

FOUR NEW SYMMETRICAL HERMIT CRABS (PAGURIDS)
FROM THE WEST INDIA REGION.

By JAMES E. BENEDICT,

Assistant Curator, Division of Marine Invertebrates.

The specimens described in this paper were all dredged by the U. S. Fish Commission steamer *Albatross* in 1885, and all belong to the West India region, with the possible exception of *Mictopagurus gilli*, which was taken in 107 fathoms off North Carolina, the extreme northern limit of the region.

The symmetrical Pagurids are regarded as approximating the macruran type more closely than the other members of the family. The relationships of *Pylocheles* and *Mictopagurus* and other forms with calcified dorsal abdominal plates are discussed by A. Milne-Edwards and Bouvier in the *Blake* Pagurids.¹

Cancellus Edwards is a well characterized genus. The door or cover to its dwelling is formed by the facets of the chelipeds and of the first pair of ambulatory legs, which are much modified for this purpose. The abdomen in the three species before me is spherical, as is also that of *Cancellus typus* Edwards and of *Cancellus tanneri* Faxon; the only exception to this structure is furnished by the *Cancellus canaliculatus* (Herbst), which is figured with a conventional abdomen. The abdomen in this genus seems to be even more readily separated from the thorax than in other genera, and this separation had not unlikely taken place in Herbst's specimen and the conventional form may have been added to the figure for the sake of completeness. A notable case of the substitution of a wrong part occurs also in Herbst's famous work,² where his *Cancer megistos* is shown with the abdomen of a macruran.

The *Mictopagurus* described shows an interesting variation from the type species of the genus in having a decidedly unsymmetrical telson.

¹ Mem. Mus. Comp. Zool. XIV, No. 3.

² Plate LXI, fig. 1.

CANCELLUS ORNATUS, new species.

The rostral projection is a broad triangle with a rather blunt apex; the sinus on either side behind the eyes is deep and evenly rounded; a broad raised collar extends from the outer limit of one to the outer

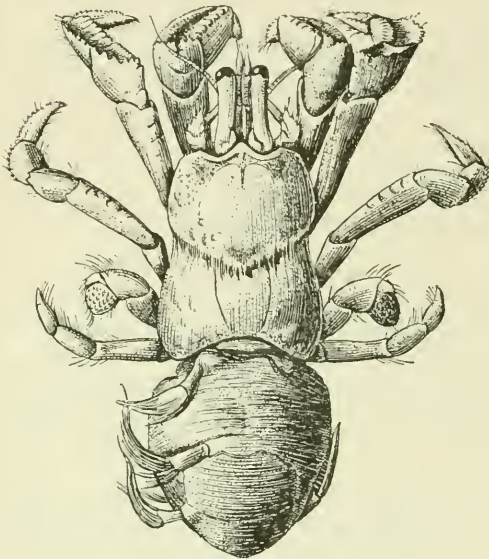


FIG. 1.—*CANCELLUS ORNATUS*. $\times 2\frac{1}{2}$.

limit of the other sinus; from these points to the antero-lateral angle the margin is straight and transverse, giving the entire front a transverse effect. The eye-stalks are slender and reach to the operculating facets; in the distal half of their length they are straight and nearly in contact; in the proximal half they are spreading.

The peduncles of the antennulae reach the cornea. The peduncles of the antennae extend to about the middle of the eye-stalk; the flagellum is small and short, extending a little if any beyond the distal margin of the carpus. The acicle of the antenna is short, stout, and subdiamond-shaped; three stout but short spines arm the outer and one the inner margin.

The anterior portion of the carapace is much broader than long, and is strongly arcuate at the sides; a transverse sulcus runs along just behind the collar or carina of the frontal margin, broadening out into a diamond-shaped depression behind the rostrum and a triangular depression behind the sinus.

