HOKKAIDO UNIVERSITY

Title	FIRST RECORD OF A STRANGE BATHYPELAGIC SPECIES, REFERABLE TO THE GENUS CENTROLOPHUS (CENTROLOPHIDAE, STROMATEIFORMES) FROM JAPANESE WATER, WITH REMARKS ON THE SPECIFIC DIFFERENTIATION
Author(s)	UENO, Tatsuji
Citation	北海道大學水産學部研究彙報, 5(3), 240-247
Issue Date	1954-11
Doc URL	https://hdl.handle.net/2115/22871
Type	departmental bulletin paper
File Information	5(3)_P240-247.pdf

Hokkaido University Collection of Scholarly and Academic Papers : HUSCAP

FIRST RECORD OF A STRANGE BATHYPELAGIC SPECIES, REFERABLE TO THE GENUS *CENTROLOPHUS* (CENTROLOPHIDAE, STROMATEIFORMES) FROM JAPANESE WATER, WITH REMARKS ON THE SPECIFIC DIFFERENTIATION

Tatsuji UENO
Faculty of Fisheries, Hokkaido University

The fishes referred to the genus *Centrolophus*, so far as the author is aware, have until now been recognized from only the northern Atlantic, Mediterranean and Antarctic Ocean, and have yet never been recorded from the Pacific Ocean.

In the following article, the present author wishes to report for the first time a single specimen, measuring 416 mm in total length, from the Pacific coast of Hokkaido, Japan.

Procuring of the present specimen

When the present author visited the Muroran Branch Station of the Hokkaido Fisheries Experimental Station during a short collecting trip for bottom-fishes to the port of Muroran in September 1951, he received for study a strange, obviously bathypelagic fish along with a large specimen of *Neoscopelus macrolepidotus JOHNSON* by courtesy of Mr. Keiji Kudo, a staff member of this station and also the collector of those fishes.

Both of them had been preserved in the above mentioned station until that time. According to a statement by the collector, the former had been accidentally secured from the Muroran Fish-Market on the morning of May 25, 1951.

Though the exact date and station of capture are yet unknown, it was probably taken off Cape Erimo, Hokkaido to the southeast, by the aid of trawl-net of a fishing boat, at a considerably deeper depth than 200 m, a few days before the fish had been landed in Muroran.

Identifying the present specimen with *Centrolophus niger* (*GMELIN*)

In consequence of careful examination of this specimen, the present author is certainly of opinion that the fish belongs to so-called Stromateiformes characterized by having of a distinct fore-stomach behind the pharyngeal, and that it is referable to the genus *Centrolophus* from elongated body, continuous dorsal fin, gently curved lateral line at the anterior part of body, and occurrence of the prominent dermal canal system on the body and head.

In the descriptions of stromateid fish given by older European ichthyologists,

several species* of this genus had been recognized from the northern Atlantic and Mediterranean chiefly based upon their external features, of which general form, number of fin-rays, proportion, colouration etc., are most important. However, there is presented no sufficient evident differences as to enable their distinguishment from each other.

With regard to the specific differentiation and synonymization of *Centrolophus*, some remarks have occasionally been made by many subsequent ichthyologists.**

In consequence, it seems to be accepted that all species known from the northern Atlantic and Mediterranean are referred to as a monospecific, and they have generally been considered as the synonyms of a generic type such as *Centrolophus niger*.

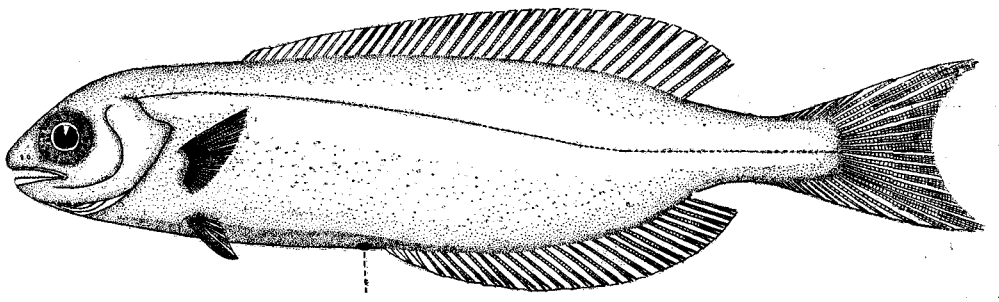


Fig. 1. Lateral view of *Centrolophus niger* (GMELIN)

In 1893, Ogilby described a new pelagic species under the name of *Centrolopus maoricus*, taken from off New Zealand, but the original paper by Ogilby has not been seen by the present author. However, judging from diagnosis of another specimen recorded from the coast of New South Wales, Australia, by McCulloch (1919), it seems to the author that this species is very closely like to the Atlantic species, and it may probably be considered identical in species with the Atlantic.

