

CORYSTOID CRABS OF THE GENERA TELMESSUS AND
ERIMACRUS.

BY

JAMES E. BENEDICT,

Assistant Curator of the Department of Marine Invertebrates.

(With Plates XXV-XXVII.)

This article is based on specimens from Mr. William H. Dall's Alaskan collection obtained from 1871 to 1874, and on the recent large collections made by the U. S. Fish Commission steamer *Albatross*. The list of localities will show that the Museum is indebted to others for additional specimens. One of the objects of this paper is to call attention to these peculiar crabs, and to invite interest in their habits and life history, of which I believe little is known. The figures were drawn by Mr. A. E. McConnell.

The following key sufficiently indicates the species of the two genera:

- a. Carapace broader than long..... *Telmessus*.
 1. Lateral teeth triangular..... *cheiragonus*.
 2. Lateral teeth spiniform..... *acutidens*.
 b. Carapace longer than broad..... *Erimacrus isenbeckii*.

Telmessus White.

Cancer Tilesius, Mém. de l'Acad. de St. Pétersbourg, Vol. v, p. 347, 1815.

Telmessus White, Ann. & Mag. of Nat. Hist., Vol. xvii, p. 497, 1846.

Platycorystes Brandt, Bulletin Physico-Mathématique de l'Académie de St. Pétersbourg, Vol. vii, p. 179, 1848; also Middendorff's Sibirische Reise, Band II, Theil I, p. 85, 1851.

Cheiragonus Brandt, Middendorff's Sibirische Reise, Band II, Theil I, p. 147, 1851.

Telmessus Dana, U. S. Exploring Expedition, Crustacea, Vol. I, p. 303, 1852.

Carapace broader than long, pentagonal. Front divided into three lobes; median lobe cut into four teeth or denticles; lateral lobes forming the inner angles of the eyes. Epistome with triangular point extending upwards on the median line between the antennulae. Basal article of the antenna wide, short, flattened; a wing-like projection fills the hiatus of the eye. Sternum of the female thickened and sculptured around the genital openings. Abdomen of the female deeply concave between the genital openings, leaving them fully exposed. Chelipeds short; ambulatory legs moderately long.

This genus contains, as far as known, but two species; one, *T. acutidens* (Stimpson), is common in northern Japan; another and closely related species, *T. cheiragonus* (Tilesius), ranges from Oregon to St.

Michaels Island, Alaska, and perhaps much farther north; westward along the Aleutian Islands, the Commander Islands, and formerly and probably yet along the coast of Siberia.

Telmessus cheiragonus (Tilesius).

Plates XXV and XXVI; figs. 2, 3, and 4.

"Cancer adperso setosus vel Hippocarcinoides *Stelleri* Mserpt. No. III. Alio loco *Stellero* Cancer pilosus et Cancer auritus dictus (1741. Awatschae)" teste Tilesius. *Cancer cheiragonus* Tilesius, Mém. de l'Acad. de St. Pétersbourg, Vol. v, p. 347, 1815. (Tab. VII, Fig. 1, is referred to in the text. There are no plates in the Smithsonian copy of the work.)

Telmessus serratus White, Ann. & Mag. of Nat. Hist., Vol. XVII, p. 497, 1846; also Voyage of Samarang, Crustacea, p. 14, 1848.

Platycorystes ambiguus Brandt, Bulletin Physico-Mathématique de l'Académie de St. Pétersbourg, Vol. VII, p. 179, 1848.

Platycorystes cheiragonus Brandt, Middendorff's Sibirische Reise, Band II, Theil I, p. 85, 1851.

Cheiragonus hippocarcinoides Brandt, Middendorff's Sibirische Reise, Band II, Theil I, p. 147, 1851.

Telmessus serratus Dana, U. S. Exploring Expedition, Crustacea, Vol. I, p. 303, Pl. 18, Fig. 8, 1852.

Cheiragonus hippocarcinoides Stimpson, Crustacea and Echinodermata of the Pacific Shores of North America, Boston Journal of Nat. Hist., Vol. VI, p. 465, 1857.

Telmessus serratus and *T. cheiragonus* Miers, Proc. Zool. Soc. of London for 1879, p. 36.