The exposed surface of the carpus of the chelipeds forms a deeply excavated facet in the plane of the palm; the excavation forms a part of a channel, which extends to the base of the fingers. The raised margin of the carpus is thin and thickly set with spiny granules; the margins of the palm are much thicker and the granules are not so spiny in character; the inner margins of the palms are straight; between this contact margin and the channel the raised surface is divided into lobes by transverse cuts; each lobe is crowded with large granules.

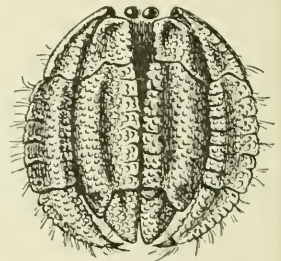


FIG. 2.—OPERCULUM OF *CANCELLUS ORNATUS*. $\times 3\frac{1}{2}$.

The outer margins of the palms are not divided into lobes, but the granules are arranged in more or less regular transverse rows; the margin is not abrupt; the upper surface rounds gradually into the side; against this rounded portion the first pair of ambulatory legs fit and rest firmly; the movable finger is short and stout; the surface is crowded with granules; it is evenly rounded with the exception of a slight depression near the articulation.

A channel on the facets of the ambulatory legs begins at the proximal margin of the carpus and ends on the dactyl a little beyond the middle; the inner margin of the palm is divided into lobes, each of which has a double row of granules, except the terminal one, which has four or more. The outer margin is deeply cut into lobes, which are well separated at the base and are in contact at near the thin edge; these foliaceous lobes appear as if built up of granules. The abdomen is spherical; the plate of the sixth segment is divided by a transverse carina; the anterior portion is subdivided by a median notch and a deep groove which widens out into a large pit at the carina; the margin is spiny. The arrangement of spines is as follows: A group of four on one side of the notch and six on the other; a single large spine is placed near the carina; between this spine and the groups at the notch are two spines which arise from a single base; the posterior part of the plate begins with a deep groove, which reaches from side to side next the carina; the posterior margin is truncate, with a notch near the angles; two or three small tubercles are placed near the notches; the angles and sides are ornamented with a number of similar tubercles. The telson is truncate and has a large lobe on the side.

A single female 25 mm. in length, without eggs, station 2405, Gulf of Mexico, 28° 45' 00" north latitude, 85° 02' 00" west longitude, in 30 fathoms. Unfortunately the specimen is without its dwelling.

Type.—U.S.N.M. No. 9784.

Cancellus ornatus seems to be more closely related to *Cancellus tanneri* than to any other described species; from this it may be readily separated by its triangular rostral projection and many other characters examined in detail. The enlarged coxal segments of the fifth pair of feet are closely like those of *C. tanneri*; this character separates it from *C. typus* Edwards.

CANCELLUS SPONGICOLA, new species.

The angle of the rostral projection in this species is closely like that of *Cancellus ornatus*, with the exception that the apex is a little more acute. The sinus behind the eyes is not bordered by a collar-like carina, and the margin and the antero-lateral angle is rounded. The eyes, as in *Cancellus ornatus*, reach the plane of the operculating facets. The antennular peduncles pass the eyes a very little. The peduncles

of the antennæ reach the middle of the eyestalks. The aciele is like that of *Cancellus ornatus*.

The depressions of the sides of the carapace are strong; the central part is smooth; it is broader than long—broadest a little behind the middle.

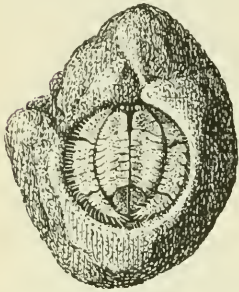


FIG. 3.—CANCELLUS SPONGICOLA IN SPONGE. $\times 11$.

The carpal facets of the chelipeds are slightly concave; the facets of the palms taken together are convex, though a slight depression extends down from the carpus of each; the fingers are very short, the tips are coal black; the facets of the first pair of ambulatory legs are all slightly convex, and, as is common in the genus, the operculating surfaces are divided into lobes by transverse sutures. The sutures do not extend across the facets; on the chelipeds the sutures are closed, while on the propodus and

dactyl of the ambulatory legs they are open on the outer margin and closed on the inner. The entire opercular surface is crowded with depressed granules; both margins of the ambulatory legs are well set with bristles.

