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III.—NOTES ON AMERICAN CRUSTACEA. BY SIDNEY I. SMITH.

NO. I. OCYPODOIDEA.

Read, December 15th, 1869.

THIS article, which is intended as one of a series, is chiefly made up of notes and descriptions resulting from the study of the higher American crustacea in the Museum of Yale College and the collection of the Peabody Academy of Science. Mention is made only of those species of which I have examined specimens and in regard to which there are some new or unpublished facts to offer, except where mention of such species seemed needful for the proper understanding of new or imperfectly described forms. In the genus *Gelasimus*, I have departed somewhat from this course and have given the principal facts known to me, whether published or not, in regard to all the American species. I have not attempted to arrange the groups according to any zoölogical system, but have merely taken up the families as convenience suggested.

All specimens referred to, unless otherwise stated, are in the collections of the Museum of Yale College.

Family, OCYPODIDÆ.

Gelasimus Latreille.

The species of this genus, like most terrestrial crabs, seem to have been neglected by collectors. This fact, together with the difficulty of distinguishing the species from females or young specimens, and the impossibility of determining, from the descriptions and figures alone, what species many of the older authors had in view, has led to much confusion in the synonymy. Even some of the modern authors have published very imperfect descriptions of numerous closely allied species, neglecting to mention the form and ornamentation of the carapax or ambulatory legs, which give some of the best characters for distinguishing the species.

The genus, as at present constituted, is chiefly characterized by the enormously unequal development of the chelipeds in the male. This unsymmetrical development is not however confined to the chelipeds, but extends to almost every part of the animal. The carapax, in every species which I have examined, is more or less one-sided, the antero-

lateral angle being more developed on the side of the larger cheliped. The ocular peduncle also is usually longer on this side, and in some species is terminated by a slender stylet. This ocular stylet is quite remarkable, and appears to be a constant and important character of several species. Desmarest mentions it in a species which he describes under the much misapplied name of *vocans*, but his description would imply that it was found upon both sides. Edwards, in his description of *G. styliferus*, mentions it, and it is represented in his figures, but his words also imply that it was not confined to one side. In Edwards' *Histoire naturelle des Crustacés*, tome ii, p. 50, however, there is the following foot note:—"Au moment de mettre cette feuille sous presse; je reçois de M. T. Bell la communication d'un fait que je ne puis passer sous silence. Quelques Gélasimes présentent, à un certain âge, sinon toujours, un stylet à l'extrémité du pédoncule oculaire du côté de la grosse pince, tandis que l'œil du côté opposé conserve toujours la forme ordinaire." This observation of Bell agrees with my own on quite a number of specimens of two species described beyond, and it is quite probable that this is always the case.

The described species of *Gelasimus*, as limited by Edwards and other authors, form two very natural and distinct groups, which should perhaps be recognized as genera, but upon which, for the purposes of the present paper, it is not necessary to impose new names.

In the first group the front is contracted between the ocular peduncles so that their bases approach very closely, and the peduncles themselves are very long and slender. This includes Edwards' section A, in which the front is spatulate, and probably also, all of his section B, in which the front is very narrow between the eyes but not spatulate. In some of the species the meral segments of the ambulatory legs are armed with sharp spines, and with these species I have united the genus *Acanthoplaa*.

In the second group, which corresponds with the section C of Edwards, the front is broad and evenly arcuate, and the bases of the ocular peduncles are thus separated by quite a broad space. The peduncles themselves are much shorter than in the species of the other section. The species are mostly small and exhibit a remarkable uniformity in general appearance, so that it is difficult to distinguish them without careful study.

A single species, described beyond, differs from both these groups, in having the male abdomen only five-jointed and not narrowed at the second segment. The carapax is transverse and very little contracted behind. This species is evidently the type of a third very distinct group.

The number of American species now known is quite large. Edwards, in his review of the Ocypodoidea in the *Annales des Sciences naturelle* for 1852, enumerates, including his *Acanthoplax insignis*, eight species as appertaining to America. In 1855 Major LeConte described another species (*G. minax*), and in 1859-60 Dr. Stimpson added three others. In the following pages nine more are described, making in all twenty-one species known in the American fauna. Of the species which I have personally examined none are common to the east and the west coast. Edwards, however, mentions one species (*G. stenodactylus*) as occurring in Chili and Brazil, but even in this instance there may have been some mistake. The following list will illustrate the distribution of the species on the two coasts. The localities from which I have examined specimens are followed by an !.

ATLANTIC COAST.

PACIFIC COAST.

SECTION A.

	<i>G. heterophthalmus</i> , nov. Central America!
	<i>G. styliferus</i> Edwards. Ecuador.
	<i>G. heteropleurus</i> , nov. Central America!
<i>G. platyductylus</i> Edwards. Guiana.	<i>G. princeps</i> , nov. Central America!
<i>G. maracoani</i> Latreille. Guiana, Brazil.	<i>G. armatus</i> , nov. Central America!
	<i>G. ornatus</i> , nov. Central America!
	<i>G. insignis</i> (Edwards, sp.) Chili.

SECTION B.

<i>G. palustris</i> Edwards. Antilles.	<i>G. brevifrons</i> Stimpson. Cape St. Lucas!
<i>G. minax</i> LeConte. Long Island Sound to Florida!	<i>G. macrodactylus</i> Edw. et Lucas. Chili.
<i>G. pugnax</i> , nov. Long Island Sound to the W. Indies!	
<i>G. rapax</i> , nov. Aspinwall!	
<i>G. mordax</i> , nov. Brazil!	
<i>G. pugilator</i> Latreille. Massachusetts to Florida!	<i>G. stenodactylus</i> Edw. et Lucas. Chili.
<i>G. sub-cylindricus</i> Stimpson. Matamoras on the Rio Grande!	<i>G. Panamensis</i> Stimpson. Panama!

SECTION C.

<i>G. gibbosus</i> , nov. Central America!

A.—*Species in which all the segments of the abdomen are separated by distinct articulations, and in which the front is very much contracted between the bases of the ocular peduncles and somewhat spatulate in form.*

Gelasimus heterophthalmus, sp. nov.

Plate II, figure 6, 6^a. Plate III, figure 1-1^b.

Male. The carapax is somewhat quadrilateral in outline, but the antero-lateral angle on the side of the larger cheliped is much produced laterally, so that the orbit is much longer on that side than on the other and the lateral border strongly divergent. The dorsal surface is smooth and shining, and convex longitudinally but not at all laterally. The branchial regions are very slightly swollen, scarcely higher than the gastric and cardiac regions, and are separated from them by slightly marked sulci. The front is spatulate, contracted between the bases of the ocular peduncles and much expanded below. The superior border of the orbit is much excavated at the base of the ocular peduncle, and strongly arcuate in the middle, and has a very slightly upturned and entire margin. The antero-lateral angle on the side of the smaller cheliped, is angular but does not project either anteriorly or laterally, while on the side of the larger cheliped it is broad, obtuse and projects very much laterally, as described above. The lateral margin is obtuse and its posterior part only is indicated by a faint granulous line. The upper part of the inferior branchial region is oblique, flat and very smooth, and is separated from the lower portion by a slightly raised line running straight from the antero-lateral angle to the base of the third pair of ambulatory legs. The inferior border of the orbit is denticulate with minute, flattened and truncate teeth. The jugal regions are smooth and shining.

The ocular peduncles are rather slender, slightly enlarged at the cornea, and the one on the side of the larger cheliped is considerably the longer and is terminated beyond the cornea by a very slender filiform stylet, much longer than the peduncle itself, and slightly flattened and expanded at the tip. There is no trace of a terminal stylet on the peduncle of the other side.

In the larger cheliped, the anterior surface of the merus is smooth, narrowly triangular in outline and considerably convex, the inferior margin is sharp and denticulate, and the superior margin is armed with a slight crest which is very low and entire for most of its length but quite high, and in some specimens slightly dentate, at its distal extremity. The carpus is short and its upper surface is slightly verrucose. The basal portion of the propodus is rounded and coarsely

and densely verrucose externally, the superior and inferior margins are thin and dentate, and the inner surface is nearly smooth, excepting three, high, tuberclose crests, of which one runs obliquely upward from the inferior margin, one from the base of the dactylus along the margin of the depression into which the carpus folds, meeting the first in nearly a right angle, and another along the margin next the base of the dactylus, leaving a rectangular, depressed area between it and the lower crest. Both the fingers are smooth on the inside, quite long, compressed and high, and the prehensile edges are evenly tuberculated and each armed with a single, stout, median tooth. The outer surface of the propodal finger is somewhat roughened with irregular, shallow punctures, the inferior edge is granulated and has a submarginal, granulous line on the outer side, and the prehensile edge is armed with a stout tooth considerably within the tooth on the dactylus; the edge beyond this tooth is straight and closes evenly against the dactylus, but between the tooth and the base it is deeply excavated, leaving a short and broad opening between the bases of the fingers. The dactylus is smooth on the outside, except a small space at the base, its superior edge is entire and smooth, and the prehensile edge is nearly straight, tuberculated and armed with a stout tooth a little beyond the middle.

In the smaller cheliped the merus is slender and somewhat triquetral, and the superior and exterior angles are sharp. The carpus is short, ovoid in form, and smooth and rounded externally. The hand is slender, and the fingers long, flattened at the tips, and the angles clothed with hairs.

The ambulatory legs are smooth and unarmed.

The abdomen is contracted at the articulation of the first with the second segment, and the edges are straight from the second segment to the terminal, which is broad and obtusely rounded at the extremity.

Four specimens gave the following measurements:—

	1.	2.	3.	4.
Length of carapax, - - - - -	18·7mm	18·5mm	18·2mm	16·9mm
Breadth of " - - - - -	32·2	32·3	30·0	27·2
Ratio of length to breadth, - - - - -	1:1·72	1:1·75	1:1·65	1:1·61
Length of larger hand, - - - - -	48·4	53·5	43·0	37·5
Length of ocular peduncle on side of smaller cheliped, 14·0		14·3	12·9	12·3
Length of ocular peduncle on side of larger cheliped,				
excluding stylet, - - - - -	16·2	16·3	15·0	13·8
Length of terminal stylet of ocular peduncle, -	19·4	20·0	----	10+

In numbers 3 and 4 the ocular stylets are broken and partly wanting.

Quite a number of specimens are in the collection of the Peabody

Academy of Science, all obtained at the Gulf of Fonseca, west coast of Central America, by J. A. McNiel.

This species is apparently closely allied to the *G. styliferus*, but the ocular stylets in that species are very short, and the hand, as figured by Edwards, is shorter and higher in proportion than in our species. The description of *G. styliferus* is, however, too short to permit of a detailed comparison of the species.

Gelasimus styliferus Edwards.

Gelasimus platyductylus Edwards, Règne animal de Cuvier, 3^{me} édit., Crust., pl. 18, fig. 1^a, non Histoire naturelle des Crust., tome ii, p. 51, 1837, (teste Edwards).

Gelasimus styiferus Edwards, Annales des Sciences naturelle, 3^{me} série, Zoologie, tome xviii, 1852, p. 145, pl. 3, fig. 3.

The following is the description given by Edwards:—"Espèce très voisine du *G. platyductylus*, mais ayant le crête marginale du bras moins développée et les podophthalmites terminés par un petit stylet comme chez les Ocy-podes.—Guayaquil."

Gelasimus heteropleurus, sp. nov.

Plate II, figure 7. Plate III, figure 2-2^b.

Male. The carapax is quadrilateral in outline, but the antero-lateral angle on one side is produced as in *G. heterophthalmus*. The dorsal surface is slightly granulous, quite flat anteriorly and only slightly convex posteriorly. The branchial regions are not at all swollen but are separated from the gastric and cardiac regions by deep sulci. The front is spatulate and expanded below the bases of the ocular peduncles. The superior border of the orbit is arcuate in the middle and has an upturned and slightly crenulated margin. The antero-lateral angle, on the side of the smaller cheliped, is acute and projects slightly forward, while on the side of the larger cheliped, it projects laterally as a very prominent obtuse tooth. The lateral margins are angular and armed with a very marked line of sharp granules. The upper part of the inferior branchial region is smooth and nearly perpendicular. The inferior border of the orbit is thin and denticulate with minute, flattened and truncate teeth. The jugal regions are granulous.

The ocular peduncles are slender, much enlarged at the cornea and the one on the side of the larger cheliped is much longer than the other and is terminated by a slender flattened stylet about as long as the cornea.

In the larger cheliped, the anterior surface of the merus is narrow, somewhat convex, and smooth, its margins are minutely denticulate, and the superior one is armed with a narrow crest-like process at the

distal extremity. The superior surface of the carpus is flattened and granulous. The outer surface of the basal portion of the propodus is thickly verrucose, the verrucæ near the upper margin being coarse and tuberculiform, the inner surface is armed only with the oblique tubercular crest running from the inferior margin. Both fingers are smooth on the inside, compressed and short, being but little longer than the basal portion of the propodus; their prehensile edges are evenly tubercular, each armed with a tooth a little way from the tip, and nearly straight, but widely separated at base, leaving a broad, open space within the teeth, but beyond the teeth, the edges meet and the tips hook by each other. The outer surface of the propodal finger is granulous or minutely verrucose and the inferior edge is minutely tuberculated and has a submarginal crest on the outer side. The outer surface of the dactylus is granulous like the other finger and the superior edge is somewhat tuberculated or denticulate.

The smaller cheliped and the ambulatory legs are very much as in *G. heterophthalmus*.

The abdomen is quite similar to that of *G. heterophthalmus*, but is more narrowed toward the tip and the edges are slightly concave.

Length of carapax, - - - - -	15.8mm	15.2mm
Breadth of " - - - - -	25.0	25.6
Ratio of length to breadth, - - - - -	1 : 1.58	1 : 1.68
Length of larger hand, - - - - -	32.0	36.0
Length of ocular peduncle on side of smaller cheliped,	10.1	---
Length of ocular peduncle on side of larger cheliped, excluding stylet, - - - - -	12.0	12.3
Length of terminal stylet of ocular peduncle, - - - - -	2.5	2.8

I have seen but two specimens, both obtained, with the other species mentioned, by Mr. McNeil, at the Gulf of Fonseca (Collection Peabody Academy of Science).

In the length of the ocular stylet this species agrees with the *G. styliferus*, but the merus and hand in the larger cheliped are very different, and at once distinguish it from that species.

The *Gelasimus vocans* of Desmarest (Considérations générales sur la Class des Crustacés, p. 123) seems to be distinct from any of the species described by recent authors and apparently belongs in this section, as it is distinctly stated that the ocular peduncles are terminated by stylets. Edwards refers it to his *G. palustris*, to which it evidently cannot belong, but, as the character of the front is not stated, it may possibly belong in section B, forming in that case a subsection with ocular stylets.

Desmarest's description is as follows :—"Carapace unie, avec le bord antérieur sinueux ; serre droite ordinairement plus grande que la gauche ; toutes les deux étant finement chagrinées en dehors, avec une ligne enfoncée courte, près de leur extrémité, et ayant leurs doigts longs, étroits, très-écartés entre eux, unis, comprimés ; pédoncules oculaires pourvus à leur extrémité d'une pointe aiguë. Des Antilles."

Gelasimus princeps, sp. nov.

Plate II, figure 10. Plate III, figure 3-3^c.

Male. The carapax is in the form of a trapezoid much contracted behind, and the dorsal surface is smooth and shining. The branchial regions are somewhat gibbous, are higher than the gastric and cardiac regions and are separated from them by deep sulci. The front is spatulate and much contracted between the bases of the ocular peduncles. The superior margin of the orbit is strongly curved, the posterior margin is slightly raised and minutely denticulated, and the outer angle projects laterally as a very prominent triangular tooth, which is considerably larger on the side of the greater cheliped than on the other side, so that the carapax is somewhat unsymmetrical. The lateral margins are marked by sharply granular lines which curve slightly inward and rapidly converge posteriorly. The upper portion of the inferior branchial region is quite oblique, flat and smooth, and is separated from the lower portion by a slight, granulated line. The inferior margin of the orbit is armed with about twenty-five small, compressed and truncate teeth.

The ocular peduncles are unequal in length, the one on the side of the larger cheliped being the longer, very slender but considerably enlarged at the the cornea and shorter than the broad, open orbits.

The larger cheliped is enormously developed, the hand being nearly three times as long as the carapax. The anterior surface of the merus is flat and smooth, and its superior margin projects into a thin, high, evenly arched and sharply dentate crest, and the inferior angle is armed with a line of small and closely set spines. The upper surface of the carpus is rounded and verrucose and the inner margin is angular and denticulate. The basal portion of the propodus is rounded and coarsely verrucose externally, the superior margin projects as a thin crest beneath which the carpus closes, the inferior margin is dentate, and the inner surface is smooth, excepting two tuberculose crests, of which one runs obliquely upward, from the base of the dactylus, along the margin of the depression into which the carpus folds and meets the first crest in a right angle. The fingers are much

compressed and very long, the inner surfaces are smooth, and the prehensile edges are very tuberculose and each is armed with a stout tooth near the middle, the tooth on the dactylus being a little nearer the base than the other; within these teeth the prehensile edges gape widely leaving an ovate space, while beyond the teeth, the edges meet and are nearly straight almost to the tips, which, however, are strongly curved. The outer surface of the digital portion of the propodus is nearly smooth but has a submarginal, crenulated crest below, and the inferior margin is denticulate. The outer surface of the dactylus is somewhat verrucose and the superior edge is denticulate and slightly margined toward the base.

In the smaller cheliped, the merus is slender and somewhat triquetral and the superior and exterior angles are sharp and granulated. The hand is very similar to that of *G. heterophthalmus*.

The ambulatory legs are stout and nearly naked and the meral segments are somewhat compressed and their edges sharp and minutely denticulate.

