Studies on the Deep-Sea Fishes of Japan.

XII. On Two New Berycoid Fishes belonging to *Ostracoberycidae* from Suruga Bay⁽¹⁾.

Kiyomatsu MATSUBARA

(The Imperial Fisheries Institute, Tokyo)

While at Heta, a fishing village on the west coast of Idu Peninsula, in November, 1938 and February, 1939, I had opportunities to go fishing on board a motor trawler off the village. The fishing ground is located in north-eastern part of Suruga Bay and about 125 to 167 fathoms in depth. Among many interesting fishes thus obtained, two berycoid specimens particularly attracted my attention. Upon careful examination, both of them proved referable to the genus *Ostracoberyx* FOWLER⁽²⁾, and each was found to represent a new species. In the present paper are given not only full descriptions of these two new species but also some comments on the rather imperfectly known type species *Ostracoberyx dorygenys* FOWLER from Mindanao, Philippines.

In the following descriptions the body length is measured from tip of upper jaw to base of lower branched caudal rays. The length of head is referred to the length between tip of upper jaw and the extremity of operculum. The depth of body is measured in front of the origin of pelvic. The length of snout is indicated by the distance from tip of upper jaw to the anterior end of orbit. By the maxillary length is meant the total length of upper jaw, measured from the extremity of snout, and this includes premaxillary as well as maxillary itself; the width of maxillary is measured in the widest part of upper jaw. Interorbital space is represented by the distance between the upper margins of the orbit. The length of preopercular spine is indicated by the distance from anterior corner of preopercle (not spine) to the distal end of the spine. The length of caudal peduncle is referred to the length from end of base of anal fin to the base of lower branched caudal rays; the depth of the same is measured in the lowest part. By the length of pectoral is indicated the measurement from upper origin of pectoral to the tip. The last ray of the dorsal and anal fins is always counted as branched to the base.

The writer wishes to express his sincere gratitude to Prof. A. TERAOKA for

(1) Contributions from Zoological Laboratory, Imperial Fisheries Institute, Tokyo, No. 91.

(2) FOWLER, H.W.: Descriptions of new fishes obtained 1907 to 1910, chiefly in the Philippine Islands and adjacent seas. Proc. Acad. Nat. Sci. Philadelphia, 85, 1933, p. 353.

his kindness in supervising the present work. He also offers his best thanks to Mr. S. NODA of Heta for kindly giving him facilities to get on the trawler on board which the specimens were collected by the writer.

***Ostracoberyx
fowleri*, n. sp.**

New Japanese Name:
Onigasira

Head 2.43 in body length; depth 2.43; width of head at the posterior end of second suborbital bone 4.38; width of body just behind the head 5.33; distance from origin of pelvic to anal fin 3.24.

Snout 4.08 in head; maxillary 2.05; width of the maxillary 7.37; orbit 2.46; interorbital space 4.38; postorbital part of head 2.58; length of preopercular spine 2.17; length of caudal peduncle 2.01; depth of the same 4.19; pectoral 1.51; pelvic 2.40; pelvic spine 2.96; first dorsal spine 8.16; second dorsal spine 6.43; third dorsal spine 3.02; fourth dorsal spine (longest) 2.72; longest dorsal ray (third) 2.58; first anal spine 10.41; second anal spine 6.29; third anal spine 5.12; longest anal ray (third) 2.58; caudal 1.55.

Longest gill-raker on first gill-arch 2.37 in orbit; longest gill-filament 4.24; width of first suborbital bone 4.56.

Fig. 1. *Ostracoberyx fowleri*, n. sp.

D. IX-9; A. III, 7; P. 14; V. 1, 5. Pored scales in lateral line 47; a transverse series of scales between base of fourth dorsal spine and insertion of anal fin 8+20 exclusive of the pored scales in the lateral line; a series of predorsal scales to supraoccipital bone 11; branchiostegal rays 7; gill-rakers on the first arch 8+1 (on the hinge)+17=26.

