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AND·DIFFVSION·OF·
KNOWLEDGE·AMONG·MEN·
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THE SPIDER CRABS OF AMERICA

BY

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The scientific publications of the United States National Museum consist of two series, the *Proceedings* and the *Bulletins*.

The *Proceedings*, the first volume of which was issued in 1878, are intended primarily as a medium for the publication of original, and usually brief, papers based on the collections of the National Museum, presenting newly acquired facts in zoology, geology, and anthropology, including descriptions of new forms of animals and revisions of limited groups. One or two volumes are completed annually and copies of each paper, in pamphlet form, are distributed, as soon as published, to libraries and scientific organizations, and to specialists and others interested in the different subjects. The date of publication is recorded in the table of contents of the volume.

The *Bulletins*, the first of which was issued in 1875, consist of a series of separate publications comprising chiefly monographs of large zoological groups and other general systematic treatises (occasionally in several volumes), faunal works, reports of expeditions, and catalogues of type-specimens, special collections, etc. The majority of the volumes are octavos, but a quarto size has been adopted in a few instances in which large plates were regarded as indispensable.

Since 1902 a series of octavo volumes containing papers relating to the botanical collections of the Museum, and known as the *Contributions from the National Herbarium*, has been published as bulletins.

The present work forms No. 129 of the *Bulletin series*.

WILLIAM DEC. RAVENEL,
Administrative Assistant to the Secretary,
In Charge of the United States National Museum.

WASHINGTON, D. C., April 15, 1925.

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THE SPIDER CRABS OF AMERICA

By Mary J. Rathbun

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INTRODUCTION

This volume is the second of the handbooks projected for the study of American crabs, the first volume of which, "The Grapsoid Crabs of America," forms Bulletin 97 of the United States National Museum. The introductory remarks in that bulletin under the headings "Sources of material," "Special researches," "Acknowledgments," and "Glossary of terms used" apply also to this bulletin. The author has been able to examine much rare and type material at the Museum of Comparative Zoölogy and the Philadelphia Academy of Natural Sciences, and a number of photographs of the same have been contributed by those museums through the courtesy of Mr. Samuel Henshaw and Dr. H. A. Pilsbry; while Dr. W. T. Calman of the British Museum has furnished a photograph of the type-specimen of *Lambrus crenatus* White, which is here reproduced. I am constrained to acknowledge also my indebtedness to my various colleagues in the United States National Museum who have assisted in getting this volume into shape for publication.

EXPLANATION OF MEASUREMENTS AND ABBREVIATIONS USED

Explanation of measurements

The length of the carapace, unless otherwise stated, is measured on the median line, from the anterior to the posterior margin.

The width of the carapace is measured at the widest part.

The fronto-orbital width or exorbital width is measured from the outer angle of one orbit to the outer angle of the other.

The length of the rostrum in the Majidae is usually measured to the angle which it forms with the orbit; in the Parthenopidae and Hymenosomidae it is measured from the tip to the posterior line of the upper margins of the orbits.

The width of the rostrum is measured at its posterior end.

The length of the segments of the chelipeds and legs is measured on the upper or anterior margin. The length of the whole cheliped or leg is measured on the lower margin, from the articulation of the coxa with the sternum to the tip of the dactylus.

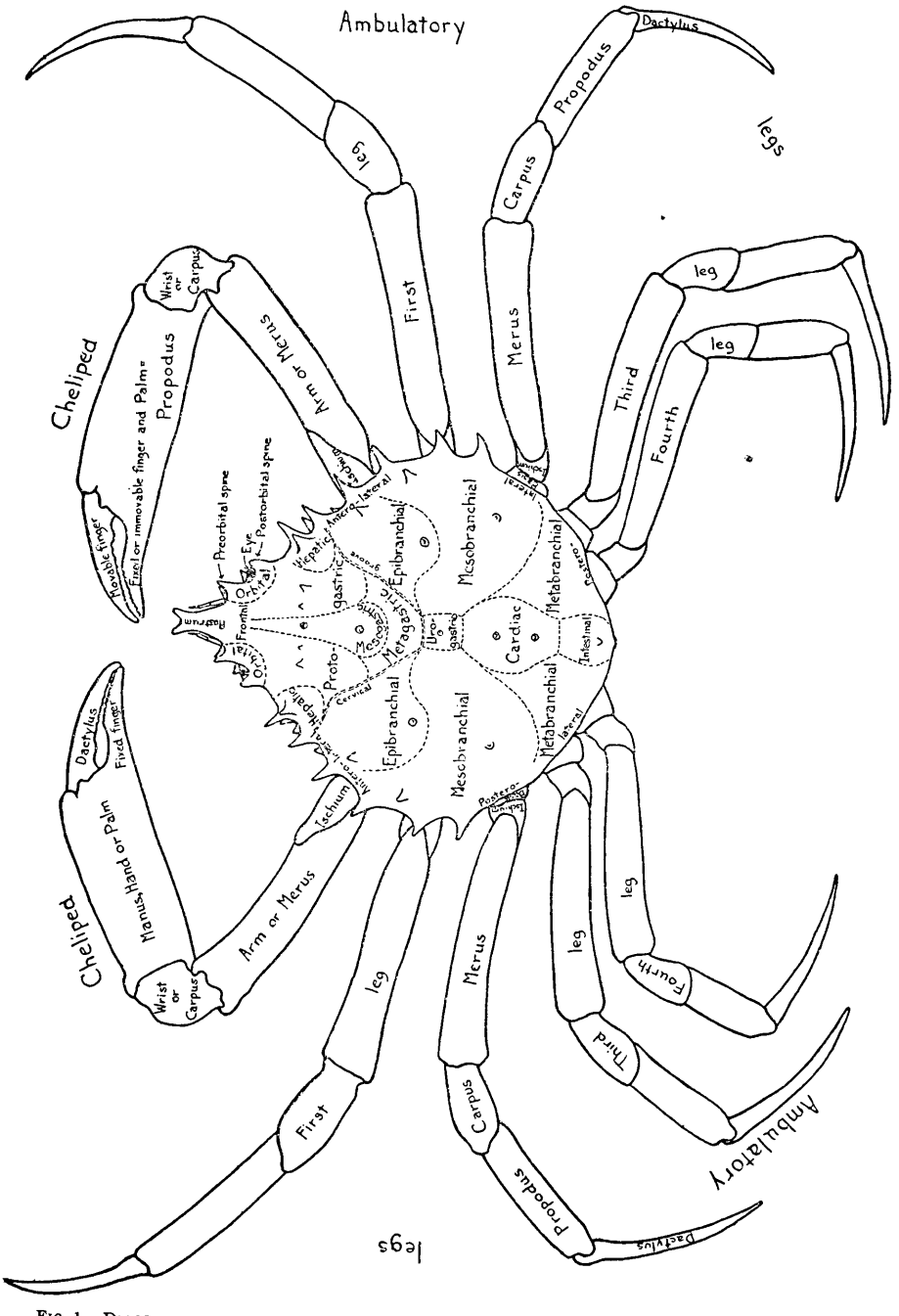

FIG. 1.—DIAGRAMMATIC DORSAL VIEW OF A SPIDER CRAB, SHOWING THE TERMS USED IN DESCRIPTION. BY W. L. SCHMITT.

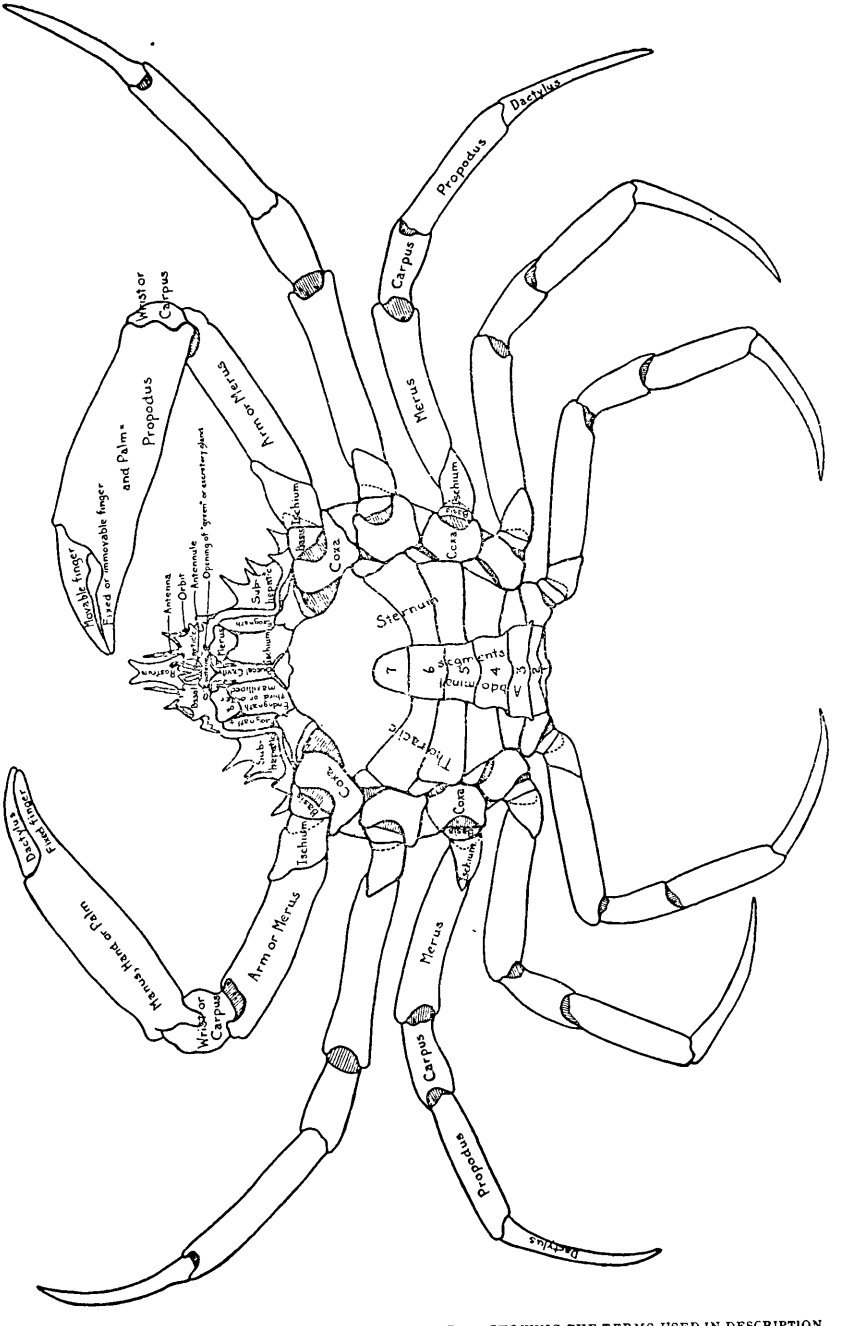

FIG. 2.—DIAGRAMMATIC VENTRAL VIEW OF A SPIDER CRAB, SHOWING THE TERMS USED IN DESCRIPTION. BY W. L. SCHMITT.

The width of the segments of the chelipeds and legs is measured at the widest part.

The length of the immovable finger is measured from the tip to the extremity of the sinus between the fingers.

Character of bottom

Under "Material examined," the abbreviations indicating the character of the bottom are those employed by the Bureau of Fisheries. Nouns begin with a capital, adjectives with a small letter.

bk.....black	grsy.....grassy	S.....sand
br.....brown	gy.....gray	sctrd.....scattered
brk.....broken	hrd.....hard	sft.....soft
bu.....blue	lge.....large	Sh.....shells
Co.....coral	lt.....light	shy.....shelly
crs.....coarse	M.....mud	sm.....small
dk.....dark	Oz.....ooze	Sp.....specks
fne.....fine	P.....pebbles	St.....stones
For.....foraminifera	Ptr.....pteropod	stky.....sticky
G.....gravel	R.....rock	vol.....volcanic
Glob.....globigerina	rd.....red	W.....seaweed
gn.....green	Rf.....reef	wh.....white
Grs.....grass	rky.....rocky	yl.....yellow

Additional abbreviations and notes

In the synonymy an attempt has been made to give all the different names or combinations which have been used, but not all the references to a species.

In the lists under "Material examined" a number in parenthesis following an indication of a specimen or specimens denotes a catalogue number of the United States National Museum unless otherwise indicated. The following abbreviations are used:

Amer. Mus.=American Museum of Natural History, New York.
B. S. N. H.=Boston Society of Natural History.
Cal. Acad.=Museum of the California Academy of Sciences, San Francisco.
M. C. Z.=Museum of Comparative Zoölogy, at Harvard University.
Mus. S. U. I.=Museum of the State University of Iowa.
Phila. Acad.=Museum of the Philadelphia Academy of Natural Sciences.
Y. U. M.=Yale University Museum.
y=young.

The words "U. S. Fisheries" should be understood before "Str. *Albatross*," "Str. *Fish Hawk*," or "Sch. *Grampus*."

In the same lists have been entered, besides specimens in the National Museum, many types examined elsewhere, as well as such specimens from other collections as increased our knowledge of the

range of the species, but for lack of space no attempt has been made to record all of the many specimens examined in museum and private collections.

THE SPIDER CRABS OR OXYRHYNCHA OF AMERICA

The term Oxyrhyncha owes its origin to Latreille,[1] who used it, with a different spelling, in 1803 for one of two divisions of the section "Brachyuri" or short-tailed crabs as opposed to the "Macrouri" which included the long-tailed crabs as well as the shrimps. Latreille's "Oxyrinchi" included not only the so-called spider-crabs of to-day, but the Oxystomes and the Euryalidae or Corystidae. In 1834, Milne Edwards restricted the term Oxyrhinques[2] to spider crabs of the families known herein as Majidae and Parthenopidae. Dana in 1852[3] used the expression "Maioidea or Oxyrhyncha." Miers later[4] adopts the name Oxyrhyncha with the same limits, while Borradaile, 1907,[5] adds the family Hymenosomidae to the Oxyrhyncha. It is in the latter sense that the superfamily is used in the following pages.

By far the greater part of the spider crabs belong to the family Majidae (=Inachidae). The members of this family have usually long, slender legs, which suggest the name "spider crab"; the chelipeds also are elongate, but are in most cases heavier than the ambulatory legs. The shape of the body is very diverse, varying from extremely long and narrow with a filiform beak, to broadly oblong or rotund with a short, and either bifid or entire rostrum. All are marine animals and occur in shallow water as well as in considerable depths, exceeding 1,600 fathoms, and on all sorts of bottom, from soft mud to coral rock.

Spider crabs are notable for their habit of decorating or masking themselves by placing bits of foreign substances on their backs and appendages. The crab picks up, one by one, fragments of seaweed, hydroids, alcyonarians, sponges, or other suitable objects, by means of its claws, using one or the other as needed. He then thrusts each piece into his mouth seemingly to soften the end, then places it on his shell where it is held in place by the hooked hairs which are always present to some extent on these crabs, forming a regular pattern of bands and patches especially on the anterior and lateral portions of the carapace. The artificial covering thus produced serves as a

[1] Oxyrinchi (Oxyrinques) Latreille, Hist. Nat. Crust., vol. 6, *an* XI (1803), p. 85.

[2] Oxyrhinques Milne Edwards, Hist. Nat. Crust., vol. 1, 1834, pp. 263 and 266. Cancériens Cryptopodes (formed for the genus *Oethra*) Milne Edwards, same reference, p. 368.

[3] Maioidea Dana, Crust. U. S. Expl. Exped., vol. 1, 1852, p. 66. Maioidea, or Oxyrhyncha, Dana, same reference, p. 75.

[4] On the Classification of the Maioid Crustacea or Oxyrhyncha, with a Synopsis of the Families, Subfamilies, and Genera. Journ. Linn. Soc., Zool., vol. 14, 1879, pp. 634–673, pls. 12 and 13.

[5] On the Classification of the Decapod Crustaceans. Ann. Mag. Nat. Hist., ser. 7, vol. 19, 1907, p. 480.

disguise, the crab having the same appearance as its environment.[6] Among the genera most commonly decorated are *Libinia*, the shore crab of the eastern coast of the United States, the various species of *Hyas*, and *Oregonia*. The members of the Acanthonychinae are less likely to be obscured than those of the other subfamilies, on account of their smoother carapaces.

The Parthenopidae are relatively few in number of specimens as well as species. Their appearance is so different from that of the Majidae that they can be distinguished at a glance. They are usually small; the largest ones in American waters do not exceed 4 cm. in carapace-width, with the exception of *Aethra* which attains a width of 9 cm. The carapace is in general broad-triangular or pentagonal with angled corners and facets. The smoother sorts resemble small chips of stone while the tubercled and eroded species simulate rock surfaces. Hooked hairs are nearly always absent. The ambulatory legs are usually small and delicate, the chelipeds immensely long and heavy in American species, the elongate hand terminated by short fingers. The Parthenopidae differ from the Majidae also in having small, complete orbits and an insignificant basal antenna-segment which is not soldered to the epistome or front. They incline toward the Brachyrhyncha.[7]

The Hymenosomidae form a small family, the species inhabiting chiefly the southern hemisphere, India, or Japan. They are small marine or estuarine crabs, with a thin, flat, triangular or subcircular carapace. Only one species is American, distributed in southern Chile, Patagonia, and various subantarctic islands eastward to New Zealand. This family is by many authors associated with the Grapsoid crabs,[8] but is included here chiefly on account of the form of the outer antennae, the longitudinal position of the antennules, the presence of a rostrum, and the absence of orbits.[9]

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[6] For details of methods and motives, the following works should be consulted:

Aurivillius, Carl W. S.: Die Maskirung der Oxyrrhynchen Dekapoden. K. Svenska Vetensk.-Akad. Handl., vol. 23, Stockholm, 1889, 71 pp., 5 pls.

Pascoe, Francis P.: Foreign Substances attached to Crabs. Nature, Dec. 26, 1889, p. 176.

Garstang, Walter: Foreign Substances attached to Crabs. Nature, Mar. 27, 1890, p. 490.

Bateson, W.: Notes on the Senses and Habits of some Crustacea. Journ. Marine Biol. Assoc. United Kingdom, n. s., vol. 1, No. 3, Apr. 1890, pp. 213–214.

Stebbing, Thomas R. R.: A History of Crustacea. The International Scientific Series. New York, 1893. Pp. 112–116.

Sayce, O. A.: Some peculiar Habits of Crabs. Victorian Naturalist, vol. 17, Melbourne, 1900, pp. 74–75.

Minkiewicz, Romuald: The Instinct of Self-Concealment and the Choice of Colors in the Crustacea. Rev. gén. Sci., Paris, 20th year, No. 3, Feb. 15, 1909; Transl. in Smithson. Rept. for 1909 (1910), pp. 465–485.

Pearse, A. S.: The Influence of Different Color Environments on the Behavior of Certain Arthropods. Journ. Anim. Behavior, vol. 1, No. 2, 1911, pp. 79–110. With bibliography.

Milligan, H. N.: The Habits of the Four-horned Spider Crab. Zoologist, ser. 4, vol. 19, 1915, pp. 248–252.

Nininger, H. H.: Crabs taken at Laguna Beach in the summer of 1916. Pomona College Journ. Entom. and Zool., vol. 10, No. 2, June, 1918, pp. 36–42.

[7] See Ortmann, Zool. Jahrb., vol. 7, Syst., 1893, p. 412.

[8] See Alcock, Journ. Asiat. Soc. Bengal, vol. 69, 1900, pp. 280, 282, 285, 291, and 385.

[9] See Ortmann, Bronn's Thier Reich, vol. 5, pt. 2, Arthropoda, 1898, p. 1168.

ANALOGOUS SPECIES ON OPPOSITE SIDES OF THE CONTINENT

Family MAJIDAE

Subfamily INACHINAE

Atlantic	Pacific
Stenorynchus seticornis.	*Stenorynchus debilis.*
Podochela riisei.	*Podochela vestita.*
Podochela gracilipes.	*Podochela hemphillii.*
Eucinetops blakiana.	*Eucinetops panamensis.*
Euprognatha rastellifera. / *Euprognatha rastellifera marthae.*	*Euprognatha bifida.*
Collodes trispinosus.	*Collodes granosus.*
Collodes rostratus.	*Collodes tenuirostris.*
Collodes inermis.	*Collodes tumidus.*
Batrachonotus fragosus.	*Batrachonotus nicholsi.*

Subfamily ACANTHONYCHINAE

Sphenocarcinus corrosus.	*Sphenocarcinus agassizi.*

Subfamily PISINAE

Pelia mutica.	*Pelia tumida.*
Herbstia depressa.	*Herbstia tumida.*
Lissa bicarinata.	*Lissa aurivilliusi.*
Lissa brasiliensis.	*Lissa tuberosa.*

Subfamily MAJINAE

Hemus cristulipes.	*Hemus analogus.*
Thoe puella.	*Thoe sulcata.*
Pitho aculeata.	*Pitho picteti.*
Pitho lherminieri.	*Pitho quinquedentata.*
Pitho mirabilis.	*Pitho sexdentata.*
Mithrax spinosissimus.	*Mithrax rostratus.*
Mithrax acuticornis.	*Mithrax spinipes.*
Mithrax hemphilli.	*Mithrax orcutti.*
Mithrax verrucosus.	*Mithrax bellii.*
Mithrax coryphe.	*Mithrax denticulatus.*
Mithrax ruber.	*Mithrax areolatus.*
Teleophrys pococki.	*Teleophrys cristulipes.*
Stenocionops furcata.	*Stenocionops contigua.*
Stenocionops spinimanus.	*Stenocionops macdonaldi.*
Macrocoeloma septemspinosum.	*Macrocoeloma heptacanthum*
Macrocoeloma subparallelum.	*Macrocoeloma villosum.*
Microphrys antillensis.	*Microphrys platysoma.*
Microphrys interruptus.	*Microphrys branchialis.*
Tyche emarginata.	*Tyche lamellifrons.*

Family PARTHENOPIDAE

Parthenope (Platylambrus) pourtalesii.
Parthenope (Platylambrus) guerini.

Thyrolambrus astroides.
Solenolambrus typicus.
Leiolambrus nitidus.
Mesorhoea sexspinosa.
Cryptopodia concava.
Heterocrypta lapidea.

Parthenope (Platylambrus) exilipes.
Parthenope (Platylambrus) depressiuscula.
Thyrolambrus erosus.
Solenolambrus arcuatus.
Leiolambrus punctatissimus.
Mesorhoea bellii.
Cryptopodia hassleri.
Heterocrypta macrobrachia.

SPECIES ON BOTH SIDES OF THE CONTINENT

Family MAJIDAE

Subfamily INACHINAE

Inachoides laevis.
Eurypodius latreillii.

Subfamily ACANTHONYCHINAE

Acanthonyx petiverii.
Epialtus bituberculatus (*fide* Milne Edwards).
Taliepus marginatus (*fide* Bell).
Leucippa pentagona.

Subfamily PISINAE

Libidoclaea granaria.
Leurocyclus tuberculosus.
Chionoecetes opilio.
?*Hyas araneus* (noted in the Pacific by Birula only).
Hyas coarctatus alutaceus.
Notolopas lamellatus.
Libinia emarginata.
Libinia spinosa.
Libinia rostrata.

Subfamily MAJINAE

Microphrys weddelli.

Family HYMENOSOMIDAE

Halicarcinus planatus.

SYSTEMATIC DISCUSSION

Order DECAPODA

Suborder REPTANTIA

TRIBE BRACHYURA

SUBTRIBE BRACHYGNATHA

Superfamily OXYRHYNCHA

KEY TO THE SUBTRIBES OF THE TRIBE BRACHYURA [10]

A[1]. Mouth field (endostome) prolonged forward to form a gutter. Last pair of legs normal or abnormal. Female openings generally sternal. First abdominal limbs of female wanting. Gills few____Subtribe **Oxystomata.**

A[2]. Mouth field roughly square.

B[1]. Last pair of legs abnormal, dorsal. Female openings coxal. First abdominal limbs of female present. Gills usually many____Subtribe **Dromiacea.**

B[2]. Last pair of legs normal, rarely reduced, not dorsal, except in *Cymopolia* and *Retropluma*. Female openings sternal. First abdominal limbs of female wanting. Gills few_____Subtribe **BRACHYGNATHA**, p. 9.

KEY TO THE SUPERFAMILIES OF THE SUBTRIBE BRACHYGNATHA.

A[1]. Fore part of body narrow, usually forming a distinct rostrum. Body more or less triangular. Orbits generally incomplete.
Superfamily **OXYRHYNCHA**, p. 10.

A[2]. Fore part of body broad. Rostrum usually reduced or wanting. Body oval, round, or square. Orbits nearly always well enclosed.
Superfamily **Brachyrhyncha.**

KEY TO THE FAMILIES OF THE SUPERFAMILY OXYRHYNCHA

A[1]. Carapace not thin and flat. Chelipeds either mobile or powerful, with bent fingers. Male opening coxal.

B[1]. Chelipeds especially mobile, rarely much greater than the other legs, or with fingers bent at an angle with the hand. Second article of antenna well developed, generally fused with epistome and often with front. Orbits generally more or less incomplete. Hooked hairs almost always present_____ Family **MAJIDAE**, p. 10.

B[2]. Chelipeds not specially mobile, usually much longer and heavier than the other legs, and with fingers bent on the hand at an angle toward the side on which the fixed finger is set. Second article of antennae small, short, and not fused with epistome or front. Orbits well made. Hooked hairs almost always wanting_____ Family **PARTHENOPIDAE**, p. 510.

A[2]. Carapace thin and flat. Chelipeds not long or specially mobile or with fingers bent at an angle with the hand. Male opening sternal. [No orbits. Second article of antennal stalk slender, fused with epistome but not with front. No hooked hairs]____Family **HYMENOSOMIDAE**, p. 561.

[10] The keys to the subfamilies and higher groups are taken mostly from Borradaile's work above cited. Those names in the right-hand margin which are printed in capitals indicate the subfamilies and higher divisions treated of in this volume.

KEY TO THE SUBFAMILIES OF THE FAMILY MAJIDAE

A¹. Basal article of antennae extremely slender and usually long. Eyes without orbits. Eyestalks generally long, either non-retractile, or retractile against the sides of the carapace, or against an acute postocular spine that affords no concealment---------- Subfamily **INACHINAE**, p. 11.

A². Basal article of antennae not extremely slender. Eyes either with orbits, or if without true orbits, the eyestalks are more or less concealed by a preocular or postocular process, or are short and sunk in the sides of the rostrum.

B¹. Basal article of antennae of moderate width, often broader at base than at extremity. Orbits incomplete, never entirely concealing the cornea.

C¹. Eyes without true orbits. Eyestalks little movable, short, and either concealed by a supraocular spine, or sunk in the sides of the rostrum. Basal article of antennae truncate-triangular. Subfamily **ACANTHONYCHINAE**, p. 140.

C². Eyes with orbits, having a large, cupped postocular process into which the eye is retractile. Basal article of antennae usually not truncate-triangular---------- Subfamily **PISINAE**, p. 193.

B². Basal article of antennae very broad. Orbits either complete or incomplete, but always complete enough to conceal the retracted cornea from dorsal view. Eyestalks usually long------- Subfamily **MAJINAE**, p. 335

KEY TO THE SUBFAMILIES OF THE FAMILY PARTHENOPIDAE

A¹. Carapace usually triangular, sometimes suboval or subpentagonal. Rostrum simple. Chelipeds much larger than other legs. Branchial regions deeply separated from cardiac----- Subfamily **PARTHENOPINAE**, p. 510.

A². Carapace usually sharply pentagonal. Rostrum cleft in two. Chelipeds of moderate size. Branchial regions not deeply separated from cardiac. Subfamily **Eumedoninae**.

Superfamily OXYRHYNCHA[11]

Carapace more or less narrowed in front, and usually produced to form a rostrum; branchial regions considerably developed, hepatic regions small. Epistome usually large; buccal cavity quadrate, with the anterior margin usually straight. Branchiae almost always nine in number on either side; their efferent channels open at the sides of the endostome or palate. Antennules longitudinally folded.

Family MAJIDAE (=INACHIDAE[12])

Macropodiens and *Maiens* MILNE EDWARDS, Hist. Nat. Crust., vol. 1, 1834, p. 272.

Maiinea and *Oncininea* DANA, U. S. Expl. Exped., vol. 13, Crust., 1852, pp. 76 and 77.

Maiinea MIERS, Journ. Linn. Soc., London, Zool., vol. 14, 1879, p. 640.

Maiidae ALCOCK, Journ. Asiat. Soc. Bengal, vol. 64, 1895, p. 160.—BORRADAILE, Ann. Mag. Nat. Hist., ser. 7, vol. 19, 1907, p. 480.

Inachidae RATHBUN, Occas. Papers Boston Soc. Nat. Hist., vol. 7, 1905, p. 11.

Chelipeds especially mobile, rarely much greater than the other legs, or with fingers bent at an angle on the hand. Second article

[11] See Rathbun, Bull. No. 97, U. S. Nat. Mus., 1918, p. 14.

[12] *Maja* having been restored to validity in accordance with Opinion 10, International Commission on Zoological Nomenclature, Publ. 1938, Smithsonian Institution, July, 1910, p. 15, it seems best to use also the family name Majidae in place of Inachidae.

of the antenna well developed, generally fused with epistome and often with front. Orbits generally more or less incomplete. Hooked hairs almost always present. Male openings coxal. The palp of the external maxillipeds is articulated either at the summit or at the antero-internal angle of the merus.

Subfamily INACHINAE

Inachinae ALCOCK, Journ. Asiat. Soc. Bengal, vol. 64, 1895, pp. 160, 162, and 168.

Inachidae STEBBING, Ann. Durban Mus., vol. 1, pt. 5, 1917, p. 435.

Eyes without orbits; the eyestalks, which are generally long, are either non-retractile, or are retractile against the sides of the carapace, or against an acute postocular spine that affords no concealment. The basal article of the antennae is extremely slender throughout its extent and is usually long. (Alcock.)

KEY TO THE AMERICAN GENERA OF THE SUBFAMILY INACHINAE

A¹. External maxillipeds somewhat pediform, with the palp large and coarse, merus often narrower than ischium. Basal article of antennae usually subcylindrical or convex on the ventral surface. Carapace usually elongate, narrowed in front.

B¹. Basal antennal article not longitudinally sulcate. Rostrum long, approaching or exceeding in length the postrostral portion of the carapace.

C¹. Rostrum a slender spine. Merus of outer maxillipeds with an antero-internal notch.

D¹. Rostrum armed with numerous spines on the lateral margins. Ambulatory legs armed with numerous spines. Carapace smooth. **Stenorynchus**, p. 13.

D². Rostrum armed with a few spines irregularly placed. Ambulatory legs with few spines, including a very long spine at end of merus. Carapace lumpy **Metoporhaphis**, p. 19.

C². Rostrum more or less deeply divided into two long slender horns. Merus of outer maxillipeds lacking an antero-internal notch. Ambulatory legs of last two pairs prehensile **Anomalothir**, p. 23.

B². Basal antennal article longitudinally sulcate. Rostrum short.

C¹. Merus of outer maxillipeds narrow, suboval, the palp articulating at the summit. Carapace ovate, not much longer than broad, spinous. Rostrum bispinous or bidentate **Achaeopsis**, p. 27.

C². Merus of outer maxillipeds subtriangular, notched anteriorly. Carapace elongate, subtriangular, not spinous. Rostrum variable, usually a simple lobe or spine. Ambulatory legs more or less prehensile. **Podochela**, p. 31.

A². External maxillipeds with the merus as broad as the ischium and the palp of moderate size. Basal article of antennae flattened or concave ventrally. Carapace usually subtriangular. A postocular spine present.

B¹. Eyestalks long and slender, when extended reaching forward beyond rostrum. Rostrum bilobed. Basal antennal article little longer than broad **Eucinetops**, p. 84.

B². Eyestalks stout or if slender, not reaching forward beyond rostrum. Basal antennal article narrower, considerably longer than broad.

C¹. Postorbital tooth large, close to the orbit and curving about the extremity of the eye, so that its outer margin is subparallel to the median line.

D¹. Carapace broadly ovate, with very short rostrum. Chelipeds not longer than carapace. Second and third pairs of legs longest.

Dasygyius, p. 137.

D². Carapace triangular-ovate, with long, pointed rostrum. Chelipeds longer than carapace. Ambulatory legs diminishing successively in length from first to fourth pair---------- **Pyromaia**, p. 127.

C². Postorbital tooth either small, or, if large, not curving around end of eye.

D¹. Rostrum longer than its basal width or, exceptionally, just as long.

E¹. Rostrum divided into two narrow spines.

F¹. Ambulatory legs of moderate length, not prehensile.

Oregonia, p. 70.

F². Ambulatory legs long, prehensile, the propodites more or less dilated and compressed---------- **Eurypodius**, p. 80.

E². Rostrum simple, spiniform, or terminating in a spine.

F¹. Sexes differing markedly in shape of carapace, postorbital spine and cheliped. Chelipeds of male extremely long, several times as long as postrostral portion of carapace.