The abdomen is broad, the basal segment is considerably shorter than the second and third, the edges approach each other somewhat at the junction of fifth and sixth, and the terminal segment is nearly twice as broad as long and its extremity is rounded.

Five specimens give the following measurements:—

Length of carapax.	Breadth of carapax.	Ratio.	Length of larger hand.
24.1mm	41.1mm	1: 1.71	64.0mm
24.0	39.8	1: 1.66	70.0
23.4	39.8	1: 1.70	71.4
22.0	36.4	1: 1.65	64.4
21.3	36.0	1: 1.69	60.4

I have examined a large number of specimens of this species collected at Corinto, on the west coast of Nicaragua, by J. A. McNeil, (Collection Peabody Academy of Science).

There are three female specimens of *Gelasimus* collected at the same locality by Mr. McNeil, which probably belong to this species although they differ quite remarkably from it. The carapax (Plate II, figure 8) is not so much narrowed behind as in the males, the dorsal surface is evenly convex and thickly covered with rounded granules, which are quite coarse along the lateral borders, and the branchial regions are not raised above the gastric and cordiac regions, and are separated from them only by slight sulci. The sides of the carapax are perfectly symmetrical, the anterior angles are prominent and sharp, and the lateral margins are marked by sharp crests of bead-like

granules. The jugal regions are granulous. The chelipeds resemble very much the smaller cheliped of the males but are rather smaller in proportion. The abdomen is broadly elliptical and there is a line of granules on the basal segment.

Two of these specimens give the following measurements :

Length of carapax.	Breadth of carapax.	Ratio.
21·8mm	33·8	1 : 1·55
15·2	23·4	1 : 1·54

Under the name of *G. platydactylus*, Saussure* mentions a species from Mazatlan, Gulf of California, which I should refer to this species without hesitation, did he not state that the carpus was bituberculate, a character which does not apply to any species of *Gelasimus* which I have seen. Saussure's notice is as follows:

“*Gelasimus platydactylus*, Latr.—Presque entièrement semblable aux individus de Cayenne, si ce n'est que le carpe est bituberculé, et que la grande crête du bras est dentelée, non entière.”

Gelasimus platydactylus Edwards.

? *Cancer vocans major* Herbst, Naturgeschichte der Krabben und Krebse, Band i, p. 83, Band iii, erstes Heft, p. 29, Tab. 1, fig. 11 (after Seba).

? *Ocypoda heterochelos* Bosc, Histoire naturelle des Crustacés, tome ii, p. 197, 1802.

? *Gelasimus maracoani* Desmarest, Considérations générales sur la Class des Crustacés, p. 123, 1825, (non Latreille).

Gelasimus platydactylus Edwards, Histoire naturelle des Crust., tome ii, p. 51, 1837; Annales des Sciences naturelle, 3^{me} série, Zoologie, tome xviii, 1852, p. 144, pl. 3, fig. 2.

The synonymy of this species is in much confusion. Edwards quotes Herbst's and Seba's figures without query as belonging to his *G. platydactylus* and refers the *Ocypoda heterochelos* of Bosc to the *G. maracoani*. Bosc's description however appears to have been drawn up from Herbst's or Seba's figure, and if these figures really belong to Edwards' species, the name *heterochelos* should be restored and the species should stand as *Gelasimus heterochelos*. The roughened or verrucose character of the carapax in Herbst's figure is a marked feature which is not mentioned in either of Edwards' descriptions, so that it is quite likely that Bosc's *heterochelos* may be distinct from Edwards' species. Edwards gives Cayenne as the habitat of *G. platydactylus*.

As described and figured by Edwards, this species differs from *G. princeps* in having the superior crest of the merus of the larger

* Description de quelques Crustacés nouveaux de la côte occidentale du Mexique. Revue et Magasin de Zoologie, 2^e série, tome v, 1853, p. 362.

cheliped entire, the hand much shorter and the fingers gaping for the whole length, and wanting the stout tooth on the prehensile edge of the propodus.

Gelasimus maracoani Latreille.

Maracoani, Maregrave de Liebstadt, Histoire rerum naturalium Brasilie, figure.

Ocypoda maracoani Latreille, Histoire des Crust. et Insectes, tome vi, p. 46, 1803.

Gonoplax maracoani Lamarck, Histoire naturelle des animaux sans vertèbres, 2^e édit., tome v, p. 465.

Gelasimus maracoani Latreille, Nouveau Dictionnaire d'Histoire naturelle, 2^e édit., tome xii, p. 517, 1817; Encyclopédie méthodique, pl. 296, fig. 1; Edwards, Histoire naturelle des Crust., tome ii, p. 51, 1837; Annales des Sciences naturelles, 3^{me} série, Zoologie, tome xviii, 1852, p. 144, pl. 3, fig. 1; Dana, United States Exploring Expedition, Crust., p. 318, 1852.

Said to inhabit Cayenne and Brazil.

Very likely two or more species are still confounded under the name of *maracoani*. Neither Edwards nor Dana mention any spines on the meral segments of the ambulatory legs, while in Latreille's figure in the Encyclopédie méthodique there are short spines represented on the posterior legs.

Gelasimus armatus, sp. nov.

Plate II, figure 5. Plate III, figure 4-4^d.

Male. The carapax is only slightly convex and very little narrowed posteriorly, and the dorsal surface is naked and deeply areolated. The gastric and cardiac regions are smooth and shining, and the cardiac is large and very prominent. The branchial regions are prominent and their surfaces smooth but covered by very distinct, raised, vein-like markings which branch off in an arborescent manner from a conspicuous central trunk. The front is small, spatulate, contracted between the bases of the ocular peduncles and expanded below. The superior border of the orbit has a strongly raised margin, its edge is slightly sinuous and the antero-lateral angle prominent, the one on the side of the smaller hand being directed forward and the one on the side of the larger hand being more prominent than the other and directed strongly outward. The anterior part of the lateral margin is longitudinal, so that the breadth of the carapax is scarcely more between the antero-lateral angles than a short distance posteriorly; at the posterior extremity of this longitudinal portion, there are two small, but prominent, marginal tubercles, from which a granulated line extends to the bases of the posterior legs, where there is another small rounded tubercle. The posterior margin is straight, smooth and

unarmed. The inferior margin of the orbit is armed with fifteen to eighteen slender, compressed and truncated teeth. The jugal regions are swollen and smooth, but their surfaces are veined somewhat as the regions above.

The ocular peduncles are unequal in length, the one on the side of the larger cheliped being the longer, are very slender, but considerably enlarged at the corina, and shorter than the broad and open orbits which they only partially fill.

The larger cheliped is enormously developed, the hand being high and lamellar, and exceeding, in length, twice the length of the carapax. The ischium is armed above and below with a small, marginal tubercle. The merus is smooth and rounded posteriorly, the anterior surface is flat and smooth, the inferior angle is armed with scattered tubercles, and the superior angle rises into a low crest toward the distal portion, and is armed with slender tubercles. The carpus is smooth and rounded, but is armed with one or two small tubercles at the proximal extremity of the inner margin, and there are several low tubercles on the outer surface. The basal portion of the propodus is short; the inner surface is smooth and unarmed, except with a prominent tubercle near the middle, from which a line of obscure tubercles extends along the slight, oblique ridge to the inferior margin; the outer surface is covered with very large, depressed, smooth tubercles which are separated by considerable spaces; and the inferior margin is thin and armed with dentiform tubercles. The digital portion of the propodus is thin and very broad toward the base; the inner surface is smooth and somewhat concave; the outer surface is flat and very coarsely punctate; the inferior edge is denticulate and slightly margined on the outside; and the prehensile edge is straight, except a slight excavation at the base, is armed with very small marginal tubercles and a high, tubercular, median ridge, and at the extremity, with a slender tooth. The dactylus is broadest toward the extremity; the inner surface is concave and smooth; the outer surface is flat and nearly smooth; the superior edge is arcuate, thin and slightly denticulate; the prehensile edge is straight, closes closely against the propodal finger, except the slightly excavated portion at the base, and is armed with three lines of tubercles, like the propodal finger, except that the inner, marginal line is separated from the median line by quite a wide space toward the tip, and that one of the tubercles, about two-fifths of the way from the base to the tip, is much larger than the rest; and the tip is armed with a tooth projecting perpendicularly downward.

In the smaller cheliped, the merus is slender and its anterior edge is

armed with three spinules. The hand is slender, and the fingers are long, flattened at the tips, and the angles clothed with long hairs.

The ambulatory legs are stout. The merus is smooth and unarmed in the first pair, but in the three last pairs, its posterior edge is armed with slender spines,—five in the second pair, six or seven in the third, and three short ones on the fourth or last.

The abdomen is quite similar to that of *G. princeps*.

Length of carapax, 25.2^{mm}; breadth of carapax, 35.5^{mm}; ratio of length to breadth, 1:1.41. Total length of propodus in larger cheliped, 60.0^{mm}. Length of dactylus, 45.6^{mm}; breadth of dactylus, 11.8^{mm}.

The only specimen of this species which I have seen is in the collection of the Peabody Academy of Science, and was obtained at the Gulf of Fonseca, West Coast of Central America, by J. A. McNeil.

The larger hand in this specimen resembles very much the figure of the hand of *G. maracoani* given by Edwards in the *Annales des Sciences naturelles*, 3^{me} série, tome xviii, 1852, pl. 3, fig. 1^b, but the carapax and ambulatory legs seem to be very different from that species, as neither Edwards nor Dana mention, in their descriptions of *G. maracoani*, the peculiar sculpturing of the branchial regions, the tubercles of the lateral margins or the spines of the ambulatory legs which are so conspicuous characters in *G. armatus*. In these characters it approaches the genus *Acanthoplax*, as described by Edwards.

Gelasimus ornatus, sp. nov.

Plate II, figure 9–9^a. Plate III, figure 5–5^c.

Female. The carapax is narrow and the greatest breadth is between the antero-lateral angles, it is convex longitudinally, but only slightly laterally, and the dorsal surface is verrucose, some of the verrucæ, especially on the branchial regions, being large and depressed. The regions are not swollen or protuberant, but the cervical and branchio-cardiac suture is very distinctly indicated. The front is narrow and spatulate, but only slightly expanded below the bases of the ocular peduncles. The superior border of the orbit is slightly and regularly arcuate, as seen from above, the margin is slightly raised and minutely denticulate, and the lateral angle projects forward and outward as a slender and prominent tooth. The antero-lateral margin is longitudinal for a short distance anteriorly, but the posterior portion curves inward to the base of the posterior leg, and is ornamented with eight to ten bead-like tubercles. The latero-inferior, branchial regions are nearly vertical, and are divided by a granulated crest

which starts a little way from the antero-lateral angle and extends obliquely backward to the bases of the penultimate legs. The posterior margin is ornamented with a line of low tubercles. The inferior margin of the orbit is armed with about fifteen compressed and truncate teeth. The jugal regions are rough and sparsely clothed with short hairs.

The ocular peduncles are equal in length, slender, slightly enlarged at the cornea and very little shorter than the broad and very open orbits.

The chelipeds are like the smaller cheliped of *G. armatus*, except that the merus has but one spine and that the ischium has a slight tooth on the lower side next the articulation with the merus.

The ambulatory legs are quite similar to those of *G. armatus*, but all of them have a tooth or spine on the lower side of the ischium, and the merus is armed in the first pair with one or two spines, in the second with three, in the third with five, and in the last with two or three.

The abdomen is broadly elliptical, and the basal segment is ornamented with a line of small tubercles.

Length of carapax, 26.6^{mm}; breadth of carapax, 36.0^{mm}; ratio of length to breadth, 1:1.35.

The single specimen above described is in the collection of the Peabody Academy of Science, and was brought home, with the *G. armatus* and several of the foregoing species, by J. A. McNeil, but unfortunately has no label to indicate the exact locality from which it came. It is however undoubtedly from some part of the west coast of Central America.

This species is allied to the *Acanthoplax insignis* Edwards, but is at once distinguished from it by the verrucose dorsal surface of the carapax. It has also considerable affinity with *G. armatus*, and it is possible that it may be the female of that species, but this seems very improbable, when the great differences in the ornamentation of the carapax and in the armature of the chelipeds and ambulatory legs are considered.

Gelasimus insignis.

Acanthoplax insignis Edwards, Annales des Sciences naturelles, 3^{me} série, Zoologie, tome xviii, 1852, p. 151, pl. 4, fig. 23; Archives du Muséum d'Histoire naturelle, Paris, tome vii, p. 162, pl. 11, fig. 1, 1854.

Edwards states that this species was known to him only from a single, female specimen brought from Chili by M. Gay, but the figures which he has given in the Annales des Sciences and in the Archives

du Muséum, differ so much that it would scarcely be supposed that they were intended to represent the same species, much less the same specimen.

The only generic characters which are given by Edwards to distinguish *Acanthoplax* from *Gelasimus*, the proportions of the carapax and the tuberculation of the branchial regions, appear to me to be of slight importance. In the proportions of the carapax, the difference between *Acanthoplax* as figured in the *Annales des Sciences* and the ordinary narrow fronted *Gelasini* is scarcely, if any, greater than the difference between the two figures of *A. insignis*, for the figure of the carapax in the *Annales* is 19·0^{mm} in length and 27·5^{mm} in breadth, giving the ratio of length to breadth, 1:1·45, while the carapax in the figure in the *Archives du Muséum* is 25·2^{mm} in length and 32·0^{mm} in breadth, giving the ratio, 1:1·27, and this when both figures are stated to be of natural size. No measurements are given in the text in either place. The tuberculation of the branchial regions appears to be merely a character of ornamentation to which there is a considerable approach in the females of many of the large *Gelasini*, and in the male *G. armatus* described in this article, there is a still closer approach to it.

The armature of the ambulatory legs, however, may prove to be a character of some importance, and would unite in one group with *A. insignis*, *G. ornatus* and *G. armatus*, and perhaps also *G. maracoani*.

B.—Species in which all the segments of the abdomen are separated by distinct articulations, but in which the front is broad and evenly arcuate between the bases of the ocular peduncles.

Gelasimus palustris Edwards.

(?) *Cancer vocator* Herbst, op. cit., Band iii, viertes Heft, p. 1, Tab. 59, fig. 1, 1804.

Gelasimus vocans Edwards, *Histoire naturelle des Crust.*, tome ii, p. 54; et *Règne animal de Cuvier*, 3^{me} édit., *Crust.*, pl. 18, fig. 1 (*teste* Edwards).

Gelasimus palustris Edwards, *Annales des Sciences naturelles*, 3^{me} série, *Zoologie*, tome xviii, 1852, p. 148, pl. 4, fig. 13.

(*Non Cancer vocans* Linné, *Systema Naturæ*, editio xii, tome i, p. 1041).

As figured in the *Annales des Sciences naturelles*, this species is quite different from any species which I have examined, and is distinguished by the form of the terminal segment of the male abdomen, which is as long as its breadth at base, with the sides straight and slightly divergent and the extremity broad and rounded, and by the anterior margin of the orbital border being symmetrical and not more rapidly curved above the base of the ocular peduncle than on the outside, as it is in most of the allied species. It is described in the fol-

lowing brief terms:—"Crête sourcilière postérieure presque droite, l'antérieure très courbe; crêtes marginales très marguées sur les lobes mésobranchiaux.—Antilles."

It is quite apparent that Edwards confounded at least two species under the name of *palustris*. The figure of *G. vocans*, which he has given in the Règne animal and which he refers to his *palustris*, evidently represents a different and distinct species, as the front is quite narrow, the basal portion of the propodus of the larger cheliped much longer in proportion and the terminal segment of the male abdomen entirely different in form. It is very likely the same as the *G. vocans* of his Histoire naturelle des Crustacés, which is said to inhabit Brazil.

Stimpson, in the Annales of the Lyceum of Natural History, New York, vol. vii, p. 62, refers the *G. vocans* of Dana and the *G. minax* of LeConte to the *palustris* of Edwards, and he evidently had more than one species before him, as he mentions that the tubercles on the outer surface of the larger cheliped were minute or obsolete in specimens from the Mexican and Central American shores.

Gelasimus macrodactylus Edwards et Lucas.

Voyage de d'Orbigny dans l'Amérique méridionale, Crust., p. 27, pl. 11, fig. 3, 1843;

Edwards, Annales des Sciences naturelles, 3^{me} série, Zool., tome xviii, 1852, p. 149.

"Côtes du Valparaiso" (Edwards and Lucas).

Gelasimus minax LeConte.

Gelasimus minax John LeConte, On a new species of *Gelasimus*, Proceedings Academy Nat. Sci., Philadelphia, vol. vii, 1855, p. 403.

Gelasimus palustris (pars) Stimpson, Annals Lyceum Nat. Hist., New York, vol. vii, p. 62, 1859.

Plate II, figure 4. Plate IV, figure 1-1^b.

Male. The carapax is quite convex longitudinally and slightly transversely, and in large specimens the branchial regions are somewhat gibbous above. The dorsal surface appears smooth, but is very minutely granulous, and there are a few small tubercles on the anterior part of the gastric region near the lateral margin. The front is broad and regularly arcuate. The posterior, or upper, edge of the superior orbital border is transverse and nearly straight, and has a smooth upturned margin. The anterior, or lower, edge is marked by a sharply raised and minutely denticulated margin which curves rapidly downward above the base of the ocular peduncle, then gradually upward and joins the posterior margin a little way from the an-

tero-lateral angle, which is obtuse and not at all prominent. The lateral border is marked by a sharply upturned and finely denticulated margin, which is arcuate anteriorly so that the breadth of the carapax is considerably less between the antero-lateral angles than a little posteriorly, and the posterior portion is strongly incurved and terminates opposite the cardiac region. The postero-lateral border is crossed by an oblique raised line or plication. The inferior orbital margin is finely toothed and the jugal region is rough and hairy.