Body ellipsoid, compressed, highest at the origin of dorsal, tapering behind into rather slender caudal peduncle which is twice as long as deep. Head large, as long as the depth of body; bones of head exposed, stout, and finely striated. Mouth rather small, oblique; premaxillaries protractile; maxillary largely concealed by preorbital, extending posteriorly somewhat beyond the anterior border of orbit; mandible projecting but little in front of the upper jaw when the mouth is closed. Teeth villiform, in rather broad bands on jaws, vomer and palatines, tongue broad, rounded anteriorly. Snout short and obtuse, broadly rounded as seen from above; nostrils two on either side, close to each other and just in front of eye, the anterior one bearing semicircular smooth dermal flap. Eye very large, high, 1.66 times of snout and 1.78 times of interorbital space, its posterior margin nearer the gill-opening than the tip of the snout; interorbital space flat.

Antero-outer corner of preorbital armed with a pungent spine which is directed forward; lower edge of the bone armed with denticles pointed ventrally and slightly forward except posterior four ones which are directed downward. First suborbital bone rhombic in shape, much narrower than one-fourth the diameter of orbit; second suborbital somewhat square in form, much larger than the first one, forming a stout suborbital stay; the third suborbital also tetragonal, but somewhat smaller than the second. Preopercular spine stout and sharp, extending posteriorly above the middle of the base of pelvic; the serrations of anterior two-thirds of the lower edge directed obliquely forward, and the rest of them vertically downward. Opercle vertically elongated, semicircular in shape, armed posteriorly with three rather pungent spines. Supraoccipital bone hexagonal, devoid of a horny process above; parietals situated outside the supraoccipital, with a shallow depression at the center, and followed by two small bony plates, the upper of them broken into four small pieces; anterior to the origin of lateral line and above the opercle there exists a large bony plate with a deep notch anteriorly; another small one on the upper posterior margin of opercle, and still another larger one behind the posterior margin of opercle; a small bony plate above the upper extremity of preopercle, and an elongated bony ridge above the third suborbital bone.

Gill-membranes free from the isthmus; gill-opening large, extending forwards and below posterior end of maxillary; pseudobranchiae well developed and long; gill-rakers slenderly lanceolate, the longest one somewhat shorter than half the diameter of orbit and 1.80 times of the longest gill-

filament. Vent opening somewhat behind the tip of pectoral and in front of anal origin by a distance equal to one-fourth the diameter of orbit.

Body covered with small, cycloid, imbricated scales, those in the lateral line not especially enlarged; head with scales in a small triangular area of cheek below the two anterior suborbital bones; fins all naked. Lateral line well arched under spinous dorsal, sloping down behind and above the end of base of anal fin.

Dorsal inserted at a short distance behind the origin of pelvic, first two spines subequal, much shorter than half the length of the third spine, fourth spine the longest, slightly shorter than diameter of orbit, the last two spines minute; soft dorsal slightly higher than spinous dorsal, the third one the longest and gradually lowered before and behind. Anal spines short and rather weak, the third one the longest, about half the length of the fourth dorsal spine; soft anal rays much higher than anal spines and about as high as the soft dorsal. Pectoral somewhat shorter than twice the length of ventral, extending scarcely to vent. Pelvic inserted at a short distance behind the origin of pectoral; the ventral spine rather stout, as long as the third dorsal spine. Caudal slightly emarginated, and the lobes rounded.

Color in formalin light brownish grey, becoming paler below, each scale on upper half of body surrounded by dark grey ring; spinous dorsal greyish brown; basal parts of soft dorsal and pectorals dark grey; caudal dotted with small brown pigments except basal part; all other parts of the fins pale. Inside of mouth and branchial chamber dark brown; peritoneum jet black.

The above description is based on a female holotype, measuring 89.2 mm in total length (73.5 mm in body length); the specimen is preserved at Imp. Fisher. Inst., Fish Spec. No. 6464.