Erileptus, p. 68.

F². Sexes differing only in the usual way. Chelipeds of male not noticeably long.

G¹. Legs subprehensile, the propodites more or less enlarged distally, the dactyli curved. Carapace sparingly granulate or smooth except for a few tubercles-------- **Inachoides**, p. 59.

G². Legs not subprehensile, the last two articles slender. Carapace very rough between the spines and tubercles.

Anasimus, p. 64.

D². Rostrum shorter, or no longer, than its basal width.

E¹. Eyestalks slender, extending laterally beyond the oblong, postorbital lobes. Ambulatory legs long, filiform. Three erect, median, dorsal spines---------- **Arachnopsis**, p. 89.

E². Eyestalks not slender.

F¹. Seven long, capitate, dorsal spines. Anterior margin of hepatic region oblique to median line. Basal antennal article and male sternum sharply cristate---------- **Aepinus**, p. 92.

F². Dorsal surface when spinous, not furnished with seven long capitate spines.

G¹. Carapace depressed, the branchial regions considerably flattened posteriorly and laterally, so that their lateral margins are visible from above for nearly their whole length.

H¹. First and second ambulatory legs of about equal length and longer than third and fourth legs. Postocular process usually large. Hepatic region with outer margin convex---------- **Collodes**, p. 105.

H². First ambulatory leg much longer than the other legs in male; legs all short in female. Postocular process typically small. Hepatic region with angular outline, its anterior margin at right angles to median line and approximating the postorbital process---- **Batrachonotus**, p. 122.

G². Carapace higher and more convex, the branchial regions not remarkably flattened, their lateral margins for the most part invisible in dorsal view. Ambulatory legs of first pair much the longest. Rostrum bilobed.

Euprognatha, p. 95.

Genus STENORYNCHUS Lamarck

Leptopodia LEACH, Zool. Misc., vol. 2, 1815, p. 15; type, *L. sagittaria* (Leach, 1814)=*S. seticornis* (Herbst, 1788). Not *Leptopodia* Leach, Edin. Encyc., vol. 7, 1814, p. 431, which is a synonym of *Macropodia* Leach, 1814.

Stenorynchus LAMARCK, Hist. Nat. Anim. sans Vert., vol. 5, 1818, p. 236 (part); not *Stenorhynchus* Latreille, 1825, nor *Stenorynchus* Milne Edwards, 1834.—RATHBUN, Proc. Biol. Soc. Washington, vol. 11, 1897, p. 158; type specified, *S. seticornis* (Herbst, 1788).

Carapace triangular, longer than broad, smooth. Rostrum very slender, flattened, longer than the carapace, its lateral margins spinuliferous. Orbits not defined; postorbital spine small. Eyes short, not retractile. Basal article of antenna very slender; flagellum concealed beneath the rostrum. Epistome very large. Ischium of external maxillipeds produced at its antero-internal angle; merus somewhat obcordate, bearing the next article at its external angle. Abdomen in male six-segmented, in female five-segmented. Chelipeds long and slender, with merus, carpus, and palm subcylindrical; fingers much shorter than palm, inner margins dentate. Ambulatory legs extremely long and slender, especially the dactyli. All the legs spinuliferous.

Inhabits both coasts of middle America; also the islands of the eastern Atlantic, and the Atlantic coast of northwest Africa.

Analogous species on opposite sides of the continent: *seticornis* (Atlantic); *debilis* (Pacific).

KEY TO THE SPECIES OF THE GENUS STENORYNCHUS

A¹. No spine at end of basal article of antenna. Rostrum very long, up to two and a half times as long as remainder of carapace.....seticornis, p. 13.

A². A small spine at end of basal article of antenna. Rostrum usually about as long as remainder of carapace, in the old longer.....debilis, p. 18.

STENORYNCHUS SETICORNIS (Herbst) [13]

ARROW-CRAB; ARAÑA DEL MAR

Plates 2 and 3

Oost-Indische Zee-Krabbe SLABBER, Natuurkundige Verlustigingen, Haarlem, 1778, p. 162, pl. 18, fig. 2.

Araña PARRA, Descripcion de diferentes piezas de historia natural, 1787, p. 162, pl. 56, fig. 3.

Cancer seticornis HERBST, Natur. Krabben u. Krebse, vol. 1, 1788, p. 229, pl. 16, fig. 91 (after Slabber); vol. 3, part 3, 1803, p. 27, pl. 55, fig. 2 (Guadeloupe).—OLIVIER, Encyc. Méth., Hist. Nat., Entom., vol. 6, 1791, p. 178.

[13] The crab *Cancer seticornis* was described by Herbst, 1788, after Slabber, who stated that it came from the East Indies. It has, however, never been found in that region. It is obviously congeneric with *Stenorynchus sagittarius* (Fabricius). There are only two species in this genus of arrow-crabs. The length of the chelae in Slabber's figure prevents its union with *S. debilis;* therefore, it is here combined with the other existing form, *sagittarius*, which is widely distributed in the Atlantic Ocean. This is in line with the procedure of Herbst, who, in 1803, united the West Indian form (he had then a specimen from Guadeloupe) with that of Slabber.

5487—25†——3

Cancer sagittarius FABRICIUS, Entom. Syst. emend. et auct., vol. 2, 1793, p. 442 (part), (type-locality, Guadeloupe; types (probably) in Copenhagen Mus., labeled "*Cancer sagittarius*," and in Kiel Mus., labeled "*Inachus sagittarius*").

Inachus sagittarius FABRICIUS, Suppl. Ent. Sys., 1798, p. 359.

Cancer sagittatus TURTON, Linn. Syst. Nat., vol. 3, 1800, p. 738.

Maja sagittaris BOSC, Hist. Nat. Crust., vol. 1, 1802, p. 253.

Maja seticornis BOSC, Hist. Nat. Crust., vol. 1, 1802, p. 255, pl. 7, fig. 2 (after Slabber); Mediterranean.

Macropus seticornis LATREILLE, Hist. Nat. Crust., vol. 6, 1803, p. 111, pl. 49, fig. 3 (after Slabber).

Macropus sagittarius LATREILLE, Hist. Nat. Crust., vol. 6, 1803, p. 112.

Maja sagittaria LATREILLE, Gen. Crust., vol. 1, 1806, p. 38.

Maia sagittaria LEACH, Edin. Encyc., vol. 7, 1814, p. 395.

Leptopodia sagittaria LEACH, Zool. Misc., vol. 2, 1815, p. 16, pl. 67.—MILNE EDWARDS, Cuvier's Règne Anim., Disciples' ed., Crust., pl. 36.—BRULLÉ, in Webb and Berthelot's Hist. Nat. Iles Canaries, vol. 2, Entom., 1840, p. 15.—A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 172; Bull. Mus. Comp. Zoöl., vol. 8, 1880, p. 6.—KINGSLEY, Proc. Acad. Nat. Sci. Philadelphia, 1879 (1880), p. 383; not *L. debilis*.—SMITH, Rept. U. S. Fish Commr. for 1885 (1886), p. 620.—AURIVILLIUS, K. Svenska Vet.-Akad. Handl., vol. 23, 1889, p. 32, pl. 4, fig. 6.—OSORIO, Jorn. Sci. Math., Phys. e Nat., ser. 2, vol. 5, 1898, pp. 185, 187 and 192 (Ilha de S. Thomé).—GUNDLACH and TORRALBAS, An. Acad. Habana, vol. 36, 1899 (1900), p. 298; reprint, 1917, p. 9.—A. MILNE EDWARDS and BOUVIER, Expéd. Sci. *Travailleur et Talisman*, Crust. Déc., pt. 1, 1900, p. 153.

Macropodia sagittaria LATREILLE, Nouv. Dict. Hist. Nat., vol. 18, 1817, p. 355.—GUNDLACH and TORRALBAS, An. Acad. Habana, vol. 36, 1899 (1900), text-fig. on p. 297; reprint, 1917, pl. 1, fig. 1.

Maia seticornis LATREILLE, Tableau Encyc. Méth., part 24, 1818, pl. 281 fig. 5 (after Slabber).

Stenorynchus seticornis LAMARCK, Hist. Nat. Anim. sans Vert., vol. 5, 1818, p. 237; ed. 2, vol. 5, 1838, p. 424.

Leptopodia ornata GUILDING, Trans. Linn. Soc. London, vol. 14, 1825(?), p. 335 (type-locality, St. Vincent; type not in Brit. Mus.; perhaps not extant).

Stenorhynchus seticornis LAMARCK, Hist. Nat. Anim. sans Vert., ed. 3, vol. 2, 1839, p. 411.

Leptopodia canariensis BRULLÉ, in Webb and Berthelot's Hist. Nat. Iles Canaries, vol. 2, Entom., 1840, p. 15 (type-locality, Canary Islands; type not in Paris Mus.).

Leptopodia lanceolata BRULLÉ, in Webb and Berthelot's Hist. Nat. Iles Canaries, vol. 2, Entom., 1840, plate "Crustacées," figs. 1–1*b*.

Leptopodia sagittarius HERKLOTS, Symbolae Carcinologicae, Leyde, 1861, p. 23 (Sénégal).

Leptopodia vittata GUÉRIN, in Kingsley, Proc. Acad. Nat. Sci. Philadelphia, 1879 (1880), p. 384, (type-locality, Senegal; type in Mus. Phila. Acad.).

Leptopodia lineata GÖLDI, Arch. f. Naturg., vol. 52, pt. 1, 1886, p. 37, pl. 3, figs. 24–31 (type-localities, Rio de Janeiro and Cape Frio, Brazil).

Stenorynchus sagittarius RATHBUN, Ann. Inst. Jamaica, vol. 1, 1897, p. 4; Proc. U. S. Nat. Mus., vol. 22, 1900, p. 293; Bull. U. S. Fish Comm., vol. 20, for 1900, pt. 2 ,1901, p. 53.—HAY and SHORE, Bull. Bur. Fisheries, vol. 35, 1915–16 (1918), p. 455, pl. 37, fig. 8.

Stenorhynchus sagittarius VERRILL, Trans. Conn. Acad. Sci., vol. 10, 1900, p. 577 (Bermuda); vol. 13, 1908, p. 397.

Diagnosis.—No spine at extremity of basal antennal article. Carapace nearly naked. Rostrum usually much longer than carapace; palm much longer than fingers.

Description.—Carapace naked or nearly so; in the old the rostrum, chelipeds and legs are pubescent. Rostrum horizontal, tapering very gradually to an acuminate tip, length varying from about one and a half to two and a half times as long as carapace, occasionally less than one and a half times; lateral spinules directed obliquely forward; margins also setiferous. A strong spine at middle of basal antennal article, directed downward and forward; no spine at anterior end. Chelipeds and legs finely spinulous and armed besides with two rows of spines on the merus, two or three spines on the carpus, besides several terminal spines on both articles. In old specimens the distal end of palm and basal half of fingers are shaggy-hairy. Palm of male cheliped from two and one-half to four times as long as fingers. Ambulatory legs of first pair from eight to nine times the length of the postrostral portion of carapace.

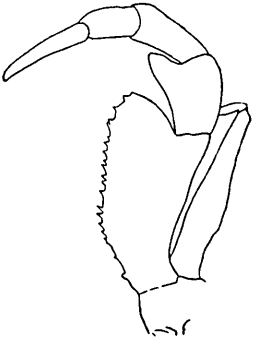


FIG. 3.—STENORYNCHUS SETICORNIS (9467), MAXILLIPED, × 7

Color.—Creamy white or buff, with bands of brown or black diverging from the median line to the posterior margin; fingers blue; spines of rostrum, legs, and teeth of chelae orange or red. (Hay.)

"Light buff; chestnut and white lines; legs reddish with bright red spots at joints. Claws bright purple." (Bartsch.)

"Light orange vermilion; ends of claws mauve; eyes maroon." (Bartsch.)

Variation.—Although there is a great range of variation in this species, as to length of rostrum, relative length of palm and fingers, and length of legs, there is only one specimen (9862) which leans toward *L. debilis;* the rostrum is very little longer than the rest of the carapace and inclines slightly upward from base to tip, and the palm is one and a half times as long as the dactylus.

Measurements.—Male (43066), length of carapace with rostrum 57.3, length of rostrum 41, width of carapace 13, length of palm 36.2, of movable finger 11.6 mm. Male (32515), length of carapace with rostrum, tip lacking, 63, length of rostrum 37.3, width of carapace 22, length of palm 43, of second leg 225 mm.

Range.—From Cape Hatteras, North Carolina, to Rio de Janeiro, Brazil; Bermudas; Madeira; Canaries; Cape Verde Islands; Senegal; St. Thomas Island in Gulf of Guinea, off French Congo. "Mediterranean" (Bosc, Latreille, Lamarck) needs confirmation. Depth, 2 to 814 fathoms, but usually moderate.

Material examined.—See table, pages 16–18.

Material examined of Stenorynchus seticornis

Locality	Bearings: Latitude N.			Bearings: Longitude W.			Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
North Carolina:	°	′	″	°	′	″			°F						
Off Cape Hatteras	35	21	00	75	21	30	16	gy. S. brk. Sh.		Oct. 19, 1884	2280	*Albatross*	1♂	14297	
Do	35	08	30	75	10	00	49	gy. S.		Oct. 17, 1885	2596	do	1♂ 2♀	17373	
Between Capes Hatteras and Lookout.	34	37	30	75	39	45	34	yl. S. brk. Sh.		Oct. 18, 1885	2604	do	1♂	11219	
Fishing grounds off Beaufort.							15				S211	*Fish Hawk*	1♂	51077	
Gulf Stream 30 m. south of Lookout Lightship.							(1)			July 28, 1915		do	1♂	50499	
Off Cape Fear	33	42	45	77	31	00	17	S. P.		Oct. 20, 1885	2616	*Albatross*	1♂	17526	
Do	33	37	30	77	36	30	14	crs. yl. S. brk. Sh.		do	2617	do	1♀	11227	
Do	33	34	00	77	42	00	9	gy. S. brk. Co.		do	2621	do	1♂ 1♀	11232	
Do	33	18	30	77	07	00	95	fne. gy. S.	65.8	Apr. 2, 1885	2417	do	1♂	9862	Variety, towards *debilis*.
Off South Carolina	32	55	00	77	54	00	79	crs. S. bk. Sp.	59.1	Jan. 5, 1885	2311	do	1 y	17524	
Bahamas: Golding Cay										June 26, 1903		B. A. Bean	1♂	31040	From Geographic Soc., Baltimore.
Florida:															
Off Miami							10–40					J. B. Henderson	1♂	49083	
Do							30			May 12, 1912		P. Bartsch	1	45571	
Off Biscayne Key							2.7–5.7			May 29, 1912		do	2♂	45614	
Straits of Florida	25	05	00	80	15	00	56	Co. S.		Apr. 9, 1886	2640	*Albatross*	1♀	11379	
Off Key West	24	25	45	81	46	00	45	Co.		Jan. 15, 1885	2318	do	7♂ 14♀	9475	
Do	24	25	45	81	46	45	45	Co.		do	2317	do	20♂ 10♀	9467	
Do	24	25	30	81	47	45	50		74	do	2316	do	1♂ 1♀	9464	
Do	24	26	00	81	48	15	37	Co.		do	2315	do	7	9459	
Pourtales Plateau, 10 m. south of Key West.							125	Co.					1♀ y	49082	
Sand Key Reef, off Key West.												J. B. Henderson	2♀ y	45513	
Tortugas										1893		Biol. Exped. State Univ. Iowa.		Mus. S. U. I.	
West coast of Florida	25	23	30	83	17	00	33.5	Sponge, Co.	68.5	Feb. 28, 1889	5072	*Grampus*	1♂	15187	
Do	25	34	00	83	28	00	39	G. Co. fne. Sh.	69	Mar. 1, 1889	5076	do	1♂	20108	
Do	25	44	32	83	21	15	34	fne. S.	69	Mar. 11, 1889	5088	do	1♂	15188	
Do	26	04	00	82	49	00	21.5	S. brk. Sh.	66	Mar. 17, 1889	5099	do	1♂	15189	
Do	26	00	00	82	57	30	24	fne. S. bk. Sp. brk. Sh.		Mar. 19, 1885	2413	*Albatross*	3♂ 3♀ 1 y	11303	

Off Charlotte Harbor	26	33	00	83	10	00	28	sdy	66	Apr. 2, 1901	7123	*Fish Hawk*	2♂ 2♀	25585
Do	26	33		83	15	30	27	fne. wh. S. bk. Sp.	°C	Mar. 18, 1885	2411	*Albatross*	1♂	17404
Highland section	27	55	30	83	11	30	13	Co. R	15.2	Jan. 28, 1902	7253	*Fish Hawk*	1♂ 1♀ ovig	46701
Anclote section	28	01	30	83	08	00	11	rky	13.5	Jan. 23, 1902	7234	do	1♂ 4♀ (3 ovig.)	46700
Do	Anclote Lt., E. ⅞ N., 21.5 m.						12.5	R. Co. S	17.2	Mar. 28, 1901	7106	do	1♂	25581
West coast of Florida	28	45	00	85	02	00	30	gy. S. brk. Co		Mar. 15, 1885	2105	*Albatross*	7 y	17403
Do	28	46	00	84	49	00	26	crs. S. Co		do	2406	do	2♂ 1♀	17375
North Key section	28	52	45	83	07	00	5.75	rky	16.1	Dec. 9, 1901	7209	*Fish Hawk*	1♀	46699
Pepperfish Key section	29	21	00	83	32	00	6.75	rky	16.7	Nov. 21, 1901	7160	do	1♀ y	46742
Aucilla section	29	52	10	83	51	47	3	S. Co	20	Nov. 6, 1901	7147	do	1♀	46696
Do	29	45	48	83	57	30	7	S. Co	21	do	7149	do	1♀ ovig	46697
Do	29	49	00	81	06	15	6	R. Co	15	Dec. 5, 1901	7192	do	1♂	46698
Do	29	34	00	84	07	20	10.5	R. Co	17.6 °F	do	7195	do	1♂	46788
Off Carrabelle	Carrabelle Lt., NW., 14⅔ m.						10		60.2	Jan. 16, 1913	24	do	3♂2♀ ovig	50980
South of Cape San Blas	29	11	30	85	29	00	26	S. G. brk. Sh		Feb. 7, 1885	2374	*Albatross*	1♀	17525
Do	29	14	00	85	29	15	25	Co		do	2373	do	1♂ 1♀	14976
Do	29	15	30	85	29	30	27	G		do	2372	do	1♂ 4♀	9613
Do	29	18	15	85	32	00	25	crs. gy. S. brk. Sh.		do	2370	do	3♂	9602
Alabama:														
South of Mobile Bay	29	27	30	87	48	30	30	crs. S. bk. Sp. Sh.		Mar. 4, 1885	2390	do	1 y	17402
Do	29	24	00	88	04	00	32	S. G. brk. Sh		do	2387	do	1♂	9689
Yucatan Channel:														
Northwest of Cape Catoche.	22	18	00	87	04	00	24	wh. R. Co		Jan. 30, 1885	2365	do	2♂1♀ 2 y	17374
Do	22	08	30	86	53	30	25	Co. S		do	2362	do	1♂	17401
Do	22	07	30	87	06	00	21	wh. R. Co		do	2363	do	1 y	17405
Off Arrowsmith Bank, Yucatan.	20	59	30	86	23	15	130	Co		Jan. 22, 1885	2354	do	1♂	14975
Cuba: Bahia Honda											15	Henderson and Bartsch, *Tomas Barrera.*	2♂ 1 y	48675
Jamaica:														
Montego Bay								on piles of wharves.		July, 1910		E. A. Andrews	2♂1♀2 y	43062 to 43065
Do								do		July - Aug. 1910.		C. B. Wilson	1♂ 2♀	43060, 43061
Kingston Harbor										May - July, 1896.		F. S. Conant	1♂	19580
Porto Rico:														
San Antonio Bridge, San Juan.										Jan. 12, 1899		*Fish Hawk*	1♂	24417
Mayaguez Harbor	Pt. del Algarrobo, E., 2¾ m.						75-76	rky. S. Co	68.5 °C	Jan. 20, 1899	6063	do	1♂	24418
Off Vieques Island	Pt. Mula Lighthouse, E. ½ N., 11¼ m.						6	Co	27.3	Feb. 14, 1899	6096	do	1♀	24419

[1] From trawl.

Material examined of Stenorynchus seticornis—Continued

Locality	Bearings		Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″									
St. Thomas						Jan. 17-24, 1884.		*Albatross*	1♂	7653	
St. Martin: Simson's Bay, lagoon.			(?)	rky		Sept. 7, 1905		J. Boeke	1♂	Leiden Mus.	
Dominica: Roseau			15-150					A. H. Verrill	1♂	32515	
Curaçao:											
Rifwater (lagoon)			(?)			June 18, 1905		J. Boeke	1♀	42955	
Piesaderos Bay			(?)	sdy		June 21, 1905		do	1♀ 1♂ 1♀	Leiden Mus. do	
Colombia:											
Santa Marta			2					C. F. Baker	1♂	22554	
Near Morrosquillo	9 30 15	76 20 30	42	gn. M. S.		Mar. 23, 1884	2142	*Albatross*	4♂ 3♀	6934	
Brazil:											
Maranhão			2	pebbly		1870		Derby and Willmot, Hartt Explor.			
Mar Grande, Bay of Bahia.						1876-77		R. Rathbun, Hartt Explor.	1♀	19940	
Periperi, Bay of Bahia						do		do			
Bay of Rio de Janeiro			(?)			do		do	1♀	19941	

[2] Shallow water.

STENORYNCHUS DEBILIS (Smith)

Plates 4 and 5

Leptopodia sagittaria Milne Edwards and Lucas, d'Orbigny's Voy. l'Amér. Mérid., vol. 6, pt. 1, 1843, p. 3; atlas, vol. 9, 1847, Crust., pl. 4, figs. 3-3*c*; Valparaiso; not *L. sagittaria* Leach.—A. Milne Edwards, Crust. Rég. Mex., 1878, p. 172 (part).—Miers, *Challenger* Rept., vol. 17, 1886, p. 4 (part).

Leptopodia debilis Smith, Rept. Peabody Acad. Sci. for 1869 and 1870, appendix, 1871, p. 87 (type-locality, Bay of Realejo, Nicaragua; type, Cat. No. 3948, M. C. Z.).—Rathbun, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 44.—Faxon, Mem. Mus. Comp. Zoöl., vol. 18, 1895, p. 5.

Leptopodia modesta A. Milne Edwards, Crust. Rég. Mex., 1878, p. 173; as variety of *L. sagittaria* (type-locality, Chile; type in Paris Mus.).

Stenorynchus debilis Rathbun, Proc. U. S. Nat. Mus., vol. 21, 1898, p. 568; vol. 38, 1910, p. 570; Proc. Washington Acad. Sci., vol. 4, 1902, p. 283.

Diagnosis.—A small spine at extremity of basal antennal article. Carapace pubescent.

Rostrum usually about same length as carapace; palm shorter and fingers longer than in *seticornis;* palm usually twice the length of dactylus.

Description.—Carapace covered with a short pubescence; chelipeds and legs pubescent in small as well as large specimens. Carapace somewhat wider across branchial regions than in *seticornis.* Rostrum slightly ascending, length in small and medium-sized specimens about equal to, or less than, that of the postrostral portion of the carapace, in larger specimens attaining to one and a half or even twice the length of carapace. A small spine directed forward at anterior end of basal article of antenna, at the inner angle; this spine is larger and sharper in males than in females. The fingers and palm never get so shaggy-hairy as in *seticornis.* Palm of male cheliped stouter than in *seticornis,* usually about twice as long as dactylus but varying from one and a half to two and a half times, in the largest specimen. The ambulatory legs of the first pair vary from six to seven and a half times the carapace length.

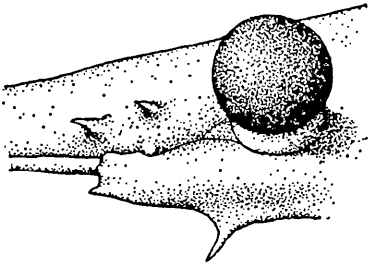


FIG. 4.—STENORYNCHUS DEBILIS, MALE (15544) PROFILE OF ORBITAL REGION SHOWING BASAL ANTENNAL ARTICLE AND ITS SMALL TERMINAL SPINE, × 10

Color.—Bright green; lateral portions of carapace and also the feet covered with soft gray down. Fingers reddish. (Milne Edwards and Lucas.)

Measurements.—Male (15544), length of carapace with rostrum 34.6, length of rostrum 20.6, width of carapace 12.6, length of palm 15.5, of movable finger 9.8 mm.

Range.—Magdalena Bay, Lower California, Mexico; Gulf of California; Nicaragua; Panama; Galapagos Islands; Chile (Milne Edwards and Lucas). Low-water mark to 31 fathoms.

Remarks.—This species has at times been united with *seticornis,* but the anterior spine of the basal antennal article separates it specifically.

Material examined.—See table, page 20.

Genus METOPORHAPHIS Stimpson

Metoporhaphis STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, 1860, p. 198 [70]; type, *M. calcarata* (Say).—A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 174.

Metoporaphis MIERS, Journ. Linn. Soc. London, vol. 14, 1876, p. 643; *Challenger* Rept., vol. 17, 1886, p. 4.

Carapace triangular, longer than broad, uneven. Rostrum long, very slender, subcylindrical, tapering to a sharp point. Eyes protuberant, peduncles terminating above in a spinule which projects

Material examined of Stenorynchus debilis

Locality	Bearings						Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	Latitude N.			Longitude W.											
	°	′	″	°	′	″			°F						
Mexico:															
Gulf of California	31	22	00	114	07	45	17	G. brk. Sh	65.2	Mar. 25, 1889	3026	*Albatross*	9♂ 6♀	15544	
Do	Patos Island, anchorage						4.5			Apr. 23, 1921		Fred Baker	2♀ (1 ovigerous)	Cal. Acad. Sci.	
Do	28	28	00	112	04	30	29	gy. S	62.9	Mar. 23, 1889	3014	*Albatross*	1♂ 1♀	18067	
Do	25	02	45	110	43	30	21	S. Sh. Coralline.		Mar. 17, 1889	3005	do	1♂ 1♀	16024	
Do	25	02	15	110	43	30	17	S. Sh		do	3002	do	1♀	17322	
Do	24	22	30	110	19	30	8	brk. Sh		Apr. 30, 1888	2824	do	1♀	21854	
Do	24	22	15	110	19	15	7	brk. Co		do	2825	do	1♂	21855	
Do	24	18	00	110	22	00	26.5	brk. Sh		do	2823	do	1♂	21853	
Do	24	12	00	109	55	00	9.5	Sh		do	2826	do	1♂	21856	
Do	24	11	30	109	55	00	10	Sh		do	2828	do	1♀	21857	
Magdalena Bay, Lower California.	24	35	30	112	05	00	27	fne. gy. S	64.5	Apr. 9, 1889	3041	do	1 y	17323	
Do	21	32	00	111	59	00	12	fne. gy. S		May 2, 1888	2831	do	1♂	21859	
Do										1917		C. R. Orcutt	1♂	50643	
Off Cape St. Lucas, Lower California.	22	52	00	109	55	00	31	rky	74.1	May 1, 1888	2829	*Albatross*	2♂	21858	
Nicaragua: Polvon, Bay of Realejo.												J. A. McNiel	1♂	3948, M.C.Z.	Holotype.
Panama:															
Panama										Mar. 12, 1891		*Albatross*	1♂ 1♀	20597	
Bay of Panama	8	44	00	79	09	00	29.5	gn. M		Mar. 6, 1888	2799	do	1♀	21852	
Do	8	10	30	78	50	30	18	gy. S. brk. Sh		Mar. 5, 1888	2798	do	3♂	21851	
Pearl Islands, Bay of Panama.										Apr. —, 1875		S. Garman	3♀	1829, M.C.Z.	
Galapagos Islands:															
Tagus Cove, Albemarle Island.							12			1898-99		Hopkins Stanford Galapagos Expedition.	2♂	25675	
Tagus Cove, on reef north of Tagus Hill.										1898-99		do	1♂ 1y. ♀	Stanford University.	

beyond the cornea. A postorbital tubercle present. Basal article of antenna slender; movable portion elongate, visible from above on either side of rostrum. Epistome large. Maxillipeds similar to those of *Stenorynchus*. Abdomen of male with the last two segments not completely coalesced; last three segments of female coalesced. Chelipeds of moderate length, stout in male. Fingers as long as palm and slightly gaping in male, shorter than palm and widely gaping in female. Ambulatory legs extremely long and slender, the middle of the three distal spines of the merus much elongated.

Contains only one species.

METOPORHAPHIS CALCARATA (Say)

Plates 6 and 7

Leptopodia calcarata SAY, Journ. Acad. Nat. Sci. Philadelphia, vol. 1, pt. 2, 1818, p. 455 (type-locality, Bay of Charleston, South Carolina; type not extant[14]).

Metoporhaphis calcarata STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, 1860, p. 198 [70].—KINGSLEY, Proc. Acad. Nat. Sci. Philadelphia, 1878, p. 316 [1].

Metoporhaphis calcaratus A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 174.—SMITH, Rept. U. S. Fish Commr. for 1885 (1886), p. 620.—RATHBUN, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 45.—HAY and SHORE, Bull. Bur. Fisheries, vol. 35, 1915–16 (1918), p. 454, pl. 37, fig. 5.

Metoporhaphis forficulatus A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 174; 1879, pl. 31, figs. 3–3*e* (type-locality, Guiana; type in Paris Mus.).

Metoporaphis calcarata MIERS, Journ. Linn. Soc. London, vol. 14, 1879, p. 643; *Challenger* Rept., Zool., vol. 17, 1886, p. 4.

Metoporaphis forficulatus MIERS, *Challenger* Rept., Zool., vol. 17, 1886, p. 5.

Stenorhynchus longirostris? GÖLDI, Arch. f. Naturg., vol. 52, pt. 1, 1886, p. 41, pl. 3, figs. 32–36; not *S. longirostris* (Fabricius).

Diagnosis.—Carapace uneven, tuberculate. Antennae visible in dorsal view. A long spine at end of merus of ambulatory legs. A spine on eye.

Description.—Surface pubescent; long, marginal hairs on chelipeds. Narrow neck longer in male than in female. Carapace nodulous, each nodule surmounted by a tubercle and this in turn usually with a pencil of soft, hooked hairs. Tubercles as follows: Four gastric, of which three are in a transverse row anteriorly; one large cardiac; one postorbital, remote from orbit and slightly in advance of gastric tubercles; two hepatic, one of which is marginal; three branchial, of which one is marginal and the other two in a nearly longitudinal row; a subbranchial tubercle in advance of marginal tubercle; a tubercle on pterygostomian ridge, visible from above; a granule in front of angle of buccal cavity. The rostrum is armed with four or five slender spines which project outward alternately from opposite sides of lower surface, and are not always apparent in small specimens;

[14] "All that remains is the stomachal region with eyes and rostrum attached." (Gibbes, 1850.)