Telmessus serratus S. I. Smith, Geological Survey of Canada, Report for 1878 and 1879, p. 208 B, 1880.

Teeth or denticles of the median lobe of the front often wanting in old worn specimens; lateral lobes triangular, forming the inner angles of the eyes. Carapace deeply areolated. Lateral teeth six in number including the angles of the eyes the anterior three with two denticles on the anterior margin of each. The points of the teeth are bent forward and are on a line with the denticles. The fourth tooth forms the lateral angle of the carapace, and has four denticles on the anterior margin, one close to the point of the tooth; then a space, followed by three denticles evenly placed. The posterior teeth are without denticles. The surface of the carapace is set with large granules, in the posterior region forming lines. From these granules arise numerous bristles of even length, which bend forward and are enlarged at the points. (See Fig. 4.)

The merus of the chelipeds has three nearly equal surfaces. The inner margin of the carpus is produced into a large, triangular, sharp-pointed tooth; a deep groove runs along its outer distal margin; the outer surface is spiny. The outer surface of the palm is traversed by four rows of tubercles; on the upper surface there are two or three spines on the inner margin, and a row of tubercles on the outer margin. The fingers are deeply grooved; the prehensile edges are heavily armed with tubercular teeth. On the ambulatory legs are lines of granules bearing coarse bristles. All of the joints are much compressed. The dactyls have short horny tips; on each side is a wide groove, and also a narrow one. The upper margin is grooved; on each

side of this groove are double rows of sharp spiny granules; the space between is filled with short, stout, curved bristles. The lower margin of the dactyls has one double row of these granules; the space between is also set with sharp bristles.

The numerous specimens of this species in the collection are without doubt identical with *T. serratus* of White. White's figure represents an imperfect male, the front is not well defined, and the greater part of the hair is gone, yet it is a graphic picture of some individual specimens.

Dana's figures are not characteristic, representing as they do an immature female. A female in the collection, with an undeveloped abdomen, might almost have served for the original of the figures, except that the inner angle of the eye is much straighter than in his figure.

The identification of this species with the *Cancer cheiragonus* of Tilesius is not quite so satisfactory, but, all things considered, the evidence seems to be, if not conclusive, at least strong.

Brandt described *Platycorystes ambiguus* in 1848, and in 1851 determined this to be identical with *Cancer cheiragonus* of Tilesius; afterwards, with White's description and figures before him, identified White's species with his. The peculiar short, coarse hair of even length with which this crab is ordinarily well covered, not unlikely suggested the name *Hippocarcinoides* to Steller at one time and *Cancer pilosus* at another, while the arched and produced inner angle of the eye as seen from above suggested the name of *Cancer auritus*.

The specimens in the collection, over one hundred and fifty in number, came from Oregon and north along the Alaskan coast, from several of the Aleutian Islands, and one from Bering Island, near the coast of Siberia. If a species liable to be confounded with *cheiragonus* existed in this locality, it would probably be represented by one or more specimens. Steller's and Brandt's specimens were obtained in the same region.

The finest lot from one locality were collected by Dr. T. H. Streets, U. S. Navy, at Kasa-an Bay, Prince of Wales Island, southeastern Alaska; ten specimens in all; five males, of which the smallest is 49 millimeters in length by 65 in breadth, the largest 63 millimeters in length by 82 in breadth; five females, of which the smallest is 45 by 58, millimeters; the largest, 57 by 74, millimeters.

The reproductive openings in the females of this genus are placed outside of, or rather out from under, the abdomen. At these openings the sternum is thickened and very solid. The opening itself is funnel-shaped, spreading out into an ear-like depression, the sides of which are thickened and elevated above the surrounding surface of the sternum. In the immature female the sixth segment of the abdomen has slightly concave edges. In the mature female the abdomen has expanded greatly, except the seventh segment and two-thirds of the sixth, which in an individual case measures 16 millimeters near the articulation with the

fifth segment, in the middle 10 millimeters, and across the distal end 10.5 millimeters. This leaves the genital opening nearly on the axis of a semicircle, and fully exposed.