Gilchrist and von Bonde(1924), distinguished *Centrolophodes irvini* as a new genus and a new species based upon a single specimen taken from the north of Paternoster, west coast of South Africa, but, as pointed out by Barnard (1927), after re-examination of the type specimen, it is nothing but a synonym of *Centrolophus niger* from the Atlantic Ocean.

---

* *Centrolophus niger*.-Lacépède, 1803, Hist. Nat. Poiss., 4, p. 411. -Collet, 1896, Res. Sci. Monaco 10, p. 26.
Centrolophus liparis.-Risso, 1826, Eur. Merid. 3, p. 337.
Centrolophus pompilus.-Cuvier & Valenciennes, 1833, Hist. Nat. Poiss. 9, p. 334. -Günther, 1860, Cat. Fish. Brit. Mus. 2, p. 403.
Centrolophus morio.-Cuvier & Valenciennes, 1833, Hist. Nat. Poiss. 9, p. 342.
Centrolophus ovalis.-Cuvier & Valenciennes, 1833, Hist. Nat. Poiss. 9, p. 346.-Günther, 1860, Cat. Fish. Brit. Mus. 2, P. 404.
Centrolophus crassus.-Cuvier & Valenciennes, 1833, Hist. Nat. Poiss. 9, p. 348.
Centrolophus britannicus.-Günther, 1860, Cat. Fish. Brit. Mus. 2, p. 403.

**Günther (1860), Goode & Bean (1895), Jordan & Evermann (1896), Regan (1902; 1914), Barnard (1927; 1948), Fowler (1936), Smith (1949)

But, the present specimen does not perfectly coincide with any descriptions of *Centrolophus niger* and its synonyms. The present author, therefore, here provisionally identifies the specimen as *Centrolophus niger* (*GMELIN*), and also wishes to propose newly a new Japanese name for this species, "Kuro-abura-ibodai."

Futhermore, judging from records of capture of this specis, it is suggested that the fish may be a variable, widespread cosmopolitan having antitropical distribution extending throughout the warm and colder regions of both oceans. The term "*antitropical*" was proposed by Hubbs (1950, 1952 and 1953) as more inclusive and more definitive in sense than "*bipolar*".

Diagnosis of the present species

Examined specimen is female, measuring 362 mm in body length except the caudal fin, and is preserved to-day in the Ichthyological Laboratory, Hokkaido University (Sp. No. 12000).

The body is elongated and wholly compressd, its upper profile is slightly arched, but the lower is nearly straight, and highest at the vertical portion of anal origin.

Head is rather small, the upper profile of it moderately curved; posterior part of head and dorsal fin have regrettably been somewhat damaged.

Snout is obtusely convex. Nostrils are two on each side, rather large, close together, and situated nearer to tip of snout than to front of eye.

The eye is moderate, elliptical, surrounded by a prominent rim. Interorbital space is slightly convex, its least width being equal to the diameter of orbit.

Mouth is rather small, slightly oblique. End of maxillary reaches to below the middle of pupil. Teeth are all minute, conical and arranged in an irregular row on each jaw, except in biserial on the anterior part of premaxillary, which is protractile. Vomer and palatine are entirely toothless. Tongue is large, smooth, its tip obtuse.

