Japanese Journal of Ichthyology
Vol. XIV, nos. 1/3
August 20, 1966

魚 類 学 雑 誌
第14巻 第1/3号
1966年8月20日発行

# A New Genus and Species of Deep-sea Brotulid from the South China Sea*

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The Research Vessel/Cape St. Mary of the Fisheries Research Station, Hong Kong, has made series of deep-water Agassiz trawls over the northern part of the South China Sea during the past years. As a result, an adequate collection of deep-water forms of the Brotulidae is now available for a review of the family in the area. The present paper is the first of a series of studies on this collection of brotulids. It involves the proposal of a new genus and species, which was tentatively identified by the author (CHAN, 1965) as a *Barathronus* species in a list of fishes associated with the occurance of an anacanthobatid skate.

*Barbuliceps* gen. von.

*Type species.*—*Barbuliceps tubercularis* sp. nov.

*Diagnosis.*—A viviparous brotulid with each ventral fin represented by a simple ray of moderate length, inserted under head at level of hind end of preopercle; dorsal fin continuous with caudal and anal fins, originated well in advance of origin of anal fin; pectoral fin with branched rays and a pedicellate basal segment. Eyes distinct, small, near tip of snout. Opercle with a strong, pointed spine, not extending to edge of opercular flap. Preopercle smooth-edged. Mouth large, terminal, slightly oblique. Head and body entirely devoid of scales, enveloped in a layer of translucent skin. Tail not tapering. Anus slightly in advance of middle of total length. Lateral line present, as a fine, subcutaneous tube connected to exterior by a series of minute tube-like openings. Pigmented tube-like openings present on dorsal part of head, intermingled with a patch of well-scattered small, flattened tactile cirri (visible only under magnification). Gill membranes joined to each other, united to anterior tip of isthmus. Two slightly flattened, prickled, rod-like gill rakers near angle on lower branch of first arch; all other gill rakers rudimentary. Maxillary with a broad, truncate posterior end, enveloped in a layer of skin, and not hidden by suborbital sheath when mouth is closed. Tongue short, with a broad base and a roundedly pointed tip. Villiform teeth present; a broad band on jaws, inner ones longer and depressible; a slightly curved narrow band on vomer; a mederately broad band on

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palatine.

*Relationships.*—Of the some nine scaleless genera of brotulids recognised by NORMAN (1939), *Pyramodon* RADCLIFFE and *Snyderidia* GILBERT are now included under the Pyramodontidae, an ophidioid family closely related to the Carapidae (STRASBURG, 1965). From the remaining seven scaleless genera, *Barbuliceps* is probably nearest to *Spectrunculus* JORDAN and THOMPSON. These have certain important resemblances: such as the very small, but definitely distinct eyes; the relative positions of the fins; the presence of a pair of simple-rayed pelvic fins; the possession of a lateral-line system on the body; the long, broad upper jaw, not hidden by the suborbital sheath; and the presence of opercular armature. However, *Barbuliceps* is quite distinct from *Spectrunoulus* in having only one lateral line and a combination of very different head features.

From all scaleless, deep-sea genera of brotulids, *Barbuliceps* differs in having the characters discussed under the *diagnosis*. The more distinctive features are the combination of the tube-like sensory openings and the tactile cirri found on the head. The presence of the tactile cirri suggests a resemblance to the fresh-water Cuban genera (*Stygicola* GILL and *Lucifuga* POEY), in which the loss of the eyes is compensated by the development of minute tactile cirri on the head.

The key to the genera of the Brotulidae by NORMAN (1939) forms the main reference to this study. Other references which have also been used frequently in the course of this study are de BEAUFORT and CHAPMAN (1951), KAMOHARA (1954), and RADCLIFFE (1913).

The generic name is taken from the Latin *barbula*, meaning a barbel, and the Greek suffice, *-ceps*, meaning head.

## *Barbuliceps tuberculatus* sp. nov.

Figs. 1-2.