Material examined of Metoporhaphis calcarata

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
North Carolina:	° ′ ″	° ′ ″			°C						
Off Cape Hatteras	35 35 20	74 58 45	27	crs. gy. S		Oct. 20, 1884	2296	*Albatross*	2♂ 2♀	7270	
Do	35 21 30	75 25 00	11	crs. gy. S		Oct. 19, 1884	2286	do	1♀	8845	
Do	35 21 25	75 24 25	13	crs. gy. S		do	2285	do	1♂1♀	7269	
Do	35 08 30	75 10 00	49	gy. S		Oct. 17, 1885	2596	do	1♀	18068	
Gulf Stream	25 m. E. by SE. of Lookout Lightship					July 28, 1915		*Fish Hawk*	1♂	50522	
Bogue Sound						July 3, 1911		do	4	51013	
Off Cape Fear	33 37 30	77 36 30	14	crs. yl. S. brk. Sh.		Oct. 20, 1885	2617	*Albatross*	1♂	18069	
Middle Sound, near Wilmington.						Apr. 18, 1880		R. E. Earll	1♂	4384	
Florida:											
Key West						Mar. 27, 1886		*Albatross*	1♂	11385	Caught with electric light.
Marco						Feb. 25, 1889		*Grampus*	1♀	15323	
Do						1885		H. Hemphill	1♀	18070	
Charlotte Harbor								From Union College.	1♀	42579	
Off Charlotte Harbor	26 35 00	83 11 00	27.5	sdy	20	Apr. 2, 1901	7122	*Fish Hawk*	1♂	25586	
Off Gasparilla Island	Gasparilla Lt., E. by S., 6½ m.		7			Jan. 4, 1912	13	do	1♂	50981	
Sarasota Bay								From Union College.	6	42580	
Do								J. S. Kingsley Collection.	1♀	53075	From Boston Soc. Nat. Hist.
Anclote section	28 19 30	83 01 00	6.25	rky. G	12.5	Jan. 24, 1902	7239	*Fish Hawk*	1 y	47066	
Do	28 19 45	83 06 30	8.5	rky. G	13	do	7240	do	1♀	46737	
St. Martins section	28 26 00	83 02 30	7.5	rky. Co	13	Jan. 15, 1902	7215	do	1♀	46969	
Do	28 27 15	83 19 00	10.5	rky. sdy	14	do	7218	do	1♂	46734	
Do	28 33 30	83 19 00	9	sdy. grassy	13.6	do	7219	do	1♂	46735	
Do	28 34 30	83 15 45	7.5	sdy. grassy	12	do	7220	do	1♀	46736	
North Key section	28 47 55	83 16 30	8	rky. grassy	17	Dec. 9, 1901	7211	do	1♂	46761	
Do	28 57 30	82 58 00	3	rky	15.5	do	7207	do	1♂	46760	
Pepperfish Key section	29 21 00	83 32 00	6.75	rky	16.7	Nov. 21, 1901	7160	do	1♂	46733	
Do	29 23 00	83 27 05	3.5	S. G	16.3	do	7159	do	3♂	47103	
Do	29 29 30	83 33 25	4.75	sdy	21.5	Nov. 5, 1901	7146	do	2♂ 3♀	46758	
Do	29 30 50	83 31 40	3.25	sdy	22	do	7145	do	1♂ y	46732	
Aucilla section	29 48 10	83 55 15	5	S. Co	21	Nov. 6, 1901	7148	do	5♂ 7♀	46759	
Alabama: Off Mobile Bay	29 24 30	88 01 00	35	yl.S.bk.Sp		Mar. 4, 1885	2388	*Albatross*	1♂	9695	

Louisiana: Gulf of Mexico, near Calcasieu Pass.	....	....	(¹)	....	Nov. 24, 1906	M. H. Spaulding.	1♂	38351	Living among hydroids, *Bugula* and algae.
Brazil: Rio de Janeiro	....	....	....	....	....	....	....	Copenhagen Mus.

¹ Dredged.

two of these spines are near together close to the extremity and give the rostrum the appearance of being trifid. Basal antennal article with a spine below midway of its length and another at outer distal angle; a spinule at end of next two articles. On sternum in front of male abdomen, two or three spines on each side forming converging lines parallel to terminal segment of abdomen.

Chelipeds twisted, those of male stout; margins of lower (really inner) surface armed with sharp spines; at distal end of inner (or upper) surface of merus, a long spine; a sharp spine near each extremity of upper surface of carpus; hand broad, inflated; fingers about as long as palm, prehensile edges furnished with truncate, denticulate, widely separated teeth except at extremities where they become closely fitting, triangular teeth. Chelipeds of female much feebler, palm shorter, fingers much longer and more gaping, sharp spines on prehensile edges. The merus of the legs has besides the conspicuous armament at the extremity a single short spine situated about midway of its length in the fourth pair but successively more distad in the other pairs. The dactyls are longer than the propodites, are fringed with hair, their extremities are gently curved and drawn out to a very slender tip.

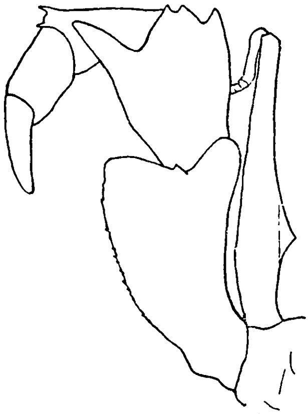


Fig. 5.—*Metoporhaphis calcarata* (11385), maxilliped, × 14.5

Color.—A dirty gray (Hay and Shore).

Measurements.—Male (18071), length of carapace 19.5, width 8.2, length of rostrum 11, length of cheliped about 21.5 mm.

Range.—From off Cape Hatteras, North Carolina, to Rio de Janeiro, Brazil. Georgia (Gibbes). Shallow water to 49 fathoms.

Material examined.—See table, pages 22–23.

Genus ANOMALOTHIR Miers

Anomalopus Stimpson, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 124; type, *A. furcillatus* Stimpson; name preoccupied by Duméril, Cat. Coll. Rept., 1851, p. 185, for a genus of Reptiles.—A. Milne Edwards, Crust. Rég. Mex., 1879, p. 187.

Anomalothir Miers, Journ. Linn. Soc. London, vol. 14, 1879, p. 648; substituted for *Anomalopus*.

Carapace much elongated, almost subcylindrical. Rostrum very long, bifurcate; horns contiguous for half their length or more. Eyes without orbits; preorbital spine small, acute; postorbital minute. Antennae exposed in dorsal view, basal article narrow. Antennular fossae large. Epistome more than half as long as broad. Merus of maxillipeds without a notch at the inner angle where the palpus is inserted; outer angle sharply prominent. Chelipeds in adults longer than the carapace; merus subcylindrical; propodus elongate, slightly compressed; fingers of male less gaping than of female. Ambulatory legs of first two pairs long and slender, the first pair much the longer; third and fourth pairs shorter, stouter and prehensile, the third pair the shorter. Abdomen of seven segments in both sexes.

Contains only two species.

KEY TO THE SPECIES OF THE GENUS ANOMALOTHIR

A¹. Three spines on lower border of merus of third leg. Length of palm more than three times its greatest width. Carapace with regularly placed tubercles ..... furcillatus, p. 24.

A². No spines on lower border of merus of third leg. Length of palm not more than three times its greatest width. Carapace almost smooth ..... frontalis, p. 25.

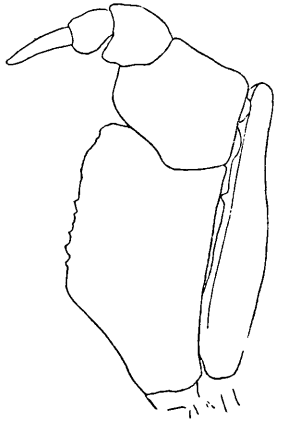


FIG. 6.—ANOMALOTHIR FURCILLATUS (18127), MAXILLIPED, × 17

ANOMALOTHIR FURCILLATUS (Stimpson)

Plate 8, fig. 2; plate 9, fig. 2; plate 206

Anomalopus furcillatus STIMPSON, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 125 (type-locality, off "The Samboes," 123 fathoms; type not extant).—A. MILNE EDWARDS, Crust. Rég. Mex., 1879, p. 188, pl. 35, figs. 4–4*e*; Bull. Mus. Comp. Zoöl., vol. 8, 1880, p. 8.

Anomalothir furcillatus MIERS, Journ. Linn. Soc. London, vol. 14, 1879, p. 648.—RATHBUN, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 65; Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, 1898, p. 254.—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zoöl., vol. 47, 1923, p. 368, pl. 10, figs. 6 and 7; pl. 12, fig. 1.

Diagnosis.—Carapace with regularly placed tubercles. Preorbital spine as long as postorbital. Length of propodus of cheliped, measured on its upper margin, more than three times its greatest width. Three spines on lower border of merus of third leg.

Description.—Carapace pubescent; a small median spine above posterior margin; four gastric and two branchial prominences; lateral margin of branchial regions with a row of spinules, continued on the pterygostomian region. Hepatic region with a minute spine. Rostrum long, from two-thirds to one and a fourth times the postfrontal length of the carapace; forked in the terminal half; horns slightly divergent. Antennae shorter than rostrum.

Merus of chelipeds with a row of small spines below and a less distinct row above; carpus with three spines on outer surface; palm unarmed, widening distally; fingers short, stout, slightly gaping in basal half. Fingers more gaping in female than in male, on account of their greater slenderness in the basal portion and the smaller size of the basal tooth on the dactylus in the female.

Ambulatory legs pubescent; merus of third pair with three strong hooked spines beneath; propodus and dactylus strongly curved and of about equal length. Propodus of fourth pair nearly straight, distally thickened; dactylus shorter than propodus and less curved than in third pair. Dactylus of third and fourth pairs spinulous.

Color.—General color, light orange yellow, palms of a much deeper color (Henderson).

Measurements.—

Cat. No.	Sex	Length (entire)	Rostrum	Width	Cheliped	First leg	Second leg	Third leg	Fourth leg
18127	♂	17.4	7.5	6	21.2	51.4	42.6	14	.....
18127	♀	19.6	6.2	5	14	43	33.5	10	20

Range.—From off Cape Lookout, North Carolina, to Gulf of Mexico and Grenada. Depth, 30 to 262 fathoms.

Material examined.—See table, page 26.

ANOMALOTHIR FRONTALIS (A. Milne Edwards)

Plate 8, fig. 1; plate 9, fig. 1; plate 207

Anomalopus frontalis A. Milne Edwards, Crust. Rég. Mex., 1879, p. 189, pl. 36, figs. 1-1*f* (type-localities, off Barbados, 100 fathoms, and off Havana, 175 fathoms; cotype, Barbados, in Paris Mus.; cotype, Havana, in M. C. Z.); Bull. Mus. Comp. Zoöl., vol. 8, 1880, p. 8.—A. Milne Edwards and Bouvier, Mem. Mus. Comp. Zoöl., vol. 47, 1923, p. 368.

Diagnosis.—Carapace almost smooth. Preorbital spine shorter than postorbital. Length of propodus of cheliped, measured on its upper margin, not more than three times its greatest width. No spines on lower border of merus of third leg.

Description.—Differs from *A. furcillatus* in the carapace broader behind and less cylindrical, and in the more deflexed rostrum, the horns of which are contiguous to near the extremity. A preorbital spine is present though smaller than in *furcillatus;* the antennal spine also is shorter than in that species.

Material examined of Anomalothir furcillatus

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat No.	Remarks
	° ′ ″	° ′ ″			°F						
North Carolina: East of Cape Lookout.	34 39 15	75 33 30	107	gy. S. P.		Oct. 18, 1885	2601	*Albatross*	1 y	18128	
Gulf of Mexico:											
Southwest of Cape San Blas, Florida.	28 38 30	85 52 30	142	gn. M. brk. Sh.		Mar. 14, 1885	2401	do	1♂ 12♀	18127	♂ with Rhizocephalid attached to abdomen.
Southeast of Cape San Blas, Florida.	28 45 00	85 02 00	30	gy. S. brk. Co.		Mar. 15, 1885	2405	do	1♀ ovig	47063	
Southwest of Cape San Blas, Florida.	26 31 00	85 53 00	[1] 119			1877-78	50	*Blake*	1	2953, M.C.Z.	
Florida Strait:											
Sambo Key, Florida			135					*Eolis*, J. B. Henderson.	1♂	53592	
Do			110					do	1♀	54427	
Northwest of Dry Tortugas.	25 33 00	84 21 00	101		61.75	1877-78	45	*Blake*	1	2657, M.C.Z.	
Gulf Stream, off Key West.	24 21 55	81 58 25	98	S.	55	Feb. 14, 1902	7279	*Fish Hawk*	1 ♀ ovig	47104	
Do	24 17 05	81 58 25	132	S.	52	do	7280	do	1♀ ovig	47064	
Off Sand Key, Florida	Sand Key Light, bearing N., about 5 miles.		[2]			June 20, 1893	34	State Univ. Iowa Exped.	2♂	Mus. S. U. I.	
Off American Shoal	American Shoal Light, bearing N. by W., 10 miles.		[3]			June 27, 1893	51	do	1♂	do	
Cuba:											
Off Havana	23 10 39	82 20 21	200	Co.		Jan. 20, 1885	2346	*Albatross*	1♀ y	15166	
Do						1885	[4]	do	2♀	15156	
Do			175			1877-78	79	*Blake*	1	2885, M.C.Z.	
Mexico: Northern part of Yucatan Bank.	23 32 00	88 05 00	95			1877-78	32	do	1	2677, M.C.Z.	
Jamaica: Off entrance to Port Royal.			100			1880		do	1♀	4471, M.C.Z.	
Lesser Antilles:											
Off Frederickstadt, St. Croix.	17 37 55	64 54 20	117	R. brk. Sh.	65	Jan. 5, 1879	132	do	1	2884, M.C.Z.	
Off Guadeloupe	15 59 10	61 44 15	196	R.	53.75	Jan. 18, 1879	159	do	1♀	4472, M.C.Z.	
Off Grenada	11 48 15	61 48 45	262	crs. S.	47	Feb. 27, 1879	249	do	2	2883, M.C.Z.	

[1] The depth at this position is really 1,700 fathoms. The latitude should perhaps be 28°. [2] About 120 fathoms. [3] About 100 fathoms. [4] Between 2319 and 2350.

The carpus of the chelipeds has four spines, three small ones in a diagonal row near the inner margin and a larger spine near the anterior outer angle. The manus is less elongate than in *furcillatus* and of more nearly uniform width throughout. Fingers of male more gaping than in male of *furcillatus* and with a large basal tooth.

Ambulatory legs shorter than in *furcillatus*, the last two articles of the third leg less falcate. Fourth leg not much longer than third, but less falcate, as is the case in the related species. No spines on lower surface of merus of third leg. Longer spinules on lower border of last two pairs of dactyls.

Measurements.—Male (15157), length of carapace including rostrum 13, rostrum 6, width of carapace 4.8, length of cheliped 15.4, first leg 28.3, second leg 20.5, third leg 10.5, fourth leg 14.2 mm.

Range.—Off Havana; Montserrat; Guadeloupe; Dominica; Barbados. Depth, 73 to 183 fathoms.

Material examined.—See table, page 28.

Genus ACHAEOPSIS Stimpson

Achaeopsis Stimpson, Proc. Acad. Nat. Sci. Philadelphia, vol. 9, 1857, p. 219 [25]; type, *A. spinulosus* Stimpson; Smithson. Misc. Coll., vol. 49, 1907, p. 21.

Dorynchus Norman, in Wyville-Thomson's Depths of the Sea, 1873, p. 175; type, *D. thomsoni* Norman.—Rathbun, Proc. Biol. Soc. Washington, vol. 11, 1897, p. 162.

Lispognathus A. Milne Edwards, Crust. Rég. Mex., 1880, p. 349; type, *L. furcillatus* A. Milne Edwards, 1880=*A. thomsoni* (Norman, 1873); Bull. Mus. Comp. Zoöl., vol. 8, Dec. 28, 1880, p. 8.

Carapace ovate-triangular, convex, spinous; interorbital portion narrow; a supraorbital and a postorbital spine. Rostrum usually bifid, not very long. Eyes retractile to sides of carapace. Antennular fossae long and narrow. Basal article of antennae very long and narrow and placed almost in a vertical plane; movable portion much longer than the rostrum and inserted beside it. Outer maxillipeds spinous; merus narrower than ischium, constricted at base, rounded at extremity, palpus articulating at summit. Abdomen composed of six segments in both sexes. Chelipeds strong, spinous; merus trigonal; manus dilated; fingers broad. Ambulatory legs long and very slender.

Contains several species of which only one, which has a very wide range, inhabits American waters.

Material examined of Anomalothir frontalis

Locality	Bearings		Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″			°F						
Off Havana, Cuba						Jan. 1885	(1)	*Albatross*	1♂	15157	
Do			175			1877–78	79	*Blake*	1	2952, M.C.Z.	Cotype.
Off Montserrat	16 41 54	62 13 24	88		69	Jan. 16, 1879	155	do	1	2739, M.C.Z.	Identified by A. Milne Edwards.
Off Dominica	15 32 18	61 30 10	118	S. brk. Sh	65	Jan. 24, 1879	177	do	1	2578, M.C.Z.	Do.
Off Barbados	13 11 54	59 38 45	73	Co. S. Sh	70.75	Mar. 9, 1879	290	do	6	2575, M.C.Z. 2663, M.C.Z. 2743, M.C.Z.	Do.
Do	13 04 12	59 36 45	76	Co. brk. Sh	64.75	Mar. 5, 1879	272	do	2	2572, M.C.Z.	Do.
Do	13 03 50	59 37 05	94	Co. brk. Sh	61	do	276	do	1	2629, M.C.Z.	Do.

[1] Between stations 2319 and 2350.

American material examined of Achaeopsis thomsoni

Locality	Bearings		Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.
	Latitude N.	Longitude W.								
	° ′ ″	° ′ ″			°F					
Off Nantucket Shoals	39 54 15	69 29 45	250	gn. M. S	41.6	Sept. 28, 1884	2262	*Albatross*	1 ♀	7190.
Off Marthas Vineyard	39 53 00	69 47 00	317	sft. gn. M	40	Aug. 11, 1882	1096	*Fish Hawk*	1 ♀	18769.
Do	39 57 00	70 31 30	225	M	41	Aug. 23, 1881	951	do	1 ♂	Y. U. M.
Off Georgia	30 44 00	79 26 00	440	Co. crs. S. Sh. For.	45.6	Apr. 1, 1885	2415	*Albatross*	1♂ 1♀	18119.
Pourtales Plateau, Florida Strait	24 16 00	81 22 00	(1)			June 27, 1893	56	State Univ. Iowa Exped.	1♂	18672.

[1] About 200.

ACHAEOPSIS THOMSONI (Norman)

Plate 10

Dorynchus thomsoni NORMAN, in Wyville-Thomson's Depths of the Sea, 1873, p. 175, text-fig. 34 (on p. 174), (type-locality, deep water between the Faroes and Scotland; type in Brit. Mus.).—RATHBUN, Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, 1898, p. 254.

Lispognathus furcillatus A. MILNE EDWARDS, Crust. Rég. Mex., 1880, pp. 349 and 360 (index), pl. 31A, figs. 4 and 4*a* (type-locality, Grenada, 291 fathoms; type in Paris Mus.).

Lispognathus furcatus A. MILNE EDWARDS, Crust. Rég. Mex., 1880, p. 364 (index); Bull. Mus. Comp. Zoöl., vol. 8, Dec. 28, 1880, p. 9.—SMITH, Proc. U. S. Nat. Mus., vol. 6, 1883, p. 12.

Lispognathus (*Dorynchus*) *thomsoni* A. MILNE EDWARDS, Comptes Rendus Acad. Sci. Paris, vol. 93, 1881, p. 932; transl. in Ann. Mag. Nat. Hist., ser. 5, vol. 9, 1882, p. 42; Arch. Miss. Scient. et Litt., ser. 3, vol. 9, 1882, pp. 16 and 39.

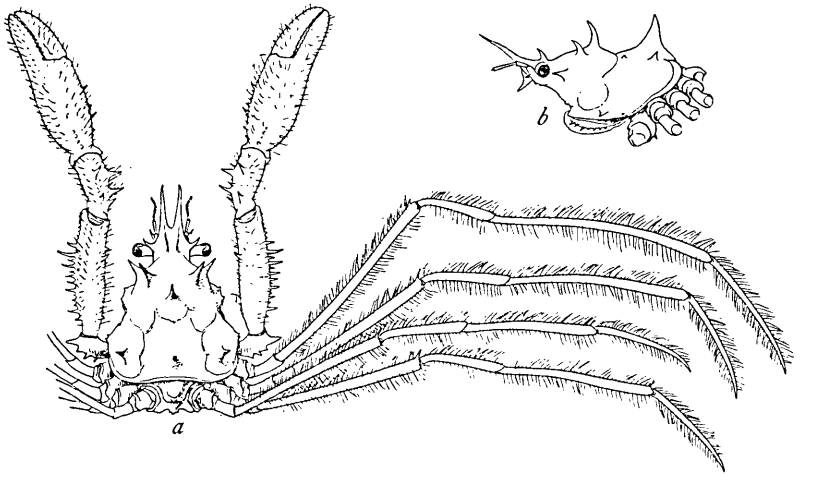


FIG. 7.—ACHAEOPSIS THOMSONI, STATION 951, FISH HAWK, × 2.4. *a*. DORSAL VIEW. *b*. CARAPACE IN PROFILE. (AFTER SMITH.)

Lispognathus thomsoni NORMAN, Museum Normanianum, Crustacea, 1886, p. 6.—MIERS, *Challenger* Rept., Zool., vol. 17, 1886, p. 28, pl. 5, figs. 2–2*c*.—A. MILNE EDWARDS and BOUVIER, Expéd. Sci. *Travailleur* et *Talisman*, Crust. Déc., 1900, p. 148, pl. 3, fig. 8 (color.); pl. 21, figs. 8–14, and synonymy.—DOFLEIN, Brachyura *Valdivia*, 1904, p. 75.

Achaeopsis thomsoni RATHBUN, Trans. Linn. Soc. London, ser. 2, vol. 14, 1911, p. 248; Biol. Results "*Endeavour*", vol. 5, part 1, 1918, p. 4.—STEBBING, Trans. Roy. Soc. Edinburgh, vol. 50, 1914, p. 258.

Diagnosis.—Two slender rostral horns. Carapace spined. Fingers not gaping. Spine at end of merus of legs.

Description.—Carapace slightly pubescent; two median spines, cardiac and gastric; two branchial spines, the anterior sometimes

reduced to a tubercle; one spine on each protogastric region; a slender spine above the orbit, and one at a little distance behind orbit. Subbranchial and pterygostomian regions each armed with a spine; lateral margin of hepatic and branchial regions with a few spinules. Rostrum upturned; horns longer than interorbital width, slightly divergent. Eyestalks with some sharp granules in front and a tubercle above at emargination of cornea. Basal antennal article with two rows of spinules and an outer terminal spine; first movable article half as long as second. Three rows of spines on maxillipeds.

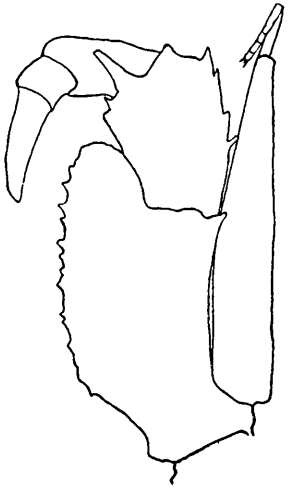


FIG. 8.—ACHAEOPSIS THOMSONI (18769), MAXILLIPED, × 14.5

Chelipeds of male: Merus armed on margins with numerous spines; carpus narrow, spinous, the spines of upper inner margin longest; manus swollen, very narrow at base, upper margin armed for its proximal two-thirds with a few long spines and several spinules; fingers longitudinally sulcate, thin at the margins; teeth of cutting edges irregular, so that the fingers though not gaping do not fit evenly together at base. Chelipeds of female much more slender; armature similar to that of male except that in the manus the spines are continued to the fingers, which fit together more closely.

The ambulatory legs diminish gradually in length from first to last pair; they are furnished with long straight hairs as well as tufts of curled hair on upper surface; a terminal spine on the merus; first dactylus straight except at tip, the remainder more curved, diminishing in length but similar to one another; a fringe of hairs on lower margin, also a few distant spinules pointing toward the propodus, and a larger spinule near the tip.

Color.—Reddish white (A. Milne Edwards and Bouvier).

Measurements.—Male (18119), median length of carapace 10.8, length to tips of rostrum 13.4, width of carapace 8.8 mm.

Range.—Western Atlantic from Nantucket Shoals to Grenada. Eastern Atlantic from Faroe Islands to Cape Verde; Mediterranean; Gough Island (South Atlantic); Agulhas Bank, near Cape of Good Hope. Indian Ocean. West and South Pacific Ocean. South Australia. Depth, 100 to 2,080 meters (55 to 1,137 fathoms).

Material examined from American waters.—See table, page 28.

Genus PODOCHELA Stimpson

Podochela STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, 1860, p. 194; type, *P. grossipes* Stimpson.—A. MILNE EDWARDS, Crust. Rég. Mex., 1879, p. 189.

Podonema STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, 1860, p. 197; type, *P. riisei* (Stimpson)=*Podochela riisei* Stimpson. *Podonema* was used by Solier in Gay's Hist. Chile, vol. 5, 1851, p. 19, for a genus of Coleoptera.

Driope DESBONNE in Desbonne and Schramm, Crust. Guadeloupe, 1867, p. 2; type, *D. falcipoda* Desbonne=*Podochela riisei* Stimpson. Spelled "*Dryope*" in introduction, by Schramm, p. ii. *Dryope* was used by Robineau-Desvoidy in 1830 for a genus of insects.

Acrorhynchus A. MILNE EDWARDS, Crust. Rég. Mex., 1879, p. 189; type, *A. depressus* A. Milne Edwards=*P. grossipes* Stimpson.

Anisonotus A. MILNE EDWARDS, Crust. Rég. Mex., 1879, p. 195; type, *A. curvirostris* A. Milne Edwards=*P. curvirostris* (A. Milne Edwards).—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zoöl., vol. 47, 1923, p. 363.

Coryrhynchus KINGSLEY, Amer. Nat., vol. 13, 1879, p. 585; type, *C. riisei* (Stimpson)=*P. riisei* Stimpson. *Coryrhynchus* is substituted for *Podonema*.—STEBBING, Trans. Roy. Soc. Edinburgh, vol. 50, 1914, p. 259.

Ericerus RATHBUN, Proc. U. S. Nat. Mus., vol. 16, 1893, p. 223; type, *E. latimanus* Rathbun. Name preoccupied by Signoret, 1874, for a genus of Coccidae.

Ericerodes RATHBUN, Proc. Biol. Soc. Washington, vol. 11, 1897, p. 164; name substituted for *Ericerus*.

Body and appendages usually ornamented with tufts of curved hairs, and also with straight hairs most often on lower parts of chelipeds and legs. Carapace somewhat depressed, elongate, pyriform; gastric region narrow, swollen. Rostrum arcuate or triangulate, sometimes prolonged in a spine. Supraorbital margin elevated or thickened. Eyes with short, stout pedicels, which terminate above in a prominent tubercle; cornea oblique, more projecting above than below. Postorbital tooth or lobe, when present, remote from eye and either well developed or reduced to a granule. Basal article of antennae very narrow, longitudinally sulcate. Sutures between sternal segments of male depressed; sternum of female deeply concave, margins elevated, laminate, forming a capsule. Abdomen of male with last two segments, of female with last three segments, coalesced; first two or three segments of male and four or five of female are visible in dorsal view.

Chelipeds of moderate length, merus curved, trigonal; palm either slender or dilated. Ambulatory legs slender, subprehensile, diminishing in length from first to fourth, the first sometimes much the longest; dactylus of first leg slenderer than the others and often unarmed; remaining dactyli more or less curved, lower edge spinulous.

Coast of middle America from North Carolina to Pernambuco, Brazil, and from San Luis Obispo, California, to the Gulf of Cali-

fornia; Galapagos Islands; Bermudas. Shallow water to 201 fathoms.

ANALOGOUS SPECIES OF PODOCHELA ON OPPOSITE SIDES OF THE CONTINENT

Atlantic	Pacific
riisei.	*vestita.*
gracilipes.	*hemphillii.*

KEY TO THE SPECIES OF THE GENUS PODOCHELA

A¹. Postorbital protuberance a large lobe.
  B¹. Supraorbital margin armed with two long spines. Sternal segments of male elevated, flat, closely and finely granulate. Manus of adult male not inflated. Rostrum long, spiniform, arched upward.
    curvirostris, p. 50.
  B². Supraorbital margin armed with a series of spinules or small spines. Sternal segments of male not closely and finely granulate.
    C¹. Manus of adult male inflated, fingers widely gaping. Sternum of male pubescent, not granulate nor laminate. No prominent lobe behind and below postorbital lobe. (Rostrum in doubt, perhaps bilobed.)
      lobifrons, p. 57.
    C². Manus of adult male not inflated, fingers contiguous. Sternum of male laminate, each lamina overlapping the one behind it; surface sparingly granulate with scattered, pointed granules. A prominent lobe behind and below postorbital lobe. Rostrum short, pointed.
      lamelligera, p. 52.

A². Postorbital protuberance a granule, or wanting.
  B¹. Rostrum long, ending in a spine. Manus inflated in male.
    C¹. Only one tubercle on first abdominal segment.
      D¹. Rostrum very long, much more than half as long as postrostral portion of carapace----------**latimanus**, p. 56.
      D². Rostrum less than half as long as postrostral portion of carapace.
        E¹. Size small (not over 13 mm. long). Gape between fingers of adult male subtriangular, deep at proximal end. Neck long. Rostral spine slender----------**gracilipes**, p. 47.
        E². Size large (up to 24 mm. long). Gape between fingers of adult male suboval. Neck short. Rostral spine stouter, gradually tapering----------**hemphillii**, p. 49
    C². Two median tubercles on first abdominal segment. Rostrum from three-fifths to one-half as long as postrostral portion of carapace.
      barbarensis, p. 54.
  B². Rostrum short, not ending in a spine.
    C¹. Rostrum thin, hood-shaped, hollow beneath.
      D¹. Rostrum somewhat triangular, widest at its origin.
        E¹. A postorbital granule. Sternum of male not granulate.
          F¹. Sternum and basal articles of legs not vermiculate. Gape narrow between fingers of adult male.
            G¹. Dactyls of last three ambulatory legs curved, short, contained twice, or more than twice, in their respective propodites. Cardiac prominence low----------**riisei**, p. 33.
            G². Dactyls of last three legs less curved and longer, those of last two pairs contained less than twice in their respective propodites. Cardiac prominence higher and more acute or ending in a short spine----------**sidneyi**, p. 39.
          F². Sternum and basal articles of legs vermiculate. Cardiac prominence elongate, compressed. (Gape between fingers of adult male not known.)----------**vestita**, p. 42.

E². No postorbital granule. Sternum of male closely covered with pearly granules. Median carina of rostrum sharp, continued to front edge. Gape narrow between fingers of adult male ..... margaritaria, p. 43.

D². Rostrum not triangular, very broadly rounded, widest in front of its origin. Concave surface of basal antennal article very broadly triangular ..... algicola, p. 41.

C². Rostrum thick, subtriangular, not hollow beneath.

D¹. Propodus of first leg four or more times as long as dactylus. Propodus of last two legs considerably longer than dactylus and slightly curved ..... macrodera, p. 44.

D². Propodus of first leg twice, or at most three times as long as dactylus. Propodus of last two legs very little longer than dactylus and strongly curved ..... grossipes, p. 45.

Macropodia occidentalis Guilding (Trans. Linn. Soc. London, vol. 14, 1824, p. 335), from the Caribbean Sea, is probably a species of *Podochela*, but the description is too short to permit of its exact determination.

PODOCHELA RIISEI Stimpson

Plate 11, figs. 1 and 2; plate 208, fig. 2

Podochela riisei Stimpson, Ann. Lyc. Nat. Hist. New York, vol. 7, 1860, p. 196, pl. 2, fig. 6 (type-locality, Island of St. Thomas; type not extant).—Miers, *Challenger* Rept., Zool., vol. 17, 1886, p. 11.—Aurivillius, K. Svenska Vet.-Akad. Handl., vol. 23, 1889, p. 34, pl. 4, fig. 7.—Rathbun, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 48; Amer. Nat., vol. 34, 1900, p. 508, fig. 1 (after A. Milne Edwards); Bull. U. S. Fish Comm. for 1900, vol. 20, part 2 (1901), p. 54.—Verrill, Trans. Conn. Acad. Arts & Sci., vol. 13, 1908, p. 398.—Hay and Shore, Bull. Bur. Fisheries, vol. 35, 1915–16 (1918), p. 453, pl. 37, fig. 9.

Podochela deflexifrons Stimpson, Ann. Lyc. Nat. Hist. New York, vol. 7, 1860, p. 197 (type-locality, West Indies; type not extant).

Driope falcipoda Desbonne in Desbonne and Schramm, Crust. Guadeloupe, 1867, p. 2 (type-locality, Guadeloupe; type perhaps not extant).

Podonema riisei Stimpson, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 126.—Miers, Journ. Linn. Soc. London, vol. 14, 1879, p. 643.

Podonema hypoglypha Stimpson, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 127 (type-localities, Key West and S. W. of Loggerhead Key, 4 to 9 fathoms; types not extant).

Podochela spatulifrons A. Milne Edwards, Crust. Rég. Mex., 1879, p. 192, pl. 34, figs. 2–2*f* (type-locality, Guadeloupe at considerable depth; type in Paris Mus.).—Rathbun, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 48.

Podochela hypoglypha A. Milne Edwards, Crust. Rég. Mex., 1879, p. 194.—Rathbun, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 49; not Univ. Iowa Studies, vol. 9, 1921, p. 80.

Coryrhynchus riisei Kingsley, Amer. Nat., vol. 13, 1879, p. 585; Proc. Acad. Nat. Sci. Philadelphia, vol. 31, 1879, p. 384.

Diagnosis.—Rostrum hood-shaped, hollow beneath. Fingers of mature male narrowly gaping. Last leg about one and a half times as long as carapace. Dactyli of legs falcate, that of second leg contained two and a half or more times in the length of the propodus.