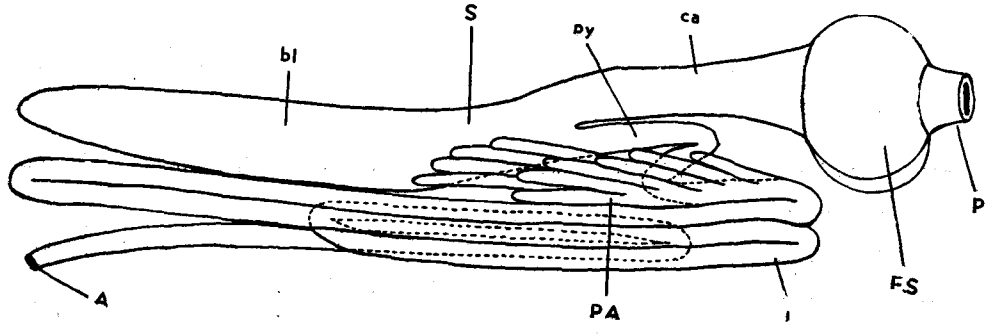


Fig. 2. Alimentary canal of *Centrolophus niger*: P- pharyngeal tube, F. S- fore-stomach or lateral sac, S- stomach; ca- cardiac part of stomach; bl- blind sac of stomach; py- pyloric part of stomach, P. A- pyloric appendages, I- intestine, A- anus

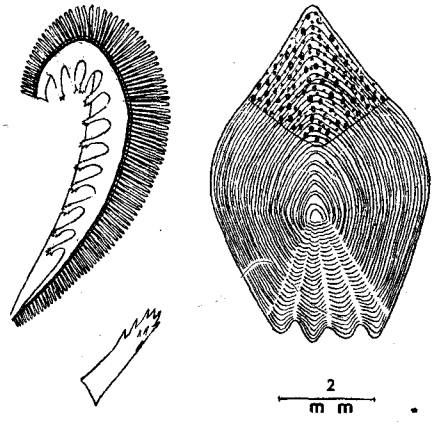
Table 1. Proportional measurements of *Centrolophus niger* and relative ratios of bodily parts to body length (B. L.) or head length (H. L.)

Items	Measurements (mm)	Ratio to B.L.
Length of body (from tip of snout to the middle of caudal fin base)	362	
Length of head (from tip of snout to posterior end of opercular flap)	69	5.24
Depth of body (at vertical through the dorsal fin origin)	71	5.10
Distance between tip of snout and origin of dorsal fin	124	2.92
Distance between tip of snout and origin of anal fin	179	2.02
Distance between tip of snout and outer base of left ventral fin	69	5.25
Distance between outer base of left ventral fin and origin of anal fin	108	3.35
Length of base of dorsal fin	179	2.02
Length of base of anal fin	112	3.23
Length of caudal fin (from upper end of caudal fin base to tip of upper lobe of caudal fin)	72	5.02
		Ratio to H.L.
Length of snout (from tip of snout to anterior margin of orbit)	20	3.45
Greatest width of head (at posterior end of interopercular flap)	32	2.16
Length of upper jaw (from tip of premaxillary to posterior end of maxillary)	21	3.28
Width of mouth (distance between both posterior angles of mouth-cleft)	23	3.00
Length of postorbital part of head (from posterior margin of orbit to the end of opercular flap)	40	1.72
Diameter of orbit (horizontal distance between opposite margins of orbit)	18	3.83
Diameter of eye-ball (horizontal diameter of eye-ball)	12.5	5.52
Length of caudal peduncle (from the last ray of caudal fin to upper foremost rudimentary ray of caudal fin)	33	2.09
Least depth of caudal peduncle (at the front of each foremost rudimentary ray of caudal fin)	26	2.65
Least width of interorbital space (distance between the middles of upper rim of both orbits)	18	3.83
Length of the longest spine of dorsal fin	13	5.30
Length of the longest ray of dorsal fin	26	2.65
Length of the longest ray of anal fin	22	3.14
Length of the longest ray of pectoral fin	31	2.23
Length of the longest ray of ventral fin	14.5	4.76
Length of the spine of ventral fin	7.0	9.85
Length of the longest ray of caudal fin	54	1.28

Oesophagus with a well developed fore-stomach or lateral sac, which is spherical, located just before the stomach, and its wall is very thick. The longitudinal plications of mucous membrane of lateral sac are thick, and bear many small hooked teeth on their surface. Stomach is long, Y-shape, of which blind sac measures about 86 mm, while cardiac part of it is about 41 mm in length, with a thick wall; there are 10 longitudinal folds of mucous membrane in its inner surface, on the other hand, the pyloric part is longer than that of cardiac, its length being about 45 mm. The stomach is entirely emptied.