*Holotype.*—BMNH 1965·11·6·1, a mature male 125.0 mm in total length, collected at Station 32 during Cruise 7/64 of the RV/Cape St. Mary at the terminal position of Lat. 6°01.8'N-Long. 109°57.4'E, about 270 miles north of Kuching, Sarawak, Malaysia, in depths from 456 to 450 fathoms, on a bottom of soft mud and rich invertebrate fauna (see *ecology*), Agassiz trawl, November 5, 1964.

*Counts and measurements* (in millimetre).—Dorsal 86; anal 57; caudal 14; pectoral 21; ventral 1; gill rakers on first arch: upper branch with 3 rudimentary, lower branch near angle with 2 larger ones (rod-like, slightly flattened, prickled) and 11 rudimentary; lateral-line tube-like openings about 30; branchiostegal rays 8; vertebrae: 14 (trunk)+42 (candal).

Greatest depth (at nape) 22.0; head length 29.0; head width (at cheeks) 17.0; body width (at middle of belly) 12.0; upper jaw 15.0; snout 7.0; diameter of eye 2.2;

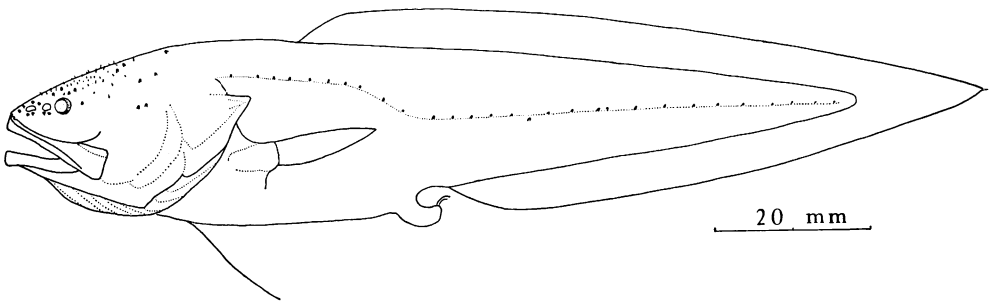


**Fig. 1.** Holotype of *Barbuliceps tuberculatus*

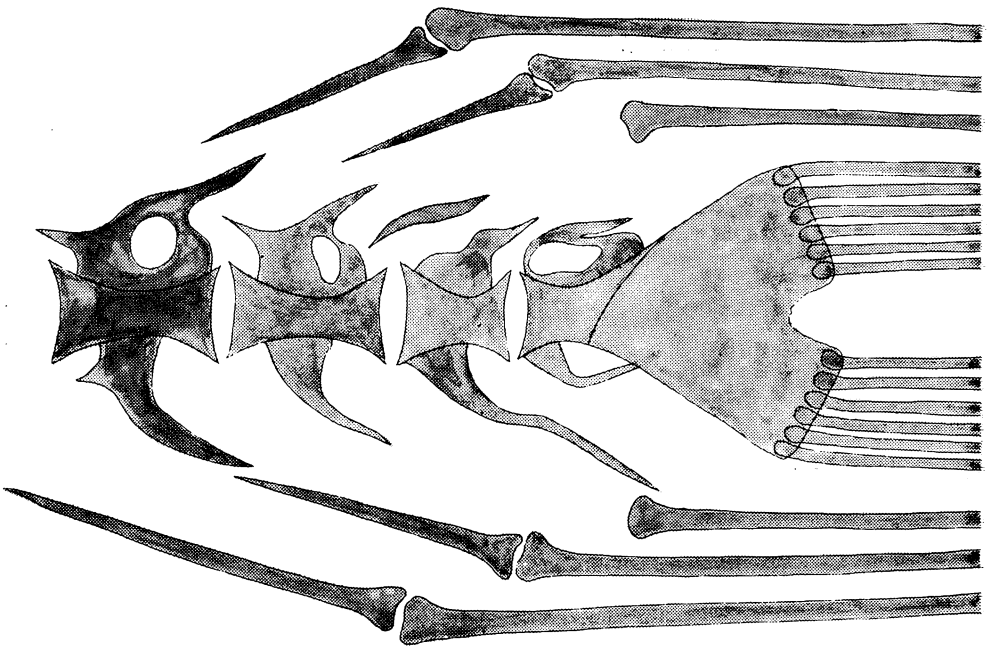

**Fig. 1.** Caudal vertebrae of *Barbuliceps tuberculatus*.

postorbital length 20.5; interorbital width 6.5; predorsal distance 32.0; preanal distance 57.0; prepectoral distance (from base of pedicellate segment) 28.5; preventral distance 24.0; pectoral length 21.0 (from base of pedicellate segment to tip of fin); ventral length 15.5; caudal length (from base to tip of median ray) 16.0: median dorsal rays 8.0; median anal rays 7.0; origin of anal fin separated from vent by a distance of 6.5 mm; intromittent urogenital apparatus 5.5 mm wide, 5.0 mm long, attaching to which a very narrow, pointed tube of 2.4 mm in length; pedicellate segment of pectoral 6 mm long, 6 mm wide.

*Description.*—Body and head compressed; head longer than deep; trunk (from vent to base of ventral fin) about as long as head; vent situated about 10 mm in advance of middle of total length. Dorsal and ventral profiles of holotype about

equally gently curved, except the slightly arched nape region. Tail pointed, not tapering.

Scales entirely absent everywhere. Body and head covered by a layer of somewhat loose, translucent skin. Lateral line extremely fine, appearing as a pale line beneath the skin, and connecting to the exterior by a series of tube-like openings; its course curved downward over the intromittent urogenital organ, becoming horizontal again above origin of anal fin, and ending close to end of tail. Head dorsally covered by a system of tube-like openings, whose function probably sensory, intermingled with scattered, fine, fleshy cirri (visible only under magnification).