The larger cheliped is stout, and the length of the hand in large specimens is nearly or quite three times as great as the length of the carapax. The anterior surface of the merus is smooth, narrowly triangular in outline and its margins are nearly straight, the inferior armed with minute tubercles, and the superior with slender tubercles on the distal portion; the upper surface is roughened with short, irregular, transverse rows of small tubercles. The superior surface of the carpus is covered with depressed tubercles, the proximal portion of the inner edge is tubercular and the inner surface is crossed by an oblique ridge armed with tubercles. The basal portion of the propodus is much shorter than the digital portion, and its superior and exterior surface is covered with depressed tubercles, which are large and separated by smooth spaces on the upper portion, but below are smaller and crowded, and, along the inferior border, almost obsolete; the inner surface is armed, on the inferior border, with a ridge of large tubercles extending from the base of the propodal finger obliquely upward to the border of the deep depression into which the carpus folds, and there are also a few tubercles between this depression and the base of the dactylus, and a line of tubercles extending upward, from the inner edge of the propodal finger, parallel to the base of the dactylus; the superior edge is tuberculose and has a crenulated margin on the outside and the inner margin is curved downward at the extremity of the depression into which the carpus folds; and finally, the inferior edge is smooth and rounded, but with a slight margin on the outside. The propodal finger is nearly straight; the inferior edge is smoothly rounded, the prehensile edge is broad and armed with marginal lines of small tubercles, and a median one of irregular tubercles, of which one, about the middle of the finger, is very much larger than the rest; and the tip has an excavation into which the dactylus fits. The dactylus is much curved, especially toward the tip, which hooks considerably by the tip of the propodal finger, and the prehensile edge is much as in the other finger, but the tubercles of the median line are nearly obsolete, except two or three large ones near the base, and as many more between the middle and the tip.

The ambulatory legs are stout and very hairy along the edges, and the meral segments are quite broad, those of the posterior pair being nearly three times as long as broad.

The abdomen is slightly narrowed at the first segment and is broadest at the second and third. The distal margin of the penultimate segment is somewhat excavated for the reception of the terminal segment, which is much narrower than the penultimate and broadest at the base, from which the margin is regularly arcuate, forming scarcely more than a semicircle.

Both in alcoholic and dry specimens the points of the articulation of the merus with the carpus, the carpus with the propodus and the propodus with the dactylus, in the larger cheliped, are marked by red spots, and there are similar, but smaller, spots on the ambulatory legs, at the articulation of the meral with the carpal segments.

The females differ from the males in being narrower and more evenly convex above, and in having the branchial regions more swollen and thickly covered with rounded tubercles.

A number of specimens give the following measurements:—

Locality.	Sex.	Length of carapax.	Breadth of carapax.	Ratio.	Length of hand.	Breadth of hand.	
New Haven, Ct.	Male.	26.5mm	38.1mm	1:1.44	75.0mm	23.0mm	
"	"	"	22.9	34.0	1:1.48	61.0	20.8
"	"	"	22.9	32.8	1:1.43	---	---
"	"	"	22.2	30.0	1:1.35	53.0	18.0
Bluffton, S. C.	"	19.0	28.2	1:1.48	45.0	15.8	
"	"	"	17.6	25.2	1:1.43	40.5	14.8
"	"	"	17.2	24.5	1:1.43	40.0	14.2
New Haven, Ct.	Female.	24.9	34.3	1:1.37	---	---	
"	"	"	21.8	29.2	1:1.34	---	---

This species is found at New Haven, Conn., on salt-marshes. There are specimens in the collection of the Peabody Academy of Science from Bluffton, South Carolina, and also, from St. Augustine, Florida. LeConte's specimens were from New Jersey.

This is a very large species and I have not seen young specimens. It has perhaps been considered an adult form of *G. pugnax*; LeConte, however, recognized it as a distinct species and pointed out the differences, having very naturally mistaken the *pugnax* for *G. pugilator*. The tubercles on the anterior portion of the branchial region of the male are probably only an adult character, but the very coarse tuberculation of the basal portion of the propodus and the red markings on the larger cheliped of the male, and the tubercular branchial regions of the female, are quite enough to distinguish it from the allied species.

Gelasimus brevifrons Stimpson.

Annals Lyceum Nat. Hist., New York, vol. vii, p. 229, 1860.

Of this species, which was found in a lagoon at Todos Santos, near Cape St. Lucas, Lower California, I have seen only a single, female specimen, which was kindly loaned from the collection of the Chicago Academy by Dr. Stimpson.

As far as can be judged from the female alone, it is very distinct from any other species with which I am acquainted and seems to be most closely allied to *G. minax*. It differs from the female of *G. minax*, in having the carapax broader in proportion and not nearly so much narrowed behind, and the dorsal surface less convex; the carinae of the lateral margins are more prominent and, from the form of the carapax, are not so much curved; the front is shorter and more perpendicular, and the anterior margin of the orbital border is more convex, leaving a broader space between it and the posterior margin; and finally, the meral segments of the ambulatory legs are much narrower in proportion, and are marked with conspicuous, transverse plications.

Length of carapax, 17.5^{mm}; breadth of carapax, 25.0^{mm}; ratio of length to breadth, 1 : 1.43.

Gelasimus pugnax, sp. nov.

Gelasimus vocans (*pars*) Gould, Report on the Invertebrata of Massachusetts, p. 325, 1841; *G. vocans*, var. A, DeKay, Natural History of New York, Crust., p. 14, pl. 6, fig. 10, 1844 (*non Cancer vocans* Linné).

Gelasimus pugilator LeConte, loc. cit., p. 403 (*non* Bosc).

(?) *Gelasimus palustris* (*pars*) Stimpson, Annals Lyceum Nat. Hist., New York, p. 62, 1859 (*non* Edwards).

Plate II, figure 1. Plate IV, figure 2-2^d.

Male. The carapax is quite similar to that of *G. minax* but it is broader, the dorsal surface is smooth and there are no tubercles on the branchial regions, the front is narrower and projects farther downward, the antero-lateral angle is sharp and the anterior part of the lateral margin is not at all, or only very slightly, arcuate.

In the larger cheliped, the anterior surface of the merus is usually somewhat granular or finely tuberculose, especially along the inferior border, its outline is triangular and much broader toward the carpus than in *G. minax*, and the distal portion of the superior margin is high and arcuate and not tuberculated as in that species. The superior surface of the carpus is covered with small, rounded tubercles and the inferior surface is crossed by an oblique, and more or less tuberculated,

ridge. The basal portion of the propodus, even in quite small specimens, is shorter than the digital portion and its superior and exterior surface is covered with small, depressed tubercles of unequal sizes and so thickly crowded together that there are scarcely any spaces between them, the oblique ridge on the inferior border of the inside is armed with numerous very small tubercles, the whole space between the upper portion of this ridge and the base of the dactylus is finely tuberculose, and the inferior edge is very distinctly margined on the outside. Both the propodal finger and the dactylus are more slender than in *G. minax* but offer no distinctive characters.

The ambulatory legs are rather stout, very hairy along the edges of the carpal and propodal segments and the meral segments are broad, those of the posterior pair being about one and a half times as long as broad.

The abdomen is scarcely at all narrowed at the basal segments. The terminal segment is very much as in *G. minax* but slightly broader in proportion and very similar to that of *G. pugilator*, figured by Edwards in the *Annales des Sciences naturelles*, 3^me série, tome xviii, 1852, pl. 4, fig. 14^b, and not at all like his figure of *G. palustris*, fig. 13^b on the same plate.

The females differ from the males in being slightly narrower in proportion and in having the dorsal surface of the carapax more convex and minutely granulous.

In life, the dorsal surface of the carapax of the male is very dark greenish olive, the middle and anterior portion, mottled with grayish white, the front, between and above the bases of the ocular peduncles, light blue varying somewhat in intensity in different specimens, and the anterior margin tinged with brown. The larger cheliped is lighter than the carapax, is marked with pale brownish yellow at the articulations and along the upper edge of the dactylus, and both fingers are nearly white along the prehensile edges. The exposed portions of the the ocular peduncles and the eyes are like the dorsal surface of the carapax. The smaller cheliped and the ambulatory legs are somewhat translucent and thickly mottled and specked with dark grayish olive. The sternum and abdomen are mottled ashy gray. The females differ from the males in having the dorsal surface of the carapax less distinctly mottled with whitish and in wanting the blue on the front. This description of the colors was taken, in November, from about a dozen specimens from New Haven.

A series of specimens give the following measurements:—

Locality.	Sex.	Length of carapax.	Breadth of carapax.	Ratio.	Length of hand.	Breadth of hand.
					_____mm	_____mm
New Haven, Conn.	Male.	15·3mm	23·2mm	1 : 1·52		
"	"	14·8	22·6	1 : 1·51	40·5	13·8
"	"	14·4	21·9	1 : 1·52	41·0	13·5
Bahamas.	"	14·3	22·0	1 : 1·54	39·5	13·4
New Haven, Conn.	"	13·8	20·7	1 : 1·50	40·0	13·0
"	"	13·7	20·3	1 : 1·48	37·0	12·4
"	"	12·8	19·3	1 : 1·51	34·5	12·2
"	"	12·1	18·1	1 : 1·49	32·2	11·0
East Florida.	"	10·6	16·6	1 : 1·57	26·0	8·8
New Haven, Conn.	"	10·4	15·5	1 : 1·49	22·0	8·5
East Florida.	"	10·3	15·7	1 : 1·52	24·5	8·6
"	"	8·8	13·2	1 : 1·50	15·2	6·5
Bahamas.	"	8·7	12·8	1 : 1·47	21·0	6·8
"	"	7·4	11·0	1 : 1·48	16·4	5·5
New Haven, Conn.	Female.	12·8	18·6	1 : 1·45		
"	"	12·5	17·8	1 : 1·42		
"	"	12·0	17·1	1 : 1·42		
"	"	9·6	13·7	1 : 1·43		
"	"	8·6	12·4	1 : 1·44		
Bahamas.	"	7·3	10·2	1 : 1·40		
New Haven, Conn.	"	7·0	10·0	1 : 1·43		

This species is common upon the salt-marshes about New Haven, Conn., and there are specimens in the Museum of Yale College from St. Augustine, Florida (Col. W. E. Foster). In the collection of the Boston Society of Natural History there are specimens from Bahamas (Dr. Henry Bryant), and in the collection of the Peabody Academy of Science, from Hayti (Dr. D. F. Weinland).

At first sight this species might be mistaken for the young of *G. minax*, but when specimens of each, of nearly equal size, are compared there is no danger of confounding them. *G. pugnax* is much smaller than *G. minax*, the carapax is considerably broader, is not so much contracted at the antero-lateral angles and is perfectly smooth, the tubercles of the outer surface of the larger cheliped are very much smaller and more crowded together, and the coloration is quite different, the red on the chelipeds and ambulatory legs being entirely wanting.

A male of this species, collected at New Haven by W. C. Beecher, presents a remarkable anomaly in having the chelipeds nearly equal in size, while in other respects it is exactly like ordinary individuals. This specimen is briefly noticed in the American Naturalist, vol. iii, p. 557, under the name of *G. palustris*. The left cheliped is exactly like the larger cheliped of ordinary specimens, and the right one

differs only in being somewhat smaller and in having the fingers slightly more incurved at the tips so as to fit nicely the buccal area. Length of carapax, 11.2^{mm}; breadth of carapax, 16.4^{mm}; ratio, 1:1.46. Length of left cheliped, 25.0^{mm}. Length of right cheliped, 21.0^{mm}. The specimen, which was examined while alive, was very active and used both hands with equal facility.

With this single remarkable exception, I have found only the slightest variations in examining carefully more than a hundred specimens.

Gelasimus rapax, sp. nov.

Plate II, figure 2. Plate IV, figure 3.

Male. The carapax is very much like that of *G. pugnax*, but the front is narrower, the upper edge of the superior orbital border is sinuous and not so transverse as in that species, being directed somewhat backward, the border itself is wider and its lower edge is not so abruptly curved above the base of the ocular peduncle.

In the larger cheliped, the anterior surface of the merus is smooth. The superior surface of the carpus is minutely tuberculose and the inner surface is crossed by a slight, oblique ridge which is nearly smooth. The basal portion of the propodus is much stouter than in *G. pugnax* and considerably longer than the digital portion, the superior and exterior surface is thickly covered with small tubercles and the inner surface is much as in *G. pugnax*, but the superior margin is curved more abruptly, and farther downward at the extremity of the depression into which the carpus folds, and there is a line of bead-like tubercles, along the border next the base of the dactylus, which are very much larger than in *G. pugnax*. The propodal finger is short and stout and considerably curved upward, the inferior edge is smooth and rounded, and the prehensile edge is much as in *G. pugnax*, but the tubercles are larger. The dactylus is stout, curved toward the extremity and the tip hooked by the end of the other finger, the superior margin is tuberculose toward the base and margined on the outside for nearly half its length, and the prehensile edge is as in *G. pugnax* but there are four or five large tubercles close together near the base.

The ambulatory legs are quite similar to those of *G. pugnax* but seem to be much less hairy.

The abdomen is as in *G. pugnax*.

Length of carapax, 12.6^{mm}; breadth of carapax, 19.0^{mm}; ratio, 1:1.51. Length of hand, 28.2^{mm}; breadth of hand, 10.8^{mm}.

I have seen but a single specimen, which was collected at Aspinwall by F. H. Bradley. Although closely allied to *G. minax* and *pugnax*, it is very different from any specimens which I have seen, of either of those species, and is readily distinguished from them by the very short and stout fingers, the tubercles on the basal portion of the upper margin of the dactylus, the long basal portion of the propodus and the line of bead-like tubercles along its border next the base of the dactylus. The differences in the carapax are however very slight, and it may possibly prove to be a variety of *G. pugnax*.

Gelasimus mordax, sp. nov.

Plate II, figure 3. Plate IV, figure 4, 4^a.

Male. The carapax is convex both transversely and longitudinally. The dorsal surface is punctate and the space between the puncta is smooth and naked, but the puncta themselves give rise to short hairs which are very easily removed. The front is much less deflexed than in the allied species, its dorsal surface is divided by a distinct median sulcus and its inferior surface, between the margin and the epistome, is quite high. The upper edge of the superior orbital border is directed somewhat backward as in *G. rapax*, but is straight and not sinuous; the border itself is much more oblique than in the allied species, so that it appears very large as seen from above. The anterior part of the lateral margin is thin and projects somewhat laterally.

In the larger cheliped, all the segments are more elongated than in the allied species. The anterior surface of the merus is smooth, narrow in outline and its margins are tuberculose. The superior and exterior surface of the carpus is obscurely tuberculose, and its inner surface is crossed by an oblique ridge which is nearly smooth. The basal portion of the propodus, as seen in front, is narrowed toward the articulation of the carpus and is very much shorter than the digital portion; the superior, and the upper part of the exterior, surface is obscurely tuberculose while the lower portion is smooth; the oblique ridge on the inferior border of the inside, is much higher and extends farther back toward the articulation of the carpus than in the allied species, and is thickly covered with very large, rounded tubercles, and all the space between its upper portion and the base of the dactylus is covered with depressed tubercles; the superior edge is somewhat carinated, slightly tuberculose and margined on the outside, and the inner margin is turned abruptly downward at the extremity of the depression into which the carpus folds; and finally, between this abruptly curved portion and the base of the dactylus and just

below the superior margin, there is an oblong, depressed space which is very conspicuous as seen from above. This depression exists in *G. minax* but is not at all conspicuous. The propodal finger is very long and slender, curved upward at the extremity, and the prehensile edge armed with a large tubercle near the middle and another near the tip, which is deeply excavated for the reception of the dactylus. The dactylus is very slender, the basal portion nearly straight, the extremity strongly hooked downward and inward, the superior edge smooth, and the prehensile edge armed with several large tubercles.

The ambulatory legs are long and much more slender than in the allied species, the meral segments being quite narrow.

The abdomen is quite similar to the abdomen of *G. pugnav*, but is somewhat narrower.

The females differ from the males in having the carapax narrower and more convex, and in the branchial regions being tuberculose along the lateral margins.

Several specimens give the following measurements:—

Sex.	Length of carapax.	Breadth of carapax.	Ratio.	Length of hand.	Breadth of hand.
Male.	16.9mm	25.5mm	1:1.51	45.0mm	12.5mm
"	15.4	23.2	1:1.51	45.0	13.0
"	15.3	23.0	1:1.50	46.5	13.0
"	14.5	21.5	1:1.48	42.0	12.6
"	10.6	15.5	1:1.46	20.5	7.0
Female.	12.9	18.1	1:1.40		
"	12.5	16.7	1:1.34		
"	10.8	14.3	1:1.32		

"Canals at Pará, South America, October or November, 1858; Caleb Cooke" (Collection Peabody Academy of Science).

Gelasimus pugilator Latreille.

Ocypoda pugilator Bosc, Histoire naturelle des Crust., tome i, p. 197, 1802; (*pars*) Say, Journal Academy Nat. Sci., Philadelphia, vol. i, p. 71, 1817, p. 443, 1818.

Gelasimus pugilator Latreille, Nouveau Dictionnaire d'Histoire naturelle, 2^e édit, tome xii, p. 520, 1817; Desmarest, op. cit., p. 123; Edwards, Annales des Sciences naturelles, 3^{me} série, Zoologie, tome xviii, 1852, p. 14, pl. 4, fig. 149; Stimpson, Annals Lyceum Nat. Hist., New York, vol. vii, p. 62.

Gelasimus vocans, DeKay, Natural History of New York, Crust., p. 14, pl. 6, fig. 9; (*pars*) Gould, Report on the Invertebrata of Massachusetts, p. 325 (*non Cancer vocans* Linné).