The females in the lot collected by Dr. Streets have these genital openings stopped up with a ragged looking plug, which more or less completely fills up the ear-like external part of these organs and even bulges out from them quite prominently. In most cases a tough, flat membrane, ragged and worn at the end, projects a little beyond the mass. Dissection shows that the plug extends to the point where the duct widens out into the seminal receptacle, where it terminates in a thin membranous funnel. What are these plugs, and what purpose do they serve? are questions which naturally arise. Are they the male organs? From underneath the head of the plug to the funnel-shaped ending the duct is exactly the same shape and size as the male organ. A section shows it to have the same structure. If the male organ is pushed in as far as it will go and detached, the flattened basal portion must project considerably on the outside. This portion would soon become broken and frayed out at the end; this could easily happen, as the strong armature of the genital openings would hold them without injury to the animal. The agitation necessary to accomplish this may aid the secretion of the substance of the head of the plug which so perfectly conforms to the parts by which it is held. A section of this enlarged part shows a continuation of the tougher frayed-out portion through the secretion. The male organ would not only stand out from the sternum beyond the plug, but it would extend beyond the inner end unless broken off or dissolved. The terminal portion of this organ is thin and flexible and of a different color from the posterior four-fifths. The organ itself is easily detached from the animal. Its loss would not necessarily be of great importance, as it would probably be quickly reproduced.

Opposed to the supposition that this is the male organ is the fact that all of the males in the collection are perfect. There are no females with eggs in the collection, and but one besides those collected by Dr. Streets in the above condition.

This species is said to be used as an article of food by the natives of the Aleutian Islands. Wosnesenski (*Sibirische Reise*) says, however, that the species was not highly regarded as food, as its flesh was very soft. Mr. William Palmer opened the stomachs of from eight to ten fur seals on the killing grounds of St. Paul Island, and though their stomachs were nearly empty, both he and Mr. H. W. Elliott were satisfied that the contents remaining in one were shells of crabs of this species. The natives believe it to be eaten by this seal.

Length of the carapace of a large specimen, 83 millimeters; width, 102 millimeters; extent of ambulatory legs, 330 millimeters.

RECORD OF SPECIMENS.

The U. S. Fish Commission steamer *Albatross* obtained this species at the following localities:

Station.	Depth.	Lat. N.	Long. W.	Mus. No.
	<i>Fath.</i>	° ' "	° ' "	
3233	7 $\frac{1}{4}$	58 23 45	157 42 45	15997
3242	11	58 44 30	160 08 45	15998
3243	4 $\frac{1}{2}$	58 45 10	160 28 00	15999
3244	4 $\frac{1}{2}$	58 37 20	161 05 00	16000
3245	11 $\frac{1}{2}$	58 31 20	161 13 00	16001
3247	17	58 40 45	162 08 30	16002

Unalaska, July 23, 1888 (15576).

Unalaska, May 24, 1890 (16004).

Herendeen Bay, July 5, 1890 (16003).

Old Harbor, Kadiak, August 11, 1888 (15574).

Beaver Harbor, B. C. (15575).

Mr. William H. Dall obtained specimens as follows:

Hagemeister Strait, 8 to 15 fathoms (13117).

Hagemeister Island, beach (14819).

Chichagof Harbor, Attu, 5 to 7 fathoms (14818).

Nazan Bay, Atka Island, 10 to 15 fathoms (14817).

Iliuliuk, Unalaska, 5 to 15 fathoms (13115).

Iliuliuk, Unalaska, near beach (12493).

Popoff Strait, 6 fathoms (14813).

Coal Harbor, Unga Island, 3 to 9 fathoms (14812).

Chiniak Bay, Kadiak (12533).

Chajafka Cove, 12 to 14 fathoms (14814).

Chugaehik Bay, Cook's Inlet, 20 fathoms (12509).

Refuge Cove, Port Chatham (14815).

At the following localities, specimens were obtained by various collectors:

St. Michaels Island; L. M. Turner, 1874 (3258).

"This specimen was found on the beach after a hard south wind." Mr. Turner was informed by a Malemut woman that "the natives catch them on their fishing lines."

St. Michaels Island; E. W. Nelson, 1878 (2502, 14820).

Iliuliuk; W. G. Harford (2136).