Material examined of Podochela riisei

Locality	Bearings		Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″			°F						
North Carolina:											
Off Beaufort fishing grounds.	34 19 00	76 58 00	13.5	Co. S. Sh	------	Sept. 6, 1913	7943	*Fish Hawk*	2♂	51004	
Do						Aug. 1, 1914		do	1♂	47960	
Do	34 20 15	76 49 00	16	hrd	------	July 14, 1915	8283	do	1♂	52761	
Florida:											
Off Carrabelle	Carrabelle, N. by W., 14⅜ miles.		10		60.2	Jan. 16, 1913	24	do	1♂	50989	
					°C						
Aucilla section	29 34 00	84 07 20	10.5	R. Co	17.6	Dec. 5, 1901	7195	do	1♀	47019	
Do	29 45 48	83 57 30	7	S. Co	21	Nov. 6, 1901	7149	do	1♂ 1♀	46992	
Do	29 48 10	83 55 15	5	S. Co	21	do	7148	do	1♂	46989	
Do	29 52 10	83 51 47	3	S. Co	20	do	7147	do	2♂	46991	One has a Rhizocephalid parasite.
Deadmans Bay section	29 37 00	83 35 15	3.5	S. G	15	Dec. 6, 1901	7206	do	1♀	47004	
Pepperfish Key section	29 30 50	83 31 40	3.25	sdy	22	Nov. 5, 1901	7145	do	2♂	46988	
Do	29 29 30	83 33 25	4.75	sdy	21.5	do	7146	do	1♀	46990	
Do	29 23 00	83 27 05	3.5	S. G	16.3	Nov. 21, 1901	7159	do	2♀	46993	
Do	29 21 00	83 32 00	6.75	rky	16.7	do	7160	do	2♂	46994	
Do	29 18 00	83 37 00	8	rky	18	do	7161	do	1♂	46995	
Do	29 15 30	83 27 30	5.5	sdy	16.2	do	7166	do	1♀	46997	
Do	29 13 15	83 32 30	7.25	rky	17.2	do	7165	do	1♀	46996	
Do	29 06 15	83 33 00	8	rky	16.7	Nov. 27, 1901	7171	do	1♀	46998	
Off Cedar Keys						Feb. 1887		Lieut. J. F. Moser, U. S. N., U. S. C. S. Str. *Bache*.	2♂	18074	Basal antennal article of *hypoglypha* form.
					°F						
Do	Cedar Keys Light, N. ¾ E., 21¾ miles.		5.75	Co	63.45	Jan. 11, 1913	21	*Fish Hawk*	1♂ 1♀	50988	
Do	Cedar Keys Light, NNE. ¾ N., 11¼ miles.		5.5	Co. Sh	63.45	do	22	do	1♂	50990	
					°C						
North Key section	29 05 00	83 22 30	5.5	sdy. rky. Co	15.5	Nov. 27, 1901	7177	do	1♂ 8♀ (1 ovig.)	47018	
Do	29 02 30	83 14 00	4.5	sdy	14.8	Nov. 28, 1901	7181	do	2♂	46999	
Do	29 00 00	83 18 45	5.75	rky. Co	15.3	do	7182	do	1♂	47048	Actinians and sponges attached.
Do	29 57 30	82 58 00	3	rky	15.5	Dec. 6, 1901	7207	do	1♀	47003	
Do	28 55 30	83 02 00	4	rky	15.3	Dec. 9, 1901	7208	do	1♂	47022	
Do	28 55 00	83 28 10	10.5	R. Co	17	Nov. 28, 1901	7184	do	1♂	47001	

Do	28	52	45	83	07	00	5.75	rky	16.1	Dec. 9, 1901	7209	do	1♂ 2♀	47026	
Do	28	52	15	83	24	00	7.5	R. Co	16.2	Nov. 27, 1901	7183	do	1♀	47000	
Do	28	47	55	83	16	30	8	rky. grsy	17	Dec. 9, 1901	7211	do	2♂ 2♀	47020	
St. Martins section	28	45	30	83	00	00	5	S. brk. Sh. G	11.7	Jan. 17, 1902	7224	do	2♂	47025	
Do	28	42	30	83	09	45	7	S. brk. Sh. G	12.2	do	7225	do	2♂	47027	
Do	28	41	00	83	15	15	8.5	rky	13.5	do	7226	do	1♂ 1♀	47028	
Do	28	39	15	83	20	30	10	sdy. grsy. rky	13.8	do	7227	do	1 ovig. ♀	47029	
Do	28	34	30	83	15	45	7.5	rky. sdy	13	Jan. 15, 1902	7220	do	1♂	47007	
Do	28	33	30	83	19	00	9	sdy. grsy	13.6	do	7219	do	1♂ 1♀	47024	
Do	28	27	15	83	19	00	10.5	rky. sdy	14	do	7218	do	1♂	47006	
Do	28	26	30	83	08	00	10	sdy. grsy	13.6	do	7216	do	1♂ 2♀	47023	One female has a Rhizocephalid parasite.
Do	28	26	00	83	02	30	7.5	rky. Co	13	do	7215	do	1♂ 3♀	47021	Sponge and actinian attached.
Do	28	25	15	82	57	00	5.25	S. G	12	do	7214	do	1♂	47005	
Anclote section	28	20	15	83	12	15	10.25	S. G	13.5	Jan. 24, 1902	7241	do	1♀	47059	
Do	28	19	45	83	06	30	8.5	rky. G	13	do	7240	do	1♂	47010	
Do	28	19	30	83	01	00	6.25	rky. G	12.5	do	7239	do	2 ovig. ♀	47033	
Do	28	08	30	83	12	00	11	hrd. & G	14	Jan. 23, 1902	7232	do	1♂	47008	
Do	28	08	30	83	10	00	10	rky. C	13.5	do	7231	do	2♂ 1♀	47031	Two pterygostomian tubercles on each side.
Do	28	08	00	83	04	30	8	rky. grsy	13.5	do	7230	do	1♀	47030	
Do	28	01	30	83	08	00	11	rky	13.5	do	7234	do	2 ovig. ♀	47032	One specimen has two pterygostomian tubercles on each side.
Do	28	01	30	83	12	30	13	rky. Sh	14	do	7233	do	1♂	47009	
Do	Anclote Light, bearing E. ⅞ N., 21½ miles.						12.5	R. Co. S	17.2	Mar. 28, 1901	7106	do	1♂ 1♀	25587	
Do										1901		J. E. Benedict	1♀	25578	
Highland section	27	55	30	83	11	30	13	Co. R	15.2	Jan. 28, 1902	7253	do	1♀	47011	
Do	27	49	30	83	02	45	7.75	S	15	do	7256	do	1♂ 3♀	47034	
Pass-a-Grille							beach.					Mrs. E. A. Hawley.	1♂	41023	
Sarasota Bay												Union College	2♂ 5♀	42581–42583	
Do												Boston Soc. Nat. Hist.	1♂ 1 ovig. ♀	53053	
Off Gasparilla Island	Gasparilla Light, E. by S., 6¼ miles.						7	hrd. S. brk. Sh		Jan. 4, 1912	13	*Fish Hawk*	3♂	50991	
Off Sanibel Islands	Bell buoy off Sanibel Islands Light, NE., 10–2½ miles.						6–7	brk. Sh. Co		Jan. 1, 1913	9	do	2♂	50987	
Off Johns Pass	Johns Pass, E. ¾ N., 9½ miles.						6			Jan. 9, 1913	18	do	1♀	50986	
West Florida										1891		J. B. Henderson and C. T. Simpson.	2♂ 1♀	18075	Basal antennal article of *hypoglypha* form.
Marco										1885		H. Hemphill	1♀	15161	
Off Cape Sable										Dec. 17, 1902		*Fish Hawk*	1 ovig. ♀	47017	
Do	25	00	55	81	22	15	4	rky		Dec. 19, 1902	7372	do	1♂	47039	

Material examined of Podochela riisei—Continued

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	° ′ ″	° ′ ″			°C						
Off Cape Sable	25 09 04½	81 18 35	3.25	rky. Co		Dec. 16, 1902	7351	*Fish Hawk*	1♂ 3♀	47038	One female has a Rhizocephalid parasite.
Do	25 00 40	81 15 37	2.5	rky		Feb. 19, 1902	7370	do	2♂	47012	
Florida Bay	5½ miles N. NW. ¼ W. of Channel Key.		1⅙	S. M. G		Jan. 29, 1903	7439	do	2♂	47045	
Upper Jewfish Bush Lake.	6¼ miles SE. by E. of Sandy Key.		1⅔	rky		do	7437	do	2♂ 3♀	47044	
Hawk Channel	½ mile SE. by S. of SE. end of Duck Key.		2⅓	rky		Jan. 27, 1903	7429	do	1♀	47015	
Off Duck Key	Duck Key, N., 1¼ miles		2¾	Co. Sh		Dec. 20, 1912	4	do	1 ovig. ♀	50992	
Grassy Key Lake	3¾ miles NW. ½ N. of E. end of Grassy Key.		1⅓	rky		Jan. 28, 1903	7431	do	1♂	47016	
Do	2¾ miles N. ½ W. of Channel Key.		1¼	rky		Jan. 29, 1903	7440	do	1♂	47046	
N. of Knights Key Channel.	3 miles NE. by N. of East Bahia Honda Key.		1⅚	rky		Jan. 22, 1903	7412	do	1♂ 2♀ (1 ovig.)	47041	
Do	3¾ miles N. NE. of West Bahia Honda Key.		2	S. G. rky		do	7413	do	2♂	47013	
Do	6 miles N. NE. ½ E. of East Bahia Honda Key.		1⅚	barry		do	7414	do	1♀	47014	
Do	2 miles NE. by N. of Basin Bank.		1½	rky		do	7417	do	1♂	47042	
Do	1½ miles NE. by N. of Knights Key.		1¼	rky		do	7420	do	1♂	47043	
Pigeon Key Lake	1 mile E. of Bahia Honda Key.		1¾	rky		Jan. 7, 1903	7404	do	1 ovig. ♀	47040	
Key West						Dec., 1883		D. S. Jordan	1♀	15162	
Off Key West, inside the reef.	Key West Light to E. Channel Bar Buoy 71° 53′, to Beacon "A" 74° 46′.		5¼	Co. S. G	20	Feb. 13, 1902	7278	*Fish Hawk*	1♂	47036	
West Channel, entrance to Key West.	Midchannel Buoy bearing W. by S. ¼ W., ½ mile.		7¾	Co. S	20	do	7271	do	1♂	47035	
Gulf of Mexico, off Northwest Channel.	24 38 40	81 56 28	5½	Co	19.5	Feb. 24, 1902	7295	do	2♀ (1 ovig.)	47037	

Off Boca Grande	Boca Grande Light, N. NE. ¾ E., 21½ miles, to NE. ¼ N., 20 miles.	4¼	°F 68.5	Jan. 2, 1913	10	do	1 ♀		50984
Tortugas		4				J. B. Henderson.	3 ovig. ♀		47050
Do		16				do	1 ovig. ♀		47060
Do				1893		State Univ. Iowa Exped.			Mus. S. U. I.
Bahamas: Off Little Cat Island on submerged bank connecting it with Eleuthera.		3–13		July 18, 1893	68	do			do
Cuba: On reef Lavesos Italienos, opposite Cayo Lavesos.		2–3	Co. S. R.	June 2, 1914	14	*Tomas Barrera*	2♂ 1 ♀		48721
Jamaica: Kingston Harbor				May – July, 1896.		F. S. Conant	1 ♀		19581
Porto Rico:			°C						
Off Vieques Island	Culebrita Lighthouse, NE. by N., 10 miles.	15	Co	Feb. 10, 1899	6091	*Fish Hawk*	1♂ 1 ♀		24994
Do	Pt. Mula Lighthouse, E. ½ N., 11¼ miles.	6	Co	Feb. 14, 1899	6096	do	1 ♀		24117
St. Thomas	Sail Rock, W. by N. ½ N., 6 miles.	20–23	Co	Feb. 6, 1899	6079	do	1 ♀		24204
Brazil: Rio Janeiro						*Hassler*	1 ovig. ♀		1832, M.C.Z.

Description.—Carapace with a cardiac and two median gastric tubercles; a downward-pointing tubercle or lamina on the hepatic region. Rostrum hood-shaped, thin, hollow beneath, a median carina above. Postorbital tooth small, tuberculiform; behind and below it a small tubercle. Pterygostomian region protuberant, more or less compressed and prolonged in a tubercle at middle. Sternum of male with segments flattened and separated by deep grooves; area in front of abdomen subvertical, divided into two protuberances which are narrow, longitudinal and parallel. Basal antennal article gradually narrowed anteriorly, longitudinally grooved through the middle.

Chelipeds of adult male stout, manus dilated, fingers narrowly gaping in basal two-thirds; chelipeds of female and immature male slender, manus not dilated, fingers in contact. Ambulatory legs of first pair much the longest, about two and a half times as long as carapace, its merus stouter than the others, dactylus about one-fifth as long as the propodus, unarmed, and much slenderer and straighter than in the other legs; second, third, and fourth legs decreasing regularly in length, the second twice or two and a fourth times, the fourth leg about one and a half times the length of the carapace; propodites unequal, distal portion slightly thickened and bent upward, but straight, not con

cave, on the edge facing the dactylus; the surface where the tip of the dactylus touches is densely haired; dactyli moderately curved, second propodus two and a half times as long as its dactylus, third propodus a little over twice its dactylus, fourth propodus just twice its dactylus (fig. 9, *b*).

Variations.—Rostrum variable as to shape and length. Margins of basal antennal article thick in the old but may be quite thin in younger ones; the anterior end of the article is always truncate. Sternal segments of male usually with a rounded surface, but sometimes flattened.

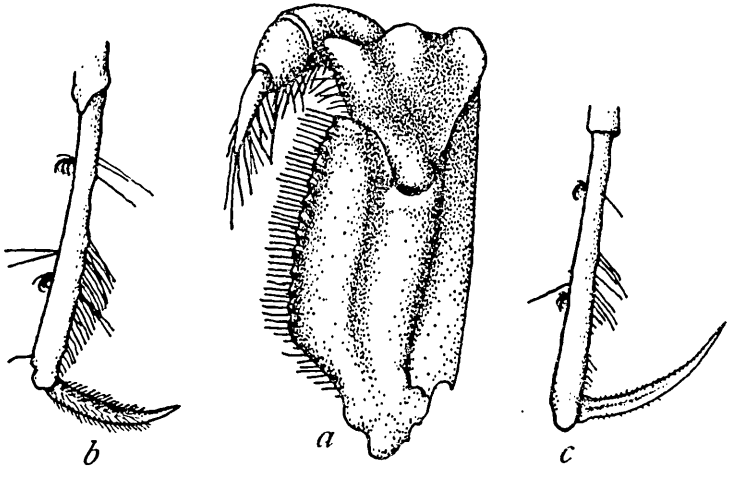


FIG. 9.—*a*. PODOCHELA RIISEI (18075), MAXILLIPED, × 12. *b*. PODOCHELA RIISEI (50991), PROPODUS AND DACTYLUS OF LAST LEG, × 5. *c*. PODOCHELA SIDNEYI (8814), PROPODUS AND DACTYLUS OF LAST LEG, × 5

Color.—One male (47042) preserved in alcohol has retained the color pattern in brown: A longitudinal band along outer margin of branchial and postorbital regions; a slightly curved band each side of median line beginning at line of larger gastric tubercle and ending at cardiac tubercle; rostrum and mesogastric region spotted with irregular patches; first two legs are largely brown.

Measurements.—Male (47048), length of carapace 20.6, width 16 mm. Female (53053), length 20.5, width 16.6 mm. Female (1832), length 23.2, width 19.6 mm.

Range.—North Carolina; Bahamas; west coast of Florida (common) to Cuba and other West Indian Islands as far southeast as St. Thomas; south of Pernambuco, Brazil (Miers). Rio Janeiro. Bermudas (Verrill). Shallow water to 30 fathoms.

Material examined.—See table, pages 34-37.

PODOCHELA SIDNEYI[13] **Rathbun**

Plates 12 and 13

Podochela reisei A. MILNE EDWARDS, Crust. Rég. Mex., 1879, p. 193, pl. 34, figs. 1 (ambulatory legs excepted), 1*a*.

Podochela riisei SMITH, Rept. U. S. Fish Commr. for 1885 (1886), p. 620 [16], not synonymy.

Podochela sidneyi RATHBUN, Proc. U. S. Nat. Mus., vol. 64, art. 14, 1924, p. 1 (type-locality, off Cape Hatteras, North Carolina, 49 fathoms, station 2297, *Albatross;* 1 male holotype, Cat. No. 7253, U. S. N. M.).

Diagnosis.—Dactyls of last three legs elongate, more than half as long as their respective propodites. Palm of adult male very slightly inflated. Sternal segments of male forming flat, sharp-edged plates.

Description.—Closely related to *P. riisei;* most easily distinguished by the longer and straighter dactyli of the last three ambulatory legs. Cardiac and posterior gastric prominences more produced than in *riisei,* spiniform. Rostrum a little narrower at base and in consequence more triangular. Pterygostomian region bearing a long thin lamina which may be subtriangular or produced downward in a lobe. The sternal segments are flat, and the flat surfaces have sharp, cristate margins; the flat, elongate tubercles in front of the abdomen are more triangular and in an oblique plane, enclosing the end of the abdomen. The margins of the basal antennal article are thinner, deeper, and more convergent anteriorly, the lobe at the posterior end of the outer margin is more pronounced.

Chelipeds of adult male with manus less dilated than in *riisei,* gape narrower, prehensile teeth more numerous and more uniform in size. Legs longer than in *riisei;* first leg three or more times as long as carapace, dactylus about one-seventh as long as propodus; second leg two and a half to two and two-thirds as long as carapace, fourth leg about twice as long as carapace. Dactyli of last three pairs less curved than in *riisei* and distinctly longer; second propodus no more than twice as long as its dactylus, third propodus from one and a half to one and three-fourths time its dactylus, fourth propodus from one and a third to one and a half times.

Measurements.—Male, holotype, length of carapace 14, width 10.7 mm. Larger male (48676), length 17.3, width 13 mm.

Range.—North Carolina; eastern part of Gulf of Mexico (sparingly on west coast of Florida); northwestern Cuba and Yucatan Channel. Depth, 2 to 49 fathoms.

Material examined.—See table, page 40.

[13] Named for Prof. Sidney I. Smith.

Material examined of Podochela sidneyi

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp	Date	Station	Collector	Specimens	Cat. No.	Remarks
North Carolina:	° ′ ″	° ′ ″			°C						
Off Cape Hatteras	35 38 00	74 53 00	49	bk. M. brk. Sh.		Oct. 20, 1884	2297	*Albatross*	2♂	7253, 8799	1♂ is holotype.
Do	35 35 20	74 58 45	27	crs. gy. S		do	2296	do	1♀	8814	
Do	35 21 25	75 24 25	13	crs. gy. S		Oct. 19, 1884	2285	do	1♂ 1♂ 1♀	7268 8792	In Yale Univ. Mus. Identified by S. I. Smith.
Do	35 20 50	75 19 50	16	gy. S. brk. Sh.		do	2277	do	1 y. ♀	8773	
Do	35 20 40	75 18 40	16	gy. S		do	2275	do	1 y	8777	In Yale Univ. Mus. Identified by S. I. Smith.
Alabama	29 27 30	87 48 30	30	crs. S. bk. Sp. Sh.		Mar. 4, 1885	2390	do	2♂ 2♀	15163	
Florida:											
Off Pensacola			3–4			July, 1893		J. E. Benedict	1♂	18153	
Off Apalachicola	28 45 00	85 02 00	30	gy. S. brk. Co		Mar. 15, 1885	2105	*Albatross*	2♂ 1♀	18073	
Do	28 46 00	84 49 00	26	crs. S. Co		do	2106	do	2♂ 2♀	9794	
Deadmans Bay section	29 30 15	83 41 30	5. 75	S	15. 2	Dec. 6, 1901	7204	*Fish Hawk*	1♂	47002	
Pepperfish Key section	29 08 15	83 42 00	10	S	19	Nov. 21, 1901	7163	do	1♀	47056	
Anclote section	28 14 00	83 13 00	11	rky. Co	13. 8	Jan. 24, 1902	7242	do	1♀	47058	
Gulf of Mexico, off Northwest Channel.	24 44 50	81 55 50	10. 25	hrd. smooth	19	Feb. 14, 1902	7292	do	1♂	47057	
Tortugas			16			July 10, 1911		J. B. Henderson	1♂	54723	
? Florida			7–10					Union College	1♂	56013	With *Mithrax hispidus*.
Cuba:											
Bahia			2–12	M. Co		June 4, 1914	15	*Tomas Barrera*	2♂	48676	
Bahia Honda, on wharf						June 1–3, 1893		State Univ. Iowa Exped.	2♀	Mus. S.U.I.	
Yucatan Channel: North of Cape Catoche.	22 07 30	87 06 00	21	wh. R. Co		Jan. 30, 1885	2363	*Albatross*	1♂	18147	

PODOCHELA ALGICOLA (Stebbing)

Coryrhynchus algicola STEBBING, Trans. Roy. Soc. Edinburgh, vol. 50, 1914, p. 259, pl. 23 (type-locality, off the coast of Brazil, lat. 18° 24′ S., long 37° 58′ W., 36 fathoms; station 81, *Scotia;* type in Dr. Bruce's Mus. Antarctica, Edinburgh, except first antennae and mouth parts which are mounted and in Mr. Stebbing's collection.

Diagnosis.—Allied to *P. riisei.* Rostrum short, broadly rounded. A pair of tubercles on surface of carapace between eyes. Edges of fingers (of female) crenulate, not denticulate. Ventral concave

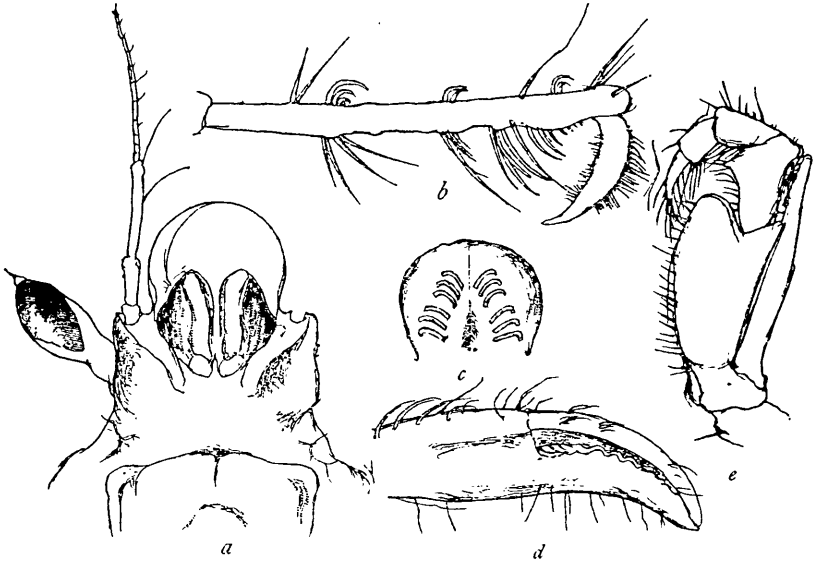


FIG. 10.—PODOCHELA ALGICOLA, FEMALE HOLOTYPE, CARAPACE 19 MM. LONG. *a.* ANTERIOR PORTION, VENTRAL VIEW. *b.* PROPODUS AND DACTYLUS OF THIRD AMBULATORY LEG. *c.* ROSTRUM. *d.* CHELA. *e.* MAXILLIPED. (AFTER STEBBING.)

surface of basal antennal article acute at distal end, broadly triangular. (After Stebbing.)

Remarks.—This may be the same form as the Brazilian specimen referred by Miers to *riisei.* The rostrum of *algicola* widens more than in *riisei,* but the dactyl of the fourth pereiopod (third ambulatory) is of the same shape as in *riisei;* the penult article shown in figure "prp. 4" should undoubtedly be divided in two, as shown in the entire figure of the animal.

Measurements.—Female, holotype, length of carapace 19, width 13, length of first ambulatory leg about 47 mm. (Stebbing.)

Range.—Known only from the type specimen. (See above.)

PODOCHELA VESTITA (Stimpson)

Plate 14

Podonema vestita STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 10, 1871, p. 97 (type-locality, Cape St. Lucas; type not extant).

Podochela vestita A. MILNE EDWARDS, Crúst. Rég. Mex., 1879, p. 195.

Podochela (Coryrhynchus) mexicana RATHBUN, Proc. U. S. Nat. Mus., vol. 16, 1893, p. 225 (type-locality, Gulf of California, 11 fathoms; holotype, Cat. No. 17330, U. S. N. M.).

Diagnosis.—Rostrum short, rounded. Neck short. Margins of basal antennal article thin, prominent. Legs filiform, propodites without thumb-process, dactyli short. Sternum vermiculated.

Description.—A species with short neck, very high gastric region, two prominent gastric tubercles, cardiac tubercle uncommonly large, laminate, the lamina continued forward in a blunt ridge; a large, laminate, hepatic lobe, a thin pterygostomian ridge bearing a small lobe. Rostrum short, arcuate, thin. Basal antennal article anteriorly narrowed, margins thin, outer margin broadly bilobed.

Chelipeds of a probably immature male feeble, palms slightly swollen, fingers meeting. Legs slender; first one less than three times as long as carapace, its propodus slender, about seven times as long as dactylus, which is unarmed, slenderer, and less curved than in the other legs; fourth leg about as long as carapace; second, third, and fourth legs similar, diminishing successively, as do also their propodal segments, which are a little thickened distally, that of the second leg three times as long as dactylus, that of the fourth leg twice as long as dactylus, that of the third leg intermediate; the three dactyli are of the same size and form.

Sternum and basal segments of legs vermiculated. Sternal segments in the form of raised plates with sharp edges and separated by deep depressions.

Said by Stimpson to be more hairy than *riisei* or *lamelligera*.

Measurements.—Male (17330), length of carapace 10, width 8, length of cheliped about 12, of first leg about 27, second 21, fourth 11 mm. Female (Stimpson), length of carapace 0.52 inch (13.2 mm.), width 0.42 inch (10.7 mm.).

Range.—Mexico: Gulf of California to Cape St. Lucas.

Material examined.—Off Adair Bay, Mexico, in the Gulf of California; lat. 31° 21′ 00″ N.; long. 113° 49′ 00″ W.; 11 fathoms; S. brk. Sh. G.; temp. 67° F.; March 25, 1889; station 3024, *Albatross;* 1 male, thin shell (17330), holotype of *P. mexicana*.

PODOCHELA MARGARITARIA Rathbun

Plate 15; plate 209, fig. 1

Podochela margaritaria RATHBUN, Proc. Washington Acad. Sci., vol. 4, 1902, p. 283, pl. 12, fig. 12 (type-locality, Tagus Cove, Albemarle Island, 12 fathoms; holotype, Cat. No. 24834, U. S. N. M.).

Diagnosis.—Rostrum hood-shaped, carinate. No postorbital lobe. Sternum coarsely granulate. Fingers of adult male narrowly gaping.

Description.—Ventral surface covered with coarse, pearly granules; dorsal surface inconspicuously granulate, especially on the depressed portions and the branchial regions. A high conical tubercle on the cardiac and on the gastric region. Rostrum long, hood-shaped, the hood thin, sharply cristate on median line. No postorbital lobe. Hepatic region small, swollen, converging to a small, downward-pointing tubercle. A similar pterygostomian tubercle. Sternal segments high, closely covered with white granules, and separated by deep smooth depressions; two tubercles in front of the abdomen terminate ridges leading upward between which is a deep trough.

Basal antennal article narrowed anteriorly, deeply concave, lateral margins prominent. Chelipeds moderately roughened, chiefly on the margins, a few tubercles on the carpus, manus swollen, fingers narrowly gaping except near the tips. Legs of moderate length, first pair two and a half times length of carapace, dactylus short, slender, curved, propodus five times as long as dactylus. Remaining legs respectively twice, one and two-thirds and one and a half times the carapace length; dactyli of similar length and curvature, the second a little slenderer. Propodites distally thickened and bent upward, the amount of thickening increasing from second to fourth leg. The second propodus is two and a half times its dactylus, the third twice, and the fourth a little less than twice its dactylus.

Measurements.—Male, holotype, length of carapace 15, width 11 mm.

Range.—Known only from Tagus Cove, Albemarle Island, Galapagos Islands.

Material examined.—

Tagus Cove; 12 fathoms; Stanford Univ. Exped.; one male holotype (24834).

Tagus Cove, on reef north of Tagus Hill; 2 males, 1 female (Stanford University).

PODOCHELA MACRODERA Stimpson

Plate 16

Podochela macrodera STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, 1860, p. 196 (type-localities, St. Thomas and Key Biscayne, Florida; types not extant).—A. MILNE EDWARDS, Crust. Rég. Mex., 1879, p. 191, pl. 34, figs. 3–3c.—RATHBUN, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 50; Bull. U. S. Fish Comm. for 1900, vol. 20, pt. 2 (1901), p. 53; in Boeke, Rapport Vischerij Kolonie Curaçao, 1920, p. 343 [27].

Diagnosis.—Rostrum short, thick, subtriangular. Fingers of adult male widely gaping. Distal ends of propodites of ambulatory legs curved.

Description.—Cardiac region depressed, bearing a low tubercle; two median gastric tubercles; hepatic region swollen, its tubercles very small; a small tubercle on the pterygostomian region. Rostrum small, short, thick, subtriangular, obtuse or subacute, flat above, sides steeply inclined. Sternum of male with smooth convex segments separated by shallow grooves. In front of the abdomen are two white-tipped tubercles. First abdominal segment in male and first and second in female with a white median tubercle.

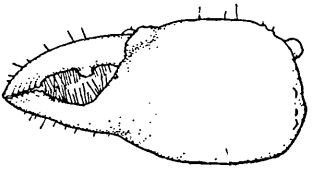


FIG. 11.—PODOCHELA MACRODERA, MALE (6368), LEFT CHELA, × 4.66

Basal antennal article long, much narrower anteriorly, lateral margins thick and convex, uniting on the anterior third. Chelipeds of adult male stout, manus much dilated, fingers widely gaping. Ambulatory legs of first pair about two-and-a-half times, of second pair about one and two-thirds times, of fourth pair about one and a third times the length of the carapace; first pair similar to that of *riisei*. Propodites of last three pairs falcate, the distal portion being curved, and the tip of the curved dactylus fitting against a thumb process; second propodus about two and a fourth times its dactylus, third propodus a little over twice, and fourth propodus less than twice its dactylus.

Measurements.—Male (6368), length of carapace 15.3, width 11.2 mm. Female (18670), length 10.8, width 8.6 mm.

Range.—Bahamas; Florida Keys from Key Biscayne (A. Milne Edwards) to Sand Key; Yucatan Channel; West Indies from Cuba and Porto Rico to Guadeloupe (A. M. E.). Curaçao. Shallow water to 14¾ fathoms; 50 fathoms (unusual).

Material examined.—See table, pages 46–47.

PODOCHELA GROSSIPES Stimpson

Plate 208, fig. 1

Podochela grossipes STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, 1860, p. 195 [67], pl. 2, fig. 5 (type-locality, island of St. Thomas, W. I.; type not extant).—A. MILNE EDWARDS, Crust. Rég. Mex., 1879, p. 190, pl. 34, figs. 4, 4*a*.—AURIVILLIUS, K. Svenska Vet.-Akad. Handl., vol. 23, 1889, p. 34.

Acrorhynchus depressus A. MILNE EDWARDS, Crust. Rég. Mex., 1879, p. 190.

Diagnosis.—Rostrum short, triangular, acute. Last two pairs of legs with the penult article short, strongly curved, and the dactylus when closed forming an oval gape.

Description (after Stimpson).—Body everywhere short-pubescent; feet setose. Rostrum acute, regularly triangular, very little longer than broad at base, setose. Chelipeds with the hand much inflated; fingers much shorter than palm, slender, gaping, and annulated with crimson near tips. First pair of ambulatory legs very robust, with a single series of very short, small tufts of curled hair along upper side; penult article very thick, armed on lower edge with a distinct tooth or thumb-process, against which the extremity of the dactylus closes. The rest of the legs become progressively shorter and more slender posteriorly and have much shorter hands; in the last two pairs the penult article is scarcely longer than the dactylus, much curved, and concave within, with the thumb-process at the base; the dactylus is almost always closed against this process and can be opened only to a limited extent, so that the last two articles are transformed into a strongly subcheliform or ancoral hand, which projects at a right angle from the carpus.

The specimen described and figured by A. Milne Edwards is much larger than Stimpson's type; it has a much longer rostrum and longer propodites of the first and second legs.

Measurements.—Male, type, length of carapace 14.2 mm. (0.56 inch), width 10.4 mm. (0.41 inch), length of first ambulatory leg 35 mm. (1.39 inches), length of last leg, dactylus excluded, 17.3 mm. (0.68 inch) (Stimpson).

Range.—St. Thomas (Stimpson); Martinique, 10 to 20 fathoms (Aurivillius); St. Pierre, Martinique (Doflein); St. Lucia (A. Milne Edwards).