Plate IV, figure 7.

This is at once distinguished from any of the east coast species, except *G. subcylindricus*, by the rectangular outline, swollen and

highly polished, dorsal surface of the carapax, and by the inner surface of the basal portion of the propodus of the larger cheliped being evenly rounded and beset with small scattered tubercles, but with no indication of an oblique tuberculose ridge. From *G. subcylindricus*, it is readily distinguished by the carapax being narrower and its posterior margin straight, by the hand in the larger cheliped of the male being margined with a slight crest on the outside of the superior edge, and by the narrow male abdomen.

It seems to be abundant from the Gulf States to Massachusetts. At New Haven, Conn., it is very common upon muddy beaches, but is not usually associated with *G. pugnae*, which prefers salt-marshes. There are specimens in the Museum of Yale College, collected at Egmont Key, West Florida, by Col. E. Jewett, and at St. Augustine, by Col. W. E. Foster and H. S. Williams; and in the collection of the Peabody Academy of Science, there are specimens from Savannah, Georgia, from Bluffton, South Carolina, and from Nantucket, Massachusetts, those from the last locality collected by Dr. A. S. Packard, Jr.

A series of specimens give the following measurements:—

Locality.	Sex.	Length of carapax.	Breadth of carapax.	Ratio.	Length of hand.	Breadth of hand.
West Florida.	Male.	15·0mm	21·6mm	1:1·44	38·0mm	12·5mm
"	"	14·7	21·0	1:1·43	33·0	10·5
New Haven, Conn.	"	14·2	20·6	1:1·44	36·5	11·8
"	"	13·6	19·4	1:1·43	34·0	11·0
"	"	13·4	18·8	1:1·40	30·2	11·4
"	"	12·5	17·4	1:1·39	27·0	10·6
"	"	11·7	16·2	1:1·38	23·8	9·6
"	"	7·6	10·2	1:1·33	9·5	4·8
West Florida.	Female.	14·6	20·4	1:1·40		
New Haven, Conn.	"	12·5	16·4	1:1·31		
"	"	10·8	14·3	1:1·32		
"	"	9·1	12·0	1:1·32		

Gelasimus subcylindricus Stimpson.

Annals Lyceum Nat. Hist., New York, vol. vii, p. 63, 1859.

Plate IV, figure 6-6^b.

This species has a general resemblance to *G. pugilator*, but the body is much broader, not so much narrowed behind and very convex, being in fact much like *G. gibbosus*. The male abdomen and its appendages are, moreover, very unlike any other species which is known to me.

Male. The dorsal surface of the carapax is minutely granulous, very convex longitudinally and swollen along the branchial regions, which, however, do not project above the middle of the carapax, and the regions are not separated by distinct sulci. The front is evenly rounded and strongly deflexed. The superior border of the orbit is nearly perpendicular, and its posterior, or upper, margin is sinuous, curving forward in a slight prominence in the middle. The antero-lateral angle is obtuse and not at all prominent. The lateral margins converge slightly anteriorly and are only faintly indicated on the postero-lateral border. The posterior margin is divided into two broad lobes by a very marked median immargination. The inferior border of the orbit is slightly curved and finely denticulate.

The external maxillipeds are proportionately smaller than in the allied species, the ischium is only very slightly wider than the merus and its outer margin is nearly straight. Corresponding with the form of the external maxillipeds, the buccal opening is smaller and more rectangular than in the other species.

In the larger cheliped, the angles of the merus are obtuse and granulous and the anterior surface is slightly convex. The outer surface of the carpus is slightly granulous. The basal portion of the propodus is nearly as long as the digital portion; the inner surface is not armed with a tuberculose ridge along the inferior margin, that portion being rounded and only obscurely tuberculose, but on the border next the base of the dactylus, there are two, sharp, tubercular, parallel ridges, the inner one highest and separated from the other by a deep, narrow groove; the outer surface is densely covered with small, depressed tubercles which are more uniform in size and more prominent than in *G. pugnae*, or *G. pugilator*; the superior edge is tuberculose but not distinctly margined on the outside as in *G. minax*, *pugnae*, and *pugilator*; the inferior edge is armed with a prominent, tubercular margin on the outside, and the flat, oblique space between the inner and outer margins is smooth and shining, while in *G. pugilator* it is covered with rounded granules. The propodal finger is considerably curved upward, its outer surface is armed, on the basal portion, with a distinct, median ridge, the inferior margin is smooth, and the prehensile edge tubercular and armed with a single, large tooth near the middle. The dactylus is strongly and evenly curved, the superior margin is smooth and the prehensile edge is tubercular and armed with several larger tubercles toward the base. The smaller cheliped and the ambulatory legs do not differ notably from those of the allied species.

The abdomen is very broad, its breadth being fully equal to two-thirds its length, while, in *G. pugilator* and allied species, the breadth is not equal to more than half the length. The terminal segment is very small, being rather less than half as broad as the penultimate and very much shorter than broad. The appendages of the first segment are very stout and nearly straight organs, reaching to the middle of the penultimate segment, and the tips are horny and slightly hairy, while in *G. pugilator* these organs are longer, very slender, and strongly curved outward at the tips.

The female differs from the male in having the posterior margin of the carapax only slightly immarginate in the middle.

Sex.	Length of carapax.	Breadth of carapax.	Ratio.	Length of hand.	Breadth of hand.
Male.	12.1mm	18.5mm	1:1.53	25.0mm	11.0mm
"	10.5	16.0	1:1.52	20.5	9.0
Female.	10.0	15.5	1:1.55		

The above description and measurements were made from three of the original specimens, collected at Matamoros on the Rio Grande, by M. Berlandier, and loaned by Dr. Stimpson.

Gelasimus stenodacylus Edwards et Lucas.

Voyage de d'Orbigny dans l'Amérique méridionale, Crust., p. 26, p. 11, fig. 2, 1843 ;
Edwards, Annales des Sciences naturelles, 3^{me} série, Zool., tome xviii, 1852, p. 149.

"Trouvé sur les côtes du Valparaiso par M. d'Orbigny," (Edwards and Lucas). In the Annales des Sciences naturelles, Edwards gives the habitat as, "Chili, Brésil," but there is very likely some mistake in regard to the latter locality for very few, if any, species of crustacea are common to Chili and Brazil.

Gelasimus Panamensis Stimpson.

Annals Lyceum Nat. Hist., New York, vol. vii, p. 63, 1859.

Plate IV, figure 5.

Stimpson had only the young of this species and did not give the characters of the larger cheliped of the male, but a good series of specimens collected at Panama by Mr. Bradley, shows that it is very different from any of the east coast species and is not allied to any from the west coast, unless it be to *G. stenodacylus* which I have not seen.

Male. The carapax is broadest between the antero-lateral angles and is much less convex than usual. The dorsal surface is very minutely granulose, and there are a few coarse granules or small tubercles on the front and on the anterior part of the branchial region

near the lateral margin. The upper edge of the superior orbital border is sinuous and the border itself is quite narrow. The anterolateral angles are sharp and project prominently forward. The inferior orbital margin is thin and sharply dentate and its outer angle is prominent and angular, and is separated from the superior margin by a deep and broadly rounded sinus.

In the larger cheliped, the merus is slender, and its anterior surface is narrow and smooth and the margins are unarmed and rounded. The carpus is evenly rounded and nearly smooth externally. The basal portion of the propodus is smooth or microscopically granulose and flat and entirely unarmed within; the depression into which the carpus folds is very short, not extending half way to the base of the dactylus; and the superior and inferior margins are evenly rounded. The propodal finger is slightly upturned at the tip, the inferior edge is perfectly smooth and evenly rounded, and the tubercles of the prehensile edge are nearly obsolete except a large depressed one near the middle. The dactylus is strongly curved downward at tip, the superior edge is smooth and rounded and the prehensile edge is obscurely tubercular. In very young specimens the hand is quite granulose above but becomes smooth with age.

In the smaller cheliped the tips of the fingers are densely clothed with soft hair.

The ambulatory legs are slender, smooth and almost entirely naked.

The females differ from the males in the carapax being a little narrower in proportion, and in the branchial regions being slightly inflated and more granular or even tuberculose.

Several specimens give the following measurements:—

Locality.	Sex.	Length of carapax.	Breadth of carapax.	Ratio.	Length of hand.	Breadth of hand.
Panama.	Male.	12.5mm	18.0mm	1: 1.44	27.5mm	9.4mm
"	"	12 1	18.0	1: 1.49	32.0	11.0
"	"	8.3	11.1	1: 1.34	9.4	4.8
"	Female.	13.6	18.5	1: 1.36		
"	"	12.2	17.0	1: 1.39		
"	"	11.5	16.0	1: 1.39		
"	"	9.7	13.8	1: 1.42		

C.—*Species in which the fourth, fifth and sixth segments of the male abdomen completely anhylose, and in which the carapax is very transverse, and the branchial regions are gibbous.*

Gelasimus gibbosus, sp. nov.

Plate II, figure 11. Plate IV, figure 8.

Male. This is a small species quite different in general appearance from any of the foregoing. The body is very short and broad, very

little contracted behind, and, in general form, a short cylinder truncated at each end. The chelipeds and ambulatory legs are slender and elongated.

The dorsal surface of the carapax is naked, smooth and shining, convex longitudinally, deeply areolated and nearly symmetrical. The cervical suture is slightly curved and very distinctly marked by a deep sulcus. The median portion of the gastric region is triangular, and is separated from the antero-lateral lobes by very distinct but shallow sulci, which meet in an acute angle on the front. The cardiac region is large, quite prominent and distinctly separated from the gastric. The branchial regions are very prominent and swollen, projecting much above the median regions, and a narrow portion next the cervical suture is cut off by a straight and sharp sulcus. The front projects well forward and is quite narrow, but not contracted between the bases of the ocular peduncles. The superior border of the orbit is nearly on a plain with the anterior part of the carapax, its anterior edge is strongly arcuate and is marked by a very slight, but sharply raised and continuous margin, and the posterior edge is marked by a faintly raised line, which is transverse and nearly straight toward the front, but, toward the side of the carapax, falls off posteriorly, so that the antero-lateral angle, which is right-angular, but not at all prominent, is considerably posterior to the rest of the anterior margin. The faintly margined lateral borders are parallel anteriorly but approach slightly posteriorly. The inferior border of the orbit is denticulate, the teeth being very minute on the portion toward the front but much larger, and very slender on the outer portion, and round into the external hiatus. The jugal regions are much swollen and are separated from the buccal area by a deep depression.

The ocular peduncles are quite stout and as long as the orbits, which they nearly fill.

The ischial segments of the external maxillipeds are very broad and the outer edges are arcuate to fit the expanded buccal area, and thus resemble the species of section A.

The larger cheliped is remarkably developed for so small a species, the merus being as long as the carapax, while the hand is almost three times as long, and nearly twice as long as the breadth of the carapax. The anterior surface of the merus is smooth, flat and quite narrow, and its angles are smooth and unarmed. The superior and exterior surface of the carpus is evenly rounded and very slightly granulous, and the inner margin is sharp and dentate. The basal portion of the

propodus is short and compressed, the outer surface is flat and granulous, the inferior edge is angular and has a very slight, granular margin on the outside, the superior edge is rounded and granulated, and the inner surface is armed with a slight, oblique, tuberculose ridge extending from the inferior edge to the short depression into which the carpus folds. The digital portion of the propodus is much compressed, straight and very slender, the inferior edge is nearly smooth, the prehensile edge is only very obscurely tuberculate and has a single, very slight tooth near the middle, and the tip is slender, acute and slightly upturned. The dactylus is compressed, very slender, straight for two-thirds its length and the terminal portion regularly curved downward, the superior edge is rounded and slightly granulous toward the base, and the prehensile edge is as in the other finger, except that the tooth is smaller and nearer the base.

The smaller cheliped is smooth and unarmed, the merns is slender and triquetral, the carpus is short and rounded, the basal portion of the propodus is quite short and thick, and the fingers are slender.

The ambulatory legs are long, very slender and nearly naked, and the meral segments are very narrow.

The sternum is very broad and very convex. The abdomen is scarcely at all contracted at the second segment, and it tapers slightly to the extremity of the sixth; the first and second are very short, the third is about twice as broad as long, the fourth, fifth and sixth are completely anchylosed into one piece, and the seventh, or last, forms very nearly a semicircle.

Length of carapax, 8.5^{mm}; breadth of carapax, 14.4^{mm}; ratio, 1:1.79. Length of hand, 24.8^{mm}; breadth of hand, 8.2^{mm}.

I have seen only one specimen, which was collected at the Gulf of Fonseca, west coast of Central America, by J. A. McNeil (Collection Peabody Academy of Science).

Family, GECARCINIDÆ.

Cardiosoma Latreille.

In this genus the abdominal appendages of the male present, in some cases at least, good specific characters. In all the species which I have examined, the appendages of the first segment are very stout and nearly straight organs reaching beyond the middle of the abdomen, articulated at their bases with a large and hard semicircular plate, which arches round the intestinal canal and joins the abdomen on each side, and armed at their extremities with slender, horny tips.

The appendages of the second segment are small and inconspicuous, and their slender tips are flexible and folded within a little groove on the inside of the bases of the appendages of the first segment.

Cardiosoma guanhumii Latreille.

Cardiosoma guanhumii Latreille, Encyclopedie méthodique, tome x, p. 685, 1824, (*teste* Edwards); Edwards, Histoire naturelle des Crust., tome ii, p. 24, 1837; Règne animal de Cuvier, 3^{me} édit., pl. 20, fig. 1; Annales des Sciences naturelles, 3^{me} série, Zoologie, tome xx, 1853, p. 204, pl. 9, fig. 1; Gibbes, On the Carcinological Collections of the United States, Proceedings American Association, 3d Meeting, p. 179, 1850; Stimpson, Proceedings Academy Nat. Sci., Philadelphia, 1858, p. 100; Saussure, Crustacés nouveaux des Antilles et du Mexique, p. 21, 1858.

Ocypode (*Cardiosoma*) *cordata* DeHaan, Fauna Japonica, Crustacea, p. 27, 1835 (*non Cancer cordatus* Linné).

Ocypoda ruricola Freminville, Annales des Sciences naturelles, 2^e série, Zoologie, tome iii, 1835, p. 217 (*non Cancer ruricola* Linné).

Ocypoda gigantea Freminville, loc. cit., p. 221, 1835.

Plate V, figure 3.

The abdomen of the male is broadest at the third segment, from which the margins converge rapidly to the sixth, which is considerably longer than broad. The terminal segment is narrow and its extremity is rounded. The first pair of abdominal appendages reach to the middle of the sixth segment, are triquetral, straight and stout, and their tips are rounded and slightly flattened laterally, and each is armed with a very small, scale-like appendage directed obliquely outward, and on the upper edge, just above this appendages, there is a small process which is straight and does not reach beyond the rounded extremity of the thickened portion of the organ.

A male from the Florida Keys gives, length of carapax, 65^{mm}; breadth of carapax, 78^{mm}; ratio of length to breadth, 1:1.20. Length of merus in right cheliped, 31^{mm}; in left cheliped, 49^{mm}. Length of right hand, 45^{mm}; breadth, 19. Length of left hand, 88^{mm}; breadth, 44.

Cardiosoma quadratum Saussure.

See these Transactions, vol. ii, p. 16.

Plate V, figure 4.

In this species the male abdomen and its appendages are almost exactly like those of *C. guanhumii* except that the horny extremities of the appendages of the first segment are a little longer and more slender. There is a remarkable difference between the male abdominal appendages of this species and the species from the west coast of

Africa, with which it is compared on page 16 of this volume. In the African species the first pair of these appendages are very much like those of the following species, the horny tips being long, slender and somewhat spiral, and the process on the upper edge extending much beyond the thickened portion of the organ.

Cardiosoma crassum, sp. nov.

Plate V, figure 5.

In general appearance this species is closely allied to *C. quadratum*. The carina of the lateral margin of the carapax is, however, much more strongly marked and the ambulatory legs are clothed with long hair, while in *C. quadratum* they are nearly naked. The male abdominal appendages are entirely unlike in the two species.

The dorsal surface of the carapax is naked, very minutely granulous, regularly and strongly convex longitudinally, but only slightly transversely, and the areolation is not strongly marked, the cardiac region and the median portion of the gastric alone being indicated; the anterior extremity of the mesogastric lobe, however, is distinct, long and slender and reaches nearly to the front. The front is broad and high and the epigastric lobes protuberant, leaving, between them and the front, a depressed space which is thickly covered with coarse granules. The superior margin of the orbit is slightly sinuous, as seen from above, and the lateral angle projects forward as an angular tooth. Just back of this tooth the antero-lateral margin is broken by a sharp notch, above which the carina of the lateral margin begins in a sharp prominence. This carina through its entire length is very high and distinct, being much more strongly marked than in *C. quadratum*. The epistome and nasal lobe are very much as in *C. quadratum*, but the labial border of the epistome is armed with a line of granules which is more sharply raised and composed of smaller granules than in that species. The jugal regions are densely clothed with short, soft hair. The inferior branchial regions are naked, but are roughened with numerous, short, sharp rugæ.

The chelipeds are very unequal in both sexes, and the ischial segments are armed, on the anterior side, with a few small tubercles. In the larger cheliped, the merns is triquetral, very stout and reaches slightly beyond the lateral margin of the carapax, the anterior surface is flat and both its margins are armed with very large and prominent tubercles directed forward, and on the outer surface and the posterior angle, which is obtuse, there are short granulous rugæ which are very conspicuous on the angle. The larger hand is very short and

stout, the breadth being about equal to four-sevenths of the length; the outer surface of the propodus is flattened and smooth; the inner surface, in the middle and toward the base of the dactylus, and the margins, are armed with scattered tubercles; and finally, the fingers are very stout, the outer edges are armed with small horny tubercles, and the prehensile edges gape but slightly, and are armed with large, irregular teeth. In the smaller cheliped, the merus is more slender and does not quite reach the lateral margin of the carapax, and the hand is very much smaller and more slender.