Sitka; L. A. Beardslee, Commander, U. S. Navy (3168).

Kasa-an Bay; Prince of Wales Island; Dr. T. H. Streets, U. S. Navy (14824).

Bering Island, Commander Islands, Siberia; Dr. Leonhard Stejneger, February 1883 (14821).

St. Paul Island, Bering Sea; H. W. Elliott, 1874 (14835).

St. Paul Island, Bering Sea; Wm. Palmer, 1890 (5342, 15343).

Puget Sound; D. S. Jordan, 1880 (3110).

Straits of Fuca (3065).

Port Orchard, Puget Sound; Prof. O. B. Johnson, 1889 (14965).

Victoria, British Columbia; Dr. C. F. Newcombe, 1891, (15790).

North Island, British Columbia; J. G. Swan, August, 1883 (6603).

Port Townsend, Oregon; Dr. Suckley (2058).

Telmessus acutidens (Stimpson).

Plate XXVI, fig. 1.

Cheiragonus acutidens Stimpson, Proc. Acad. Nat. Sci. Phila., p. 40, 1858.*Telmessus acutidens* Miers, Proc. Zool. Soc. of London, for 1879, p. 36.*Telmessus acutidens* S. I. Smith, Geol. Survey of Canada, Report for 1878-'79, p. 208 B, 1880.

The collection contains one male specimen from 8 fathoms, mud bottom, Yokohama, taken by the U. S. S. *Tuscarora* (3388); and 14 males, 8 females, from Japan, H. Loomis (16275).

This species can easily be distinguished from *T. cheiragonus* by the much more slender lateral spines, and by the spine at the posterior base of the long spine, making three postero-lateral spines, while *cheiragonus* has but two. Its outline is not so angular, and it is much more convex than the preceding species. The point of the long lateral spine curves forward but little, while that of *cheiragonus* curves so much that it is naturally counted with the denticles on its anterior edge and base. Not counting the terminal point these denticles number four in *cheiragonus* and five in *acutidens*.

The following description of *Telmessus acutidens* is from Dr. Stimpson's unpublished report upon the Crustacea of the North Pacific Exploring Expedition: (The latin description was printed under the name *Cheiragonus acutidens* Stimpson in Proc. Nat. Sci. Phila., p. 40, 1858.)

"Carapax rather narrow; proportion of length to distance between tips of lateral teeth, 1:1.26. Surface covered with setiferous tubercles, mostly transverse, as in other species of the genus. Lateral teeth slender, sharp, the principal or middle one very long; a small intermediate tooth at the base of the principal one behind. Between the teeth and sometimes on their edges there are a few small spiniform denticles. Interantennal front or rostrum with a deep median sinus, and a smaller sinus or excavation at the tip of each fork, as in *C. hippocarcinoides*. Antenna more than one-third as long as the carapax. Feet all squamose or scabrous and setose. Chelopoda somewhat spinous above; hand costate externally, the costae sharply tuberculated.

"Color in life light brick-red above; paler, inclining to yellowish below. Some specimens are of an orange color, but always dusky. Pincers dark brown. Dimensions of a male: Length of carapax, 1.45; breadth between tips of lateral teeth, 1.83 inch. It grows to a length of 3 inches, but the larger specimens, of which several were collected, were accidentally lost.

"It may be distinguished from *C. hippocarcinoides* as found on the west coast of America, as well as from *Telmessus serratus*, White, by the greater length and acuteness of the lateral teeth, particularly the larger one; also by the existence of a small intermediate tooth behind the large one."

This crab is very common in the Bay of Hakodadi, in northern

Japan. It is commonly taken with the seine on sandy shores, but often occurs on gravelly beaches above low-water mark. In June the young, of half an inch to an inch in length, were much more abundant than adults, and were taken with the dredge in 4 fathoms weedy sand.

In the time of Steller a species of *Cheiragonus* was so abundant in Avatcha Bay (Kamschatka) that it formed a common article of food among the inhabitants. At the present time, however, it has entirely or nearly disappeared, as we did not succeed in obtaining a specimen; nor do the naturalists of Beechey's voyage mention having found it.

ERIMACRUS, gen. nov.