Material examined of Podochela macrodera

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
Bahamas:	° ′ ″	° ′ ″			.°C						
Bahama Banks						May 15, 1893		State Univ. Iowa Exped.	1♂	Mus. S. U. I.	
Harbor Island						July 8, 1893		do	1♂ 1♀	18670	
Clarence Harbor						July 15, 1903		B. A. Bean	4♂	31044	
Florida:											
Hawk Channel	1½ miles E. of Tea Table Key.		2.5	barry		Feb. 19, 1903	7466	*Fish Hawk*	1♂	47055	
Do	1¼ miles E. by S. of W. end of Lower Matacumba.		3	barry		Feb. 18, 1903	7464	do	1♂ 1♀	47049	
Do	1¼ miles S. by W. of SE. point of Long Key.		2.5	barry		do	7463	do	2♂	47054	
Do	1¾ miles S. ¾ E. of Pigeon Key.		3	S. G	23.5	Jan. 27, 1903	7426	do	1 ovig. ♀	47053	
Key West						Dec., 1883		D. S. Jordan	1♂	6368	
Do						Feb. 3, 1901		B. A. Bean and W. H. King.	2 ovig. ♀ 1 ♀	24848 47051	
Off Key West			(1)			June 26, 1893	46	State Univ. Iowa Exped.	2♀	Mus. S. U. I.	
Key West, inside the reef.	Key West Light to East Channel Bar Buoy, 71° 53′; to Beacon "A," 74° 46′.		5.25	Co. S. G	20	Feb. 13, 1902	7278	*Fish Hawk*	1♂	47052	
Off Sand Key Light				In rocks, sponges, etc.		1893		State Univ. Iowa Exped.	1♂	Mus. S. U. I.	
Off Sand Key			50			May, 1913		J. B. Henderson	1♀	46067	
West Florida			50					Wm. Stimpson	1	6317, M.C.Z.	Identified by A. Milne Edwards
Yucatan: Off Mujeres			12	crs. co. S				do	1	2955, M.C.Z.	
Cuba: Reef Lavesos Italienos.	Opposite Cayo Lavesos.		2–3	Co. S. R		June 2, 1914	14	*Tomas Barrera* Exped.	1 ovig. ♀	54722	
Porto Rico:											
Off Vieques Island	Point Mula Lighthouse, S. SW. ⅜ W., 5¾ miles.		14	Co. S. Sh	25.6	Feb. 8, 1899	6085	*Fish Hawk*	1♂	24118	
Off Culebra Island	Point Mula Lighthouse, SW. ½ S., 8½ miles.		14.75	Co. S	25.5	do	6086	do	1♀	24116	

St. Thomas						*Albatross*	1♂	18078				Soft shell.
St. Martin: Groote Bal		0.5	sdy		Sept., 1905	J. Boeke	1 sm. ♂		Leiden Mus.			
St. Eustatius: West of Oranjestad.		4	sdy		Aug. 17, 1905	do	1♂		do			
Curaçao: Caracas Bay			Co		Apr. 7, 1920	C. J. van der Horst.	1♀		Amsterdam			

[1] Shallow

PODOCHELA GRACILIPES Stimpson

Plate 17

Podochela gracilipes STIMPSON, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 126 (type-localities, west of Tortugas, off Pacific and Carysfort Reefs, 36 to 60 fathoms; types not extant).—A. MILNE EDWARDS, Crust. Rég. Mex., 1879, p. 192, pl. 35, figs. 1–1*b*.—RATHBUN, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 50.

Diagnosis.—Rostrum long, spiniform, unarmed. Carapace much constricted behind orbits. Fingers widely gaping in adult male. Legs filiform.

Description.—A small species. Carapace narrow; a rounded protuberance on the cardiac region and two smaller median protuberances on the gastric region; two pterygostomian tubercles; a small tubercle at either end of epistome which, together with the projecting angles of the buccal cavity, is visible in dorsal view in large specimens. On the male sternum a thick blunt spine at base of cheliped. Basal antennal article long and narrow, posteriorly with two blunt margins which converge and unite anteriorly.

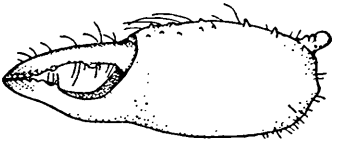


FIG. 12.—PODOCHELA GRACILIPES, MALE (18089), LEFT CHELA, × 6

Chelipeds stout in male; manus much inflated, fingers gaping to near the tips, more widely gaping than in any other Atlantic species, the fixed finger slightly bowed downward below the line of the manus; a large tooth near base of dactyl. Chelipeds slender in female. Ambulatory legs very slender; first pair much the longest, three times as long as carapace; dactyli long and almost straight, about one-third the length of the preceding segment; propodites of last three pairs thickened toward distal end, dactyli somewhat scythe-shaped; in second pair the dactylus is two-fifths as long as propodus, in third pair one-half, in last pair two-thirds as long as propodus.

Measurements.—Male (18079), length of carapace 12.7, width 8.7 mm.

Range.—Off Cape Lookout, North Carolina, to Gulf of Mexico, Caribbean Sea (to Colombia and Barbados), and Cape Frio, Brazil. Depth, 18 to 79 fathoms.

Material examined.—See table, pages 48-49.

Material examined of Podochela gracilipes

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
North Carolina:	° ′ ″	° ′ ″			°F						
Off Cape Lookout	34 38 00	76 12 00	18	fne. gy. S.		Oct. 19, 1885	2607	*Albatross*	1♂	18896	
Do	34 35 30	75 45 30	32	wh. S. bk. Sp.		Oct. 18, 1885	2605	do	1♂	18895	
South Carolina: Off Cape Romain.	32 55 00	77 54 00	79	crs. S. bk. Sp.	59.1	Jan. 5, 1885	2311	do	1♂	18079	
Gulf of Mexico:											
South of Mobile Bay, Alabama.	29 24 30	88 01 00	35	yl. S. bk. Sp.		Mar. 4, 1885	2388	do	2♂ 4♀	18086	
Between Mississippi Delta and Cedar Keys, Florida.	29 27 30	87 48 30	30	crs. S. bk. Sp. Sh.		do	2390	do	3♂	18087	
Do	29 18 15	85 32 00	25	crs. gy. S. brk. Sh.		Feb. 7, 1885	2370	do	1♀	22291	
Do	29 15 30	85 29 30	27	G		do	2372	do	3♂	18084	
Do	29 14 00	85 29 15	25	Co		do	2373	do	1♂ 1♀	18085	
Do	28 45 00	85 02 00	30	gy. S. brk. Co.		Mar. 15, 1885	2405	do	2♂ 8♀ (2 ovig.)	18088	
Do	28 46 00	84 49 00	26	crs. S. Co		do	2406	do	5♂ 3♀ (1 ovig.)	18089	
Do	28 47 30	84 37 00	24	Co. brk. Sh		do	2407	do	1♂	18090	
Off Anclote River						1901		J. E. Benedict	1♂	54724	
Between Charlotte Harbor and Dry Tortugas, Florida.	26 19 00	83 22 00	31	S. G. bk. Sp.	67.5	Mar. 18, 1889	5107	*Grampus*	1 ovig. ♀	47061	
Do	26 18 30	83 08 45	27	fne. gy. S. bk. Sp. brk. Sh.		Mar. 19, 1885	2412	*Albatross*	3♂	18091	
Do	26 00 00	82 57 30	24	fne. S. bk. Sp. brk. Sh.		do	2413	do	2♀	18092	
Do	25 04 30	82 59 15	26	fne. wh. S. brk. Sh.		do	2414	do	2♂	18093	
Florida Keys:											
Strait of Florida	25 04 50	80 15 10	56	Co. S		Apr. 9, 1886	2639	do	2♂	11408	
West of Dry Tortugas	24 44 00	83 26 00	37			1877–78	10	*Blake*	2	2887, M.C.Z.	
Off Key West	Sand Key Light bearing W. NW., Key West Light bearing N.		60			June 19, 1893	24	State Univ. Iowa Bahama Exped.	2♂ 2♀	In S. U. I.	
Do	Sand Key Light bearing NW. by N., Key West Light N. ½ E.		50–60			do	27	do	1♂	do	

Do	Sand Key Light bearing W. 1/2 N., about 6 1/2 miles.				20		June 24, 1893	30	do	2♂	do		
Off Sombrero					54			(1)	*Bache*, W. Stimpson.			2954, M.C.Z.	
Yucatan Channel	22	18	00	87 04 00	24	wh. R. Co.	Jan. 30, 1885	2365	*Albatross*	1♂ 3♀		18082	
Do	22	08	30	86 40 00	26	wh. Co.	do	2360	do	1♂ 1♀		18080	
Do	22	07	30	87 06 00	21	wh. R. Co.	do	2363	do	1♀		18274	
Colombia: Gulf of Morrosquillo.	9	30	15	76 20 30	42	gm. M. S.	Mar. 23, 1884	2142	do	1♀		7780	
Barbados	Lazaretto bears SE. by E., 1/2 mile off shore.				35	rky	May 24, 1918	42	State Univ. Iowa Barbados-Antigua Exped.	1♂		Mus. S. U. I.	
Do	Cable station bears E. by S., Lazaretto E. SE. 1/2 S.				35-60	mostly rky., on steep slope.	June 3, 1918	75	do	1♂	do		
Do	Paynes Church, E. NE. and the Lazaretto, SE. by S., off shore 1/2 mile.				50	rky	May 31, 1918	64	do	1♀	do		Incorrectly identified as *P. hypoglypha*.
Brazil: Off Cape Frio					35				*Hassler*	1 ovig. ♀		1835, M.C.Z.	

[1] 5th sounding.

PODOCHELA HEMPHILLII (Lockington)

Plate 18; plate 209, fig. 2

Microrhynchus hemphillii LOCKINGTON, Proc. California Acad. Sci., vol. 7, 1876 (1877), p. 30 [3] (type-locality, Bay of San Diego, 7 fathoms; type destroyed in San Francisco earthquake, 1906).

Inachoides (*Microrhynchus*) *hemphillii* LOCKINGTON, Proc. California Acad. Sci., vol. 7, 1876 (1877), p. 75 [13].

Inachodes hemphilli STREETS and KINGSLEY, Bull. Essex Inst., vol. 9, 1877, p. 104.

Podochela tenuipes RATHBUN, Proc. U. S. Nat. Mus., vol. 16, 1893, p. 224 (type-locality, Catalina Harbor, Santa Catalina Island, California; type, Cat. No. 17505, U. S. N. M.). Identity with *P. hemphillii* determined by Dr. S. J. Holmes who examined the type of the latter.

Podochela hemphillii RATHBUN, Proc. U. S. Nat. Mus., vol. 21, 1898, p. 569; Harriman Alaska Exped., vol. 10, 1904, p. 171, pl. 10, fig. 2.—HOLMES, Occas. Papers California Acad. Sci., vol. 7, 1900, p. 17.—SCHMITT, Univ. California Publ. Zool., vol. 23, 1921, p. 195, text-fig. 120, and synonymy.

Diagnosis.—Rostrum acuminate or spinous. Postorbital lobe small or minute. Fingers of adult male widely gaping. First pair of ambulatory legs about three times length of carapace.

Description.—Carapace without prominent tubercles on dorsal surface; cardiac region low except in very large specimens; gastric region rounded, bearing five tufts of curved setae, two of which are on either side forming a rectangle and the fifth posterior and median; branchial regions flattened, having a longitudinal row of curved setae across its surface and a tuft of the same at the inner angle;

hepatic region tumid and bearing a spine or tubercle. Pterygostomian ridge having a similar tubercle at its middle. Rostrum thick, triangulate, longer than broad and varying considerably in length, acuminate, with two double rows of curved setae above. A small postorbital spine or tubercle. Segments of male sternum convex, deeply separated.

Basal antennal article narrow anteriorly; posteriorly it bears a thick, compressed protuberance nearer the inner than the outer margin. Chelipeds in adult male robust, pubescent; merus trihedral, curved, outer margin spiny; carpus with a supero-posterior spine; palm inflated and with several spiny projections, especially on lower edge; fingers shorter than palm, gaping in basal three-fifths. Chelipeds in female and young slender, hands semicylindrical, fingers nearly meeting. Legs long and slender, especially of first two pairs, long-hairy, hairs on upper surface curled; dactyli falciform, dentate, in the first pair about one-third the length, in the other pairs about half the length of the penultimate articles; these last have no thumb-processes but in the last two pairs are slightly thickened in distal half.

Color.—Plain pale brown (Hilton). Some formalin specimens are brown and white mixed.

Measurements.—Male (21862), length of carapace 24.1, width 16, length of first leg about 57.5 mm. Female (50614), length of carapace 18.2, width 13.3 mm.

Range.—From San Luis Obispo, California (Lockington), to Gulf of California. Depth, 1 to 47 fathoms.

Material examined.—See table, page 51.

PODOCHELA CURVIROSTRIS (A. Milne Edwards)

Plates 19 and 210

Anisonotus curvirostris A. Milne Edwards, Crust. Rég. Mex., 1879, p. 196, pl. 36, figs. 3–3*d* (type-localities, Barbados, 100 fathoms, and near Havana, 127 fathoms; cotypes in M. C. Z.).—A. Milne Edwards and Bouvier, Mem. Mus. Comp. Zoöl., vol. 47, 1923, p. 364, pl. 10, figs. 4 and 5, text-figs. 14 and 15.

Podochela spinifrons Rathbun, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 51 (type-locality, off Havana, 199 fathoms; holotype, Cat. No. 9510, U. S. N. M.).

Diagnosis.—Rostrum terminating in a long arched spine. Postorbital tooth well developed. Bases of legs ornamented with laminiform plates inclosing shallow cavities. Sternum of male formed of plates separated by deep grooves.

Description.—Carapace spinuliferous; an erect cardiac spine; gastric region with a spine directed forward and in front of it a spiny tubercle; rostrum long, sharp, arched, a median spiniferous crest; orbit with an erect crest bearing spinules and two slender spines;

Material examined of Podochela hemphillii

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	° ′ ″	° ′ ″			°F						
California:											
Off Venice, Santa Monica Bay.						Aug. 8, 1913		*Anton Dohrn*	1 ovig. ♀	50225	From Venice Mar. Biol. Station.
Laguna Beach			12-15					W. A. Hilton	1♂ 3♀ (2 ovig.)	50613-50616	
Isthmus Harbor, Santa Catalina Island.						Jan. 1, 1913		*Anton Dohrn*	3♂ 1 ovig. ♀	50223	From Venice Mar. Biol. Station.
Catalina Harbor								W. H. Dall	11	17505	1♂ is holotype of *P. tenuipes*.
Do						Apr. 1, 1915		*Anton Dohrn*	1♂	50262	
Entrance to Catalina Harbor.						Dec. 30, 1912		do	4♂ 4♀ (1 ovig.)	50222, 50224	
			Meters								
San Diego Bay	32 40 42	117 08 48	2-3 *Fathoms*	gn. M		June 18, 1909	1663	Scripps Inst	1♂	Scripps Inst.	
Lower California (outer coast):											
Off Cerros Island	27 54 12	115 08 00	33	brk. Sh		Sept. 1, 1908	1631	do	10♂ 7 ovig. ♀	do	
Magdalena Bay	24 38 00	112 05 30	17	fne. gy. S	65	Apr. 9, 1889	3042	*Albatross*	1♀	17328	
Do	24 32 00	111 59 00	12	fne. gy. S		May 2, 1888	2831	do	3♂ 4♀	21862	
Off Santa Margarita Island.	24 27 00	111 59 00	47	fne. yl. S	68.5	Apr. 8, 1889	3039	do	2♂ 1♀	17327	
Off Point Marques	23 47 45	111 23 00	325	dk. gn. M. For.	44.1	Mar. 22, 1911	5679	do	1♂	55763	Depth excessive. Perhaps an error in station number.
Off Cape St. Lucas	22 52 00	109 55 00	31	rky	74.1	May 1. 1888	2829	do	3♂	21861	
Gulf of California:											
East of La Paz	24 11 30	109 55 00	10	Sh		Apr. 30, 1888	2828	do	1♀	21860	
Off San José Island	24 54 30	110 39 00	39	crs. S	63.6	Mar. 16, 1889	2999	do	1♂	17326	
Do	24 55 15	110 39 00	33	fne. gy. S. brk. Sh.	64.5	do	3001	do	1♀	17329	
San Estaban Island						Apr. 14, 1911		do	1♂	Amer. Mus	
Off Cape San Miguel	29 30 00	112 40 00	45					Lieut. H. E. Nichols, U.S.N.	1♀	18009	

antennal article largely visible from above, bearing a spine at anterior angle; an oblong postorbital lamina and behind and below it a flat triangular tooth; these two teeth correspond in position to the small tubercles present in *P. gracilipes* and other species. Hepatic region much dilated laterally and ventrally, its spine narrow, flattened, obtuse; a similar pterygostomian spine; buccal cavity conspicuously crested at anterior angle; basal antennal article with a cristiform inner margin and an angular ridge on posterior half. Sternal crests in male flat, tuberculate, separated by deep sulci; crests on coxae of legs similar to those of *P. lamelligera* but less prominent; anterior part of male sternum pubescent, two stout spines in front of abdomen, projecting downward and forward; first segment of abdomen bears a spiniform tubercle at distal end.

Chelipeds in both sexes slender, hirsute, spinuliferous; fingers in contact. Legs very hairy except slender, yellow, horny tips of dactyls; propodites slender, dactyls slightly curved.

Measurements.—Male (9510), length of carapace 22, width 15 mm.; female (6945), length 21, width 13.5 mm. Male (A. M. Edwards), length 29, width 16 mm.

Range.—Straits of Florida and Yucatan Channel to Barbados and Carriacou. Depth, 73 to 201 fathoms.

Material examined.—See table, page 53.

PODOCHELA LAMELLIGERA (Stimpson)

Plate 20, figs. 1 and 2

Podonema lamelligera Stimpson, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 126 (type-locality, off Tennessee Reef, 21 fathoms; type not extant).

Podochela lamelligera A. Milne Edwards, Crust. Rég. Mex., 1879, p. 193.—Rathbun, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 49.

Diagnosis.—Rostrum short, pointed. Postorbital tooth well developed. Bases of legs ornamented with laminiform plates enclosing cup-shaped cavities. Sternum of male formed by overlapping plates.

Description.—Cardiac region protuberant; gastric region with two small pointed tubercles, the posterior the more elevated. Rostrum triangular, rough above, tapering to a sharp point, hollow underneath. Orbits with erect, spinuliferous margins. Postorbital tooth triangular, laminiform. Farther back and lower down, at either extremity of epistome, there is a smaller tooth. Hepatic projection tipped with a slender spine. Angle of buccal cavity cristate. A large tooth in the middle of the pterygostomian crest. At the base of each cheliped two thin plates project downward and inward, and there are also two on the sternum at the extremity of the male abdomen. Sternal plates broad, thin, spinulous, their posterior margins turned downward and overlapping the next plate. Coxal segment of each

Material examined of Podochela curvirostris

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	° ′ ″	° ′ ″			°F						
Off Havana, Cuba	23 10 40	82 20 30	201	Co		May 1, 1884	2167	*Albatross*	1 ovig. ♀	6945	
Do	23 10 39	82 20 21	199	Co		Jan. 19, 1885	2337	do	1♂	9510	Holotype of *P. spinifrons.*
Do			127			1877–78	65	*Blake*	1♂	3034, M.C.Z.	Cotype.
Off Arrowsmith Bank, Yucatan.	20 59 30	86 23 45	130	Co		Jan. 22, 1885	2354	*Albatross*	1♀	18094	
Off Montserrat			120			1879	157	*Blake*	1	3032, M.C.Z.	
Off Barbados	13 11 54	59 38 45	73	Co. S. Sh	70.75	Mar. 9, 1879	290	do	1	2890, M.C.Z.	
Do			100					*Hassler*		3031, M.C.Z.	Cotype.
Off Carriacou, Grenadines	12 28 22	61 32 18	163	S. Co	53	Feb. 24, 1879	241	*Blake*		3033, M.C.Z.	

Material examined of Podochela lamelligera

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.
	° ′ ″	° ′ ″			°F					
Gulf Stream, off Cape Florida	2⅛ miles S. SE. of Fowey Rocks Light.		45	rky	70	Mar. 25, 1903	7511	*Fish Hawk*	1 ovig. ♀	47047.
Off Key West	24 25 45	81 46 45	45	Co	75	Jan. 15, 1885	2317	*Albatross*	1♂ 1♀	18076.
Do	Sand Key Light, W. NW.; Key West Light, N.		60			June 19, 1893	24	State Univ. Iowa Exped.	1♀	Mus. S. U. I.
Gulf of Mexico, south of Apalachicola	28 45 00	85 02 00	30	gy. S. brk. Co		Mar. 15, 1885	2405	*Albatross*	1♂	18077.

ambulatory leg furnished on the lower side with a cup-shaped expansion.

A small acute tooth projects forward from the antero-external angle of the basal antennal article; laminiform margins very prominent, especially the inner one, which is deepest at about its middle, at which point there is a transverse, bilobed crest on the article. Inter-antennular partition prolonged downward at middle in a sharp tooth.

Chelipeds of both sexes with palm not dilated and fingers almost meeting throughout their length. First pair of legs much longer than those following, merus rather stout; all the legs have a long propodus with a very slight thumb-process, and a little-curved dactylus.

Measurements.—Male (18076), length of carapace 18, width 12.5 mm. Female (18076), length 20, width 16, length of first leg 60 mm.

Range.—Florida, from Cape Florida through Straits of Florida to Gulf coast. Depth, 21 to 60 fathoms.

Material examined.—See table, page 53.

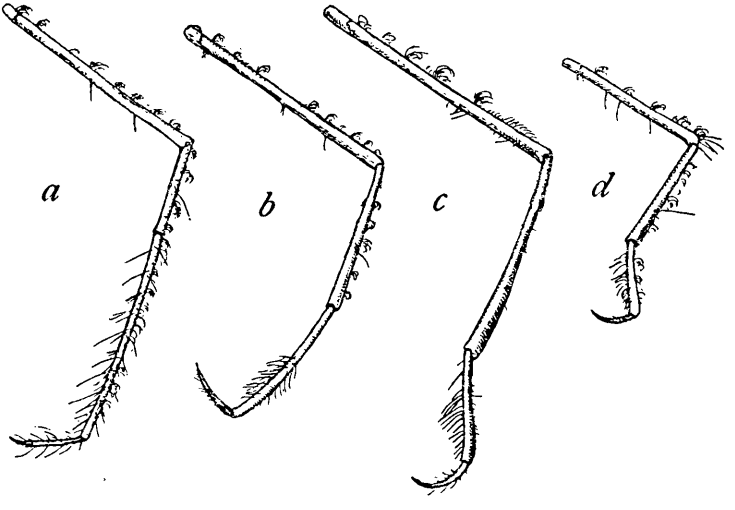


FIG. 13.—PODOCHELA BARBARENSIS, × 2. LEGS 1, 2, AND 4 ARE CAT. NO. 29955, U.S.N.M., AND MAY BE FROM DIFFERENT SPECIMENS; LEG 3 IS CAT. NO. 48256, U.S.N.M. *a*. FIRST LEG. *b*. SECOND LEG. *c*. THIRD LEG. *d*. FOURTH LEG

PODOCHELA BARBARENSIS Rathbun

Plate 20, figs. 3 and 4

Podochela barbarensis RATHBUN, Proc. U. S. Nat. Mus., vol. 64, art. 14, 1924, p. 1 (type-locality, off Brockway Point, Santa Rosa Island, California; 38–45 fathoms; station 4431, *Albatross;* 2 males, Cat. No. 48256, U.S.N.M.).

Diagnosis.—Rostrum a long spine. Antennae filiform. First leg very much longer than the others. Two median tubercles on first segment of abdomen.

Material examined of Podochela barbarensis

Locality	Bearings		Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″			°F						
California: Off Santa Rosa Island	Brockway Point, Santa Rosa Island, S. 35° W., 3.5 miles.		38–45			Apr. 15, 1904	4131	*Albatross*	2♂	48236	1 male is holotype.
Off Santa Catalina Isl			50					H. N. Lowe	7♂ 3♀ (1 ovig.)	29955	
Mexico: W. of Los Coronados Islands.	32 23 42	119 06 00	50	crs. S. bk. M.		July 17, 1908	1556	Scripps Inst.	3♂ 4♀	Scripps Inst.	
Do	32 23 42	119 06 00	50	crs. S.		do	1555	do	2♂ 2♀	do	
Do	32 23 30	119 05 48	50	crs. S.		do	1552	do	1♂ 1♀	do	
Do	32 23 12	119 05 24	48	crs. S.		do	1551	do	1♂ 1♀ ovig.	do	

Description.—A hairy species. Cardiac region with a large conical elevation; two median gastric tubercles, the anterior the smaller; two blunt median tubercles on first segment of abdomen. A prominent strapshaped spine on hepatic region; a small, similar one on the pterygostomian ridge, and a still smaller postorbital spine; some spinules in front of the angles of the buccal cavity, a few of which are visible in dorsal view. Orbital arch finely spinulous. Rostrum a long, slender, gradually diminishing spine, varying from three-fifths, in the largest, to one-half, in the smallest, as long as the postrostral portion of the carapace. Antennae overreaching the rostrum, filiform, the movable articles of the peduncle as well as the flagellum unusually slender; the basal article has laminate anterior and outer margins, the latter spinulous.

Chelipeds moderately enlarged, spinulous, especially on and near the margins, and hairy, the hairs entangling mud, foraminifera, etc. A spine at outer distal end of merus; a stout, spinuliferous knob on outer surface of carpus; chela widest behind middle of palm, thence tapering to end of fingers; gape correspondingly narrow, one tooth on the dactyl at middle of gape may be somewhat enlarged. First ambulatory leg three times (in largest specimen) as long as carapace with rostrum; merus and propodus equal, nearly twice as long as carpus and three times as long as dactylus, which is very slender and slightly curved. Dactyli of remaining legs falcate. In the second leg the car-

pus and propodus are equal, nearly two-thirds as long as merus and two and a half times as long as dactylus. (See *Measurements.*)

The sternum is deeply grooved between segments, the tubercles in line with base of chelipeds are very large and flattened antero-posteriorly.

Measurements.—Male, holotype, length of carapace 23.8, length of rostrum 9, width of carapace 12.7 mm. The legs are nearly all detached and those measured belong to four different males:

Leg	*merus*	*carpus*	*propodus*	*dactylus*
1	23	12	23	7.4
2	11	7.5	7.5	3
3	16.2	13.2	7	4.2
4	7	7	4	3

Range.—Santa Barbara Islands, California; northern extremity of Mexico. Depth, 38 to 50 fathoms.

Material examined.—See table, page 55.

PODOCHELA LATIMANUS (Rathbun)

Plate 21

Ericerus latimanus RATHBUN, Proc. U. S. Nat. Mus., vol. 16, 1893, p. 224 (type-locality, Gulf of California, 11 fathoms, station 3024, *Albatross;* holotype, Cat. No. 17324, U.S.N.M.).

Diagnosis.—Rostrum a long spine nearly equaling postrostral length of carapace. A postorbital tubercle present. Sternum almost smooth. Chelipeds dilated.

Description.—Male: Cardiac region elevated, conical; branchial regions swollen, a tubercle on their antero-lateral margin; gastric region with two median tubercles, the anterior the smaller; hepatic region not prominent, bearing a marginal tubercle; pterygostomian ridge with a tubercle; postorbital tubercle small, midway between orbit and buccal cavity. Rostrum a triangulate, acuminate spine nearly as long as the remainder of the carapace, posteriorly hollow beneath, anteriorly upturned. Orbital arch thickened. Basal antennal article partially visible from above, a tooth at its antero-external angle, from which a convex ridge extends backward and inward; flagellum visible at sides of rostrum. Surface of maxillipeds spinulous.

Inner surface of chelipeds spinulous; outer margin of merus irregularly lobed; a spine at distal end above and on inner side; carpus with a stout external, and also anterior, spine. Palm dilated, fingers gaping; in the gape there is a truncate and a spiniform tooth on the dactyl and a triangular tooth on the immovable finger. First pair of ambulatory legs about one and two-thirds, second pair one and one-third, times the total length of the carapace; fourth pair not so

long as the carapace. Propodus slightly thickened distally, about one and two-thirds times the length of the dactylus in the first pair and one and a half times in the remaining pairs.

The sternum has very slight depressions between the segments, and two stout cylindrical spines tipped with a granule at the base of the chelipeds. A tubercle on first abdominal segment.

Measurements.—Male, holotype, length of carapace with rostrum 26, length of rostrum from anterior margin of orbit 12.3, width of carapace 12.3 mm.

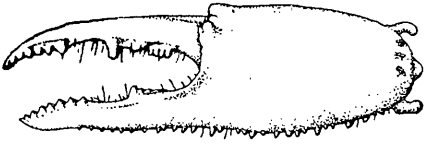


FIG. 14.—PODOCHELA LATIMANUS, MALE HOLOTYPE, LEFT CHELA, × 5.3

Range.—Gulf of California, Mexico. To a depth of 11 fathoms.

Material examined.—Off Adair Bay, Mexico, in Gulf of California; lat. 31° 21′ 00″ N.; long. 113° 49′ 00″ W.; 11 fathoms; S. brk. Sh. G.; temp. 67° F.; Mar. 25, 1889; station 3024 *Albatross;* 1 male, holotype (17324).

Patos Island, Gulf of California; anchorage; 4½ fathoms; April 23, 1921; Fred Baker, California Academy Expedition; 2 males, 2 females (1 ovigerous) (Cal. Acad. Sci.).

Concepcion Bay, Lower California (gulf coast); March 19, 1889; *Albatross;* 1 male (17325).

PODOCHELA LOBIFRONS Rathbun

Plate 11, figs. 3 and 4

Podochela (*Coryrhynchus*) *lobifrons* RATHBUN, Proc. U. S. Nat. Mus., vol. 16, 1893, p. 226 (type-locality, off Abreojos Point, Lower California, 58 fathoms; holotype, Cat. No. 17331, U. S. N. M.).

Diagnosis.—Postorbital and hepatic lobes large. Carpus of chelipeds rough with spinules single or clustered. Dactylus of first ambulatory leg very long, half as long as propodus.

Description.—Carapace covered with a short, dense pubescence; margins of lobes, of basal antennal article, of all ventral ridges, rough with sharp granules; chelipeds rougher than in other species, armed not only on the margins but elsewhere with spinules, largest on the upper and lower edges of the palm. The type and only specimen known is of large size and in a very soft-shelled condition. The front is very short and bilobed; in spite of the symmetry of the lobes, it is probable that the rostrum has been accidentally abbreviated, as the basal antennal article extends far beyond it and the antennular cavities are anteriorly incomplete. A deep sulcus surrounds the cardiac region except in front. Postorbital lobe large. The long thin

hepatic lobe projects obliquely forward and slightly downward; close behind it shows in dorsal view the large pterygostomian lobe, and in front of it the obtuse angle of the buccal cavity.

Segments of sternum rounded and deeply separated; in front of the abdomen a rounded lobe on each side close to base of cheliped. Basal antennal article strongly angled, the extremity of the ridges accented.

Chelipeds stout, bordered by long straight hairs on lower edge of ischium and adjacent parts of merus, on upper edge of remainder of

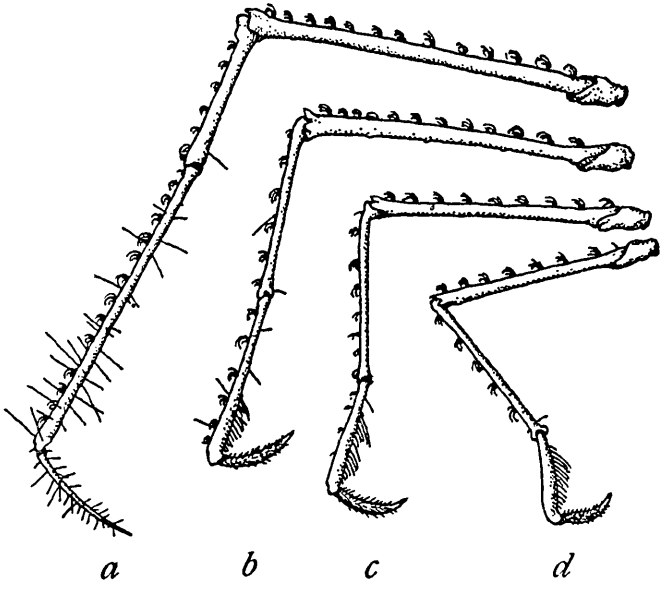


FIG. 15.—PODOCHELA LOBIFRONS, MALE HOLOTYPE, CARAPACE 20.5 MM. LONG. *a*. FIRST LEG. *b*. SECOND LEG. *c*. THIRD LEG. *d*. FOURTH LEG

cheliped (hairs directed inward), on both edges of fingers and outer surface of dactylus. Some of the spinules are clustered on tubercles, as on the ischium, and the outer surface of the carpus. Distal two-fifths of fingers in contact, remainder gaping, leaving an oval interspace into the middle of which an enlarged tooth of the dactylus projects.