The ambulatory legs are stout and the carpal and propodal segments, and the meral on the angles below, are clothed with long black hairs, which are very conspicuous and fasciculated on the carpal and propodal segments of the first and second anterior pairs.

In the male, the abdomen is broadest at the third segment, from which the margins converge regularly to the sixth, which is nearly or quite as broad as long and only slightly narrowed for most of its length, but sharply contracted just before the articulation with the small and narrow terminal segment. In the female, the abdomen is broadest near the articulation of the fifth with the sixth segment, and the margins of the sixth segment are arcuate and converge rapidly to the small, obtusely triangular terminal segment.

The first pair of male abdominal appendages reach to the middle of the penultimate segment of the abdomen, and their extremities are slightly flattened laterally, thickly clothed with hair on the outside and terminated by a long, slender, hard and horny tip, which curves outward for nearly half its length, then rapidly upward, and again outward at the end, forming thus about the third of a very elongated spiral. From the under edge, just below the base of this horny tip, there is a stout, straight process, which is soft and flexible, and clothed at the extremity with hair.

Four specimens give the following measurements:—

Sex.	Length of carapax.	Breadth of carapax.	Ratio.
Male. - - - -	50.7mm	62.0mm	1: 1.22
" - - - -	54.0	66.3	1: 1.23
" - - - -	56.4	68.0	1: 1.21
Female. - - - -	53.0	64.5	1: 1.22

I have examined a large number of specimens collected at the Gulf of Fonseca, west coast of Central America, by J. A. McNeil, and in the Museum of the Peabody Academy of Science.

Family, BOSCIADÆ.

Pseudothelphusa Saussure.

Potamia Latreille, Cours d'entomologie, p. 338, 1831 (*teste* Edwards); Edwards et Lucas, Voyage de d'Orbigny dans l'Amérique méridionale, Crust., p. 22, 1843; White, List of the Crustacea in the British Museum, p. 30, 1847; Dana, United States Exploring Expedition, Crust., p. 293; Saussure, Crustacés nouveaux des Antilles et du Mexique, p. 19, 1858 (*non* Robineau-Desvoidy).

Boscia Edwards, Histoire naturelle des Crust., tome ii, p. 14, 1837; Annales des Sciences naturelles, 3^{me} série, Zoologie, tome xx, 1853, p. 207; A. Edwards, Annales de la Société entomologique de France, 4^{me} série, tome vi, 1866, p. 203.

Pseudothelphusa Saussure, Revue et Magasin de Zoologie, 1857, p. 305 (*teste* Saussure).

Latreille's name, *Potamia*, given in 1831, was properly rejected by Edwards on account of its previous use, in 1830, by Robineau-Desvoidy, for a genus of Diptera, but the name *Boscia*, proposed by Edwards in 1837, is quite as objectionable, having been used, according to Agassiz's Nomenclator Zoologicus, by Leach, in 1813, for a genus of Cirripedia, by Schweigger, in 1820, for a genus of Polyps, and by Leach again, in 1824, for a genus of Coleoptera. *Pseudothelphusa*, although at first proposed as a new genus, does not differ essentially from the species of Edwards' *Boscia* which have no superior frontal crest, and was finally united with *Potamia* by Saussure himself, so that it may properly be adopted for the genus as defined by Edwards.

Pseudothelphusa, as here limited, includes the following American species:—

P. Americana Saussure, from Hayti.

P. gracilipes (*Boscia gracilipes* A. Edwards, Annales de la Société entomologique de France, 4^{me} série, tome vi, 1866, p. 204), from Haute Vera-Paz, Gautemala.

P. plana, sp. nov., from Peru.

P. macropa (*Boscia macropa* Edwards, Archives du Muséum d'Histoire naturelle, Paris, tome vii, p. 175, pl. 12, fig. 3), from Bolivia.

P. Chilensis (*Potamia Chilensis* Edwards et Lucas, Voyage de d'Orbigny dans l'Amérique méridionale, Crust., p. 22, pl. 10, fig. 1), from Lima, Peru.

P. denticulata (*Boscia denticulata* Edwards, Annales des Sciences naturelle, Zoologie, 3^{me} série, tome xx, 1853, p. 208), from Guiana.

P. Bocourti, (*Boscia Bocourti* A. Edwards, loc. cit., p. 203), from the River Coban, Haute Vera-Paz, Gautemala.

P. dentata (*Boscia dentata* Edwards, Histoire naturelle des Crust., tome ii, p. 15, pl. 18, fig. 14-16), from the West Indies.

The only other described species is the *P. sinuifrons* (*Boscia sinuifrons* A. Edwards, loc. cit., p. 205), the habitat of which was not known.

Potamiiu latifrons Randall (Journal Academy Nat. Sci., Philadelphia, vol. viii, p. 120, 1839), supposed to have come from Surinam or the West Indies, probably belongs here, but the description is too indefinite to determine its affinities with any degree of certainty.

Pseudothelphusa plana, sp. nov.

Female. The carapax is very broad and its dorsal surface is flat in the middle and posteriorly, but convex along the anterior border, and is punctate, but the surface between the widely separated punctures is glabrous. The gastric region is undivided, except by a short and shallow median sulcus, which separates the slightly indicated anterior lobes and extends down the front. The anterior portion of the cervical suture, from the median lobes of the gastric region to the antero-lateral margin, is well indicated by a straight, broad and deep sulcus. There is no sulcus between the gastric and hepatic regions. The branchial regions are very prominent and undivided. The front is deflexed and the narrow inferior margin is perpendicular, and has a distinct submarginal groove. The orbits are well filled by the stout ocular peduncles. The antero-lateral margin is evenly and very strongly arcuate, and its edge is sharp and finely denticulated. The postero-lateral margin is concave in outline.

The external maxillipeds, as well as the sternum, are punctate like the carapax but the punctures are much larger.

A single cheliped is quite small; the merus scarcely reaches beyond the carapax, is triangular, the anterior angle slightly dentate, and the posterior angle rounded and granulated; the upper side of the carpus is punctate like the carapax, evenly rounded and armed with an angular tooth on the inner margin; the basal portion of the propodus is punctate, slender and evenly rounded; and finally the fingers are long, slender, cylindrical, nearly straight, and slightly toothed within.

The ambulatory legs are naked, slender and rounded, and the dactyli are nearly straight, cylindrical and sparsely spinulose.

The color of alcoholic specimens is uniform dark olive brown above and lighter beneath.

Sex.	Length of carapax.	Breadth of carapax.	Ratio.
Female.	13.6mm	22.4mm	1: 1.65
"	16.5	27.7	1: 1.67

There are two rather badly preserved specimens, collected at Paita, Peru, by Prof. James Orton, in the Museum of Yale College. The smaller specimen wants both chelipeds, and the larger specimen, one.

This species is closely allied to *P. macropa*, but is easily distinguished from it by the denticulated antero-lateral margin, by the short merus of the chelipeds, and by the flattened carapax—the carapax of *P. macropa* being represented in Edwards' figure as quite convex transversely, while in *P. plana* it is flat in that direction. Moreover the front seems to be much more deflexed in our species, the orbits are much smaller and are well filled by the eyes, and the antero-lateral margin is not “creusés en dessous d'un sillon bien marqué.” In the depressed form of the carapax, it is apparently closely allied to *P. gracilipes*, but the ambulatory legs are not longer in proportion than in *P. macropa*, and the front is almost straight, as seen from above, and not lobed as in *P. Americana*, with which the front of *P. gracilipes* is compared. In the denticulated antero-lateral margin it resembles *P. Chilensis*, but in the form of the carapax, and in other characters it is much nearer to *P. macropa*.

Opisthocera,* gen. nov.

The carapax is much as in *Pseudothelphusa*; the dorsal surface is not distinctly areolated; the front is deflexed, smooth and unarmed, and the edge is not reflexed beneath a superior crest as in *Epilobocera* and *Potamocarcinus*; and the lateral margins are not armed with strong teeth or spines.

The epistome is deeply channeled transversely and the labial border is divided into three very prominent lobes projecting far forward, and of which the lateral ones are bilobed at tip and are separated from the antero-lateral angles of the buccal opening by broad and very deep efferent orifices.

The external maxillipeds are as in *Epilobocera*, the merus transverse, the anterior margin rounded, and the palpus goniarthroid.

In the single species upon which the genus is based, there is a long and slender spine projecting from the upper side of the expiratory canal near the external orifice.

In the character of the front, this genus agrees with the species of *Pseudothelphusa* which have no superior frontal crest and differs from *Epilobocera*, while, in the position of the antennæ, it agrees with *Epilobocera* and differs from *Pseudothelphusa*.

* Ὀπισθε, pone; κέρα, cornu.

Opisthocera Gilmanii, sp. nov.

Plate V, figure 1.

Male. The dorsal surface of the carapax is evenly convex in two directions and nearly smooth, but very minutely granulated and conspicuously punctate with widely scattered punctures. There is no indication of areolation except two minute lunate impressions in the middle. The front has a smooth, revolute margin, which is continuous with the upper margin of the orbits, and a distinct, submarginal groove, which extends slightly along the inner portion of the superior orbital border. The orbits are large, open and shallow, only partially filled by the ocular peduncles, and the inferior margin is sharp and minutely denticulate. The antero-lateral margin is evenly convex in outline, is broken by a small, oblique groove near the angle of the orbit, and its edge is sharp and very slightly and obtusely denticulated anteriorly, but smooth posteriorly. The postero-lateral margin is concave in outline and rounded. The inferior lateral regions are naked and smooth. The labial border of the epistome is deeply divided; the lobes are very prominent, and nearly horizontally, the median lobe being longest and its extremity triangular.

The external maxillipeds are nearly smooth externally, but are marked with a few scattered punctations.

The chelipeds are very unequal; in both, the merus is triquetral, the inferior angle rounded, but armed with a few small tubercles toward the carpus, and the superior angles are obtuse and armed with numerous tubercles, which are somewhat spiniform on the anterior angle; the carpus is smooth and rounded externally and has a prominent spine on the inner margin. The basal portion of the propodus in the larger hand, is very stout, the superior margin is quite high, but rounded, and the inferior margin is armed with a few small tubercles near the base, the fingers are long, rather slender, and irregularly toothed within, and the dactylus is strongly curved so that the fingers gape very widely. The smaller hand is quite slender, the fingers are nearly cylindrical, very long, nearly straight, and but slightly gaping.

The ambulatory legs are slender, naked and nearly smooth, the meral segments are narrow, and the dactyli are armed with three rows of spines above and two below.

The abdomen is widest at the third segment, and the first and second segments are only slightly narrower; from the third segment, the margins converge quite rapidly to the sixth, which is nearly twice as broad as long and its lateral margins only slightly converging; the terminal segment is much broader than long and its extremity som

what acutely arcuate. The appendages of the first segment are very stout and nearly straight organs reaching to the middle of the sixth segment, and articulated at their bases to a hard plate, which arches round the intestinal canal much as described under the genus *Cardiosoma*. A deep groove extends from the basal articulation along the inside of each of these organs, curving round to the outside and terminating at the tip, which is truncate, turned sharply outward and armed with sharp, hooked spinules, and, on the inferior edge, with a small, curved process. The appendages of the second segment are as long as those of the first, are widely separated at their bases, and the terminal portions, which are lodged in grooves in the appendages of the first segment, are long, very slender and taper to acute points.

The color, in alcohol, is uniform dirty yellowish brown, lighter beneath.

Length of carapax, 38.7^{mm}; breadth of carapax, 57.2^{mm}; ratio, 1:1.48. Length of larger hand, 61.0^{mm}; breadth, 24.5; length of dactylus, 37.0. Length of smaller hand, 41.0^{mm}; breadth, 12.8; length of dactylus, 24.5.

The single specimen, which furnishes the above description, is in the collection of the Boston Society of Natural History, and was collected in a small stream near the center of the Isle of Pines by S. H. Scudder and Winthrop S. Gilman, Jr. At the suggestion of Mr. Scudder, the species is named for his friend.

Epilobocera Stimpson.

Epilobocera Cubensis Stimpson.

Annals Lyceum Nat. Hist., New York, vol. vii, p. 234, 1860.

This species, discovered in fresh water streams on the Island of Cuba, near Santiago, has close generic relations with the last species, but the character of the front and of the epistome is very different.

I have seen only a single, imperfect, female specimen loaned by Dr. Stimpson. In this specimen, the dorsal surface of the carapax is armed, along the lateral border, with small, tuberculiform granules, and the inferior lateral regions are armed, toward the lateral margin, with similar granules which are conspicuous on the anterior part of the inferior branchial region. The superior frontal crest projects considerably beyond the inferior one and is divided into two, slightly convex lobes by a well marked, median sulcus which extends back upon the carapax to the mesogastric lobe. The inferior margin of the front is straight, as seen in a front view, and its edge is slightly crenulated.

The inferior margin of the orbit is finely crenulated, and the crenulations cease near the external angle, but there is no hiatus.

The labial border of the epistome has a prominent, triangular tooth in the middle and smaller ones each side; they all project downward and very slightly forward, and the median one has one or two small denticles toward its base. There is a quite broad, but very short, process projecting from the upper side of the expiratory canal, nearly in the position of the slender spine in *Opisthocera*.

The abdomen is very similar to that of the male *Opisthocera* just described, except that the first and second segments are scarcely narrower than the third. It is remarkably narrow for a female, and the specimen is probably a sterile individual of that sex.

Epilobocera armata sp. nov.

Plate V, figure 2.

The carapax is flattened above and the dorsal surface is nearly smooth, but very minutely granulous and punctate with widely scattered punctures. The epigastric lobes are just indicated by slight elevations and are separated by a very distinct, broad and shallow median sulcus which extends forward and breaks through the superior frontal crest in a smooth sinus. There are no other marks of areolation except two minute lunate impressions in the middle of the carapax. The superior margin of the front projects slightly beyond the inferior one, is nearly straight, as seen from above, but curved downward in the middle, as seen in a front view, and is closely armed with conspicuous, rounded tubercles. The inferior margin of the front is straight and its edge is raised into a prominent crest and is distinctly crenulated. The superior margin of the orbit is continuous with the inferior margin of the front and is crenulated like it, and, at the outer angle is armed with one or two spiniform tubercles. The inferior margin of the orbit is finely dentate and is broken beneath the outer angle by a broad, smooth sinus. The antero-lateral margin is separated from the angle of the orbit by a slight hiatus and is armed with sharp, spiniform teeth, which are prominent and slender on the anterior portion, but decrease in size posteriorly and are quite small at the broadest portion of the carapax. The postero-lateral margin is concave in outline, as seen from above, smooth and rounded.

The labial border of the epistome is divided into three lobes as in the last species. The median lobe is very prominent, projects outward nearly as far as the superior crest of the front, is acutely triangular and armed with two or three spiniform tubercles on each side,

of which the ones toward the base are very prominent. The lateral lobes are obtusely rounded, their outer margins are unarmed and the inner margins are armed somewhat as the median lobe, but the tubercles at the bases are slightly separated from the lobes, and stand partially between the lateral and median. There is a process projecting from the upper side of the expiratory canal, as in the last species.

The external maxillipeds, the chelipeds, and the ambulatory legs are very much as in *E. Cubensis*.

The abdomen is very broad, nearly covering the whole sternum, the greatest breadth being at the fifth segment, and the fourth and sixth but little narrower.

Sex.	Length of carapax.	Breadth of carapax.	Ratio.
Female.	43·8mm	70·4	1: 1·61
"	47·2	77·5	1: 1·64

The two specimens from which this description was taken are in the collection of the Boston Society of Natural History, and without labels to indicate from whence they came, but they are probably from the Bahamas.

Although closely allied to *E. Cubensis*, it is readily distinguished from the only specimen of that species which I have seen, in wanting wholly any granulations or tubercles along the lateral margins of the carapax, either above or below, by the more tuberculose superior frontal crest, in having tubercles at the outer angles of the orbits and a marked hiatus beneath it in the inferior margin, by the much longer teeth of antero-lateral margin, and by the quite different labial border of the epistome.

Family, TRICHODACTYLIDÆ.

Dilocarcinus Edwards.

Dilocarcinus pictus Edwards.

Annales des Sciences naturelles, 3^{me} série, Zoologie, tome xx. 1853, p. 216; Archives du Muséum d'Histoire naturelle, Paris, tome vii, p. 181, pl. 14, fig. 2, 1854.

There are specimens in the collection of the Peabody Academy of Science and of the Museum of Yale College, from the River Amazon, at Nauta, Peru, which I refer to this species, although they do not agree perfectly with Edwards' figures and description. The specimens from Nauta are alcoholic and both females, and are considerably larger than the figure given by Edwards, one of them giving the following measurements:—Length of carapax, 29·0^{mm}; breadth of

carapax, including teeth, 34.6; ratio, 1:1.19. The carapax in our specimens is somewhat broader and the lobes of the front, as seen from above, are more prominent and their summits nearer together, leaving the orbit larger, than in the figure. The propodi and dactyli of the ambulatory legs are thickly ciliated along both edges, while Edwards' figures 2^e and 2^d represent only a few cilia on the posterior edges; in the text, however, the dactyli are said to be "à bords ciliés." The abdomen is quite remarkable for a female, the third and the three following segments being united into a single piece, as in the figure of the male abdomen, given by Edwards,* but, unlike the figure, it is broadest at the middle and the margins are convex in outline.

Family, GRAPSIDÆ.

Glyptograpsus, gen. nov.