The abdomen is spherical. The plate of the sixth segment, as in *Cancellus ornatus*, is divided transversely by both a carina and a channel; the anterior half has an evenly rounded margin armed with spines. Bunches of hair are scattered over its surface. The posterior part is short, and is armed with much smaller tubercles than is the other species.

The under surfaces of the ambulatory legs are mottled with orange and white; the other parts are a light straw color.

The specimen is a male, about 22 mm. in length, taken at station 2354, $20^{\circ} 59' 30''$ north latitude, $86^{\circ} 23' 45''$ west longitude, 130 fathoms. Its carinæcium is a firm siliceous sponge.

Type.—U. S. N. M. No. 9549.

Cancellus spongicola is more nearly related to *C. parvifiti* Milne-Edwards and Bouvier than to any other species. A small specimen of the latter shows the

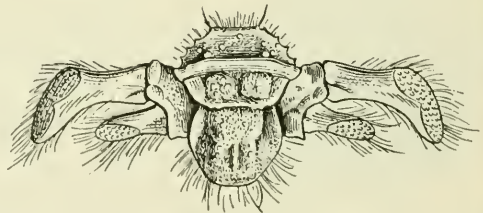


FIG. 4.—CANCELLUS SPONGICOLA. EXTREMITY OF ABDOMEN. $\times 8$.

palms more deeply excavated and with the inner margins a little more raised and more distinctly cut into lobes. The triangular median projection of the front has a distinct raised margin, which is altogether wanting in *spongicola*. The dactyls of the first pair of ambulatory feet are nearly smooth, not lobed as in *C. spongicola*.

PYLOCHELES PARTITUS, new species.

The frontal line of the carapace is made up of a short, straight line, in the middle ending in a short, sharp tooth. This is followed by an angular sinus, with a slightly carinate margin. This sinus ends at the outer line of the eye. Its terminus is marked by a small spine. Beyond this point the margin is straight for the width of the antenna, and runs diagonally back to where it rounds into the side. The eye-stalks are stout, straight to the middle, where they expand to the moderately dilated cornea.

The eye scales are simple rounded plates. The peduncles of the antennulae are nearly twice as long as the eyes; the terminal segment and the greater part of the much longer preceding segment extending beyond. The peduncle of the antenna reaches the base of the cornea. The acicle is straight on the inner side, its margin being in line with the point of the terminal. A little below this spine, on the outside, is another spine, which forms a fork with it. At an equal distance below this is a third spine of equal size. Between this and the base the margin is concave. The armature of the inner margin consists

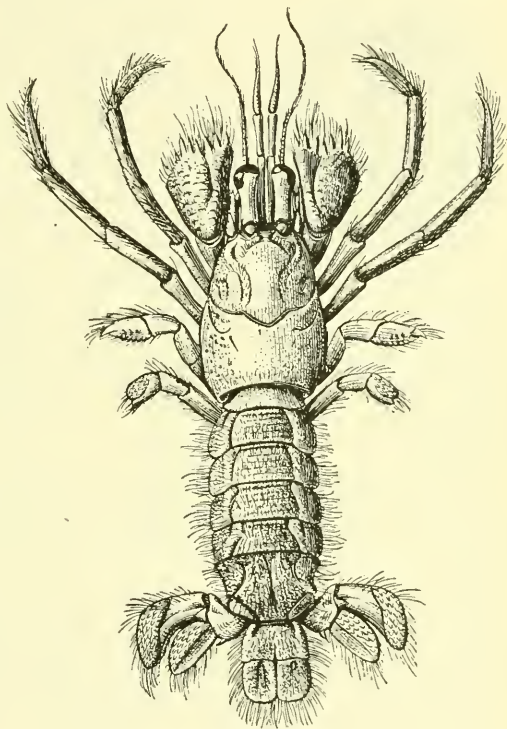


FIG. 5.—PYLOCHELES PARTITUS. × 2.

of a comb of twelve or thirteen sharp spinules, which stand perpendicular to the axis of the acicle.