Legs slender. First leg three times as long as the carapace, propodus twice as long as the slender and little curved dactylus; second two and a third times, third twice, and fourth one and three-fifths times, as long as carapace; second, third, and fourth dactyli equally curved, the second perceptibly longer; second propodus nearly three times as long as its dactylus, third and fourth propodites nearly one and three-fourths times their respective dactyli.

Measurements.—Male, holotype, length (perhaps incomplete) of carapace 20.5, width 18 mm.

Range.—Known only from off Abreojos Point, Lower California: lat. 26° 16′ 15″ N.; long. 113° 42′ 15″ W.; 58 fathoms; gy. S. brk. Sh.; temp. 56° F.; April 10, 1889; station 3044, *Albatross;* 1 male holotype (17331).

Genus INACHOIDES Milne Edwards and Lucas

Xiphus Eydoux and Souleyet, Voy. *Bonite*, atlas, 1842 (?), pl. 1, figs. 1–6; type, *Xiphus margaritifère* Eydoux and Souleyet.

Inachoides Milne Edwards and Lucas, d'Orbigny's Voy. l'Amér. Mérid., vol. 6, pt. 1, Crust., "1843," p. 4; type, *Inachoides microrhynchus* Milne Edwards and Lucas.—Eydoux and Souleyet, Voy. *Bonite*, vol. 1, pt. 2, 1842 (?), p. 219.[16]—Dana, Amer. Journ. Sci., ser. 2, vol. 11, 1851, p. 432; Crust. U. S. Expl. Exped., pt. 1, 1852, p. 83; pt. 2, 1853, p. 1421.—A. Milne Edwards, Crust. Rég. Mex., 1879, p. 198.

Carapace longer than broad; cardiac, branchial, and gastric regions swollen. A preorbital spine may be present or absent. Postorbital tooth present, small, and pointing outward. Rostrum short and simple, with triangular base, terminating in a spine. Basal antennal article with an antero-external tooth; flagellum exposed from its insertion. Merus of outer maxillipeds cut at the antero-internal angle for insertion of palpus; antero-external angle rounded. Abdomen of male with six segments, of female with five. Chelipeds of male enlarged; palms swollen. Ambulatory legs slender, of medium length, first pair longest; subprehensile, the propodal segments more or less enlarged distally; dactyli curved, folding against the propodi.

Restricted to America, on the west coast from Magdalena Bay, Lower California, Mexico, to Valparaiso, Chile, and on the east coast from the Gulf of Mexico (west coast of Florida) to Desterro, Brazil.

KEY TO THE SPECIES OF THE GENUS INACHOIDES

A[1]. Carapace with tubercles and granules. Antennal spines incurved at tip. microrhynchus, p. 60.

A[2]. Carapace nearly smooth dorsally except for a cardiac tubercle. Postorbital spine minute. Antennal spines divergent.....laevis, p. 61.

Species on both sides of the continent: *laevis.*

[16] This synonymy is arranged in the sequence vouched for by Eydoux and Souleyet (Voy. *Bonite*, vol. 1, pt. 2, 1842 (?), p. 219), who, however, omit dates. It is obvious that the dates here given can not all be correct.

INACHOIDES MICRORHYNCHUS Milne Edwards and Lucas

Plate 22, figs. 1 and 2

Xiphus margaritifère EYDOUX and SOULEYET, Voy. *Bonite*, atlas, 1842 (?) pl. 1, figs. 1–6 (type-locality, Cobija, Chile; type in Paris Mus.).

Inachoides microrhynchus MILNE EDWARDS and LUCAS, d'Orbigny's Voy. l'Amér. Mérid., vol. 6, pt. 1, Crust., 1843, p. 5; atlas, vol. 9, 1847, pl. 4, figs. 2–2*m* (type-locality, Chile; type in Paris Mus.).—NICOLET, in Gay, Hist. Chile, Zool., vol. 3, Crust., 1849, p. 126 (*microrynchus*).—MIERS, Proc. Zool. Soc. London, 1881, p. 65.—RATHBUN, Proc. U. S. Nat. Mus., vol. 38, 1910, p. 533, pl. 36, fig. 1.

Inachoides inornatus A. MILNE EDWARDS, Journ. Mus. Godeffroy, vol. 4, 1873, p. 77 (type-locality, "les îles Viti;" [17] type in Mus. Godeffroy, Hamburg).—ORTMANN, Zool. Jahrb., Syst., vol. 7, 1893, p. 38.

Diagnosis.—Carapace tuberculate and granulate. Postorbital tooth with anterior margin transverse. Antennal spines incurved at tip. Chelipeds longer than ambulatory legs.

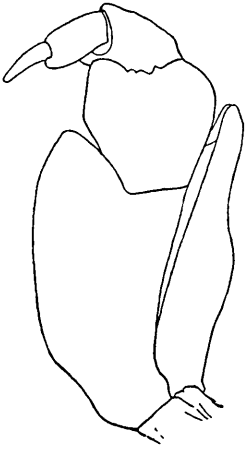


FIG. 16.—INACHOIDES MICRORHYNCHUS (18056), MAXILLIPED, × 17

Description.—Cardiac region surmounted by a tubercle and perhaps a few granules, otherwise smooth. Gastric region with two median tubercles, the anterior of which is the largest of a transverse row of five; each of the terminal tubercles of this row has usually a tubercle in front of it. Branchial region with two irregular, longitudinal series of tubercles, one marginal, the other considerably higher and separated from the first and from the inner border by a smooth space. Hepatic region with marginal tubercles, a larger one at anterior angle. Rostrum triangular, longer than its width at base, acute, and with a shallow median sulcus in its posterior half. Orbital border elevated, granulate, surmounted by a tubercle or blunt tooth. Postorbital tooth triangular, its anterior border transverse or nearly so.

Abdomen of both sexes medially carinate, a tubercle on the first segment in the old. Sternum of male sparsely granulate. Basal segment of antenna with two finely granulate crests meeting in an acute antero-external tooth visible at the sides of the rostrum. Maxillipeds granulate.

Chelipeds of male strong, about one and a half times length of carapace; palms swollen; fingers narrowly gaping except near the extremities; an enlarged tubercle near middle of fixed finger. Ambulatory legs shorter than the chelipeds in adult males; upper sur-

[17] This locality is an error; it should be Valparaiso; see Ortmann, Zool. Jahrb., Syst., vol. 7, 1893, p. 38.

face of propodites terminating in a rounded lobe, produced beyond the articulation of the falciform dactyli.

Color.—Bright bottle green (Edwards and Lucas).

Measurements.—Male (40463), length of carapace 17.7, width 14 mm. Male, type, length 30, width 21 mm. (Edwards and Lucas).

Range.—Peru and Chile, as far south as Valparaiso.

Material examined.—

Bay of Sechura, Peru; dredged about half way between Bayovar and Matacaballa; 5 to 6 fathoms; Apr. 10, 1907; R. E. Coker, collector; 2 males, 1 female (40463), received from Peruvian Government.

Paraca Bay, Peru; U. S. C. S. S. *Hassler;* 1 ovigerous female (2051, M. C. Z.).

Caldera, Chile; U. S. C. S. S. *Hassler;* 1 male, 1 ovigerous female (1837, M. C. Z.).

Valparaiso, Chile; U. S. C. S. S. *Hassler,* 1 male (1838, M. C. Z.); 2 females (18056), purchased from Henry A. Ward; 1 male (Copenhagen Mus.), obtained from Museum Godeffroy and labeled "*I. inornatus.*"

INACHOIDES LAEVIS Stimpson

Plate 22, figs. 3–6

Inachoides laevis Stimpson, Ann. Lyc. Nat. Hist. New York, vol. 7, 1860, p. 192 [64] (type-locality, Panama; cotype, Cat. No. 1247, M. C. Z.).—A. Milne Edwards, Crust. Rég. Mex., 1879, p. 200.

Inachoides forceps A. Milne Edwards, Crust. Rég. Mex., 1879, p. 199, pl. 33, figs. 4–4*d* (type-localities, Guiana, and Desterro, Brazil; types in Paris Mus.).

Inachoides obtusus A. Milne Edwards, Crust. Rég. Mex., 1879, p. 199, pl. 33, figs. 3–3*d* (type-locality, Guadeloupe; type in Paris Mus.).

Inachoides intermedius Rathbun, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 57 (type-locality, off Rio de Janeiro; holotype, Cat. No. 19942, U.S.N.M.); Bull. U. S. Fish. Comm., vol. 20, for 1900, pt. 2 (1901), p. 59.

Diagnosis.—Carapace nearly smooth. Postorbital spine minute. Antennal spines divergent. Immovable finger of male arched downward at its middle.

Description.—Body and appendages covered with a soft pubescence. Regions of carapace protuberant, rounded; cardiac region with a median tubercle; hepatic region produced to a submarginal, deflexed tubercle; a small tubercle on margin of branchial region, above base of cheliped; otherwise the regions are smooth. The rostrum has a triangular base and a styliform extremity as long as the base. Supraorbital arch furnished with a tubercle which may be acute or be altogether absent. Postorbital tooth or spine minute. On the infero-lateral regions, in front of the bases of the chelipeds, one or two branchial tubercles and one pterygostomian.

The basal segment of the antenna has on its margins two ridges which anteriorly converge, and at its external angle an oblique spine or tooth visible from above; the marginal ridges may be smooth to the naked eye or more or less denticulate or spinulous.

The maxillipeds have a longitudinal, denticulate ridge on the outer part of the ischium; antero-internal corner of merus projects sharply and obliquely forwards.

Chelipeds of male long and heavy in comparison to the body; merus subcylindrical; palm stouter, increasing distally, margins convex, surface sparingly spinulous, spinules arranged more or less in rows, especially along the margins of the inner surface; both fingers curved, a larger tooth at base of the fixed finger, which is strongly bent down in male, leaving a narrow, oval gape.

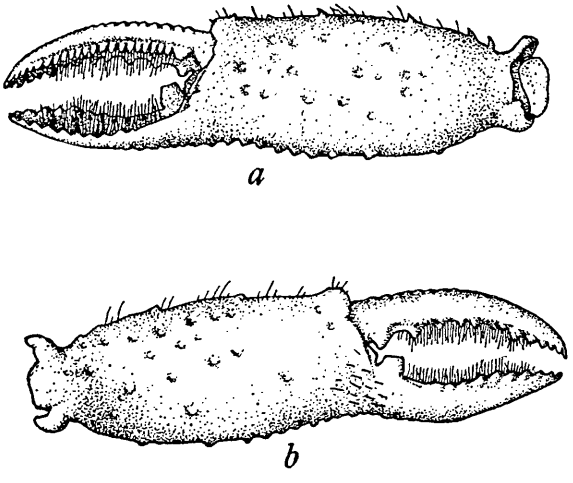


FIG. 17.—INACHOIDES LAEVIS, MALE (43023), RIGHT CHELA, 6.3 MM. LONG. *a*. INNER SIDE. *b*. OUTER SIDE.

The second, third, and fourth ambulatory legs are nearly the same length, the carpus and propodus are subequal to each other, and the dactylus falciform; first leg not much longer but slenderer, dactylus straighter.

Sternum of male with a large tubercle on either side in front of the abdomen.

Variations.—A most variable species. Differs in proportion of length to breadth of carapace, in length of rostrum, smoothness of carapace, in roughness of margins of basal article of antenna and size of tubercles on hand. See notes under "Material examined."

Measurements.—Male, cotype, length of carapace 10.7, width 8.2, length of cheliped 22.8 mm.

Range.—From west coast of Florida to Desterro, Brazil; from Magdalena Bay, Mexico, to Panama.

Material examined.—

Deadmans Bay section, Florida; *Fish Hawk;* lat. 29° 37′ 00″ N.; long. 83° 35′ 15″ W.; 3.5 fathoms; S. G.; temp. 15° C.; December 6, 1901; station 7206; 1 male, soft shell (47076).

Pepperfish Key section, Florida; *Fish Hawk;* lat. 29° 08′ 45″ N.; long. 83° 28′ 00″ W.; 6.25 fathoms; S. G.; temp. 16° C.; November 27, 1901; station 7170; 1 ovigerous female (47077). Antennal ridges denticulate.

North Key section, Florida; *Fish Hawk;* lat. 28° 54′ 00″ N.; long. 83° 30′ 30″ W.; 11 fathoms; R. Co. S.; temp. 17° C.; November 28, 1901; station 7185; 1 male (47078); antennal ridges granulate.

Off Northwest Channel, Florida; *Fish Hawk;* lat. 24° 44 ′50″ N.; long. 81° 55′ 50″ W.; 10.25 fathoms; hard, smooth; temp. 19° C.; February 24, 1902; station 7292; 1 ovigerous female (47079); no cardiac tubercle; antennal ridges distinctly denticulate.

Jamaica; 1910; E. A. Andrews; 1 male, 1 female (43023); nearest approach to *I. forceps*, pl. 33, fig. 4, cited.

Montego Bay; 1910; E. A. Andrews; 1 female (43022); antennal ridges faintly granulate.

Mayaguez, Porto Rico; Jan. 19 and 20, 1899; *Fish Hawk;* 2 males, 1 female (24185); small specimens; 3 large tubercles on hand, as in 24186; antennal ridges slightly rough.

Boqueron Bay, Porto Rico; Jan. 25 and 27, 1899; *Fish Hawk*; 3 males, 1 female (24186); largest male, depressed tubercles on cardiac and gastric regions, 3 large tubercles on hand; nearest approach to *I. obtusus*, pl. 33, figs. 3 and 3*d*, cited.

St. Thomas; 1915; C. R. Shoemaker collector; gift of Carnegie Institution: 1 male, from piles near town (50997), antennal ridges nearly smooth; 1 small female (55487); 1 ovigerous female (55488).

Rio de Janeiro, Brazil: Dredged; 1876–77; R. Rathbun; 1 female, holotype of *I. intermedius* (19942); antennal ridges slightly roughened. Thayer Exped.; received 1865; 1 male, 4 ovigerous females (1833, M. C. Z.). Rat Island, Rio de Janeiro; U. S. C. S. S. *Hassler;* 2 males, 3 ovigerous females (1834, M. C. Z.).

Lower California; Magdalena Bay; 1917: C. R. Orcutt; 1 female (50641); a sharp supraorbital tubercle; antennal ridges nearly smooth.

Panama: Rev. J. Rowell; 1 male, cotype of *I. laevis*, received from Smithsonian Institution (1247, M. C. Z.). May, 1869; Dr. Sternberg; 1 male (2044, M. C. Z.).

Genus ANASIMUS A. Milne Edwards

Anasimus A. MILNE EDWARDS, Crust. Rég. Mex., 1880, p. 350; type, *A. fugax* A. Milne Edwards; Bull. Mus. Comp. Zoöl., vol. 8, 1880, p. 9.—RATHBUN, Bull. U. S. Fish Comm., vol. 20, for 1900, pt. 2 (1901), p. 58.

Carapace pyriform or ovate, very convex, armed with spines; rostrum simple, pointed, ascending. Eyes large. Postorbital spine usually prominent. Supraorbital spine present. Basal article of outer antenna long and narrow, terminating in a spine. Exognath of outer maxillipeds broad posteriorly, very narrow anteriorly; merus of endognath narrow at its base, deeply cut at its antero-internal angle for insertion of palpus, and strongly auriculate behind insertion. Sternum forming a considerable angle with the plane of the maxillipeds. Chelipeds of moderate length, the palms swollen in male; fingers long and slender, of nearly equal length and more than twice the length of carapace; dactyli long.

Inhabits the Atlantic coast of America from South Carolina to Cape Frio, Brazil.

KEY TO THE SPECIES OF THE GENUS ANASIMUS

A[1]. Carapace much longer than broad.
  B[1]. Three spines in longitudinal row on branchial region. Interantennular tooth well developed ..... **fugax**, p. 64.
  B[2]. Two spines in a longitudinal row on branchial region. Interantennular tooth shallow ..... **latus**, young, p. 65.
A[2]. Carapace nearly as broad as long, subcircular ..... **latus**, old, p. 65.

ANASIMUS FUGAX A. Milne Edwards

Plate 23, figs. 5 and 6; plate 211

Anasimus fugax A. MILNE EDWARDS, Crust. Rég. Mex., 1880, p. 350, pl. 31 *A*, figs. 1–1*d* (type-localities, near Santa Cruz, 115 fathoms, and near Barbados, 56 and 82 fathoms; cotype from Santa Cruz in Paris Mus.; 2 cotypes from Barbados in M. C. Z.); Bull. Mus. Comp. Zoöl., vol. 8, 1880, p. 9.—RATHBUN, Bull. U. S. Fish Comm., vol. 20, for 1900, pt. 2 (1901), p. 59 (part).—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zoöl., vol. 47, 1923, p. 366, text-fig. 16.

Diagnosis.—Carapace much longer than broad. A longitudinal series of three spines on branchial region. Interantennular tooth well developed.

Description.—Three erect median spines on carapace, one gastric, one cardiac of equal size, one intestinal, smaller. A spine on first article of abdomen. Protogastric lobes each armed with a spine, three spines or tubercles in a longitudinal series on branchial regions. Surface of carapace irregularly granulate, rostrum short and spinulous above. Supraorbital border armed with a spine. Basal article of antenna with a spine near its middle pointing obliquely downward and forward; flagellum long. Interantennular septum prolonged in a strong triangular tooth. Chelipeds of male feeble, clothed with

stiff, distant hairs; merus armed with some small spines; fingers in contact throughout their length. Ambulatory legs cylindrical, smooth, first and second of equal length, third and fourth a little shorter; all have the dactylus and part of the propodus thinly fringed with hair. Sternum and abdomen granulate: a spine on first segment of abdomen; abdomen of female very wide.

Variations.—A Porto Rican male in the National Museum differs as follows from the type described above: Instead of an intestinal spine there is a very low tubercle; instead of three branchial spines there is only one, which is in the middle of the region; before and behind it there is a very low tubercle. Postorbital spine more slender than in the figured type. Besides the two spines on the anterior half of the basal article of the antenna, there is a third one behind the eye. The carpus and the outer margin of the merus of the chelipeds bear some good-sized spines; manus oval-globular, thicker than in Edwards's figure 1. The chelipeds of the type male are described as "*faibles*," but they are stout in the figure cited. The dactyl of the ambulatory leg is armed below with very small, sharp spinules, visible only with a strong lens.

Measurements.—Male, type, length of carapace 13, width 9, total width of animal with legs extended 75 mm. (A. M. E.). Male (24222) length 7.6, width 5.1 mm. Female cotype (2888), length 15, width 11 mm. Male cotype (2889), length 14.6, width 8.7 mm.

Range.—From Porto Rico to Cape Frio, Brazil. Depth 35 to 115 fathoms.

Material examined.—

Porto Rico: Mayaguez Harbor; Port del Algarrobo, E. by N. ½ N., 5¾ m.; 97 to 120 fathoms; Co.; temp. 24° C.; January 20, 1899; station 6076, *Fish Hawk*; 1 male (24222).

Off Barbados; March 9, 1897; *Blake:* Lat. 13° 13′ 55″ N.; long. 59° 38′ 50″ W.; 56 fathoms; Co. S. brk. Sh.; temp. 74.5° F.; station 292; 1 female cotype (2888, M. C. Z.). Lat. 13° 14′ 23″ N.; long. 59° 39′ 10″ W.; 81 fathoms; Co. S. brk. Sh.; temp. 64.5° F.; station 293; 1 male cotype (2889, M. C. Z.).

Off Cape Frio, Brazil; 35 fathoms; U. S. C. S. S. *Hassler;* 1 male (1836, M. C. Z.).

ANASIMUS LATUS Rathbun

Plate 214

Anasimus latus RATHBUN, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 58 (type locality, Gulf of Mexico, station 2378, *Albatross;* holotype, Cat. No. 9656, U. S. N. M.); Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, 1898, p. 254, pl. 2, figs. 2–5.

Diagnosis.—Carapace nearly as broad as long in the old, narrower in the young. A longitudinal series of two spines or tubercles on branchial region. Interantennular tooth shallow.

Description.—Carapace broadly ovate, elevated on median line, posterior half semicircular, anterior half broadly triangular; surface covered with unequal granules; four median spines, two gastric, the posterior the larger, one large cardiac spine, one small, backward-pointing intestinal spine; also a long, acuminate spine directed backward at the distal end of the first abdominal segment; the anterior of the median gastric spines is one of a transverse row of five; in front of the end spines of this row are two longer and sharper; on the branchial region are three small spines or tubercles forming a triangle; three antero-lateral spines, one hepatic, and two branchial above base of cheliped. Rostrum short, broadly triangular at base, ending in a short, sharp, upturned spine, medially carinate. Supraorbital spines prominent, separated by a depression; postorbital spines long, exceeding eye in large specimens. Antenna short, exceeding rostrum but little; the basal article has, beside its terminal spine, a stout spine pointing downward and forward in front of eye; peduncle not attaining end of rostrum. The pterygostomian region has a row of spines and spinules continued to antennal segment and including a long spine at angle of buccal cavity. Sternum of male coarsely granulate; abdomen of female with a median tubercle on third and fourth segments.

Chelipeds of male a little more than twice length of carapace; ischium, merus and carpus granulate; merus cylindrical; palm swollen, shorter than fingers, and covered with fine scattered granules; digits slender, curved inward, gaping at base only, where there is an enlarged tooth on the dactyl. Chelipeds of female a little longer than carapace, much smaller than in male; fingers not gaping. Legs long, slender, cylindrical, roughened, except on the dactyls, with numerous short, stout, appressed spinules; propodi and dactyli with a double fringe of hair.

The young are narrower, rostrum and dorsal spines longer, postorbital spine very small and pointing directly outward, and in specimens 9 mm. long and less this spine is scarcely more than a tubercle.

Measurements.—Male, holotype, length of carapace 25.5, width 24, length of cheliped 58, of first leg 106 mm. Young male (18122), length of carapace 10.5, width 8.7 mm.

Range.—From South Carolina to Florida Keys and Gulf of Mexico; West of Trinidad. Depth, 26 to 88 fathoms.

Material examined.—See table page 67.

Material examined of Anasimus latus

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	° ′ ″	° ′ ″			°F						
Off South Carolina	32 54 00	77 53 30	88	crs. S. bk. Sp	57.8	Jan. 5, 1885	2312	*Albatross*	1♀ y	9437	
Off Miami, Florida			30			May, 1912		*Eolis*, J. B. Henderson.	1♀ y	17071	
Off Key West, Florida	24 25 45	81 46 00	45	Co	75	Jan. 15, 1885	2318	*Albatross*	1♂ 2♀	18121	
Do	24 25 45	81 46 45	45	Co	77	do	2317	do	2♂ 1♀ ovig	18120	
Do	Sand Key Light bearing W.NW., Key West Light bearing N.		60			June 19, 1893	26	State Univ. Iowa Exped.	1♀ y	Mus. S. U. I.	
Do	Key West Light bearing NW. by N., Sand Key Light W. by N.		(1)			June 26, 1893	47	do	1 y	Mus. S. U. I.	
Off Sand Key, Florida	S. by E. from Sand Key Light.		61					*Eolis*, J. B. Henderson.	1♀ y	16738	
Southeast of Apalachicola, Florida.	28 46 00	84 49 00	26	crs. S. Co		Mar. 15, 1885	2406	*Albatross*	1♂ y	18125	
South of Apalachicola, Florida.	28 45 00	85 02 00	30	gy. S. brk. Co		do	2105	do	2♂ y	18124	
South of Cape San Blas, Florida.	28 41 00	85 16 00	60	gy. S		do	2401	do	1♂ 1♀ y	18123	
South of Mobile Bay, Alabama.	29 24 30	88 01 00	35	yl. S. bk. Sp		Mar. 4, 1885	2388	do	1♂ y 2♀ (1 y. 1 ovig.).	18122	
East of delta of Mississippi River.	29 14 30	88 09 30	68	gy. M		Feb. 11, 1885	2378	do	3♂ 1♀ ovig	9656	1 male is holotype.
West of Trinidad	10 37 40 to 10 37 00	61 42 40 to 61 44 22	31-34	dk.slate-col.M.	67-73	Feb. 3, 1884	2121-2	do	2♂ 2♀ ovig	6904	

[1] About 80 fathoms.

Genus ERILEPTUS Rathbun

Erileptus RATHBUN, Proc. U. S. Nat. Mus., vol. 16, 1893, p. 226; type, *E. spinosus* Rathbun.

Carapace pyriform, convex, regions well defined; rostrum simple, slender; postorbital and supraorbital spines present. Sexes differing in shape of carapace, postorbital spine and cheliped. Basal article of antennae long and narrow, with spine at distal end. Antero-internal lobe of ischium of outer maxilliped large and strongly advanced; merus subtriangular, the anterior margin the longest; outer, or principal, margin of next article nearly as long as outer margin of merus and almost straight until near distal end where it forms an elbow; terminal article unusually long. Chelipeds of male extremely long. Ambulatory legs very slender, decreasing in length from first to fourth pair and in male much shorter than chelipeds.

Contains only one species.

ERILEPTUS SPINOSUS Rathbun

Plates 212 and 213

Erileptus spinosus RATHBUN, Proc. U. S. Nat. Mus., vol. 16, 1893, p. 227 (type-locality, off San Diego, California, 36 fathoms, station 2934, *Albatross;* holotype, Cat. No. 17341, U.S.N.M.); Harriman Alaska Exped., vol. 10, 1904, p. 171, pl. 10, fig. 1.—HOLMES, Occas. Papers California Acad. Sci., vol. 7, 1900, p. 21.—WEYMOUTH, Stanford Univ. Publ., Univ. Ser., No. 4, 1910, p. 27, pl. 3, fig. 7.

Anasimus rostratus RATHBUN, Proc. U. S. Nat. Mus., vol. 16, 1893, p. 227 (type-locality, NW. of Cerros Island, Lower California, 58 fathoms, station 2983, *Albatross;* (holotype, Cat. No. 17340, U.S.N.M.); Harriman Alaska Exped., vol. 10, 1904, p. 171, pl. 10, fig. 4.—WEYMOUTH, Stanford Univ. Publ., Univ. Ser., No. 4, 1910, p. 27.

Anasimus spinosus SCHMITT, Univ. California Publ. in Zool., vol. 23, 1921, p. 196, text-fig. 121.

Description.—Male: Carapace behind the rostrum equilaterally triangular, and spinous, as follows: Two median spines, one gastric, the other cardiac; one long branchial spine, with a small spine or spinule considerably in front of it and two or three small spines on the outer margin; a strong marginal hepatic spine; two very small spines arranged transversely on the gastric region, well in advance of the median spine; a slender spine on orbital arch. Rostrum slender, about one-half as long as postrostral portion of carapace, margins spinulous. Postorbital spine very small, sometimes tuberculiform, at some distance behind eye. A spine on first abdominal segment. Abdomen and sternum granulate, segments of sternum separated by deep grooves. Antero-external lobe of merus of maxillipeds bent strongly downward.

Chelipeds three or four times as long as carapace, slender, granulate; arm with a row of spinules along inner side and a spine at superior

Material examined of Erileptus spinosus

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
California:	° ′ ″	° ′ ″			°F						
Off Santa Rosa Island	S. by W. of Point.	Brockway	38-45			Apr. 15, 1904	4431	*Albatross*	3♂ 1♀	46745	
Off San Nicolas Island			32-33	fne. gy. S		Apr. 12, 1904	4420	do	1♀ ovig	46744	
Entrance to Catalina Harbor, Santa Catalina Island.						Dec. 30, 1912		*Anton Dohrn*	4♂ 3♀ ovig	50231 50232	From Venice Mar. Biol. Sta.
Isthmus Harbor, Santa Catalina Island.						Aug. 19, 1913		do	1♂	50391	Do.
Off Santa Catalina Island.			50					H. N. Lowe	2♂	29954	
Santa Catalina Island (probably).								W. H. Dall	1♂ 2♀	18059 18058	
Off La Jolla	32 50 00	117 18.3 00	30-39	R		July 16, 1906	1287a	*Loma*	5♂	Scripps Inst.	
Off San Diego	Point Loma Lighthouse, N. 6.1 miles.	12° W.,	21-21	gy. S. Co. G		Mar. 1, 1904	4303	*Albatross*	1♂	46743	
Do	32 33 30	117 16 00	36	gy. S	58.2	Jan. 26, 1889	2934	do	2♂	17341	1 is holotype of *Erileptus spinosus*.
Lower California, Mexico:											
West of Los Coronados Islands.	32 23 30	119 05 48	50	crs. S		July 17, 1908	1552	*Agassiz*	3♂	Scripps Inst.	
Do	32 23 42	119 06 00	50	crs. S		do	1555	do	1♂ 1♀	do	
Do	32 23 42	119 06 00	50	crs. S. bk. M		do	1556	do	5♂ 2♂	53957 Scripps Inst.	
Northwest of Cerros Island.	28 58 30	118 15 45	58	gy. S. brk. Sh	55.8	Feb. 28, 1889	2983	*Albatross*	2♀	17340	1 is holotype of *Inasimus rostratus*.
Off Abreojos Point	26 14 00	113 13 00	48	yl. M	53.9	May 3, 1888	2834	do	1♀ ovig	54718	

distal end; hand slender, slightly compressed, increasing very little in width toward distal end; fingers from a third to a fourth as long as palm, arched, gaping narrowly in basal half. Legs much shorter than chelipeds, decreasing regularly in length from first to fourth; fourth leg a little more than half length of first; dactyls minutely spinulous.

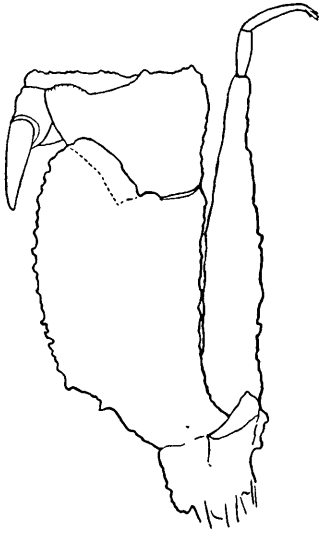


FIG. 18.—ERILEPTUS SPINOSUS, MALE (53957), MAXILLIPED, × 21.3

Female: Smaller than male and of very different shape, the carapace being broader anteriorly and narrower posteriorly; it lacks the long neck of the male, the postorbital spine is longer and not far behind the eye, the hepatic region is more prominent laterally and the branchial region less so. Rostrum shorter than in male, about one-fourth as long as postrostral portion of carapace. Abdomen densely granulate except in the depressions either side of the median elevation. Chelipeds one and a third times as long as carapace and shorter than the first pair of ambulatory legs; fingers nearly as long as palm.

Measurements.—Male (53957), length of carapace 11.5, width 7.8, length of cheliped 41 mm. Female (17340), length of carapace 7.5, width 5, length of cheliped 10 mm.

Range.—From Santa Rosa Island, California, to Abreojos Point, Lower California, Mexico. Depth, 21 to 58 fathoms.

Material examined.—See table, page 69.

Genus OREGONIA Dana

Oregonia DANA, Amer. Journ. Sci., ser. 2, vol. 11, 1851, pp. 270 and 431; type, *O. gracilis* Dana; U. S. Expl. Exped., vol. 13, Crust., pt. 1, 1852, p. 105; pt. 2, 1853, p. 1421.

Carapace subtriangular or suboblong, moderately convex and tuberculate; a large postorbital, but no preorbital spine; rostral spines slender. Antennae visible in dorsal view at sides of rostrum, basal article narrow. Merus of maxillipeds distally truncate, bearing the palpus at its antero-internal angle. Chelipeds in male much elongated, somewhat enlarged; palm long, compressed and distally widened. Ambulatory legs of moderate length, slender, and decreasing regularly in length. Abdomen composed of seven distinct segments.

Bering Sea and North Pacific Ocean. Shallow water to 764 fathoms.

KEY TO THE SPECIES OF THE GENUS OREGONIA

A¹. Rostral horns long, parallel, contiguous. Supraorbital arch prominently angled at posterior end. Body, including rostrum, subtriangular. gracilis, p. 71.

A². Rostral horns short, divergent. Supraorbital arch not prominent nor angled posteriorly. Body suboblong ..... bifurca, p. 79.

OREGONIA GRACILIS Dana

DECORATOR CRAB

Plates 24 and 25

Oregonia gracilis Dana, Amer. Journ. Sci., ser. 2, vol. 11, 1851, p. 270 (type-locality, Puget Sound; cotype, Cat. No. 1232, M. C. Z.); U. S. Expl. Exped., vol. 13, Crust., part 1, 1852, p. 106; atlas, 1855, pl. 3, fig. 2*a–c*.—Rathbun, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 59; Harriman Alaska Exped., vol. 10, 1904, p. 171.—Doflein, S.B., K. Abh. Bayer. Akad. Wiss., math.-phys. Klasse, vol. 29, 1899, p. 183.—Holmes, Occas. Papers California Acad. Sci., vol. 7, 1900, p. 19.—Way, Puget Sd. Mar. Sta. Publ., vol. 1, 1917, p. 369, text-fig. 20.—Schmitt, Univ. California Publ. Zool., vol. 23, 1921, p. 198, text-fig. 122.