The carapax is much broader than long and the dorsal surface is distinctly areolated. The front is arched and nearly horizontal above the antennæ and antennule, but excavated and deflexed in the middle. The lateral margins are strongly arcuate and are dentate anteriorly.

The epistome is high and nearly perpendicular and is crossed transversely by a sharp groove, and the labial border is straight, as seen in a front view, but broken by a distinct notch in the middle, as seen from below. At the sides of the epistome, in the antero-lateral angle of the buccal area, there is a deep and narrow notch, which serves as an efferent orifice. There are no longitudinal ridges on the palate.

The basis of the antenna is movable and fills the whole space between the small, triangular, inner suborbital lobe and the front, and its summit is excavated on the inner side for the reception of the succeeding segments, which are within the orbit.

The external maxillipeds are not crested and their inner margins are closely approximated; the ischium and merus are of nearly equal length and are both very broad, the merus being broader than long, and its antero lateral angle not expanded.

The ambulatory legs are long and the dactyli are quadrangular and the angles armed with spines.

None of the segments of the male abdomen are anchylosed.

* This figure is marked 3 on plate 14, as if it belonged with fig. 3, *D. spinifer*, and on p. 180 it is referred to under that species, but in the explanation of the plates on p. 192, no fig. 3^e is mentioned, while under *D. pictus* is placed, "Fig. 2^e. Abdomen du mâle," yet there is no fig. 2^e on the plate, and 3^e is the only abdomen there figured. The abdomen is not referred to in the description of *D. pictus*.

The aspect of the single species upon which this genus is founded is quite peculiar. The body is thick, the dorsal surface is uneven and the lateral margin is armed with five teeth (including the angle of the orbit), the last and smallest of which is on the postero-lateral margin. The form of the carapax, the arching of the front above the antennulæ, and the number of teeth on the lateral margin, recall the genus *Cryptograpsus*, from which, however, it is widely separated by the form of the external maxillipeds and of the epistome. In the form of the maxillipeds it is allied to *Heterograpsus*. The form of the epistome and the peculiar, deep efferent orifice are very marked and distinctive characters.

Glyptograpsus impressus, sp. nov.

Male. The dorsal surface of the carapax is uneven, with numerous, irregular, shallow punctures, and along the lateral borders, with small, tuberculose elevations. The cervical suture is indicated by a very distinct sulcus. The median portion of the gastric region is separated from the protogastric lobes by deep sulci, which unite between these lobes and extend down the front as a broad and deep depression. The epigastric lobes are very prominent and their anterior margins are transverse and precipitous. The protogastric lobes are well indicated, and an outer lobule is separated as a small, but very distinct, tuberculiform elevation opposite the inner angle of the orbit. The epibranchial lobes are uneven and partly separated from the mesobranchial by well marked, but short, depressions. The posterior portion of the branchial region is divided by a longitudinal ridge into a flat inner area and a broad precipitous portion between the ridge and the lateral margin. The front, as seen from before, is very sinuous, and broken in the middle by a broad, deep, rounded sinus; its outer angles, as seen from above, are obtusely rounded, and the margin is continuous to the inner angle of the orbit, where it passes abruptly downward beneath the ocular peduncle as a sharp ridge, leaving a distinct notch, above which the margin begins again and is continuous to the acutely triangular antero-lateral tooth, which is prominent and directed straight forward. The second tooth of the lateral margin is broad and obtusely rounded and situated above the plain of the anterior tooth; the third and the fourth are slender and acute; the last is on the postero-lateral margin and is small, acutely pointed and somewhat below the level of those just in front of it. The inferior margin of the orbit is straight and finely dentate. The inferior lateral regions are granulous and slightly hairy.

The chelipeds are short and very unequal; in both, the merus is short, not extending beyond the margin of the carapax, and triquetral, with the angles denticulate, and the carpus is small and its outer surface granulous and slightly margined on the inner edge. In the larger hand, the propodus is short and very stout, the outer surface is convex and finely granulous, and the digital portion is very short, and its prehensile edge directed obliquely downward; the dactylus is straight, rather slender, and granulous like the propodus; both fingers are obtusely tubercular on the prehensile edges and have horny, slightly excavated tips. The smaller hand is slender, somewhat cylindrical, the basal portion is granulous externally, and the fingers are very slender, with the prehensile edges minutely toothed and the tips as in the larger hand.

The ambulatory legs are nearly naked; the meral segments are flat and each is armed with a small spine on the anterior edge near the distal extremity; the carpi are slightly bicarinated along the anterior edges; the propodi are broad, somewhat expanded in the middle, the anterior edges carinated like the carpi, and the posterior edges spinulous. The dactyli are slender, slightly curved, somewhat flattened, and the angles armed with sharp spinules.

The abdomen is broadest at the base, from which it tapers to the last segment, which is longer than broad and rectangular, except that the extremity is slightly rounded.

Length of carapax, including lobes of frontal margin, 12.4^{mm} ; breadth of carapax, including lateral teeth, 15.0^{mm} ; ratio, 1:1.21. Breadth between antero-lateral angles, 11.5^{mm} . Length of ambulatory legs, first, 19^{mm} ; second, 25; third, 25; fourth, 21.

I have seen only a single specimen, which was collected at Acajutla, west coast of Central America, by F. H. Bradley.

The appendages of the first abdominal segment in the male are widely separated at their bases, which are articulated to a slender plate arching round the intestinal canal, and converge toward their tips, but do not meet, although they extend to the middle of the sixth segment. Each of the organs is nearly straight and rather stout for two-thirds its length, and the terminal portion is suddenly constricted on the under side and curved outward and strongly downward to the tip. The appendages of the second segment are small and are lodged in grooves at the bases of the first pair.

Sesarma Say.

Sesarma reticulata Say.

Ocypode (Sesarma) reticulatus Say, Journal Academy Nat. Sci., Philadelphia, vol. i, p. 73, 76, pl. 4, fig. 6, 1817, and p. 442, 1818.

Sesarma reticulata Gibbes, Proceedings American Association, 3d meeting, p. 180, 1850; Edwards, Annales des Sciences naturelles, 3^{me} série, Zoologie, tome xx, 1853, p. 182; Stimpson, Annals Lyecum Nat. Hist., New York, vol. vii, p. 66, 1859.

This species is found at New Haven, Conn., inhabiting salt-marshes and associated with *Gelasimus pugnax*.

Sex.	Length of carapax.	Breadth of carapax.	Ratio.	Breadth of front.
Male.	14.0mm	17.1mm	1:1.22	9.4mm
"	15.2	18.3	1:1.20	9.9
"	17.2	21.0	1:1.22	11.4
"	19.7	24.2	1:1.23	13.2
"	22.4	27.5	1:1.23	15.0
"	23.0	28.3	1:1.23	15.4
Female.	19.7	24.6	1:1.25	13.5

In this species, the first segment of the male abdomen projects laterally considerably beyond the second segment, and beyond the posterior margin of the carapax, and the third segment is as wide as the first and its lateral margins are strongly arcuate; at the fourth segment, the abdomen is suddenly contracted and the remaining portion is quite narrow and the margins are slightly concave to the sixth segment; the terminal segment is scarcely more than one half as wide as, but considerably longer than, the sixth, much longer than broad, and its extremity rounded. The appendages of the first segment extend nearly to the extremity of the sixth segment, are articulated at their bases to a slender, arched plate, much as in *Glyptograpsus impressus*, are triquetral, quite stout, nearly straight and widely separated even to their tips, which are slightly flattened and hairy. The appendages of the second segment are short and slender and are lodged in grooves at the bases of the appendages of the first segment.

Sesarma sulcata, sp. nov.

Female. The carapax is quadrilateral in outline and much broader than long. The dorsal surface is convex in both directions, but somewhat more so longitudinally than laterally, and is clothed anteriorly and along the sides with scattered fascicles of short hairs. The protogastric lobes are divided, for half their length anteriorly, into nearly equal lobules by well marked sulci, and are limited next the orbits by deep depressions which extend to the antero-lateral angle of the carapax. The median portion of the gastric region is surrounded by a

broad depression and is somewhat separated from the rather broad mesogastric lobe, which extends forward, in the median sulcus between the protogastric lobes, nearly to the front. This median sulcus is broad and very deep, with precipitous sides and cuts through the whole height of the frontal crest. The branchial regions are traversed by sharp transverse plications. The front is perpendicular and low, and the inferior margin is broken by a broad excavation in the middle, where it scarcely projects beyond the epistome; above the antennulæ the edge projects, but toward the orbit slopes off again. The antero-lateral margin is armed with two stout teeth (including the angle of the orbit) and with the trace of a third. The first tooth is acute, directed forward and situated below the level of the rest of the margin, the second is prominent, acute, and projects forward partially over the deep, rounded incision which separates it from the first tooth, and the third is only indicated by a slight emargination.

The chelipeds are equal and rather small; the merus is rough externally, the angles are sharp and the anterior ones serrate; the carpus is very granulous externally; and the hand is slightly compressed, smooth externally, and the superior margin armed with a sharp crest.

The ambulatory legs are stout and much compressed, the meral segments are very broad, the breadth being equal to half the length, and rough with short transverse plications, the propodi and dactyli are hairy along the edges, and the dactyli are stout, curved and acuminate.

Length of carapax, 25.0^{mm}; greatest breadth of carapax, 31.0^{mm}; ratio of length to breadth, 1:1.24. Breadth of carapax between antero-lateral angles, 29.5^{mm}. Breadth of front, 16.4^{mm}; height of front, 3.4^{mm}.

The single specimen described was obtained at Corinto, west coast of Nicaragua, by J. A. McNeil, and is in the collection of the Peabody Academy of Science.

Sesarma cinerea Say.

Grapsus cinereus Bose, Histoire naturelle des Crust., tome i, p. 204, pl. 5, fig. 1, 1802;

Latreille, Histoire naturelle des Crust. et Insects, tome, vi, p. 72, 1803.

Grapsus (Sesarma) cinereus Say, Journal Academy Nat. Sci., Philadelphia, vol. i, p. 442, 1818 (*non Grapsus cinereus* Say, loc. cit. p. 99, 1817).

Sesarma cinerea Edwards, Histoire naturelle des Crust., tome ii, p. 75, 1837; Annales des Sciences naturelle, 3^{me} série, Zoologie, tome xx, 1853, p. 182; Gibbes, Proceedings American Association, 3d meeting, p. 180, 1850; Stimpson, Annals Lyceum Nat. Hist., New York, vol. vii, p. 65, 1859.

There are specimens before me collected at Egmont Key, west coast of Florida, by Col. E. Jewett; at Bluffton, South Carolina, by Dr. J. H. Mellichamp (collection Peabody Academy of Science), and at Fort Monroe, Virginia, by Dr. Kneeland.

Several specimens give the following measurements:—

Locality.	Sex.	Length of carapax.	Breadth of carapax.	Ratio.	Breadth at orbital angles.	Breadth of front.
Bluffton.	Male.	12.1mm	13.8mm	1:1.14	13.9mm	8.2mm
Ft. Monroe.	"	12.8	14.4	1:1.13	14.0	8.3
Bluffton.	"	15.2	17.4	1:1.13	17.0	10.0
Ft. Monroe.	"	16.4	18.6	1:1.13	17.8	10.8
Egmont Key.	Female.	11.0	12.8	1:1.16	12.6	7.2
"	"	12.8	15.0	1:1.17	14.5	8.7

The abdomen of the male is broadest at the third segment, the first and second are much narrower and of equal length; from the fourth to the sixth, the abdomen is broad and the lateral margins converge regularly; the terminal segment is scarcely a third as wide, but about as long, as the sixth, and very little longer than broad. The appendages are similar to the appendages of *S. reticulata*, but those of the first segment are a little shorter and much stouter.

Sesarma occidentalis, sp. nov.

A species closely allied to *S. cinerea* Say.

Male. The carapax is quadrilateral in outline and considerably broader than long. The dorsal surface is flat in the middle and posteriorly, but somewhat convex in front and along the sides. The protogastric lobes are convex and divided by slight depressions anteriorly, and the surface is rough with coarse, sharp granules arranged in very short, irregular, broken lines. The median portion of the gastric region is sparsely granulous, surrounded by a shallow sulcus, and the mesogastric lobe is very narrow and extends far forward in the well marked, median sulcus between the protogastric lobes. The branchial regions are traversed by indistinct transverse plications, and the posterior regions are punctate with indistinct, shallow puncta. The front is nearly perpendicular, quite high and slightly concave, the concave surface is irregularly and coarsely granulous, and the inferior margin is curved forward somewhat beyond the crest and its edge is nearly straight. The antero-lateral tooth is acute and projects well forward. The lateral margin is sharp, continuous, and nearly straight as seen from above.

The chelipeds are equal, short and stout; the anterior angle of the merus is sharp, dentate and raised into a thin crest at the end next

the carpus; the carpus is thickly beset externally with sharp granules; the basal portion of the propodus is short, and the outer surface is evenly rounded and very granulous and the superior margin is armed with a sharp crest; and finally, the dactylus is granulous on the upper side at base.

The ambulatory legs are rather slender, the meral segments are sharply granulous above, and the propodi and dactyli are clothed with a few short, stiff hairs along the margins.

Two males give the following measurements:—

Length of carapax.	Breadth of carapax.	Ratio.	Breadth at orbital angles.	Breadth of front.	Height of front.
11.6mm	13.1mm	1:1.13	12.9mm	7.0mm	2.1mm
15.8	17.6	1:1.12	16.9	9.4	3.0

I have seen only two specimens, both males, which were collected at Acajutla, west coast of Central America, by F. H. Bradley.

Although closely allied to *S. cinerea*, it is very readily distinguished from all specimens of that species which I have seen, by the granulous anterior regions of the carapax, the coarsely granulous front, and by the crested and granulous hands. The carapax also is more convex anteriorly and along the branchial regions.

The male abdomen and its appendages are almost exactly as in *S. cinerea*, except that the last segment of the abdomen is somewhat larger in proportion.

Sesarma angustipes Dana.

United States Exploring Expedition, Crust., p. 353, pl. 22, fig. 7, 1852; Stimpson, Proceedings Academy Nat. Sci., Philadelphia, 1858, p. 106; Annals Lyceum Nat. Hist., New York, vol. vii, p. 66, 1859.

Six specimens give the following measurements:—

Locality.	Sex.	Length of carapax.	Breadth of carapax.	Ratio.	Breadth at orbital angles.	Breadth of front.
Aspinwall	Male.	8.7mm	9.3mm	1:1.07	9.5mm	4.7mm
"	"	15.2	16.2	1:1.07	15.3	8.5
Florida.	"	17.0	18.2	1:1.07	17.0	10.2
"	"	18.9	20.2	1:1.07	18.4	10.6
"	Female.	11.2	12.0	1:1.07	11.5	6.8
"	"	16.6	18.2	1:1.10	16.8	9.5

Sesarma angusta, sp. nov.

Female. The carapax is quadrate, longer than broad and depressed. The protogastric lobes are very little convex, slightly divided anteriorly and their surfaces beset with sharp granules. The median portion of the gastric region is surrounded by a well marked sulcus,

and the anterior portion of the meso-gastric lobe extends forward, almost to the line of the front, as a very narrow ridge in the deep sulcus between the protogastric lobes. The median and posterior regions are punctate with irregular, coarse punctations, and the branchial regions are slightly plicate transversely. The front is nearly perpendicular, but low and very concave, the superior crest projects almost as far forward as the inferior margin, and is divided into four equal lobules by a deep median groove and slight lateral ones, and the inferior margin is strongly reflexed, its edge sinuous, as seen from above, with a broad and shallow sinus in the middle, and a very slight one each side. The antero-lateral tooth is nearly right-angular, and projects but slightly forward. The lateral margin is straight and entire.

The chelipeds are equal and very small, the merus and carpus are sharply granulous externally, the hand is about half as long as the breadth of the front, slender, the inferior edge evenly rounded, and the superior edge more angular and sparsely granulous, but not crested, and the fingers are slender, nearly cylindrical, and very slightly toothed within.

The ambulatory legs are very long and slender, even longer than in *S. angustipes*, and the meri and propodi are rough above.

Length of carapax, from its posterior margin to superior lobes of the front, 14.1^{mm}; breadth of carapax, 13.8^{mm}; ratio, 1:0.98. Breadth of carapax between antero-lateral angles, 13.6^{mm}. Breadth of front, 7.2; height of front, 1.8. Length of ambulatory legs, first, 22.0; second, 28.4; third, 32.0; fourth, 25.0. Length of propodus in first pair of ambulatory legs, 5.6; second pair, 8.0; third pair, 9.0; fourth pair, 6.6.

I have seen only one specimen, a female, collected at the Pearl Islands, Bay of Panama, by F. H. Bradley.

It is readily distinguished from all the other described American species of the genus by the narrowness of the carapax, the low, perpendicular and excavated front, and the great length of the ambulatory legs.

GONOPLACIDÆ.

Prionoplax Edwards.

Prionoplax ciliatus, sp. nov.

A species similar to *P. spinicarpus* Edwards, Archives du Muséum d'Histoire naturelle, Paris, tome vii, p. 167, pl. 11, fig. 3.

Male. The carapax is very convex longitudinally, but scarcely at all transversely. The dorsal surface is thickly beset with small, tuberculiform granules, but the space between the granules is smooth and shining. The areolation is similar to that of *P. spinicarpus*; the cervical suture is indicated by a very distinct, smooth sulcus, which is sharp and deep in the longitudinal portions in the middle of the carapax; the mesogastric and the metogastric lobes are united; there are no distinct sulci between the protogastric lobes and the hepatic regions; the branchial regions are undivided and only indistinctly separated from the cardiac. The front is lamellar, very strongly deflexed and its edge divided into two prominent, rounded lobes, which, when seen in a front view, project below the inferior margins of the orbits. The antero-lateral margin is thin and is divided by deep rounded sinuses into four slightly upturned lobes or teeth, of which the anterior, the hepatic, and the epibranchial are broad and truncate and their truncated edges finely denticulated, while the posterior, or mesobranchial, is acutely pointed. The inferior lateral regions are granulous like the dorsal surface, and, along the lateral borders, are clothed with long cilia which project beyond the margins. There are also, some hairs along the lateral margins of the dorsal surface, but they are very easily removed.