Carapace longer than broad, suboval; median lobe of the front cut into four teeth. Lateral margins arcuate, armed with seven teeth. The genital openings of the female occupy the posterior wall of a deep depression in the sternum, and are not covered by the abdomen, which is not concave on its margins between these openings. Epistome with a straight upper margin. Basal article of antenna stout; a short wing-like extension fills the hiatus of the eye. Chelipeds long; ambulatory legs moderately long, spiny.

Brandt considered this genus, or the species for which it is constructed, to be generically or subgenerically distinct from *Platycorystes*, but unfortunately gave it a name (*Podacanthus*) which had been used by Gray for a genus of Orthoptera. His other name, *Platycorystes*, was based on *Telmessus cheiragonus* as the type; therefore the name is not available.

Erimacrus isenbeckii (Brandt).

Plate XXVI, figs. 5, 6, and 7; plate XXVII.

Platycorystes (Podacanthus) isenbeckii Brandt, Bulletin Physico-Mathématique de l'Acad. de St. Pétersbourg, vol. VII, p. 179, 1848. Also in Middendorff's Sibirische Reise, Band II, Theil I, p. 83, 1851.

Cheiragonus isenbeckii Brandt, in postscript of the last work, p. 147.

Brandt described this species under the heading "Genus vel subgenus *Platycorystes* Sect. B (num subgenus proprium *Podacanthus*?)." The collection contains over forty specimens, all from the Aleutian and seal islands, the habitat given by Brandt, who says that it is much rarer than *cheiragonus*. "Mertens obtained but one, and Wosnesenski only five, in eight years collecting."

Brandt described the front as having four teeth, no doubt counting the spines of the inner angles of the eyes, as in *cheiragonus*, and says the middle pair are conspicuous. A large specimen before me has this appearance; the front is worn or broken until it shows but two central teeth. The young, however, have four small sharp teeth at this place, very closely like those of *cheiragonus*; the central pair are separated by the median sulcus; they are very brittle and in most specimens are broken off, leaving a straight margin between the outer pair broken only by the median sulcus. Afterwards when these latter are broken off, as is the case with the large specimen, the median sulcus divides the pro-

duced front into two large, prominent, blunt teeth. "The lateral margins are armed with seven teeth, of which the four anterior are subequal or a little larger than the first of those remaining."

The carapace is thickly set with spiny tubercles. The merus joints of the four pairs of ambulatory legs have their distal upper margin set with six or seven sharp procurved spines; the lower margins have a double row; the posterior sides of the last pair are tuberculous or spiny; the anterior side of the last pair and the sides of the others are hairy. The carpal, propodal, and dactyl joints have three rows of sharp spines. The hands are nearly equal; a row of spines extends along the upper margin and part way down the movable finger; the outer lower margin has another row; on the outside of the hand there are four rows. The spines of the row which extends from the gape of the fingers to the carpal joint are conspicuously smaller than the others. The fingers are long and pointed and armed with large teeth.

The mature female abdomen is altogether different from that of *cheiragonus*, the sixth article being but slightly concave. The reproductive openings are placed outside of the abdomen, and differ much in shape and a little in position from those of *cheiragonus*. In the latter they are opposite the middle line of the second pair of ambulatory legs; in this species they are on the line between the first and second pairs.

The legs and lower parts of the body are thinly covered with long hair, the carapace with short bristles (see pl. XXVI, fig. 7).

Length of carapace of a large specimen, 110 millimeters; width, 106 millimeters; extent of ambulatory legs, 460 millimeters.

RECORD OF SPECIMENS.

Albatross dredgings, 1890.

Station.	Depth.	Lat. N.	Long. W.	Mus. No.
	<i>Fath.</i>	° ' "	° ' "	
3222	50	54 20 00	165 30 00	16006
3268	26	55 29 00	163 13 00	16007
3269	16	55 19 00	163 04 30	{ 16008 16015
3271	25	55 29 15	162 58 00	{ 16009 16016
3272	31	55 31 40	163 07 00	16017
3275	22	55 44 20	162 17 30	16010
3277	18	55 58 45	161 46 30	16011
3281	36	56 14 00	161 41 15	16018
3289	16	56 44 30	159 16 00	16012
3294	30	57 16 45	159 03 30	16013
3311	85	53 59 36	166 29 43	16014

Mr. William H. Dall obtained specimens as follows:

Kyska Harbor, 6-12 fathoms (14831).