The middle area of the anterior portion of the carapace is spool shaped and is bordered by bunches of bristles; the sides of this portion are cut by irregular depressions. The posterior portion is calcified.

The chelipeds are bent downward as in *Cancellus*; the anterior margin of the carpus is raised in the form of a spiny crest, the spines forming a continuous row with those of the hand; the summit of the crest is armed with six spines divided into groups of three by a deep notch; the largest spine is the third from the notch on the outside; the

others are equal or subequal; from the large spine the margin slopes rapidly to the hand; the direction of the crest is perpendicular to the plain of the hand. A sulcus runs along the ridge of the carpus into the notch. The palm is broad arcuate on the outside, straight on the inside; the surface is flat. The largest spines are on the inside margin of the palm; there are three spines on the dactyl near its base; beyond this the margin is granular rather than spiny. Scattered over the surface of the hand are numerous but well separated bristle-bearing granules; behind the fingers the granules are arranged in more or less regular rows; elsewhere the granules are more numerous and irregular. The exposed surfaces of the hand and the crest of the carpus are well covered with stiff bristles.

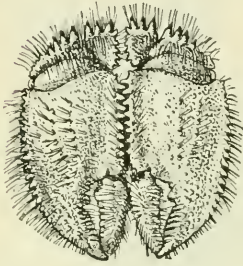


FIG. 6.—OPERCULUM OF PYLOCHELES PARTITUS. $\times 3$.

The segments of the abdomen are slightly calcified and very hairy. The telson is about as in *Pylocheles agassizii* Milne-Edwards, except that the articles are markedly longer in proportion than are shown in the figures of that species.

Type.—One specimen, a male, is labeled "Cozumel in a sponge Jan. 29th, 1885. *Albatross*", U.S.N.M. No. 9892. Length, 45 mm. from the end of the chelipeds to the end of the telson. Length of the carapace 10 mm. Length of the abdomen to the end of the telson 20 mm. U.S.N.M. No. 9901.

A second specimen, a female, was taken by the U. S. Fish Commission steamer *Albatross* off Habana, station 2348, $23^{\circ} 10' 39''$ north latitude, $82^{\circ} 20' 21'$ west longitude, in 211 fathoms. Length of carapace 7.5 mm.

This species is closely related to *Pylocheles agassizii* A. Milne-Edwards. A comparison of the specimens with the plate¹ brings out the following strong characters by which they may be separated:

In *Pylocheles agassizii* the projections of the front are weak. The sinus behind the eye is shallow and evenly rounded. The acicle is figured as broad and notched or toothed on each side, while in *Pylocheles partitus* the acicle is narrow and has but three spines, including the terminal spine. The spinules of the inside margin are so small that they can not be well made out without a lens. The carpal crests differ greatly in shape. *Pylocheles agassizii* has no notch nor has it a sulcus running along the upper margin of the carpus.

¹A. Milne-Edwards et E. L. Bouvier, Mem. Mus. Comp. Zool., XIV, No. 3, p. 20, pl. 1, April, 1893.

MIXTOPAGURUS GILLI, new species.