Pyloric appendages are slender, rather long, and 10 in number. The length of the longest one of it is about 36 mm, and 1.92 in head length. Intestine is very long, total length is about 341 mm, equal to the body length except the snout. There are 5 distinct windings.

Gill opening continues forward to a vertical through the posterior margin of orbit. Gill membranes are entirely free from the isthmus. Gill arches are 4 in number, and with a narrow slit behind the last one. Gill rakers are rather slender, lanceolate, and 3 on upper, 8 on lower lobe of the first gill arch of left side, while 4 in number on upper, 10 on lower on the right side. Each gill raker bears several minute prickles on their top. Branchiostegal rays are 7 on each side. Pseudobranchiae are small, degenerative. Posterior margins of preoperculum, subоperculum and interoperculum are membraneous, finely lobulate, and each one with many minute and weak serrations on the posterior margins.



A B

Fig. 3. Gill rakers on the first arch (A), and scales (B) on the posterior part of dorsal fin base

Scales on body have almost been lost except a few on upper part of body, which are rather small, blade-like, and concentrically striated. Greater part of opercular bones are covered with larger scales, but snout, interorbital space, orbital rims, suborbital regions, and mandibles are naked, scaleless.

Basal half of vertical fins is covered with smaller scales, while paired fins are covered with similar scales only at their bases. Top of head and orbital rims are closely pitted by many mucous pores. The scale-pockets after the scales have fallen are perforated by a median mucous pore; those pores are prominent especially on anterior part of body, opening parallel on the surface of skin on upper part of lateral line. The pores appear to be decreased in number toward caudal fin as indicated on *Centrolophodes irvini* by Gilchrist and von Bonde.

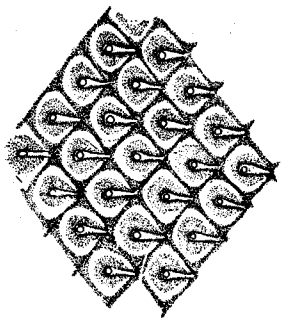


Fig. 4. Upper view of surface of body skin on the side of body, showing general arrangement of median mucous pore on scale-pockets after the scales have fallen

Lateral line is developed. There is a gentle curve on the anterior part of body, becoming a straight line in posterior part, about the middle of body to backward.

Dorsal fin originating nearly above the tip of pectoral fin, and consists of X. 28, in number. The anterior spines are slender, flexible, ray-like, and hidden by the skin, and so, those spines are difficult to distinguish without the cutting of skin. The fin increases gradually in height to backward. The rays are all branched and articulated.

Anal fin is similar to the dorsal fin in general form, consisting of III. 25, in number. The fin inserted at below the first 4th ray of dorsal fin. The last ray is opposite to that of dorsal fin, and anterior spines are very short, feeble.

Pectoral fin is rather small, triangular in shape, consisting of 20 rays. Ventral fin is situated at a point a little behind the pectoral fin base. The fin is short, a half length of pectoral fin, and its tip does not reach to that of pectoral fin. Both ventral fins are placed closely together, and consist of I. 5, in number. The spine is very short and weak.

Caudal fin is deeply forked; both lobes are pointed. The total number of rays determined by X-ray is 35, of which the central 15 rays are developed and branched.

The color in formalin solution is uniformly grayish brown without distinct blotchs on back and side of body, becoming gradually to leaden gray on the lower. Orbital rims are dark-brown. The vertical fins are darker than the color of body, but paird fins are lighter. Peritoneum and mouth cavity are dark brown.

Discrepancies from other descriptions

As has been previously mentioned, the present specimen is somewhat different from each previous descriptions of *Centrolophus niger* * and its synonymized species ** by various ichtyologists, principally in number of fin-rays and gill rakers (especially, in dorsal and anal fin, both fins with a few spines on their anterior-most part, but they have often been mis-named as soft-rays because of being very faint and flexible, and so, those spines were counted as soft-rays by some authors, accordingly, such number of dorsal and anal fin-rays approximately coincides with

* Jordan & Evermann, 1896, p. 936, pl. 149, fig. 403: Collet, 1896, p. 26: Regan, 1902, p. 195: Barnard, 1927, p. 895, pl. 22, fig. 1: Fowler, 1936, p. 665, fig. 299; Barnard, 1948, p. 388, figs. 10-11: Smith, 1949a, p. 845; Smith, 1949b, p. 305, fig. 850.