Nazan Bay, Atka, 10-16 fathoms (14828).

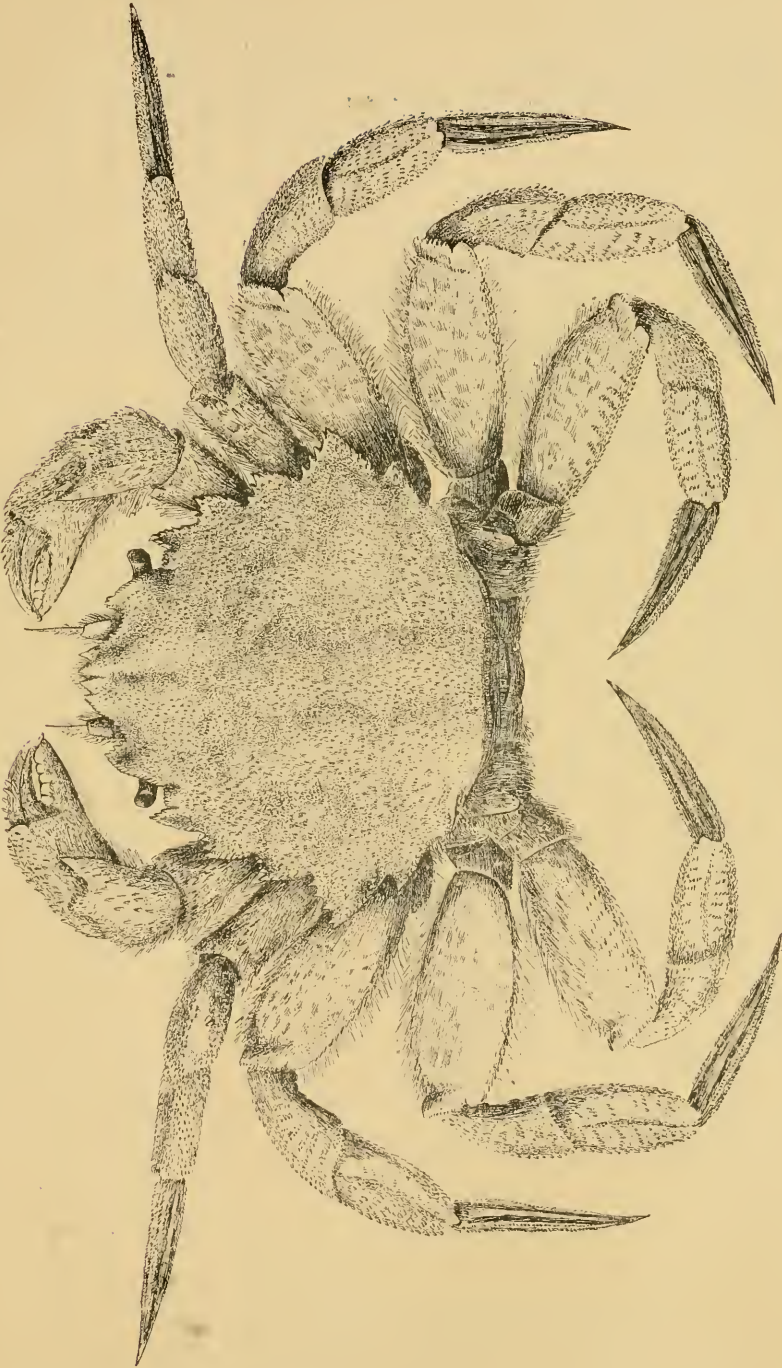
Off Rocky Point, Iliuliuk, Unalaska, 10 fathoms (13141).

Captain's Bay, Unalaska (14832).

Off Round Island, Coal Harbor, Unga Island, 6-8 fathoms (14830).

Port Levasheff (14833).

Additional specimens were collected at St. Paul Island, H. W. Elliott, 1872 (14834); and at St. Paul Island, William Palmer, 1890 (15344, 15345).