Remarks: The present new species differs from *Ostracoberyx dorygenys* FOWLER in having the following characters: Interorbital space flat (convex in the latter); the first two dorsal spines very short, much shorter than half the length of third spine (the first dorsal spine⁽³⁾ about half as the second which is slightly shorter than the third in the latter); caudal fin emarginated (rounded in the latter); caudal peduncle slender, twice as long as deep (the length⁽⁴⁾ equal to its depth in the latter).

Despite the fact that FOWLER defines the genus *Ostracoberyx* as having "caudal peduncle rather slender," *O. dorygenys* as illustrated by FOWLER (fig. 105) appears to have the corresponding part very robust, but not at all slender. If FOWLER's illustration is erroneous in representing not only the

(3), (4) These characters are not given in FOWLER's description but read by referring to his drawing.

caudal peduncle but also the length of dorsal spines, the differences between *O. fowleri* and *O. dorygenys* as discussed above may not exist even though something is known of two of the four characters of *O. dorygenys* in FOWLER's text. It goes without saying that the characters of interorbital space and the caudal fin are not significant as criteria for distinguishing species inasmuch as they are more or less variable with the age of fish.

It should be admitted that the erection of *O. fowleri* as a species distinct from *O. dorygenys* is partly based on the assumption that FOWLER's illustration which furnishes more information than his text is accurately prepared.

Ostracoberyx tricornis, n. sp.

New Japanese Name: *Tunogasira*.

Head 2.39 in body length; depth 2.26; width of head at the end of second suborbital bone 4.63; width of body just behind the head 5.38; distance between origin of ventral and that of anal 3.41.

Snout 3.66 in head; maxillary 2.71; width of the same 7.71; orbit 2.69; interorbital space 3.81; postorbital part of head 2.34; length of preopercular spine 1.83; length of caudal peduncle 1.89; depth of the same 3.91; pectoral 1.58; ventral 2.22; ventral spine 2.40; first dorsal spine 4.19; second dorsal spine 2.59; third dorsal spine 2.31; fourth dorsal spine 2.44; longest dorsal ray (third) 2.44; first anal spine 9.77; second anal spine 5.86; third anal spine 5.63; longest anal ray (third) 2.93.

Longest gill-raker on first gill-arch 2.73 in orbit; longest gill-filament 3.76; width of first suborbital bone 2.73.

D. IX-9; A. III, 8; P. 15; V. I, 5. Pored scales in lateral line 52; a transverse series of scales between base of fourth dorsal spine and insertion of anal fin 8+22 excluding the pored scales in lateral line: predorsal scales 9; branchiostegals 7; gill-rakers on first gill-arch 6+1(on the hinge)+16=23.

Body ovate, compressed, deepest at the origin of ventral; caudal peduncle slender, twice as long as deep. Head large, but slightly shorter than depth of body; bones of head exposed, stout, and finely striated. Mouth small, inclined; jaws equal when the mouth is closed; premaxillaries protractile; maxillary mostly concealed under the large preorbital bone, extending posteriorly below antero-orbital rim. Teeth villiform, in rather broad bands on jaws, vomer and palatines; tongue broad and rounded anteriorly. Snout short, 1.36 times in orbit, broadly rounded as seen from above; nostrils equal in size, located in front of and close to the eye, the anterior one with a semicircular dermal flap. Eye large, high, 1.42 times of interorbital space; its posterior margin nearer to the gill-opening than to the tip of the snout. Interorbital space flat.