** *vid.*, previous pages

those of the present specimen in total number), in relative ratio of proportional measurements of bodily parts (of which the principal are head length, depth of body, length of pectoral fin, diameter of eye, interorbital space, base length of dorsal and anal fin, and length of upper jaw, etc., it is possible that those differences in relative ratio are frequently due to variation by individual sizes within one species), in situation of dorsal and anal origin and coloration (those characters are also widely variable with growth or condition of life in the same species as indicated by many other fishes).

Moreover, each of the descriptions given by previous ichthyologists as above mentioned was different from each other to more or less extent, therefore, the discrepancies as above indicated seem to the present author not so striking and conclusive as to justify the distinguishing of separate species. However, even if specimens have essentially been included under one original species, they may be divisible into some subspecies or varieties from their external features.

For the purpose of making certain their specific differentiation, an actual comparison between specimens from various seas in the world is indubitably desirable.

Acknowledgments

The author expresses primarily his thanks to Mr. Keiji Kudo above-mentioned for his kindness in presentation of valuable specimens for the author's studies, and also, his sincere acknowledgments are due to Prof. Dr. Kiyomatsu Matsubara and Mr. Tamotsu Iwai of Kyoto University, who have given him much kind instruction and facilities for copying of valuable literature.

Further, the author wishes cordially to thank to Prof. Shin-ichi Sato of this University and Dr. Tokiharu Abe of the Tokai Regional Fisheries Research Laboratory, for their encouragement to this work.

Literature cited

Barnard, V. H. (1927). A monograph of the marine fishes of South Africa, Part II. *Ann. South African Mus.* **21** (2), 419-1065.

———— (1948). Further notes on South African marine fishes. *Ibid.* **36** (5), 341-406.

Collett, R. (1896). Poisson provenant des campagnes du yacht "L'Hirondelle" (1885-1888). *Result des campagnes scientifique accomplies sur son yacht par Albert premier, Prince Souverain de Monaco* **10**, VII-198.

Cuvier, C. & Valenciennes, A. (1833). *Histoire naturelle des poissons* **9**, 1-579.

Fowler, H. W. (1936). The marine fishes of West Africa, Part II. *Bull. Amer. Mus. Nat. Hist.* **70** (2), 609-1493.

Gilchrist, J. D. F. & von Bonde, C. (1924). The stromateidae (butter fishes) collected by the S. S. "Pickle". *Fisheries and Marine Biological Survey Report* (3) *Special Rept.* (4), 1-12.

Goode, G. B. & Bean, T.H. (1895). Oceanic ichthyology. *U. S. Nat. Mus. Special Bull.* 1895,

1-553, pl. 1-123.

Günther, A. (1860). *Catalogue of fishes in the British Museum* 3. 1-548.

Jordan, D. S. & Evermann, B. W. (1896). Fishes of North and Middle America, Part I. *Bull. U. S. Nat.Mus.* (47), i-ix. 1-1240.

McCulloch, A. R. (1919). Studies in Australian fishes, No.5. *Rec. Austr. Mus.* 12 (8), 171-177.

Regan, C. T. (1902). A review of fishes of the family Stromateidae. *Ann. Mag. Nat. Hist. Ser.* 7, 10, 115-131; 194-207.

———— (1914). Fishes. *British Antarctic "Terra Nova" Expedition* 1910. *Rept. Hist. Zool.* 1 (1), 1-54.

Smith, J. L. B. (1949a). The Stromateid fishes of South Africa. *Ann. Mag. Nat. Hist. Ser.* 12, 2, 839-851.

———— (1949b). *The sea fishes of South Africa.* i-xvi, 1-550. Cape Town; Central News Agency.

Suehiro, Y. (1942). A study on the digestive system and feeding habits of fishes. *Jap. Jour. Zool.* 10 (1), 1-303.