Origin of dorsal fin over distal portion of pedicellate segment of pectoral fin. Origin of anal fin close to vent, separated by a distance of 6.5 mm occupied by an intromittent urogenital organ. Median fins continuous. Pectoral fin with a distinct pedicellate basal segment, originated below distal tip of opercular flap. Ventral fin simple, its distal portion extremely slender, inserted below hind margin of preopercle.

Opercle a somewhat triangular bone, postero-dorsally ending in a short but stout spine: spine falling short of tip of opercular flap, entirely hidden beneath skin. Preopercle with smoothly rounded, unarmed posterior margin; its length about twice as long as opercle, its width about one-third its length. Eyes very small, but distinct, immediately beneath a thin layer of transparent skin, situated close to dorsal surface of head and over middle of upper jaw. A pair of nostrils, smaller than pupil, arranged linearly in front of eye. Mouth terminal, large, slightly oblique with both jaws of similar length; upper jaw extending almost to middle of head, dorsally with a slender supra-maxillary.

*Caudal osteology.*—With a Japanese model of soft X-ray machine, the caudal section of the holotype has been radiographed. For deatiled examination of the caudal vertebrae, enlarged prints of the caudal fin have been made. *Barbuliceps* is found to bear a bilobed hypural plate (fig. 2) similar to that observed by STRASBURG (1965) in *Rissola* JORDAN and EVERMANN (family Ophidiidae). This plate is very thin, and each of its two lobes is attached to a group of six caudal rays. Both antero-dorsally and antero-ventrally, this last caudal vertebra is crested.

The penultimate vertebra is adruptly short when compared with preceeding vertebrae. It bears a short neural spine and a long haemal spine. The zygapophysis and ventral process are absent on the radiograph. The last dorsal and anal rays are without a pterygophore. The last anal ray is recorded as closely associated with the conspicuously long haemal spine of the penultimate vertebra.

Anterior caudal vertebrae are elongate, with long, slender neural and haemal spines. Each vertebra bears a distinct prezygapophysis, and a very thin ventral process.

*Ecology.*—*Barbuliceps tuberculatus* has been found to occur on a sea-bed of soft mud with a large quantity of glass sponges of the genus *Hyalonema*, and a great

number of some thirty species of crustaceans. The bottom temperature of the sea-bed at the terminating position of the haul was 5.97°C. The salinity measured at the same time was 32.07 $^{0}/_{00}$. Eighteen fish species have been found to associate with *B. tuberculatus* (CHAN, 1965). Among these are a *Lamprogrammus* species and a *Mastigopterus* species, whose specific identifications will be dealt with in a later study.

*B. tuberculatus*, Latin, refers to the tube-like sensory openings on the head.

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