The outer surface of the external maxillipeds is minutely granulous.

The chelipeds are stout and slightly unequal. The merus is triquetral and armed with a spine on the posterior angle near the distal extremity. The upper side of the carpus is flat, somewhat roughened, and armed on the middle of the inner side with a long spine. The hands are stout, slightly compressed laterally, and perfectly smooth; the upper edge is angular, but not crested, and the fingers are compressed, deflexed, somewhat incurved, coarsely and irregularly toothed within, and do not gape.

The ambulatory legs are slender and thickly hairy along the edges, especially on the dactyli, which are long, very slender, and cylindrical.

The sternum is granulous like the carapax, only more minutely. The abdomen is smooth; the first and third segments are very much wider than the second, and the penultimate is much broader than long and its lateral margins are deeply concave in outline. The appendages of the first segment are long, slender, triquetral, and nearly straight organs reaching almost to the extremity of the abdomen. The appendages of the second segment are short and inconspicuous.

I have seen only males.

Length of carapax, 15.2mm	Breadth of carapax, 22.9mm	Ratio, 1: 1.44
“ “ “ 15.5	“ “ “ 23.9	“ 1: 1.47

Collected at Panama by F. H. Bradley.

This species is closely allied to *P. spinicarpus*, and it may possibly prove to be identical with the species from Panama mentioned under that name by Stimpson, *Annals Lyceum Nat. Hist.*, New York, vol. vii, p. 59. Edwards states, however, that, in his species, the teeth of the antero-lateral margin are “aplaties et aiguës,” and they are so figured on his plate, while in our species, all, except the posterior one, are broad, truncate and denticulated. The carapax in his figure is considerably broader, and the chelipeds seem to be much less robust, than in *P. ciliatus*. Moreover, there are no hairs or cilia indicated in the figure, on the carapax or the ambulatory legs, and they are not mentioned in the description.

The specimens, when received, were completely covered with ferruginous mud. Their cylindrical form is well adapted for living in holes, and this is quite probably the habit of the species, as it is of *Speocracinus*, according to Stimpson.

Euryplax Stimpson.

Euryplax nitidus Stimpson.

Annals Lyceum Nat. Hist., New York, vol. vii, p. 60, 1859.

Of this species, there is a specimen, in the Museum of Yale College, collected at Egmont Key, west coast of Florida, and there is another in the collection of the Peabody Academy labeled New Orleans, but probably from some part of the Gulf of Mexico.

Both these specimens are adult males and agree perfectly with Stimpson's description. The pit on the anterior surface of the merus is exactly alike in both chelipeds and in each specimen. The antero-lateral margins converge anteriorly so that the breadth of the carapax between the anterior angles, is very much less than between the posterior teeth. The anterior angle is obtuse, the second tooth is triangular, but blunt, and the last is slender and acutely pointed.

The male abdomen is broadest at the second segment, the sides of which extend in narrow projections quite to the coxæ of the posterior legs. The first segment is narrow and is only exposed in the broad excavation of the posterior margin of the carapax. The third segment is very broad and its sides project in acute angles, over the channel between the sixth and seventh segments of the sternum, nearly to the coxæ of the posterior legs. From the third segment, the abdo-

men is narrow and tapers to a very narrow terminal segment, which is two-thirds longer than broad, and obtuse at tip. The appendages of the first segment extend a little beyond the sixth segment. They are widely separated at base, strongly incurved till they meet a little way from the tips, which are again curved strongly outward. They are slender and taper to slender and acute tips, and the terminal third is shining black in color. The appendages of the second segment are situated within those of the first, are short, slender, straight, and white.

Alcoholic specimens are pale yellowish white, and the fingers white at tips.

Locality.	Sex.	Length of carapax.	Breadth of carapax.	Ratio.	Breadth of front.
Florida.	Male.	13.4mm	22.0mm	1 : 1.64	10.2mm
New Orleans?	"	14.6	24.0	1 : 1.65	10.4

Euryplax politus, sp. nov.

This species is allied to the last, but wants wholly the pits on the meral segments of the chelipeds, and the antero-lateral margins are parallel instead of converging anteriorly.

Male. The carapax is glabrous, convex longitudinally and very slightly transversely. The dorsal surface is not distinctly areolated, although the cervical suture can be traced by a slight depression. The front is nearly straight and has a distinct marginal groove upon the upper edge and is deeply notched each side at the insertion of the antennæ, as in *E. nitidus*. The antero-lateral margins are parallel, very short, and each is armed with three acute teeth. The postero-lateral margin is slightly incurved. The posterior margin is slightly concave in the middle.

The chelipeds are nearly equal, stout, smooth and glabrous. The merus is armed with a small spiniform tooth, as in *E. nitidus*, and the carpus, with a small tooth within. The hands are slightly swollen, the superior margins are quite high, but smooth and rounded, and the fingers are slender and slightly deflexed.

The ambulatory legs are smooth, nearly naked, and very slender.

The abdomen is quite similar in form to that of *E. nitidus*, and the appendages are very much as in that species, but those of the first segment are not as strongly curved at the tips, and the terminal portion is brown instead of black.

An alcoholic specimen is pale yellowish white, with the fingers brown at tip.

Sex	Length of carapax.	Breadth of carapax.	Ratio.	Breadth of front.
Male.	6.9mm	11.2mm	1 : 1.63	4.4mm

A single specimen was collected at Panama by F. H. Bradley.

This species agrees perfectly with all the characters assigned to the genus *Euryplax* by Stimpson, except in wanting wholly the pit on the front side of the merus of the chelipeds. This character might, perhaps, be considered generic, but, in the absence of any knowledge in regard to its functional importance, it seems best to refer this species to *Euryplax*, and especially, since it agrees so closely in most of its specific characters with the type of that genus.

Glyptoplax, gen. nov.

The carapax is canceroid in form and similar to *Eucratopsis*.* The dorsal surface is deeply areolated, the front is prominent and nearly horizontal, and the antero-lateral margin is dentate and about as long as the postero-lateral.

The basis of the antenna is long and joins a slight process from the side of the front.

The epistome is much as in *Panopeus*. There is a sharp carina on each side of the palate, along the efferent canal, but it is interrupted a little way from the border of the epistome.

The external maxillipeds are approximated along their inner margins. The ischium is longer than broad, and its anterior extremity projects farther forward on the inside than the outside. The merus is somewhat triangular, the antero-lateral angle is very prominent, the anterior margin is very short and nearly parallel with the inner margin, which slopes off rapidly toward the antero-lateral angle. The palpus is endarthroid.

The chelipeds are short, but the hands are very stout. The ambulatory legs are slender and smooth.

The seventh segment of the male sternum is exposed on each of the abdomen. The verges pass from the coxæ of the posterior legs to the abdomen, through canals beneath the sternum. The sides of the first segment of the abdomen extend in triangular projections to the coxæ of the posterior legs; the second segment is much narrower than either the first or the third; the sides of the third segment do not reach the margins of the sternum; and the third, fourth, and fifth segments are anchylosed.

This genus is allied to *Eucratopsis*, but differs very much from it in the form of the external maxillipeds, in the more prominent and horizontal front, and in the longer antero-lateral margins of the carapax. From *Speocarcinus* Stimpson (Annals Lyceum Nat. Hist., New York,

* *Eucrate* Dana. See these Transactions, vol. ii, p. 35.

vol. vii, p. 58), it differs in the approximation of the external maxillipeds and in the form of the carapax.

Glyptoplax pugnax, sp. nov.

Male. The dorsal surface of the carapax is slightly convex longitudinally, but not at all transversely, and is thickly granulous. The mesogastric lobe is not distinct from the metagastric, but is well separated from the protogastric, and its anterior portion is narrow and extends well forward. The protogastric lobes are prominent and undivided, and are not distinctly separated from the epigastric, which are very slight elevations separated by a marked median sulcus. The hepatic region is prominent, undivided, and separated from the gastric and branchial regions by deep sulci. The mesobranchial and metabranchial lobes are separated by a very slight sulcus, and the anterior portion of the branchial region is divided into three lobules,—one at the base of the epibranchial tooth, a larger one just within this, and a small, indistinct one next the gastro-cardiac sulcus. The front is thin and horizontal, its edge is slightly convex, as seen from above, and divided by a very slight notch in the middle. At each side of the front, there is a deep antennal notch, above which, the inner angle of the superior orbital border projects as a prominent tooth. The superior margin of the orbit is divided by two deep notches. The antero-lateral margins are arcuate. The outer angle of the orbit projects only slightly beyond the second tooth and is separated from it by a slight sinus. The remaining portion of the margin is divided into three, prominent, triangular teeth, of which the middle one, or epibranchial, is most prominent.

The ocular peduncles are armed with a granulous tubercle on the anterior side near the cornea.

The chelipeds are slightly unequal and the hands are very large. The merus does not project beyond the lateral margin of the carapax. The carpus is short and the outer surface is granulous, has a slight groove along the margin next the propodus, a tooth upon the inner margin, and a small tubercle near the articulation of the propodus. The hand is compressed, very broad, and nearly smooth. The basal portion of the propodus is slightly convex on both sides, the lower edge is rounded, and the upper edge is slightly crested; the digital portion is very broad at base and very much deflexed, so that the prehensile edge is parallel with the margin at the base of the dactylus, the inferior edge is slightly margined on the outside, and the tip is slender and upturned. The dactylus is long and slender, the upper

edge is slightly crested and the tip is hooked by the tip of the propodus. The prehensile edges of both fingers are sharp, very slightly dentate, and do not gape, or only very slightly.

The ambulatory legs are slender and minutely granulous; the propodi are slightly hairy on the posterior edges; and the dactyli are slender, slightly compressed, those of the posterior pair considerably shorter than the others, and all clothed with very short hair.

The sternum is minutely granulous. The terminal segment of the abdomen is about as broad as long, and the extremity is obtusely rounded. The appendages of the first abdominal segment are long, slender, nearly straight, and reach to the terminal segment. The appendages of the second segment are short and very small.

The females differ from the males in being more convex and in the front being less prominent and very slightly deflexed. The young males approach the females in these characters.

The fingers are black in both sexes.

No.	Sex.	Length of carapax.	Breadth of carapax.	Ratio.	Breadth of front.
1.	Male.	4.8mm	6.4mm	1:1.33	2.6mm
2.	"	5.7	7.8	1:1.37	2.8
3.	"	6.0	8.3	1:1.36	3.0
4.	"	6.8	9.4	1:1.38	3.5
5.	"	7.7	11.0	1:1.43	3.7
6.	"	8.6	12.1	1:1.41	4.1
7.	Female.	4.4	6.1	1:1.39	2.3
8.	"	4.8	6.7	1:1.40	2.6
9.	"	5.1	7.2	1:1.41	2.7

The chelipeds of numbers 2, 4, 6, and 9, give the following measurements:—

No.	Length of hand.		Breadth of hand.		Length of dactylus.	
	Right.	Left.	Right.	Left.	Right.	Left.
2.	6.7mm	6.2mm	4.7mm	3.8mm	5.1mm	4.6mm
4.	7.2	8.4	4.2	5.0	5.3	6.0
6.	10.2	11.0	5.8	6.2	8.0	8.4
9.	5.0	5.1	2.6	3.0	3.1	3.2

Collected at Panama by F. H. Bradley.

Family, PINNOTHERIDÆ.

Pinnotheres Latreille.

Pinnotheres margarita Smith.

L. Verrill, American Naturalist, vol. iii, p. 245, July, 1869.

This is a stout, thick species, with a firm integument, and every where covered, except the dactylus of the right ambulatory leg of the

second pair in the female, and the tips of the others in both sexes, with a very short and close, clay-colored pubescence, looking much like a uniform coating of mud.

Female. The carapax is very strongly convex in all directions and the dorsal surface, beneath the pubescence, is smooth and shining. The cardiac region is protuberant and is separated from the gastric region by a conspicuous sulcus, and from the branchial regions, by very marked and deep depressions, which extend along the cervical suture to the hepatic region. The branchial regions are protuberant along their inner sides. The front is not protuberant, is strongly deflexed, and has a slight median depression.

The external maxillipeds are more longitudinal and of a firmer consistency than is usual in the genus. The merus is short and broad, and the inner margin is angulated in the middle, the portion toward the base fitting the anterior margin of the sternum and the distal portion being slightly concave and fitting closely the terminal segments of the palpus. The second segment of the palpus is large, broadest in the middle at the attachment of the terminal segment, and the outer surface is flattened. The terminal segment is slightly spatulate in form and reaches almost to the tip of the second segment.

The chelipeds are equal and very stout and the hands are long and nearly cylindrical. The fingers are somewhat cylindrical, nearly straight almost to the tips, which are hooked by one another, and the prehensile edge of the dactylus is armed, near the base, with a small tooth, which fits a slight excavation in the propodal finger.

The ambulatory legs are stout and all the ischial segments, and the posterior margins of the propodi and dactyli in the last pair, are clothed with a long, woolly pubescence. The dactyli in the three anterior pairs are short, curved, and pubescent nearly to the tips, except in the right leg of the second pair, where the propodus is considerably longer than in the corresponding leg on the other side, and the dactylus very long, almost straight, and entirely naked. In the posterior legs, the dactyli are long, straight, slender, and pubescent.

The anterior margin of the sternum is excavated into a broad, rounded sinus for the reception of the tips of the palpi of the external maxillipeds.

The abdomen is orbicular and completely covers the sternum.

Male. The only male which I have seen is much smaller than the females, and is not so thickly pubescent. The cardiac and branchial regions are less protuberant and are separated from the gastric by a

slight depression only. The front projects slightly and is not so much deflexed as in the female.

The chelipeds and ambulatory legs are like those of the female, except that the ambulatory legs of the right side are like those of the left.

The abdomen is broadest at the third segment, from the third to the sixth, the margins are straight and converging, the sixth is abruptly contracted, and the terminal segment is nearly square. The appendages of the first segment are rather stout organs, somewhat hairy along the margins, and reach to the terminal segment. They curve inward for about two-thirds of their length and then outward again to the tips. The appendages of the second segment are short and are lodged in grooves at the bases of the first pair of appendages.

Locality.	Sex.	Length of carapax.	Breadth of carapax.	Ratio.
Pearl Islands.	Male.	5.5mm	6.1mm	1:1.11
La Paz.	Female.	8.1	8.9	1:1.10
Pearl Islands.	'	8.8	9.7	1:1.10
"	"	10.0	11.0	1:1.10
"	"	10.3	11.4	1:1.11
"	"	10.9	12.0	1:1.10
"	"	11.8	13.4	1:1.14

This species was found living in the Pearl Oyster (*Margaritophora fimbriata* Dunker), at the Pearl Islands, Bay of Panama, by F. H. Bradley. It has also been sent from La Paz, Lower California, by Capt. J. Pedersen.

A sterile female *Pinnotheres*, found in an alcoholic specimen of the Pearl Oyster collected at the Pearl Islands by Mr. Bradley, probably belongs to this species. It agrees closely with specimens of *P. margarita*, described above, in the form of the external maxillipeds and the firm integument.

The carapax is more like the male than the ordinary female, but is narrower and more depressed. The front is more prominent and scarcely at all deflexed. The dorsal surface is very slightly arcolated, quite flat, and is clothed, except the cardiac region and a small space in the middle of the gastric, with a very dark, almost black, velvety pubescence.

A single cheliped is stouter in proportion than in the ordinary male and female, and the pubescence upon the upper surface of the carpus and a small space at the base of the hand, is black as on the dorsal surface of the carapax.

The ambulatory legs are less pubescent than in the male, while the propodus and dactylus of the right leg of the second pair are longer

than in the corresponding leg of the left side, but are not as long as in the female.

The abdomen is not broader than in the male, but the margins are slightly convex, it is not contracted at the sixth segment, and the extremity is rounded.

Length of carapax, 5.1^{mm}; breadth of carapax, 5.3^{mm}; ratio, 1:1.04.

Pinnotheres Lithodomi, sp. nov.

Female. The carapax, in the single specimen examined, is much crushed out of shape, but the dorsal surface is smooth and naked.

The merus of the external maxilliped is broadest at the distal extremity, and both margins are nearly straight.

The chelipeds are equal, smooth, and naked. The hands are cylindrical, and the fingers are short, nearly straight, the tips are slightly hooked by each other, and the prehensile edge of the dactylus is armed, near the base, with a small tooth, which fits a slight excavation in the propodal finger.

The ambulatory legs are very slender and wholly naked, except the dactyli. In the first pair, the dactyli are very short and only slightly curved; in the second, they are considerably longer than in the first, and nearly straight; in the third, they are very long, being nearly as long as the propodi, slender, and slightly curved; and in the posterior pair, they are about as long as in the second and are ciliated along the posterior edges.

Breadth of carapax, about, 4^{mm}.

The only specimen seen, was found in a specimen of *Lithodomus aristatus* Forbes and Hanley which was in its excavation in the shell of a *Spondylus* collected at the Pearl Islands by F. H. Bradley. Although the specimen is very small, it has a large number of eggs beneath the abdomen.

Ostracotheres Edwards.

Ostracotheres politus, sp. nov.

Female. The carapax is depressed, naked, smooth, and shining. The dorsal surface is flat and the borders are smoothly rounded. There is a short median sulcus on the front, and a very slight U-shaped one extending from the orbits to the middle of the carapax. The front does not project beyond the anterior margins.