The rostral projection of this species is a broad, low, evenly rounded lobe bordered by a narrow carina; the sinus behind the eye is shallow and evenly curved; it ends, as is usual in the family, at the triangular projection between the eye and antenna; these projections are a

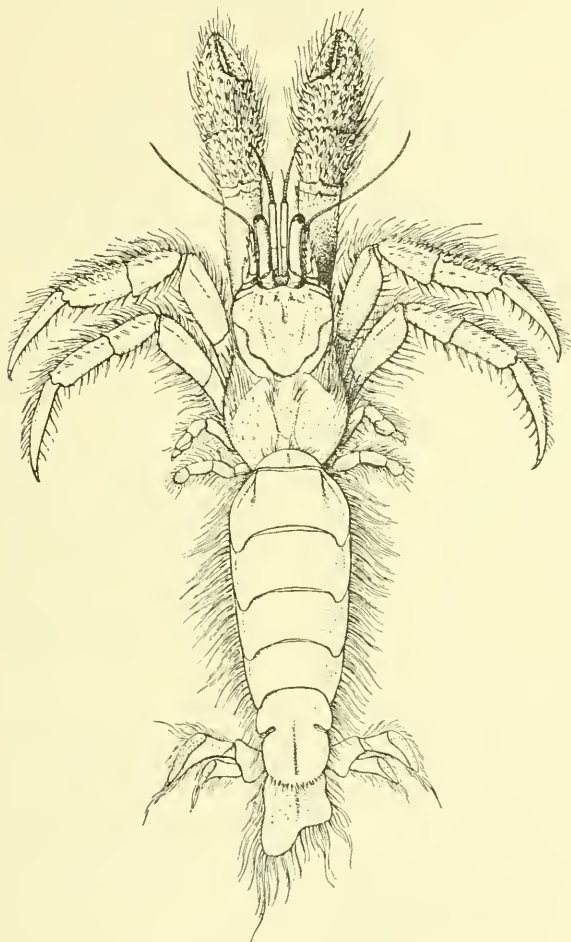


FIG. 7.—MIXTOPAGURUS GILLI. $\times 1\frac{1}{2}$.

little in advance of the rostral lobe and terminate in a sharp point. Close examination of the lobe shows it to be armed with a single very small spinule which does not deflect the bordering carina in the least. The length of the eye laid off on the front reaches from the outer base of one antenna to the outer base of the other. The peduncles are cylindrical and slightly bow upward. From the middle they very gradually increase in size to the not otherwise dilated cornea. The

peduncles of the antennulæ extend beyond the eyes by about one-quarter of the length of the distal segment. The peduncles of the antennæ are three-fourths as long as the eyes. The basal article is armed with a single spine on the outer side, the second segment by a single spine near the base of the eye, and an elongated process with a terminal and three other spines on the outer side. The acicle is about twice as long as this process, and is armed with five spines on the inner side, by a terminal spine and by three spines on the external margin.

Mictopagurus gilli differs from *M. paradoxus*, A. Milne-Edwards,¹ in the character of the front, which in that species is sharp and produced and is described as being more prominent than the lateral points. The antennular peduncles do not reach the corneæ, while in *Mictopagurus gilli* they pass them. The chelipeds are quite different in proportion. The telson in *Mictopagurus paradoxus* is symmetrical, in *M. gilli* very unsymmetrical.

The central areolation of the anterior portion of the carapace is shield shaped and smooth, the other parts of this portion are cut up by depressions. The posterior portion and the plates of the abdomen are calcified.

The chelipeds are short and stout; the inner and anterior margins are spiny; short conical spines are scattered over the surface. The crest of the palm has a row of six large spines; smaller ones are scattered over the surface; the movable finger has two rows of spines above.

The first right ambulatory leg has its carpus and propodus armed with a row of spines on the upper margin; there are two on the base of the dactyl; in the other ambulatory feet the spines are confined to the carpus. All of the feet are hairy.

The segmental plate of the sixth segment of the abdomen is armed with a row of spines on its distal margin. The telson is very unsymmetrical. It is fringed with long hair.

A single female with eggs was dredged at station 2601, 34° 39' 15" north latitude, 75° 33' 30" west longitude, in 107 fathoms. The anterior portion of the carapace is 8 mm. long.

Type.—U.S.N.M. No. 24805.

¹A. Milne-Edwards and E. L. Bouvier, Mem. Mus. Comp. Zool., XIV, No. 3, p. 24, pl. II, 1893.