Oregonia hirta Dana, Amer. Journ. Sci., ser. 2, vol. 11, 1851, p. 270 (type-locality, Puget Sound; type not extant); U. S. Expl. Exped., vol. 13, Crust., pt. 1, 1852, p. 107, pl. 3, fig. 3*a–b*.

Oregonia longimana Spence Bate, Proc. Zool. Soc. London, 1864, p. 663 (type-locality, Esquimalt Harbor, B. C.; type in Brit. Mus.); Lord's Naturalist in Brit. Columbia, vol. 2, 1866, p. 267, plate facing p. 262, fig. 5.

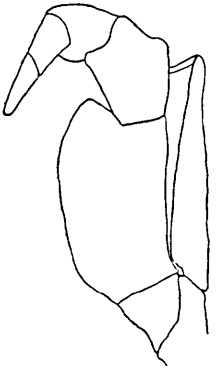


Fig. 19.—Oregonia gracilis (17065), maxilliped, ×4

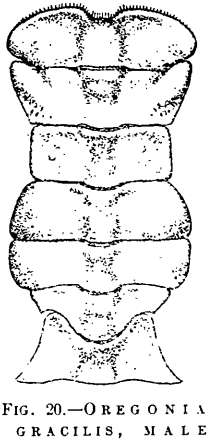


Fig. 20.—Oregonia gracilis, male (14705), abdomen, × 2.76

Diagnosis.—Rostral horns long, parallel, contiguous. Supraorbital arch prominently angled at posterior end. Body, including rostrum, subtriangular.

Description.—Surface covered with setae and bunches of longer hairs. Carapace unevenly tuberculate; cardiac region somewhat depressed; hepatic region with a tuberculate prominence below the margin. Postorbital spine remote from the eye, long, lanceolate, directed obliquely forward, and projecting laterally beyond the eye. Supraorbital border posteriorly dilated and terminating in a dentiform projection. Rostral horns contiguous, sometimes distally divergent, slightly arched, curving downward at the extremity, of variable length, often more than half the postfrontal portion of the carapace. Antennae long, often exceeding the rostrum.

Material examined of Oregonia gracilis

Locality	Bearings		Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	Latitude N.	Longitude W.									
Bering Sea (American waters):											
Cape Etolin, Nunivak Island	° ′ ″	° ′ ″	8	stony	°F	1874		W. H. Dall	4♂ 12♀	14705	At anchorage.
Off Cape Newenham	58 34 15	162 22 00	21	fne. gy. S. G.	43	June 13, 1890	3248	*Albatross*	2 y	17359	
Do	58 27 30	162 36 00	13.5	fne. gy. S. bk. Sp.	37	do	3249	do	1	15958	
Bristol Bay	58 31 20	161 13 00	11.5	S. P.		June 9, 1890	3245	do	1	15957	
Do	58 38 30	159 33 30	14	bk. M	47	June 8, 1890	3241	do	2	15956	
Do	58 27 00	157 52 00	5	gy. S		June 2, 1890	3234	do	1	15952	
Do	58 23 45	157 42 45	7.25	S. P	44.5	do	3233	do	3	15951	
Do	58 16 30	158 13 00	11	bk. S		June 7, 1890	3235	do	3	15953	
Do	58 12 30	159 55 00	15	P	42.2	July 20, 1890	3300	do	5	15989	
Do	58 11 00	158 05 30	14.75	G. S. Sh	39	June 7, 1890	3236	do	6	15954	
Do	58 03 40	158 37 30	18	fne. gy. S		do	3238	do	1	15955	
Do	58 02 30	161 13 45	28	fne. gy. S		July 21, 1890	3304	do	1	15992	
Do	57 59 00	158 44 00	20	fne. gy. S. yl. Sp.	44	July 20, 1890	3299	do	3	15988	
Do	57 45 45	160 12 15	30	fne. gy. S	40.2	July 21, 1890	3302	do	8	15990	
Do	57 38 00	159 07 30	26	gy. S	41.5	July 19, 1890	3297	do	5	15987	
Do	57 30 00	159 33 00	30	fne. gy. S	40	July 18, 1890	3293	do	5	15983	
Do	57 27 00	160 23 30	33	bk. S	39.5	July 21, 1890	3303	do	3	15991	
Do	57 26 30	158 46 00	21	gy. S. bk. Sp	43	July 19, 1890	3296	do	28	15986	
Do	57 16 45	159 03 30	30	bk. G	41	July 18, 1890	3294	do	35	15984	
Do	57 14 30	158 26 30	11.5	fne. gy. S		July 19, 1890	3295	do	1	15985	
Do	57 14 00	159 35 00	32	bk. S. G		July 18, 1890	3292	do	46	15982	
Do	56 58 30	159 11 00	26	bk. S. G	41.2	do	3291	do	65	15981	
Do	56 50 30	159 01 00	16	gy. S. G		do	3290	do	1	15980	
Do	56 44 30	159 16 00	16	bk. S		do	3289	do	13	15779	
Mouth of Bristol Bay	56 26 30	160 00 00	15	bk. G	45.5	July 17, 1890	3288	do	8	15978	
Do	56 33 00	160 14 00	30	ers. bk. S	42	do	3287	do	5	15977	
Do	56 39 30	160 29 00	37	fne. gy. S. Sh. G.	41.5	do	3286	do	11	15976	
Do	56 16 30	160 53 00	25	fne. G	43	June 29, 1890	3284	do	13	15975	
Do	56 28 00	161 16 30	39	fne. gy. S	40.3	do	3283	do	1	15974	
Do	56 14 00	161 41 15	36	gy. S. bk. Sp		June 28, 1890	3281	do	17	15972	
Do	55 58 45	161 46 30	18	G. S. R	43.2	do	3277	do	4	15968	
Do	56 30 45	161 50 15	53	fne. S. gn. M	38.2	June 29, 1890	3282	do	3	15973	
Do	56 27 00	162 08 00	36	fne. gy. S	41	June 28, 1890	3280	do	1	15971	
Do	56 12 30	162 13 00	47	fne. gy. S	38.8	do	3278	do	25	15969	
Do	56 25 40	162 39 15	41	fne. gy. S	37	do	3279	do	1	15970	

Off Pribilof Islands	56	28	00	169	28	00	54	bk. S. rky	39.8	Sept. 2, 1893	3552	do	1♂	18314	
Do	56	02	00	169	30	00	121	fne. gy. S. G.	38.6	July 17, 1893	3500	do	8 y	18311	
Do	56	32	00	169	45	00	41	gy. S. St. gn. M.	39.9	do	3496	do	1♀	18617	
Do	57	12	30	169	51	00	27	Sh. bk. S	40.1	Aug. 1, 1893	3510	do	1♀	18312	
Do	56	58	00	170	09	00	25	S. dk. Sp. rky	42.9	Sept. 3, 1893	3558	do	1♂ 2♀	18316	
Do	57	04	00	170	24	00	26	S. bk. Sp	45	Sept. 2, 1893	3557	do	1♀	18315	
Do	57	07	30	170	28	15	33	G	38.7	July 18, 1896	3638	do	1♂	20148	
Do	56	32	00	172	40	00	81	gn. M. S	37.1	Aug. 10, 1895	3602	do	4	19312	
St. George Island												G. D. Hanna, Bur. Fisheries.	1♀ ovig	48285	
Do	2 miles off shore						40			Sept. 11, 1913		do	1♀ ovig.	48286	
Do										July 18, 1914		do	1♂	48288	
Do										May 29, 1918		C. E. Crampton.	1♀ ovig	53618	In stomach of fish
St. Paul Island										July 10, 1914		Bur. Fisheries	1♂	48833	
Aleutian Islands and Gulf of Alaska:															
Attu Island							(1)			June, 1906		*Alba tross*	1♂, soft shell	46511	
				Long.	*E.*										
Off Attu Island	52	55	40	173	26	00	135	crs. P		June 11, 1906	4781	do	25♂ 14♀ (1 ovig.)	46503	
Kiska Harbor, Rat Islands.							7–14	M. S		1873		W. H. Dall	5♂ 16♀ 1 y	14707	
Petrel Bank	52	12	00	179	52	00	43	fne. bk. G		June 5, 1906	4778	*Albatross*	9♂ 3♀ (2 ovig.)	46502	
Do	52	11	00	179	49	00	52	fne. G		do	4777	do	14♂ 13♀ (9 ovig.)	46501	
				Long.	*W.*										
Do	52	11	00	179	57	00	54	brk. Sh. P. S		do	4779	do	5♂ 4♀ (3 ovig.)	46500	
Bay of Islands, Adak Island.							9–16	M. S				W. H. Dall	1♀ 2 y	14710	
Nazan Bay, Atka Island.							10–16	S		1873		do	1 y	14770	
Off Unalaska	53	26	00	167	31	10	51	fne. bk. S	42	Aug. 19, 1890	3323	*Albatross*	1	15996	
Do	53	40	30	167	30	00	59	bk. S	40.8	Aug. 18, 1890	3319	do	5	15993	
Do	53	28	45	167	23	50	35	bk. S	42.4	do	3322	do	3	15995	
Do	53	33	30	167	15	40	54	dk. M	41.5	do	3321	do	3	15994	
Off Imagnee Pinnacle, Unalaska.							8–20					W. H. Dall	1♂	12540	
Port Levashef, Unalaska.												do	1♀	14713	
Dutch Harbor, Amaknak Island.												Harriman Alaska Exped.			
North of Akutan Island	55	00	00	166	10	00	78	fne. bk. S	40.1	Sept. 1, 1893	3549	*Albatross*	1♀	18313	
Do	54	15	00	166	03	00	72	P	41	July 23, 1888	2842	do	20	15553	
South of Akutan Island	53	56	00	165	56	00	45	brk. Sh. P	43.5	July 28, 1888	2843	do	2♂ 2♀ 26 y	15556	
Do	53	56	00	165	40	00	54	gy. S	42	do	2844	do	1♀	15561	
North of Unimak Pass	54	42	50	165	37	00	121	bk. S. G	38.7	May 22, 1890	3224	do	1	15950	
Do	54	49	00	165	32	00	81	gy. S. G	39	June 24, 1890	3257	do	1	15959	
Unimak Pass	54	26	15	165	32	00	56	bk. P	39	May 22, 1890	3223	do	4	15949	
Do	54	20	00	165	30	00	50	bk. S. P. Sh	39.7	do	3222	do	30	15948	
Do	54	15	00	165	06	00	34	G. brk. Sh		do	3220	do	10	15947	
North of Unimak Island	54	40	50	165	05	00	41	bk. S. G	40.6	June 24, 1890	3259	do	1	15960	
Do	55	04	00	165	04	00	61	bk. M	39.5	do	3263	do	2	15962	

[1] Shore.

Material examined of Oregonia gracilis—Continued

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
Aleutian Islands and Gulf of Alaska—Continued.	° ′ ″	° ′ ″			°F						
North of Unimak Island	54 49 30	165 02 00	43	bk. S. R	40.7	June 24, 1890	3262	*Albatross*	25	15961	
South of Unimak Island.	54 14 00	164 35 00	59	bk. S. G	38	May 22, 1890	3219	do	5	15946	
Do	54 14 40	163 24 00	43	G	38.5	May 21, 1890	3215	do	1	15944	
Do	54 13 00	163 06 00	38	gy. S. G		do	3214	do	5	15945	
South of Sannak Islands	54 10 00	162 57 30	41	bk. S		May 21, 1890	3213	do	86	15943	
Do	54 05 30	162 54 00	49	gy. S. bk. Sp	38	do	3212	do	1	15942	
Do	54 08 00	162 44 00	44	G	42	July 30, 1888	2846	do	1 y	17354	
North of Alaska Peninsula	55 23 30	163 29 00	32	bk. S	41	June 25, 1890	3267	do	11	15963	
Do	55 31 40	163 07 00	31	bk. & rd. S	42	June 27, 1890	3272	do	7	15965	
Do	55 26 30	162 52 00	16	bk. S	43.5	June 26, 1890	3270	do	1	15964	
Do	55 34 30	162 31 45	19	bk. S. Sh		June 27, 1890	3274	do	9	15966	
Do	55 44 20	162 17 30	22	fne. bk. S	42.8	do	3275	do	1	15967	
Belkofski Bay			15–25	Sh. G		1880		W. H. Dall	2♂ 2♀	12496	
Off Round Island, Coal Harbor, Unga.			8–9	S. St				do	3♂ 3♀	14703	
Popof Strait, Shumagins			(2)			July 5, 1872		W. G. Hall	1♀	14769	
Sanborn Harbor, Nagai						1872		W. H. Dall	1♂	14702	
Big Koniuji Island, anchorage.			6–20	S. R		1874		do	1♀	14709	
Off the Shumagins	55 16 00	160 28 00	69	gn. M	43	Aug. 2, 1888	2849	*Albatross*	1 y	17355	
Do	54 55 00	159 52 00	35	gy. S. brk. Sh	44.8	Aug. 4, 1888	2851	do	3	15563	
Do	54 42 00	159 46 00	21	brk. Sh	18.2	do	2850	do	33	15939	
Port Möller			15	S				W. H. Dall	1♂	14708	
Semidi Islands			12–28	G		1874		do	1 y	13132	
Shelikof Strait	Cape Uyak, S. 51° W., 8.5 miles.		65–48	bu. M. S. G		Aug. 15, 1903	4291	*Albatross*	1♂ 3♀	31537	
Alitak Bay, Kodiak Island.	Cape Alitak, S. 71° W., 4.8 miles.		27–29	dk. gy. M		Aug. 6, 1903	4278	do	1♂ 3♀	31536	
Do	Cape Alitak, S. 41° W., 7.1 miles.		36–41	gn. M. fne. S		do	4273	do	2♂ 1♀	31535	
Uyak Bay, Kodiak Island.	S. end Harvester Island, S. 38° W., 1.5 miles.		99	sft. gy. M., fne. bk. S.		Aug. 14, 1903	4290	do	1 y	31652	
Kodiak						Aug. 14, 1888		do	3♂ 6♀	15554	
Shahafka Cove, Kodiak Island.			12–14	M. S				W. H. Dall	5♂ y. 5♀ y	14706	
Do			15–20	G				do	2♂ 5♀	12501	

Woody Island, Kodiak Island.			(1)			Sept. 21, 1920		G. D. Hanna	1♂ y. 3♀	Cal. Acad.	
Chiniak Bay, Kodiak Island.								W. H. Dall	1♂ 1♀	12195	
Afognak Bay, Afognak Island.			11-19					*Albatross*	2♂ 1♀	31533	
Do			14-19					do	1♂ 1♀	31534	
Portlock Bank	58 07 00	151 36 00	68	gy. Sh. bk. Sp.	41	Aug. 22, 1888	2856	do	6♂ 2♀ 3y	15558	
Do	58 05 00	150 46 00	51	brk. Sh. gy. S.	44.6	do	2857	do	2	15940	
Kachemak Bay, Cook Inlet.			20-60	sdy. M				W. H. Dall	1♀	14711	
Port Etches			5-18					do	2♂ 1♀ 1 y	14704	
West side of Middleton Island.			10-12	G. S		1874		do	8 y	14768	
Southeastern Alaska:											
Lituya Bay			6-9					W. H. Dall	4♂ 1♀	14712	
Granite Cove, Port Althorp.								do	1♂	12517	
Juneau								Harriman Alaska Exped.			
Dundas Bay, Icy Strait	Point Wimbleton, S. 46° W., 0.1 mile.		78-21	gy. S. brk. Sh. R.	44.7	July 24, 1903	4259	*Albatross*	1♂	31651	
Do	Point Wimbleton, S. 25° W., 0.2 mile.		21-8.5	crs. S. R	44.2	do	4260	do	1♂	31532	
Stephens Passage	Thistle Ledge, N. 53° E., 1.7 miles.		188-131	R. brk. Sh	40.9	July 14, 1903	4253	do	1♂ 5♀	31531	
Freshwater Bay						June 20, 1903		do	1♂	31540	
Killisnoo								do	7	21760	In stomach of halibut.
Sitka Harbor			15	G. M		1874		W. H. Dall	1 y	14771	
Sitka								do	1♂	14714	
Do								Harriman Alaska Exped.			
Sumner Strait	Point Amelius, S. 80° W., 5.8 miles.		212-169	bu. M	44.2	Aug. 24, 1903	4302	*Albatross*	1♂ 3♀	31538	
Kasaan Bay, Prince of Wales Island.	Center of Round Island, S. 10° W., 0.4 mile.		95-98	dk. gn. M. S. Sh. R.	48.9	July 11, 1903	4245	do	1♂	31529	
Do	E. end Long Island, N. 78° W., 1.1 miles.		95-114	gn. M. fne. S. brk. Sh.		do	4247	do	2♂ 1♀	31530	
Yes Bay						Aug. 25, 1905		do	1♀ ovig	46490	
Hunters Bay, Prince of Wales Island.						June 19, 1897		do	1♂	46538	
Metlakatla, Annette Island.						June 10, 1897		do	1♀	21761	
Cordova						June 20, 1914		do	1♀ ovig	48839	With hook and line.

[2] Low water.

[3] Low tide.

Material examined of Oregonia gracilis—Continued

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
British Columbia:	° ′ ″	° ′ ″			°F						
Queen Charlotte Sound.	Center of Island, N. 22° W., 1.5 miles.	Round	25–30	vol. S. G. brk. Sh. sponge.	49.1	June 25, 1903	4203	*Albatross*	1♂	31649	
Do	Center of Island, N. 79° W., 1.6 miles.	Round	69–51	gn. M. vol. S. G.	47.6	do	4204	do	1♂	31523	
Fort Rupert, Vancouver Island.			(4)	R. Seaweed, Kelp.				Harlan I. Smith	1♀ y	22587	
Menzies Bay, Discovery Passage.			6	soft		{July 31, and Aug. 1, 1881}		{U. S. C. S. S. *Hassler*, H. E. Nichols.}	5♂ 3♀	5778	
Comox			(5)			July 6, 1915		W. Spreadborough.	4♂ 7♀ ovig	(6)	
Strait of Georgia	48 58 00	123 10 00	67	fne. S. brk. Sh.	48.5	Sept. 5, 1888	2863	*Albatross*	2♂ 1♀	15562	
West of Vancouver Island.	49 00 00	125 48 00	24	gy. S.	52.3	Sept. 26, 1888	2881	do	2♂ 3♀ 10 y	15560	
Do	48 53 00	125 53 00	34	R	50.3	do	2880	do	1♂ 2♀	15557	
Do	48 53 00	125 53 00	34	R	50.3	do	2879	do	1 y	17358	
Strait of Fuca, south shore of Vancouver Island.	48 31 15	124 43 15	136	gy. S.	44.2	Sept. 1, 1891	3456	do	1 y	18310	
Do	48 29 40	124 40 10	135	gy. S. G.		Aug. 28, 1891	3449	do	6 y	17059	
Do	48 24 20	124 24 40	123	gy. S. P.	44.5	Sept. 2, 1891	3459	do	2	17060	
Do	48 25 05	124 10 00	53	gy. S.	46.8	do	3460	do	{9 1	17061 23943	
Do	48 16 00	123 45 05	100	rky	44	Aug. 27, 1891	3445	do	1♂ y	18309	
Do	48 15 00	123 35 50	92	dk. S. rky	44.8	Sept. 3, 1891	3462	do	3	17062	
Do	48 16 30	123 29 40	80	gn. M. P.	45	Aug. 27, 1891	3444	do	1 y	18308	
Do	48 18 30	123 22 00	56	gy. S. Sh. rky.	48.5	Sept. 4, 1891	3466	do	5	17066	
Do	48 21 00	123 14 00	48	rky	49.9	do	3465	do	10	17065	
Washington:											
Flattery Bank	48 21 45	124 50 30	77	gn. M. S.	45	May 14, 1897	3673	do	{2 y 2 y	21759 26369	
Do	48 17 00	124 52 00	38	gy. S.	38	Sept. 24, 1888	2872	do	1 y	18616	
Strait of Fuca	48 09 30	123 23 30	45	gy. S.	47.8	Sept. 4, 1891	3463	do	1	17063	
Do	48 14 00	123 20 40	40	gy. S. P.	47.8	do	3464	do	2	23944	
Do	48 13 30	123 11 20	97	gn. M. P.	46	Aug. 27, 1891	3443	do	7 y	17058	
Washington Sound	48 22 00	122 51 00	48	M. brk. Sh. S.	48	Sept. 6, 1888	2864	do	1♀ 3 y	17356	
Puget Sound	48 15 00	123 00 00	67	crs. bk. S.	67	Apr. 30, 1894	3597	do	3 y	18957	
Do	48 11 30	122 48 00	37	rky	37	do	3593	do	2 y	18956	

Do											U. S. Expl. Exped.	1♂	1232, M.C.Z. Cotype.
Sineahmoo, Puget Sound.											Dr. C. B. R. Kennerly, U. S. W. Boundary Survey.	1♂	1223, M.C.Z.
												2♀	1231, M.C.Z.
Kilisut Harbor											*Albatross*	2♂ 3♀	31539
Port Townsend Bay	Kala Point, N. 4.1° W., 1.1 miles.			14-17	sft. gn. M. br. Co.	50.8	July 1, 1903	4214			do	1♂	31525
Port Townsend							Aug. 15, 1889				do	2♂ 4♀ 4 y	15555
Admiralty Inlet	48 12 00	122 49 00		40	P	51.7	Sept. 6, 1888	2865			do	2♀ 5 y	15564
Do	Admiralty Head Lt., N. 38° W., 1.3 miles.			26-15	R. Sh	50.8	June 29, 1903	4205			do	1♀	31650
Do	Admiralty Head Lt., N. 88° W., 1.4 miles.			19-25	ers. gy. S. brk. Sh.	51	June 30, 1903	4212			do	2♂ 3♀	31524
Do	Olele Point, Oak Bay, S. 27° E., 1.5 miles.			16-26	gn. M. S. brk. Sh.	51.8	July 1, 1903	4219			do	2♂ 1♀	31526
Do	Olele Point, Oak Bay, S. 20° E., 0.8 mile.			16-31	do	50.8	do	4220			do	6♂ 5♀	31527
Do	Olele Point, Oak Bay, S. 61° W., 1.4 miles.			39	gy. S. brk. Sh.	50.8	do	4222			do	4♂ 3♀	31528
Port Orchard							July, 1889				O. B. Johnson	4♂ 3♀	14971
Oregon:													
Off Columbia River	46 09 00	124 22 30		68	gy. S	45.8	Oct. 13, 1888	2882			*Albatross*	1♀	15559
Heceta Bank	43 58 00	124 57 00		42	Co. P	47.1	Oct. 19, 1888	2887			do	1	15566
California: West of Golden Gate.				39-41							do	1	52647
Bering Sea (Siberian waters):		*Long.*	*E.*										
Off Copper Island	54 51 30	167 14 00		54	gn. S		June 14, 1906	4786			*Albatross*	1♀ y	46657
Do	54 50 24	167 13 00		57-56	gn. S		do	4788			do	2♂ 1♀	46504
Do	54 49 45	167 12 30		56	gn. S		do	4789			do	2♂ 1♀	46505
Off Bering Island	54 38 45	167 11 45		64	P		do	4790			do	2♀ (1 ovig.)	46506
Do	54 36 15	166 58 15		76-72	rky		do	4791			do	2♂ 1♀	46507
Do	54 36 15	166 57 15		72	P		do	4792			do	1♂ 1♀ ovig	46508
Bering Island							1882-3				L. Stejneger	9 y	13510
Do							1884				N. Grebnitski	5♂ 1♀	14716
Do							1890				do	1♂ 6♀	18951
Japan:													
Off Simushir Island, Kurile Islands.	46 46 40	151 41 00		107	ers. bk. S. P	35.4	July 16, 1906	4801			*Albatross*	1♂ 10♀ (7 ovig.)	46509
Yezo Strait	44 04 00	145 32 00		86	dk. S. G	43.7	Sept. 30, 1906	5031			do	1♀	46512
Sea of Japan	45 33 40	140 54 00		86	bk. S. P	43.4	Sept. 22, 1906	4995			do	1♀ y	46660
Do	45 27 50	140 54 00		190	br. M. fne. bk. S.	34	do	4994			do	2♂	46659
Do	43 19 20	140 17 00		59	rky	44.8	Sept. 20, 1906	4987			do	1♀ y	46658
Otaru, Hokkaido											M. Sasaki	2♂	54515
South coast of Hokkaido.	42 16 30	142 04 00		140	br. M. fne. bk. S. Co. S.	41.1	Oct. 3, 1906	5041			*Albatross*	1♂	46513

[4] Between high and low tide.

[5] Dredged.

[6] Victoria Memorial Museum.

Material examined of Oregonia gracilis—Continued

Locality	Bearings		Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	Latitude N.	Longitude E.									
Japan—Continued.	° ′ ″	° ′ ″									
Hakodate, Hokkaido								Imper. Univ. Tokio.	1♀ ovig	45867	
									1♀ ovig	45876	
Do								M. Sasaki	1♂ 1♀	54514	
Tsugaru Strait	41 36 12	140 36 00	44	Sh. crs. G		July 16, 1906	4807	*Albatross*	3♂ 9♀ (8 ovig.)	46647	
Do	41 35 50	140 36 45	47	S. Sh. crs. G		do	4808	do	4♂ 1♀ ovig	46648	
Southwest of Tsugaru Strait.	41 18 00	140 08 00	207	gy. S. P. brk. Sh.		do	4809	do	1♀	46510	
Off Kinka San Lt., Honshu Island.	Kinka San Lt., N. 49° W., 5.9 miles.		78	bk. S		June 5, 1900	3773	do	1♂	46656	
Do	38 12 50	141 49 15	107	dk. gy. S. brk. Sh. P.		Oct. 10, 1906	5047	do	1♂ 1♀ y	46661	
Do	38 09 24	141 52 30	129	dk. gy. S. brk. Sh.		do	5048	do	1♀ y	46514	

Material examined of Oregonia bifurca

Locality	Bearings		Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″									
Bowers Bank, Bering Sea	54 33 30	178 44 00	584	gn. M. bk. Sp. For.		June 4, 1906	4775	*Albatross*	1♀	43828	
Do	54 30 30	179 14 00	314–372	gn.-br. S		do	4772	do	15♂ 23♀ (11 ovig.)	46489	
Do	54 30 00	179 17 00	426	brk. Sh		do	4771	do	22♂ 19♀ (8 ovig.)	46488	
Do	54 20 30[1]	179 09 30[1]	764	gn.-br. M. fne. bk. S.		June 3, 1906	4768	do	1♀	43829	
North of Rat Islands	Rat Islands, Aleutians, S., 150 m.		270	gy. S. brk. Sh		June 27, 1900	3785	do	1♀	25287	Holotype.

[1] Approximate.

Chelipeds longer than the legs, the merus, carpus and upper margin of manus tuberculate. Fingers in adult male two-thirds to three-fourths as long as upper margin of palm, gaping in basal half, deflexed, lower margin of propodal finger convex; dactylus with a large tooth in the gape, fixed finger with a smaller tooth nearer the palm. In the ambulatory legs the carpus and dactylus are more than half as long as the propodus.

Color.—Tan or gray, with dots and small markings of red; color, however, can not be seen until decorative material is removed. (Way.)

Measurements.—Male (48833), length of carapace with rostrum 65.7, length of rostrum 19, width of carapace 39 mm.

Range.—From Bering Sea (Nunivak Island and Commander Islands) to Monterey Bay, California, and Honshu Island, Japan. Shallow water to 212 fathoms.

Material examined.—See table, pages 72–78.

OREGONIA BIFURCA Rathbun

Plates 26–28

Oregonia bifurca RATHBUN, Proc. U. S. Nat. Mus., vol. 24, 1902, p. 885 (type-locality, North of Rat Island, Aleutians, 270 fathoms, station 3785; holotype, Cat. No. 25287, U. S. N. M.); Harriman Alaska Exped., vol. 10, 1904, p. 171, pl. 6, fig. 5.

Diagnosis.—Rostral horns short, divergent. Supra-orbital arch not prominent nor angled posteriorly. Body sub-oblong.

Description.—Body and appendages covered with soft downy hairs. Carapace wider anteriorly than in *O. gracilis,* the width at base of postorbital spines about two-thirds of the branchial width. Tuberculation finer than in *gracilis.* Rostrum short, flat, horns divergent from their base, gradually tapering, acuminate. Postorbital spines similar in shape to the rostral horns, but shorter; they are directed more forward than in *gracilis.*

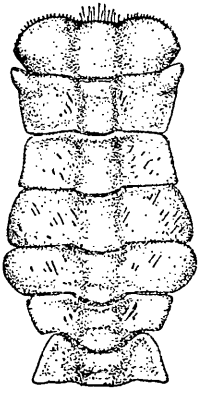


FIG. 21.—OREGONIA BIFURCA, MALE (48488), ABDOMEN, × 2.76

Basal article of antenna with spinulous outer and inner margins and a stout antero-external spine. Lower margins of arm furnished with stout spines, upper margin with much smaller spines. On the inner surface of the palm are four longitudinal rows of spinules, one just within the upper and the lower margins and one at the middle and below the middle. The fingers are nearly as long as the palm and gape ever so slightly in their basal two-fifths; at the base of the fixed finger an

enlarged tooth fits into a hollow in the dactylus. The first ambulatory leg may exceed the cheliped.

Measurements.—Male (46488), length of carapace including rostrum 33.7, length of rostrum 5, width of carapace 25 mm.

Range.—Western part of Bering Sea. Depth 270 to 764 fathoms.

Material examined.—See table, page 78.

Genus EURYPODIUS Guérin

Eurypodius GUÉRIN, Encyc. Méth., Hist. Nat., Entom., vol. 10, 1825, p. 700, footnote; Mém. Mus. Hist. Nat. Paris, vol. 16, 1828, p. 350; type, *E. latreillii* Guérin.—MILNE EDWARDS, Hist. Nat. Crust., vol. 1, 1834, p. 283.—DANA, U. S. Expl. Exped., vol. 13, Crust., part 1, 1852, p. 100.—MIERS, Journ. Linn. Soc. London, vol. 14, 1879, p. 646; *Challenger* Rept., Zool., vol. 17, 1886, p. 21.

Carapace elongate-triangular, moderately convex, and spinous or tuberculate above; a distinct postorbital, but no preorbital spine. Spines of rostrum contiguous, at least in part of their length. Abdomen seven-segmented. Antennae visible in dorsal view at sides of rostrum; peduncular articles slender. Merus of maxillipeds distally truncate, bearing the next article at its antero-internal angle. Chelipeds of male well developed, with the palm compressed or turgid and the fingers distally acute. Ambulatory legs considerably elongate, with the penultimate articles more or less dilated and compressed; the dactyls slightly arcuate, shorter than the propodites and reflexible against their inferior margins.

Contains not more than two species, inhabiting South American waters.

KEY TO THE SPECIES OF THE GENUS EURYPODIUS

A¹. Rostrum almost horizontal, only slightly arched upward in the middle of its length. No supraorbital spine ..... latreillii, p. 80.

A². Rostrum of male inclined strongly upward (about 45°) from base to tips. A supraorbital spine ..... longirostris, p. 83.

Species on both sides of the continent: *latreillii.*

EURYPODIUS LATREILLII Guérin

Plates 30, 31, and 215

Eurypodius latreillii GUÉRIN, Mém. Mus. Hist. Nat. Paris, vol. 16, 1828, p. 354, pl. 14 (type-locality, Iles Malouines [Falkland Islands]; type in Paris Mus.); Icon. Règne Anim. Cuvier, pl. 11, fig. 1 (female).—MILNE EDWARDS, Règne Anim. Cuvier, Crust., Disciples ed., pl. 34bis, fig. 1.—BELL, Trans. Zool. Soc. London, vol. 2, 1836, p. 40.—DANA, U. S. Expl. Exped., vol. 13, Crust., pt. 1, 1852, p. 104; atlas, 1855, pl. 3, fig. 1.—CUNNINGHAM, Trans. Linn. Soc. London, vol. 27, 1871, p. 491.—STEBBING, Proc. Zool. Soc. London, 1900, p. 527.

Erypodius latreillia MILNE EDWARDS, Hist. Nat. Crust., vol. 1, 1834, p. 284.

Eurypodius cuvieri AUDOUIN, in de Haan, Fauna Japon., Crust., pl. H.

Eurypodius tuberculatus EYDOUX and SOULEYET, Voy. *Bonite*, Zool., vol. 1, pt. 2, 1842, p. 221, atlas, pl. 1, figs. 7–9 (type-localities, Chile and Peru; types in Paris Mus.).

Eurypodius latreillia NICOLET, in Gay, Hist. Chile, vol. 3, 1849, p. 123.