Antero-lateral margin of preorbital armed with three anteriorly directed pungent spines, the innermost one somewhat larger than the others which are subequal in length; anterior two-thirds of lower edge of the preorbital

armed with fine denticles directed obliquely forward. First suborbital bone rhombic in shape and very deep, much higher than one-third the diameter of orbit; second suborbital bone pentagonal, forming a stout suborbital stay and somewhat smaller than third tetragonal suborbital bone. Preopercular spine pungent, extending posteriorly above the end of base of pelvic; denticulation on the lower edge of the bone weak and irregular. Opercle elongated, triangular in shape, with rounded posterior corner, devoid of the spines. Supraoccipital bone hexagonal, with a strong, characteristically produced horny process; parietals tetragonal, with a blunt tubercle at the center; immediately above the opercle there existing a large bony plate, preceded by two

Fig. 2. *Ostracoberyx tricornis*, n. sp.

smaller plates, the upper one of them not broken into several small pieces; a small bony plate on the upper posterior border of opercle, and another larger one behind the opercle and above the base of pectoral; an elongated ridge above the third suborbital bone; no small bony plate present immediately above the upper extremity of preopercle.

Gill-opening large, extending forwards and below the anterior end of pupil; gill-membranes free from the isthmus; pseudobranchiae well developed; gill-rakers slender, the longest one of the first arch somewhat longer than one-third the diameter of orbit, 1.38 times of the longest gill-filament and equal to the width of the first suborbital bone.

Scales small, cycloid and imbricated; head scaly merely on a small patch of cheek below the first and second suborbital bone; fins all naked. Lateral line with normal scales, well arched under the spinous dorsal, then gently sloping down behind and above the end of the base of anal fin.

First dorsal spine somewhat longer than half the length of second spine; second to fourth dorsal spines subequal, slightly longer than diameter of orbit; last dorsal spine minute; soft dorsal as high as the spinous dorsal, the third ray the longest and the first ray the shortest. Anal spines short and weak, the third one the longest, but shorter than the fourth dorsal spine; soft anal rays much higher than spines and lower than soft dorsal. Ventral inserted at a short distance behind the origin of pectoral; ventral spine long, as long as the fourth dorsal spine. Pectoral much shorter than twice the length of the ventral, extending somewhat before the vent. Caudal shallowly concave.

Color in formalin light brownish grey, gradually paler below, each scale on upper half of body surrounded by a dark grey ring; opercle, spinous dorsal, basal parts of pectoral and soft dorsal and anteriormost four rays of the latter dark grey; caudal and ventral dotted with small brown pigments. Inside of mouth and branchial chamber dark brown, but the former much paler; peritoneum black.

Described and figured from a single male specimen, Imp. Fisher. Inst. Spec. No. 6463, measuring 85 mm in total length (70 mm in standard length).

Remarks: The present new species differs from *O. dorygenys* FOWLER at least in having the flat interorbital space; three pungent spines on anterolateral margin of preorbital bone (only one spine present in the latter), strong horny process on supraoccipital bone, concave caudal fin and much slenderer caudal peduncle.

Differs from *O. fowleri* in the following features:

O. tricornis.

1. Supraoccipital bone armed with a strong horny process.
2. Preorbital with three pungent spines on antero-lateral margin
3. First suborbital bone very high, much higher than one-third the diameter of orbit.
4. Second suborbital bone pentagonal and smaller than third suborbital.
5. Parietal with a blunt tubercle at the center.
6. The bony plate behind the upper posterior margin of parietal not broken into small pieces.
7. No bony plate present immediately above the upper extremity of preopercle.
8. Opercle triangular in shape, not armed posteriorly with spines.
9. First dorsal spine much shorter than second or third one, but longer than half the length of either of them.

O. fowleri.

- 1....without horny process.
- 2....with only one pungent spine.
- 3....low, much lower than one-fourth the diameter of orbit.
- 4....tetragonal and larger than third suborbital.
- 5....with a shallow depression at the center.
- 6....broken into four small pieces.
- 7....A small bony plate present immediately above the upper extremity of preopercle.
- 8....vertically elongated semicircular in shape, armed posteriorly with three pungent spines,
- 9....First two dorsal spines much shorter than half the length of third one.