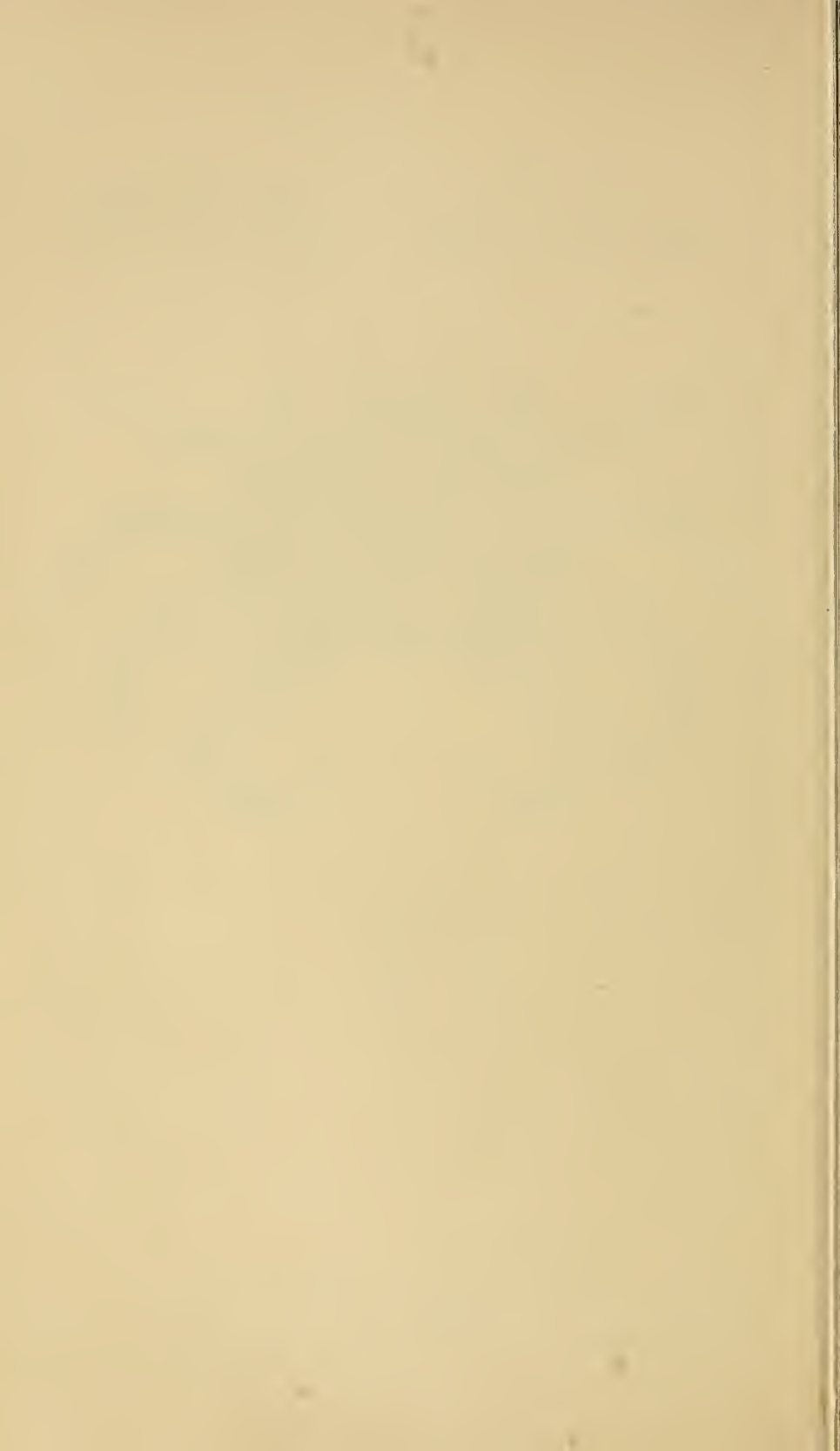


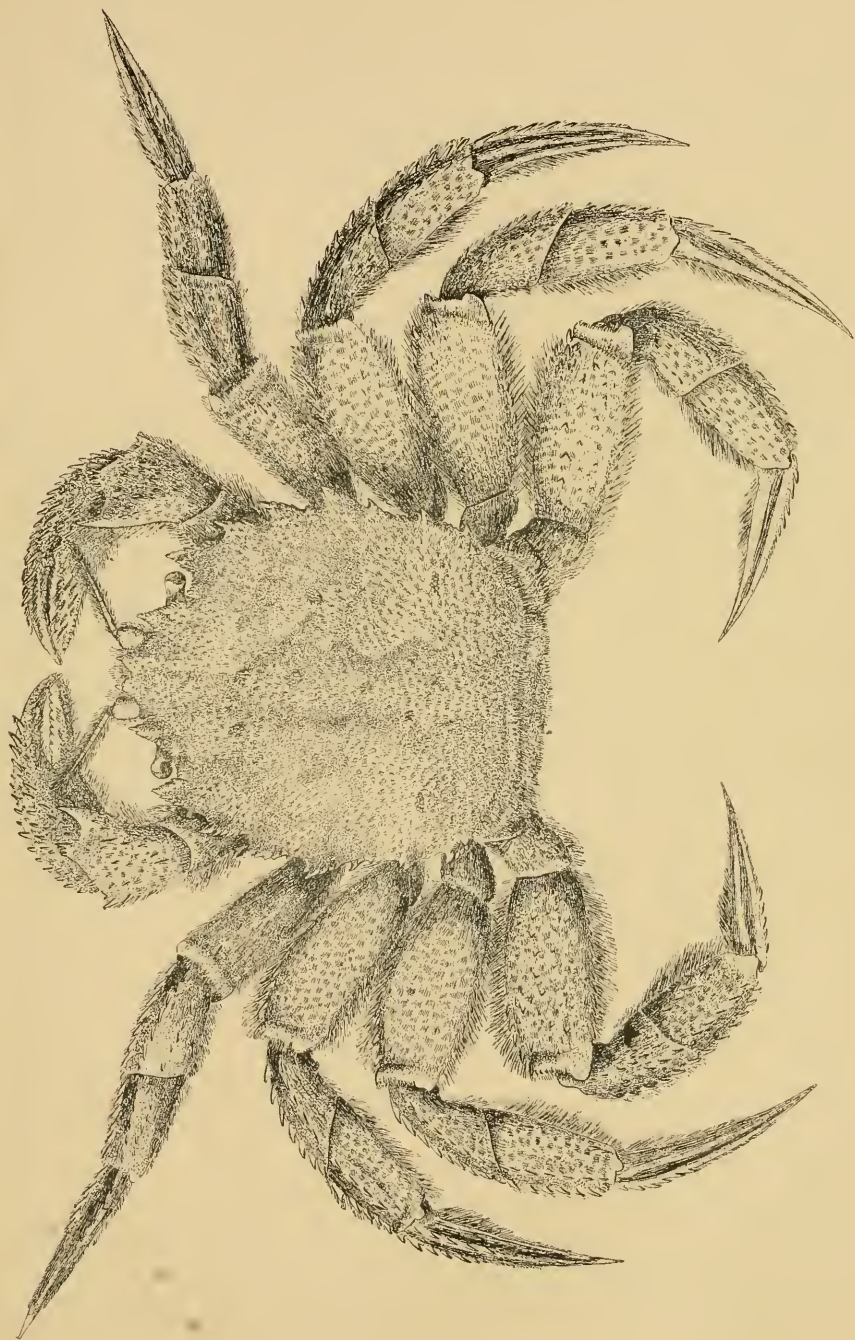
Tetraodon chetivogonus (reduced).





Fig. 1. *Telmessus acutidens*.
 Fig. 2. *Telmessus cheiragonus*, epistome.
 Fig. 3. *Telmessus cheiragonus*, female abdomen and sternum.
 Fig. 4. *Telmessus cheiragonus*, bristle from carapace (enlarged).
 Fig. 5. *Erimacrus isenbeckii*, epistome.
 Fig. 6. *Erimacrus isenbeckii*, female abdomen and sternum.
 Fig. 7. *Erimacrus isenbeckii*, bristle from carapace (enlarged).





Erimacrus isathbeckii (reduced).