The external maxillipeds are smooth and almost entirely naked, and, in form, are considerably like the figure of *O. affinis* given by Edwards (*Annales des Sciences naturelles*, 3^{me} série, Zoologie, tome xx, 1853,

pl. 11, fig. 11), but the merus is wider at the distal end and the outer margin is not so arcuate.

The chelipeds are equal and all the segments are rounded, smooth, and glabrous. The hands are small and much compressed. The fingers are shorter than the basal portion of the propodus, do not gape, and the dactylus is slightly curved and is armed, near the base, with a small tooth, which fits a slight excavation in the propodal finger.

The ambulatory legs are short, slender, cylindrical, and smooth. Those of the first pair are shorter than those of the second, and the dactyli, in both the first and second pairs, are very short and curved, and close against the expanded end of the propodus, which is clothed at that point with a little tuft of short, stiff hair. Those of the third pair are about the length of those of the second pair, and the dactyli are short and curved, but the distal ends of the propodi are not expanded for their reception. The posterior legs are shorter than those of the second or third pair, are much more slender than any of the others, and the dactyli are only slightly curved and are very long and slender, their length being about equal to that of the propodi.

The abdomen is very broad and covers the whole sternum.

Length of carapax,	5.4mm;	breadth of carapax,	7.3mm;	ratio,	1: 1.35
" " "	6.3	" " "	8.3	"	1: 1.32
" " "	6.4	" " "	8.5	"	1: 1.33

Collected at Callao, Peru, by F. H. Bradley.

The integument is quite thin and yielding, and the species undoubtedly lives protected within some bivalve mollusk (probably *Mytilus algosus* Gould). It appears to differ remarkably from the other species of the genus in the depressed carapax and naked ambulatory legs, and I refer it to Edwards' genus with some doubt, although it agrees in the two-jointed palpus of the external maxillipeds.

The other described species of *Ostracotheres* are:—*O. Savignyi* Edwards (*Pinnotheres veterum* Savigny), from the Red Sea; *O. Tri-duenæ* Edwards (Ruppell), also from the Red Sea; and *O. affinis* Edwards, from the Isle of France.

Pinnaxodes Heller.

Pinnaxodes Chilensis Smith.

- Pinnotheres Chilensis* Edwards, Histoire naturelle des Crust., tome ii, p. 33, 1837;
 Edwards et Lucas, Voyage de d'Orbigny dans l'Amérique méridionale, Crust., p. 23, pl. 10, fig. 2, 1843.
Fabia Chilensis Dana, United States Exploring Expedition, Crust., p. 383, 1852.
Pinnaxodes hirtipes Heller, Reise der österreichischen Fregatte Novara um die Erde, p. 68, pl. 6, fig. 2, 1865.
Pinnaxodes Chilensis Smith, in Verrill, American Naturalist, vol. iii, p. 245, 1869.

The parasitic habits of this species have been fully described by Prof. Verrill.* It inhabits *Euryechinus imbecillis* Verrill, living in a sac formed by the distention of the intestine near the anal orifice. The females, after they have arrived at any considerable size, must remain permanently within the same echinus, since the anal orifice is much smaller than the body of the crab.

I have examined quite a number of individuals obtained from specimens of the *Euryechinus* collected by Mr. Bradley at Paita and Callao, Peru, and by Prof. James Orton at Paita, and have little doubt that the species figured by Edwards and Lucas and by Heller are identical, although the figures given by these authors are quite different. The specimens before me agree very well with the figure in the work of Edwards and Lucas, except that the outer margin of the carpus of the external maxillipeds is not quite so much curved toward the distal extremity as in the figure. On account of the soft and yielding nature of the carapax, many of the specimens do not show distinctly the sulci in the dorsal surface. The figure given by Heller seems to have been drawn from such a specimen, for no sulci are represented. The carpus in the figure of the external maxilliped in Heller's work, is quite different from Edwards' and Lucas' figure; but the figure of the latter authors represents the whole maxilliped removed from the rest of the animal, while Heller's figure represents only the exposed portion, and was evidently drawn from the maxilliped while in place, and, if the carpus were seen in a slightly oblique position, it would account for its narrower form in his figure. The dactyli of the ambulatory legs, as represented in Heller's figure, are somewhat longer than in our specimens.

The peculiar habit is also a confirmation of the identity of the species. Heller's specimens were from Ecuador, and he says of them:—"Diese in zwei weiblichen Exemplaren vorliegende Art soll nach Dr. Scherzer in einer Echinus-Art vorkommen." Neither Edwards nor Edwards and Lucas give anything in regard to the habits of the species, but merely state that it was found at Valparaiso. Dana, however, mentions it as "from an Echinus on the coast of Chili, near Valparaiso."

A single specimen of a male, which evidently belongs to this species, was found upon the outside of an echinus which contained within it a female. This male is very small, the carapax is rather narrower

* These Transactions, vol. i, p. 306, American Journal of Science, 2d series, vol. xlv, p. 126, 1867, and American Naturalist, vol. iii, p. 245, 1869.

than in the female, the chelipeds are stouter in proportion, and the ambulatory legs are somewhat less hairy. The carapax is of the same weak consistency, and the external maxillipeds of the same form, as in the female. The abdomen is quite narrow and all the segments are distinct. The margins are very straight to the sixth segment, which is slightly contracted, and the extremity is broadly rounded.

A number of specimens give the following measurements, which are only approximately correct, on account of the soft and flexible nature of the carapax.

Locality.	Sex.	Length of carapax.	Breadth of carapax.	Ratio.
Callao.	Male.	2.6mm	2.5mm	1 : 0.96
Paíta.	Female.	7.2	7.8	1 : 1.08
Callao.	"	9.0	9.2	1 : 1.02
Paíta.	"	12.2	12.7	1 : 1.04

The genus *Pinnaxodes* is quite distinct from the typical species of *Fabia* Dana, in the form of the external maxillipeds, which are nearly longitudinal and much as in *Pinnixa*, with which, in fact, Heller compares them, while in *Fabia subquadrata*, they are oblique and resemble those of *Pinnotheres*. The carapax also is quite different in form, and in *Fabia*, the sulci which extend back from the orbits are very deep and there is no median sulcus on the front, while in *Pinnaxodes*, the sulci from the orbits are very slight, not more distinct than the median.

Family, DISSODACTYLIDÆ.

This family, which is here established for the following genus, appears to be most nearly allied to the *Pinnotheridæ*, but differs from that family, and in fact from all other Oecypodoidea, in the structure of the palate, or endostome, which is not divided by a median ridge separating the efferent passages.

Dissodactylus,* gen. nov.

The carapax is depressed, the dorsal surface is smooth and not areolated, and the front is narrow and horizontal.

The eyes are very minute, being much smaller even than in the *Pinnotheridæ*.

The epistome is very short, so that the labial border approaches very near to the front, leaving only a narrow space which is nearly filled by the antennulæ. The labial border is regularly concave, as seen in a front view, is not interrupted in the middle by any projec-

* Δισσός, *duplex*; δάκτυλος, *digitus*.

tion or emargination, and is continuous with the lateral margin of the buccal area, which is broad behind as in the *Pinnotheride*. The pal-ate is not divided longitudinally either by lateral ridges or even by a median one, so that the efferent passages are not distinctly separated at their external orifices.

In the external maxillipeds, the ischium is coalescent with the merus as in the *Pinnotheride*, and the palpus is composed of only two segments, of which the terminal one is large and spatulate.

The chelipeds are small and equal and the hands short and rounded.

The ambulatory legs are small and slender and the dactyli in the three anterior pairs are short and deeply bifurcate, while those of the posterior pair are simple and slender.

In the male, the sternum is flat and very broad, the breadth between the posterior legs being much more than twice as great as the breadth of the basal segments of the abdomen.

The male abdomen is narrow and only three-jointed, the first and second segments anchylosing into one piece, the third, fourth, fifth, and sixth into another, and the terminal being free. The verges are sternal and the appendages of the first segment are large and stout, while those of the second segment are very small.

Dissodactylus nitidus, sp. nov.

Male. The carapax is broad posteriorly, the breadth at the posterior margin being but little less than that between the lateral angles, and the postero-lateral margins are about as long as the antero-lateral. The dorsal surface is naked and polished, and is slightly convex in front and along the lateral margins, but flat in the middle and posteriorly. The antero-lateral border is slightly arcuate and is armed with an upturned margin which curves suddenly inward at the lateral angle, and extends a third of the way to the middle of the carapax. The postero-lateral border is nearly straight and is armed with a slight upturned margin.

The merus in the external maxillipeds is of about equal width at base and summit, the inner and outer margins are nearly straight, and the angles at the summit are rounded. The segments of the palpus are quite long, and, when folded down, the tip reaches to the anterior margin of the sternum; the terminal segment is spatulate and its distal end quite broad and squarely truncated.

In the chelipeds, the merus extends but little beyond the margin of the carapax; the carpus is short, smooth, and unarmed; the hands are smooth, rounded, somewhat swollen, and the fingers are slender,

acutely pointed, slightly deflexed, and the prehensile edges minutely dentate. There is a small tuft of dense pubescence on the inferior edge of the propodal finger near the base.

The ambulatory legs are slightly hairy along the edges, and the meri, carpi, and propodi are somewhat compressed. In the first, second, and third pairs, the dactyli are smooth, naked, and divided half-way to the base; the divisions are cylindrical, acutely pointed, slightly curved, and the anterior one of each leg somewhat longer than the other. In the posterior pair, the dactyli are nearly straight, slightly compressed, sulcate above and below, and naked.

The first and second segments of the abdomen are narrower than the third and are completely anchylosed, but the suture which separates them is slightly shown for a little space in the middle and each side. The succeeding piece, composed of the third, fourth, fifth, and sixth normal segments, is slightly expanded at base, considerably contracted at the distal end, and does not show the slightest trace of any sutures. The terminal segment is small and forms a nearly equilateral triangle.

The appendages of the first segment reach almost to the terminal segment, they are straight for the basal two-thirds, and the terminal portion is turned sharply outward at an obtuse angle. The basal portion is hairy along the outer edge, and the terminal portion, on both edges.

The color, in alcohol, is dirty white, the carapax marked with irregular, transverse bands of purplish brown, and the divisions of the dactyli in the first and third pairs of ambulatory legs tipped with dark brown.

Length of carapax, 4.7^{mm}; breadth of carapax, 5.1^{mm}; ratio of length to breadth, 1:1.08.

Collected at Panama by F. H. Bradley.

Unfortunately only a single specimen was sent home by Mr. Bradley, and on this account, as well as from the minuteness of the species, the description is not so complete as might be wished. Although so small, the integument is firm and indurated, and the sexual organs are fully developed, so that it is evidently an adult. The structure of the endostome shows a very remarkable approach to the Oxystomata. The efferent canals do not, however, issue in a deep and narrow median opening as in that group, but seem to be spread out over the whole, broad, concave surface of the endostome, while the external maxillipeds retain the form peculiar to the Pinnotheridæ. The form of the

carapax, the minute eyes, the peculiar, Ostracotheres-like, external maxillipeds, the broad male sternum with the verges arising from it, and the narrow male abdomen, show close affinity with the Pinnotheridæ, but the union of so many segments of the male abdomen separates it again from that family.

EXPLANATION OF PLATES.

PLATE II.

All the figures are natural size, except 2, 11, and 11^a, and all are copied from photographs, except 6^a.

Figure 1.—*Gelasimus pugnax*. Carapax of a male, from New Haven.

Figure 2.—*G. rapax*. Anterior portion of the carapax of the male, seen partly in a front view and enlarged two diameters.

Figure 3.—*G. mordax*. Carapax of a male, from Pará.

Figure 4.—*G. minax*. Carapax of a male, from New Haven.

Figure 5.—*G. armatus*. Carapax of the male, from the Gulf of Fonseca.

Figure 6.—*G. heterophthalmus*. 6, carapax of a male, from the Gulf of Fonseca. 6^a, terminal portion of the ocular peduncle, on the side of the larger cheliped, with its stylot, seen in a front view.

Figure 7.—*G. heteropleurus*. Carapax of a male, from the Gulf of Fonseca.

Figure 8.—*G. princeps*. Carapax of a female, from Corinto.

Figure 9.—*G. ornatus*. 9, carapax of the female. 9^a, facial region of the same specimen.

Figure 10.—*G. princeps*. Carapax of a male, from Corinto.

Figure 11.—*G. gibbosus*. 11, carapax of the male, enlarged two diameters. 11^a, outline of the front of the same specimen, enlarged two diameters.

PLATE III.

All the figures are natural size, and all from photographs, except 4^d, 5, and 5^b.

Figure 1.—*Gelasimus heterophthalmus*. 1, outer surface of the hand of the larger cheliped. 1^a, inner surface of the hand of another specimen. 1^b, anterior surface of the merus of the same cheliped as figure 1.

Figure 2.—*G. heteropleurus*. 2, outer surface of the hand of the larger cheliped. 2^a, inner surface of the hand of another specimen. 2^b, anterior surface of the merus of same cheliped as figure 2^a.

Figure 3.—*G. princeps*. 3, outer surface of the hand of the larger cheliped. 3^a, basal portion of the inner surface of the hand of another specimen. 3^b, anterior surface of the merus of the same cheliped as figure 3^a. 3^c, external maxilliped.

Figure 4.—*G. armatus*. 4, outer surface of the hand of the larger cheliped. 4^a, anterior surface of the merus of the same cheliped. 4^b, 4^c, 4^d, ambulatory legs of the posterior, of the third, and of the second pair in the same specimen.

Figure 5.—*G. ornatus*. 5, outer surface of the hand of the female. 5^a, 5^b, 5^c, ambulatory legs of the posterior, of the third, and of the second pair in the same specimen.

PLATE IV.

- All the figures are natural size, and all from photographs, except 2^d, 6^b, 7^a, 8^a, and 9
- Figure 1.—*Gelasimus minax*. 1, inner surface of the hand of the larger cheliped of a male, from Bluffton, S. C. 1^a, anterior surface of the merus of the same cheliped. 1^b, outer surface of the hand of the larger cheliped of a male, from New Haven, (from the same specimen as figure 4 on plate II).
- Figure 2.—*G. pugnax*. 2, inner surface of the hand of the larger cheliped of a male. 2^a and 2^b, outer surface of the hand of the larger cheliped in two males. 2^c, anterior surface of the merus of the larger cheliped of a male. 2^d, abdomen of a male. All the specimens from New Haven.
- Figure 3.—*G. rapax*. Inner surface of the hand of the larger cheliped of the male.
- Figure 4.—*G. mordax*. 4, inner surface of the hand of the larger cheliped of a male. 4^a, outer surface of the hand of the larger cheliped of a young male. Both specimens from Pará.
- Figure 5.—*G. Panamensis*. 5, inner surface of the hand of the larger cheliped of a male, from Panama. 5^a, anterior surface of the merus of the same specimen.
- Figure 6.—*G. subcylindricus*. 6, outer surface of the hand of the larger cheliped of a male, from Matamoros. 6^a, inner surface of the basal portion of the same hand. 6^b, abdomen of the same specimen.
- Figure 7.—*G. pugilator*. 7, outer surface of the hand of the larger cheliped of a male. 7^a, abdomen of a male. Both specimens from New Haven.
- Figure 8.—*G. gibbosus*. 8, outer surface of the hand of the larger cheliped of the male from the Gulf of Fonseca. 8^a, abdomen of the same specimen.
- Figure 9.—*G. princeps*. Abdomen of a male from Corinto.

PLATE V.

- All the figures are natural size. Figures 1, 1^a, 2, and 2^a are copied from photographs, all the others from drawings.
- Figure 1.—*Opisthocera Gilmanii*. 1, dorsal view of the whole animal. 1^a, facial region. 1^b, abdomen. 1^c, one of the first pair of abdominal appendages. 1^d, one of the second pair of abdominal appendages. All the figures from the male collected at the Isle of Pines.
- Figure 2.—*Epilobocera armata*. 2, facial region of one of the female specimens in the collection of the Boston Society of Natural History. 2^a, outline of the antero-lateral margin of the carapax of the same specimen. 2^b, external maxilliped.
- Figure 3.—*Cardiosoma guanhumi*. 3, one of the appendages of the first segment of the abdomen of a male, from the Florida Keys. 3^a, side view of the same.
- Figure 4.—*Cardiosoma quadratum*. 4, one of the appendages of the first segment of the abdomen of a male, from Pernambuco, Brazil. 4^a, side view of the same.
- Figure 5.—*Cardiosoma crassum*. 5, one of the appendages of the first segment of the abdomen of a male, from the Gulf of Fonseca. 5^a, side view of the same.

ERRATA.

- Page 1, line 13, for "Flordia," read Florida.
- " 11, " 35, " "immargination," read emargination.
- " 16, " 26, " "spistome," read epistome.
- " 31, " 18, " "Podophthalmia," read *Podophthalmia*.
- " 35, " 9, " "Eucrete," read *Eucrate*.
- " 35, last line but one, for "margin," read margins.
- " 106, line 4, from foot, for "Norton Street," read Blake Street.
- " 108, " 11, " "twenty rods," read twenty-one rods.
- " 118, " 11, for "styiferus," read styliiferus.
- " 138, " 11, " "immargination," read emargination.
- " 139, " 11, " "immarginate," read emarginate.
- " 153, first line of foot note, for "is marked 3," read is marked 3^c.
- " 162, above "*Euryplax*," insert CARCINOPLACIDÆ.
- " 188, line 8, for "spinosus," read spinosum.
- " 197, " 31, " "palpaster," read polpaster.
- " 343, in title of paper, for "1873," read 1872.
- " 343, under No. 5, for "variable," read variable.
- " 346, No. 24, line 7, for "Montague," read Montagne.
- " 348, No. 44, for "Euteromorpha," read Enteromorpha.







