip not quite reaching the anal fin. The pectoral fin long and slender, its tip reaching to the posterior end of the dorsal fin. Body color purplish black, fins dark, but crests,

* Kabutouwo means a helmet fish in Japanese.

Table 1. Comparison of measurements and counts of *Poromitra* (*Melamphaes*) *cristiceps* from the western North Pacific.

Items \ Number of specimens	Present specimens (a)	Present specimens (b)	MARUYAMA's (1957) specimens. (4)
MEASUREMENTS			
Total length (mm)	112.1	110.0	
Body length (mm)	97.4	94.4	96.5 ~98.5
(*in body length*)			
Length of head	2.61	2.66	2.48~ 2.59
Depth of body	4.12	3.43	3.50~ 3.72
Length of caudal peduncle	3.34	3.22	3.58~ 3.86
Distance from tip of snout to origin of dorsal fin	2.07	2.04	2.08~ 2.19
Distance from tip of snout to origin of anal fin	1.55	1.57	
Distance from origin of dorsal fin to base of caudal fin	1.92	1.83	
Distance from origin of anal fin to base of caudal fin	2.50	2.42	
(*in head length*)			
Length of snout	3.80	4.48	4.34~ 4.75
Length of maxillary	2.26	1.93	2.29~ 2.52
Width of interorbital space	2.64	2.64	2.82~ 3.25
Diameter of orbit	6.01	5.05	6.91~ 7.80
Length of dorsal fin base	1.54	1.34	1.46~ 1.50
Length of anal fin base	3.65	3.24	3.00~ 3.46
Length of longest dorsal ray	3.05	2.03	
Length of longest anal ray	3.58	3.54	
Length of longest pectoral ray	1.21	1.13	1.18~ 1.24
Length of longest gill-raker	6.21	4.48	
COUNTS			
Dorsal spines	III	III	III
Dorsal rays	13	13	12~13
Anal spine	I	I	I
Anal rays	10	10	9~10
Pectoral rays (right : left)	14 : 14	14 : 14	14
Ventral spine (both sides)	1	1	1
Ventral rays (right : left)	8 : 8	7 : 7	7
Caudal rays (total number)	25	25	
Scales in lateral series on body	*ca.* 27	*ca.* 25	
Gill rakers on the first gill arch	9+18	8+1+18	7−9+17?−21
Vertebrae*	10+17	10+17	
Pyloric appendages	7	9	

* Counted by radiographs.

occipital region, and an area about the eye white.

Our specimens agree well with the original description of this species given by GILBERT (1890) as well as the descriptions given by EVERMANN and GOLDSBOROUGH (1907), NORMAN (1929), MARUYAMA (1957), etc. in general character except for some proportions of body parts such as size of eye, width of interorbital space, length of caudal peduncle, and etc. However, those differences may result from the differences in measurement of such portions among authors.

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Explanation of figs. 1-3

Fig. 1. Lateral side view of a specimen of *Poromitra cristiceps* (GILBERT), 97.4 mm long, found from the stomach of a chum salmon taken in the North Pacific Ocean.

Fig. 2. Dorsal view of the same specimen.

Fig. 3. Ventral view of the same specimen.

Fig. 1

Fig. 2

Fig. 3