Eurypodius latreillei MILNE EDWARDS and LUCAS, d'Orbigny's Voy. l'Amér. Mérid., vol. 6, pt. 1, 1843, p. 4.—TARGIONI TOZZETTI, Zool. *Magenta*, vol. 1, 1877, p. 9, pl. 1, figs. 14–20.—A. MILNE EDWARDS, Bull. Mus. Comp. Zoöl., vol. 8, 1880, p. 10.—MIERS, Proc. Zool. Soc. London, 1881, p. 64; *Challenger* Rept., Zool., vol. 17, 1886, p. 22.—COUTIÈRE, Bull. Mus. Hist. Nat. Paris, vol. 6, 1900, p. 238 (two forms of male).—LENZ, Zool. Jahrb., Suppl. 5, 1902, p. 755.—LAGERBERG, Schwed. Südpolar Exped., 1901–1903, vol. 5, Lief. 7, Anom. u. Brach., 1905, p. 17.

Eurypodius audouinii MILNE EDWARDS and LUCAS, d'Orbigny's Voy. l'Amér. Mérid., vol. 6, pt. 1, 1843, p. 3 (type-locality, Chile; type in Paris Mus.); vol. 9, atlas, 1847, pl. 1.—NICOLET, in Gay, Hist. Chile, vol. 3, 1849, p. 123.—DANA, U. S. Expl. Exped., vol. 13, Crust., pt. 1, 1852, p. 104.—CUNNINGHAM, Trans. Linn. Soc. London, vol. 27, 1871, p. 491.

Eurypodius septentrionalis DANA, Amer. Journ. Sci., ser. 2, vol. 11, 1851, p. 270 (type-locality, Nassau Bay, Fuegia; types not extant); U. S. Expl. Exped., vol. 13, Crust., pt. 1, 1852, p. 101; atlas, 1855, pl. 2, fig. 6*a–d*.—CUNNINGHAM, Trans. Linn. Soc. London, vol. 27, 1871, p. 491.

Eurypodius brevipes DANA, Amer. Journ. Sci., ser. 2, vol. 11, 1851, p. 270 (type-locality, Nassau Bay, Fuegia; types not extant); U. S. Expl. Exped., vol. 13, Crust., pt. 1, 1852, p. 103; atlas, 1855, pl. 2, fig. 7*a–c*.—CUNNINGHAM, Trans. Linn. Soc. London, vol. 27, 1871, p. 491.

Paramithrax peronii? TARGIONI TOZZETTI, Atti Soc. Ital., Milan, vol. 15, 1872, p. 2; not *P. peronii* Milne Edwards.

Eurypodius danae TARGIONI TOZZETTI, Zool. *Magenta*, vol. 1, 1877, p. 15 (type-locality, Valparaiso; type not extant).

Eurypodius audouini TARGIONI TOZZETTI, Zool. *Magenta*, vol. 1, 1877, p. 16, pl. 1, figs. 1–3, 7, 9, 12, 13, 21.

Diagnosis.—Rostrum almost horizontal. Supraorbital margin without spine. Carapace wide, length without rostrum less than one and a fourth times its width.

Description.—Surface pubescent. Carapace rough with tubercles and short spines; five median spines: two gastric, one genital, one cardiac, and one above the posterior margin. Branchial region surmounted by a spine, from which a row of smaller spines extends obliquely to the inner angle; margin anteriorly spinous; a spine near the antero-external angle, from which an irregular row extends backward above the margin. Hepatic region with a spine near the inner angle and one or two on the margin. Gastric region with a stout marginal spine behind the postorbital spine, and a dorsal row of spinules extending forward to each rostral horn. Many of these spines may be replaced by tubercles; there are two tubercles side by side on the genital and the intestinal regions.

Rostral horns stout, tapering distally, contiguous, usually less than one-third the length of postrostral portion of carapace, curving downward toward the tips. The horns may have a buttonhole interspace or may be slightly divergent in the terminal portion.

Material examined of Eurypodius latreillii

Locality	Bearings		Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	Latitude S.	Longitude W.									
East coast Patagonia:	° ′ ″	° ′ ″			°F						
Off Gulf of San Matias	42 24 00	61 38 30	43	dk. S. bk. Sp.		Jan. 14, 1888	2768	*Albatross*	1♂	21883	
	48 37 00	65 46 00	58	gy. S. bk. Sp.		Jan. 16, 1888	2770	do	2♀ (1 ovig.)	21884	
Off Cape Virgins	51 34 00	68 00 00	50.5	gy. S. bk. Sp.	49.4	Jan. 17, 1888	2771	do	2♂ 5♀	21885	
Do	52 23 00	68 11 00	10	fne. gy. S.		do	2773	do	13 y	21886	8 with slightly divergent horns.
Strait of Magellan:											
	52 23 00	68 31 30	17	S. G.		Jan. 18, 1888	2774	do	1♂ 1♀	21887	
	52 22 30	69 22 00	29.5	S. St.		do	2775	do	3♂	21888	1 (adult) with horns divergent for a short distance.
	52 41 00	69 55 30	21	S. G.		do	2776	do	2♂	21889	
	52 38 00	70 10 30	19.75	G.		Jan. 19, 1888	2777	do	1 y	21890	
									1♂	40627	
Gregory Bay						do		do	4♂ 8♀	21895	2 (half grown) have partially divergent horns.
Laredo Bay						Jan. 22, 1888		do	7♂ 5♀	18218	
	53 01 00	70 42 15	61	gy. S. bk. Sp.	47.9	Jan. 23, 1888	2778	do	44	21891	Mostly half grown; 17 with horns partially divergent.
	53 06 00	70 40 30	77.5	gn. Oz.	46.9	do	2779	do	4♂ 4♀	21892	
Sandy Point						Jan. 23-24, 1888.		do	2♂ 1♀ 2 y	21896	
West coast Patagonia:											
Mayne Harbor						Feb. 5, 1888		do	1♂	21894	
Latitude Cove						Feb. 6, 1888		do	2♂ 2♀	21893	3 (adult) with horns divergent for a short distance.
Chile: Valparaiso										Copenhagen Mus.	

A strong, spine-pointed, interantennular tooth. Orbital arch unarmed. A conical spine or tubercle on first segment of abdomen.

Merus and carpus of chelipeds tuberculate and spinous; merus triangulate, more or less swollen, upper margin spinous, the row of spines continued on the carpus. Manus roughly granulate, either wide and swollen or narrow and compressed (a less developed form); fingers gaping for more than half their length, dactylus with a large tooth midway of its length; immovable finger with a smaller basal tooth; these teeth are much reduced in the narrow form of manus. The two forms of cheliped are found in individuals of the same size and from the same locality.

The propodus of the ambulatory legs usually greatly exceeds in length the carpus, but occasionally the carpus nearly equals or even exceeds the propodus. The latter is dilated below and the distal half of this expansion, where the dactylus closes, is margined with a thick fringe of hair. The dactylus, as a rule, is more than half the length of the propodus.

Color.—Greenish brown (Guérin). General color, light green; lateral portions of carapace and feet covered with a grayish down (Milne Edwards and Lucas).

Measurements.—Male (21887), length of carapace including rostrum 69, length of rostrum 12, width of carapace 51.6 mm.

Variation.—Extremely variable, especially as to length and direction of horns, prominence and sharpness of tubercles and spines, amount of pubescence, development of chelipeds of adult male, and relative length of carpus and propodus of legs. In the young and immature the horns are more horizontal than in the old and are more likely to diverge towards the tips; as they grow the horns gradually arch upward, the tips get in contact or occasionally overlap.

Range.—From Peru to Strait of Magellan and northward to Rio de Janeiro (Bell); Falkland Islands. Depth, 4 to 77.5 fathoms.

Material examined.—See table, page 82.

EURYPODIUS LONGIROSTRIS Miers

Plate 35, figs. 1 and 2

Eurypodius longirostris Miers, *Challenger* Rept., vol. 17, 1886, p. 23, pl. 5, figs. 1, 1*a* (type-locality, "off the coast of Chiloe," lat. 50° 08′ 30″ S., long. 74° 41′ 00″ W., 175 fathoms, station 308 [18]; type in Brit. Mus.).—Stebbing, Proc. Zool. Soc. London, 1900, p. 527.

Euripodius longirostris Murray, *Challenger* Rept., Summary, pt. 2, 1895, p. 1152.

Diagnosis.—Rostrum of male inclined strongly upward. Supraorbital margin armed with a spine. Carapace narrow, length without rostrum one and a fourth times its width.

[18] "Off the coast of Chiloe" is an error, as station 308 is much farther south, off northeastern end of Madre Island. See *Challenger* Summary, part 2, 1895, p. 1149. The error was due to a mix-up with station 303; see Summary, p. 1138.

Description.—Distinguished by the remarkably reflexed rostrum of the male, which is bent upward at an angle of nearly 45° to the front, with the spines laterally divergent toward their apices. Body and limbs thinly pubescent, carapace narrow in proportion to its length, with the spines disposed as commonly in specimens of *E. latreillii* of the same size and sex, as, for instance, two upon the gastric, one upon the cardiac, one on each branchial region and one on the posterior margin, besides some smaller granules on the sides of the hepatic and branchial regions. There is a small spine on the upper margin of the orbit; also a postocular spine. The spines of the rostrum considerably exceed half the length of the carapace,[19] the spines are contiguous at the base, but in the distal third of their length they curve laterally and outward; there is a strong spine on the interantennular septum. Eyes, antennae, and maxillipeds of same form as in *E. latreillii*. The chelipeds have, as in the young males of that species, the palms not turgid but compressed, the fingers acute, without teeth, and without any intramarginal hiatus when closed; the merus and carpus have a few distant granules on their upper margins. The ambulatory legs of the single male are very imperfect, but they were evidently slender and considerably elongated, with the penultimate articles a little larger than the preceding and very little dilated.

An immature female from the same locality has the rostrum scarcely at all reflexed and somewhat shorter, with the spines less divaricate at the apex; the chelipeds and legs clothed with a denser pubescence; the latter much less elongated. This specimen, though distinguished by the narrower carapace and more elongated rostrum, much more nearly resembles typical *E. latreillii* than does the male.[19] (Miers.)

Measurements.—Length of carapace to base of rostrum, about 19; length of rostrum about 11; width of carapace a little over 15, length of cheliped nearly 32 mm. (Miers.)

Range.—Known only from the type-locality, inland waters of western Patagonia (or Magallanes Territory, Chile), off northeastern end of Madre Island, Wide Channel, lat. 50° 08′ 30″ S., long. 74° 41′ 00″ W., 175 fathoms, blue mud, January 5, 1876, station 308, *Challenger*; 1 male (type), 1 female (Brit. Mus.).

Genus EUCINETOPS Stimpson

Eucinetops Stimpson, Ann. Lyc. Nat. Hist. New York, vol. 7, 1860, p. 191 [63]; type, *E. lucasii* Stimpson.—A. Milne Edwards, Crust. Rég. Mex., 1875, p. 119.—Miers, Journ. Linn. Soc. London, vol. 14, 1879, p. 644.—Rathbun, Bull. U. S. Fish Comm., vol. 20, for 1900, pt. 2 (1901), p. 55.

Carapace oblong. Rostrum small, bifid, little deflexed. Eyes very long, reaching much beyond the margins of the carapace.

[19] This is not borne out by Miers's fig. 1, pl. 5.

Orbits small, inclosing only base of eye peduncles; external angle acute, spiniform; superior margin with one fissure, without teeth and spines. Antennular fossae not deep, round, margins obtuse. Basal article of external antennae small, armed at external angle with a minute tooth or spine; movable part depressed, first and second articles very broad. Epistome very short or wanting. Buccal cavity very broad anteriorly. Merus of outer maxillipeds subtriangular, outer front angle prominent, distal margin longest; palpus very short and stout, terminal article much narrower than the others.

Found sparingly on the west coast of Mexico and Panama, and in the Bahamas and West Indies.[20]

KEY TO THE SPECIES OF THE GENUS EUCINETOPS

A¹. Rostral horns long and narrow.
  B¹. Rostral horns blunt at tips. Fingers of male gaping.....lucasii, p. 85.
  B². Rostral horns acute at tips. Fingers of male not gaping..rubellula, p. 86.
A². Rostral horns short and broad, tipped with a small spine.
  B¹. Eyes reaching beyond postocular tooth by little more than length of cornea.....panamensis, p. 87.
  B². Eyes reaching beyond postocular tooth by half their length..blakiana, p. 88.

Analogous species on opposite sides of the continent: *blakiana* (Atlantic); *panamensis* (Pacific).

EUCINETOPS LUCASII Stimpson

Eucinetops lucasii STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, 1860, p. 191 [63], female, not pl. 2, fig. 3, male (type-locality, Cape St. Lucas; type not extant).—A. MILNE EDWARDS, Crust. Rég. Mex., 1875, p. 119.

Peltinia longioculis LOCKINGTON, Proc. California Acad. Sci., vol. 7, 1876 (1877), p. 76 [14] (type-locality, Lower California; type not extant).

Diagnosis.—Horns blunt. Fingers of male gaping. Transorbital width less than half greatest width of carapace in male.

Description of female.—"Body and feet hairy above. Carapax oblong, subquadrate, with very uneven surface, not granulated, much depressed between the branchial and hepatic regions; gastric region strongly prominent, with three small tubercles in a transverse row across the middle. Protuberant parts of frontal region clothed with curled hairs. Horns of the rostrum bluntly rounded at the extremities. Lateral margins of the carapax without teeth or spines. Feet moderate, cylindrical, unarmed. Inferior surfaces short-pubescent, not densely so." (Stimpson.)

Description of male.—"Posterior portion of carapax broadly triangular, post-orbital spine expanded, trans-orbital width rather less than half the greatest width; rostrum short, stout, bifid. Stomachal region prominent. Fixed joint of external antennæ emarginate at

[20] *Eucinetops ? stimpsoni* Miers, Ann. Mag. Nat. Hist., ser. 5, vol. 4, 1879, p. 3, is probably not a true *Eucinetops*, but may be called *Anacinetops* as Miers suggested.

apex, the outer tooth acute, not longer than the inner. Peduncles of eyes about equal in length to the distance between the eyes. First pair of feet about equal in length to the second and to the length of the body; meros tuberculate; hand thin, broad, smooth, marbled; fingers touching at the extreme tip only; a tooth on the inside of the movable finger near its base. Four hinder pairs short, slender, cylindrical, setose, except the tarsus, which is smooth and shining, like the manus of the first pair. Carapax and abdomen tomentose above and below." (Lockington.)

Measurements.—Female, type of *E. lucasii*, length of carapace 0.36 inch (9.1 mm.), width 0.27 inch (6.8 mm.). (Stimpson.)

Male, type of *Peltinia longioculis*, length and width of carapace nearly equal, about 8 mm. (Lockington.)

Remarks.—In a manuscript note in reference to *P. longioculis*, Lockington says: "Stimpson's description of *Eucinetops lucasii* agrees closely with this. He describes a female, but figures a male specimen which he states may not unlikely be of a different species. My specimen (male) agrees pretty closely with his description of the female, but not with the figure."

Range.—Cape St. Lucas, Lower California, Mexico.

EUCINETOPS RUBELLULA Rathbun

Plate 219, fig. 6

Eucinetops lucasii STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, 1860, p. 192 [64], male, pl. 2, fig. 3, not *E. lucasii*, female.

Eucinetops rubellula RATHBUN, Proc. Biol. Soc. Washington, vol. 36, 1923, p. 73 (type-locality, Cape St. Lucas, Lower California, Mexico; type not extant).

Diagnosis.—Horns acute. Fingers of male not gaping. Red spot on dactyls of ambulatories.

Description of male.—Compared to the female of *E. lucasii*, it is smaller and narrower,[21] with the horns of the rostrum acutely pointed, and the external antenna narrower, with the external angle of the first movable article considerably produced. Chelipeds large, much compressed and crested; carpus with two slight crests confluent posteriorly in a projecting angle or point; hand rather broad, flat, tapering to the slender fingers, not gaping. Dactyli of ambulatory legs much shorter than in female *lucasii*. (Stimpson.)

Color.—Apparently pale orange; a distinct red patch on dactyli of ambulatory feet at middle. (Stimpson.)

Measurements.—Stimpson does not give any, but according to his figure, which is twice natural size, the length of the carapace to tips

[21] The statement of narrower body is not sustained by the figure, when compared with the measurements of the female type of *E. lucasii*.

of horns is 8 mm., length on median line to base of horns, 6.7 mm., width of carapace 6.2 mm.

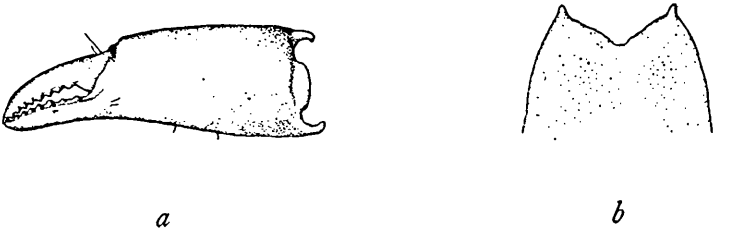
Range.—Known only from Stimpson's description of the type-specimen, which no longer exists.*

EUCINETOPS PANAMENSIS Rathbun

Plate 23, figs. 3 and 4

Eucinetops panamensis RATHBUN, Proc. Biol. Soc. Washington, vol. 36, 1923, p. 73 (type-locality, Pearl Islands, Bay of Panama; holotype, Cat. No. 2040, M. C. Z.).

Diagnosis.—Rostral horns widely separated, tipped with a spine. Carapace tuberculate. Eyes extending slightly beyond postorbital tooth.



a *b*

FIG. 22.—EUCINETOPS PANAMENSIS, MALE (55120). *a*. LEFT CHELA, × 24. *b*. ROSTRUM, × 17.6

Description.—Carapace high on the median line where it is strongly tuberculate; three large tubercles cover the cardiac region while a smooth oblong tubercle forms a bridge to the gastric region; a large, median intestinal tubercle. Branchial regions also tuberculate. Lateral angle marked by a small but strong spine; antero-lateral margin nearly straight, tuberculate, interrupted slightly between the hepatic and branchial regions. Rostrum one-third as wide as the fronto-orbital distance, divided less than half way into two shallow triangular teeth, each tipped with a small sharp curved spine. Postocular tooth large, triangular, almost equilateral, obliquely upturned. Eyes exceeding postocular tooth by little more than length of cornea; stalks not tapering. First movable segment of antenna very large, as wide as half the rostrum, furnished on its antero-external margin with a row of long hairs.

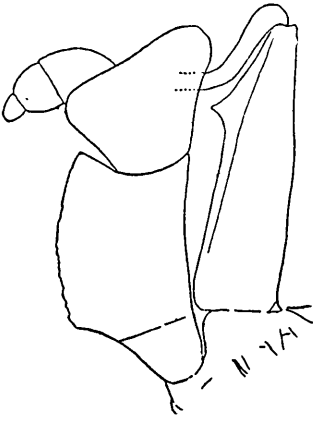


FIG. 23.—EUCINETOPS PANAMENSIS, MALE (55120), MAXILLIPED, × 29.5

Chelipeds shorter than next leg, chelae tapering distally, fingers narrowly gaping in proximal half. Ambulatory legs hairy; dactyli strongly curved, terminating in long, pale, horny spines.

Measurements.—Male, holotype, length of carapace to tip of horns 10.5, width including spines 8.5 mm.

Range.—Gulf of California, Mexico, to Panama.

Material examined.—

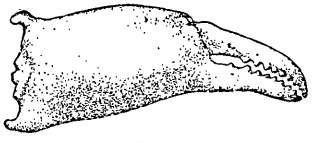
San Francisquito Bay, Lower California; beach; April 9, 1911; *Albatross;* 1 male, soft shell (56219).

Pearl Islands, Bay of Panama; S. W. Garman; 1 male (holotype) and 1 female (2040, M. C. Z.), 1 male (55120, U.S.N.M.).

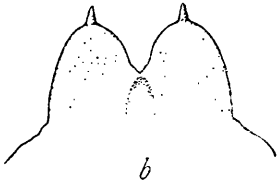
EUCINETOPS BLAKIANA Rathbun

Plate 23, figs. 1 and 2

Eucinetops blakiana RATHBUN, Proc. U. S. Nat. Mus., vol. 19, 1896, p. 141 (type-locality, Port Royal, Jamaica; holotype, Cat. No. 19405, U. S. N. M.); Ann. Inst. Jamaica, vol. 1, 1897, p. 4; Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, 1898, p. 252; Bull. U. S. Fish Comm., vol. 20, for 1900, pt. 2 (1901), p. 55.



a



b

FIG. 24.—EUCINETOPS BLAKIANA (19405). *a*. RIGHT CHELA OF MALE, × 35. *b*. ROSTRUM OF FEMALE, × 20

Diagnosis.—Rostral horns broad, triangular, tipped with a spine. Fingers of male not gaping. Carapace width behind postorbital spine three-fourths of branchial width.

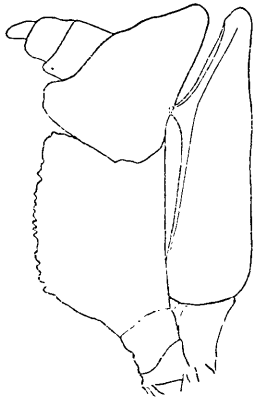


FIG. 25.—EUCINETOPS BLAKIANA, FEMALE (19405), MAXILLIPED, × 29.5

Description.—Antero-lateral margins slightly converging anteriorly, nearly straight. Surface uneven; median regions elevated, hepatic region depressed, separated from branchial by a deep hollow and a marginal sinus. Antero-lateral margin tuberculate, a spinule at postero-lateral angle; a few additional tubercles on upper surface of branchial region and on intestinal region. Front depressed, with two triangular, rounded lobes, tipped with a small, sharp, upturned spine and separated by a V-shaped sinus. Outer orbital tooth longer than broad, acute, upturned, separated from upper margin of orbit by a narrow, rounded sinus. Eye-stalks filling orbit, tapering to near cornea; tip slightly enlarged. Antero-external lobe of first movable article of antennae moderately developed, a tooth at outer angle, not reaching end of rostrum.

Abdomen composed of seven free segments in both sexes; in the male constricted at fifth segment; sixth segment with convex lateral outlines; seventh rounded, broader than long. Chelipeds small, smooth, and shining; merus subtrigonal; carpus with a tubercle above, near merus; hands compressed, margins converging toward fingers. Ambulatory legs subcylindrical; dactyli very slender and much curved. Carapace and ambulatory legs clothed with hair.

Measurements.—Male, holotype, median length of carapace 4.4, length to tip of horns 4.7, width of carapace 3.3 mm. Female (19405), median length of carapace 5.9, length to tip of horns 6.3, width of carapace 5 mm.

Range.—Bahama Banks; West Indies.

Material examined.—

Bahama Banks; 1893; State Univ. Iowa Exped. (specimen in S. U. I.).

Port Royal, Jamaica; P. W. Jarvis; 1 male (holotype), 2 ovigerous females (19405).

Arroyo, Porto Rico; February 4, 1899; *Fish Hawk;* 1 young female (24219).

Genus ARACHNOPSIS Stimpson

Arachnopsis Stimpson, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 121; type, *A. filipes* Stimpson.—A. Milne Edwards, Crust. Rég. Mex., 1878, p. 181.

Carapace oblong, narrow, and somewhat truncated in front. Rostrum short, bifid. Orbital arch high, protuberant. Postocular lobe long, separated from the orbital arch by a deep, narrow fissure. Eye long, considerably overreaching the tip of the postocular lobe, but capable of being drawn back beneath it. Basal article of antennae with two spinulous crests on the inferior surface which meet anteriorly, the outer crest continued back to the angle of the buccal area; a small, sharp spine at extremity, pointing obliquely forward and outward, between which and the rostrum the long movable part of the antenna is exposed. Merus of maxillipeds broader than long, and with sharply prominent internal and antero-external margins. Ambulatory legs long, filiform, second pair longest; dactyls slightly curved, nearly as long as the penult article. The last three segments of the abdomen are coalesced in the female.

Contains only one species.

ARACHNOPSIS FILIPES Stimpson

Plate 32, figs. 1 and 2; plate 219, figs. 4 and 5

Arachnopsis filipes Stimpson, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 121 (type-localities, off Conch, Carysfort and French Reefs, Florida, 34 to 45 fathoms; types not extant).—A. Milne Edwards, Crust. Rég. Mex., 1878, p. 181; 1879, pl. 33, figs. 1–1c; Bull. Mus. Comp. Zoöl., vol. 8, 1880, p. 6.—Kendall, Bull. U. S. Fish Comm., vol. 9, for 1889 (1891), p. 303.—Rathbun, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 57; Bull. Lab. Nat.

Hist. State Univ. Iowa, vol. 4, 1898, p. 253.—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zoöl., vol. 47, 1923, p. 370, pl. 11, fig. 1.

Diagnosis.—Eye long, slender. Postocular spine long, directed obliquely forward. Rostrum short. Legs filiform, varying little in length.

Description.—Body armed above with three erect, slender, blunt spines, one gastric, one cardiac, and the other on the first segment of the abdomen; abdominal spine small, cardiac and gastric spines equal and about as long as the distance between the orbital arches; these last armed with a spinule. Carapace convex anteriorly, flattened posteriorly; surface smooth and glossy, naked, except for a few hairs on the anterior part of the branchial, the sides of the gastric, and the frontal region. Beneath, the subhepatic and pterygostomian regions are armed with spiniform granules. The triangular rostral teeth are widely separated at their tips by a shallow interspace, in which the sharp point of an interantennular tooth is visible in dorsal view. Antennae half as long as carapace.

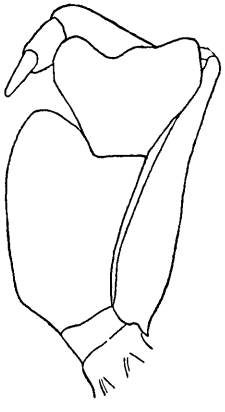


FIG. 26.—ARACHNOPSIS FILIPES (15199), MAXILLIPED, × 22

Chelipeds in male moderately enlarged, a little longer than carapace, much curved; edges of ischium, merus and basal portion of propodus, and surface of carpus spinulous. Remainder of propodus smooth, upper and lower margins convex; fingers as long as palm, gaping except near tips; the largest prehensile tooth is on immovable finger in middle of gape; just distad is an enlarged but still much smaller tooth on dactylus.

Sternum, abdomen and maxillipeds granulate.

Measurements.—Male (18117), length of carapace to extremity of rostral teeth 6.9, width of carapace 5.5 mm., length of ambulatory leg of second pair about 17 mm.

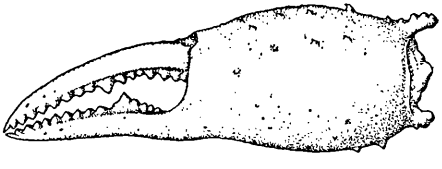


FIG. 27.—ARACHNOPSIS FILIPES, MALE (18117), LEFT CHELA, × 13.33

Range.—South and west coasts of Florida; Dominica and Barbados. Depth, 15 to 130 fathoms.

Material examined.—See table, page 91.

Material examined of Arachnopsis filipes

Locality	Bearings		Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	Latitude N.	Longitude W.									
					°F						
Florida Straits (off Key West).	Sand Key Light bearing W. NW., Key West Light bearing N.		60			June 19, 1893	24	State Univ. Iowa Bahama Exped.	2♀	Mus. S. U. 1.	
Do	Sand Key Light bearing NW. by N., Key West Light, N. ½ E.		50–60			do	27	do	2♂ 3♀	do	
Do	Near the preceding					do	29	do	1♂	do	
Do	Sand Key Light bearing W. ½ N., about 6½ miles.		20			June 24, 1893	39	do	2♂	do	
Do	Sand Key Light bearing W. about 8 miles.		15			do	41	do	1♀	do	
	° ′ ″	° ′ ″									
Do	24 25 45	81 46 00	45	Co	75	Jan. 15, 1885	2318	*Albatross*	1♀	18115	
Do	24 25 45	81 46 45	45	Co	75	do	2317	do	1♂	18114	
Do	24 26 00	81 48 15	37	Co		do	2315	do	1♂	18113	
West coast of Florida	25 23 30	83 17 00	33.5	Sponge, Co	68.5	Feb. 28, 1889	5072	*Grampus*	1♀	15196	
Do	25 34 00	83 07 00	30	fne. S. bk. Sp	68.5	Mar. 1, 1889	5078	do	1♂	15198	
Do	25 34 00	83 28 00	39	G. Co. fne. Sh	69	do	5076	do	1♀	15197	Rhizocephalid parasite in abdominal cavity.
Do	26 13 00	83 44 00	51	wh. S	69	Mar. 18, 1889	5104	do	1♀	15199	Do.
Do	26 31 50	83 42 00	37.5	gy. S	69	Mar. 23, 1889	5117	do	1♀	15200	
Do	28 45 00	85 02 00	30	gy. S. brk. Co		Mar. 15, 1885	2405	*Albatross*	2♂	18117	
Do	29 18 15	85 32 00	25	crs. gy. S. brk. Sh.		Feb. 7, 1885	2370	do	1♂	18116	
Off Dominica	15 34 40	61 29 35	130	yl. S	61.5	Jan. 25, 1879	178	*Blake*	1	2878, M.C.Z.	
Off Barbados			30			Dec. —, 1871		U. S. C. S. S. *Hassler.*	1♀	2058, M.C.Z.	
Do			80			do		do	1♀	2059, M.C.Z.	2 Rhizocephalids in abdominal cavity.
Do	13 11 54	59 38 45	73	Co. S. Sh	70.75	Mar. 9, 1879	290	*Blake*	1	2610, M.C.Z.	
Do	13 04 12	59 36 45	76	Co. brk. Sh	64.75	Mar. 5, 1879	272	do	1	2601, M.C.Z.	

Genus AEPINUS Rathbun

Apocremnus A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 184; type, *A. septemspinosus* A. Milne Edwards. Name *Apocremnus* preoccupied by Fieber, Wien Ent. Monschr., vol. 2, 1858, p. 320, for a genus of Hemiptera.—ALCOCK, Journ. Asiat. Soc. Bengal, vol. 64, 1895, p. 188.

Aepinus RATHBUN, Proc. Biol. Soc. Washington, vol. 11, 1897, p. 163; substituted for *Apocremnus*.

Carapace triangular, or pyriform, wide behind, narrow in interorbital region. Rostrum short, bifid. A strong supraocular spine and postocular tooth or spine which is close to the eye.[22] Basal antennal article narrow, its antero-external angle forming a strong spine visible from above on either side of rostrum; remaining articles also visible. The maxillipeds completely close the buccal cavity, the ischium increases in width distally, the merus is as wide as or wider than the ischium. Chelipeds not much enlarged. Ambulatory legs short and slender, propodites distally thickened, dactyls capable of flexion against them.

In the male the last two abdominal segments are fused; in the female the last three are typically fused. (In *A. indicus* they appear to be all separate.)

Contains only two species, one on the Atlantic coast of middle America, the other in the Indian Ocean. Depth, 7 to 100 fathoms.

AEPINUS SEPTEMSPINOSUS (A. Milne Edwards)

Plate 32, figs. 3 and 4; plate 219, figs. 1–3

Apocremnus septemspinosus A. MILNE EDWARDS, Crust. Rég. Mex., 1879, p. 185, pl. 35, figs. 5–5*d* (type-locality, Florida Strait, lat. 24° 55′ N., long. 83° 25′ W., 37 fathoms; type, Cat. No. 2882, M. C. Z.); Bull. Mus. Comp. Zoöl., vol. 8, 1880, p. 7.—MIERS, *Challenger* Rept., Zool., vol. 17, 1886, p. 17.

Aepinus septemspinosus RATHBUN, Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, 1898, p. 254; Bull. U. S. Fish Comm., vol. 20, for 1900, part 2 (1901), p. 54.

Diagnosis.—Rostral projections lobiform. Seven dorsal capitate spines. A postocular tooth.

Description.—The carapace and feet bear a few hooked hairs; carapace punctate. The seven capitate spines from which the species takes its name are situated on gastric, cardiac, and branchial regions, these four spines being large and subequal; on the first abdominal segment, spine shorter and directed obliquely backward; and on the orbital arches, spines considerably smaller. Gastric region narrow and high; in front of spine there are a few tubercles and, on the outer slope, a triangular laminate projection with an acute tip. A

[22] There is a small but distinct spine in *A. indicus* Alcock, Journ. Asiat. Soc. Bengal, vol. 64, 1895, pl. 4, fig. 2*a*, and Illus. Zool. *Investigator*, Crust., pt. 4, 1896, pl. 20, fig. 1*a*.

tubercle either side of cardiac spine; margin of branchial region tuberculate. Hepatic region steep, a granulate ridge running down to a laminate tooth on the margin. A triangular pterygostomian tooth.

Front very short, formed of two rounded lobes separated by a narrow cut. The antennular cavities extend nearly to the extremity of the front and are separated by a partition developed inferiorly in a triangular tooth. Eyestalks short, with a flat upper surface, a tubercle on the anterior margin and another at the extremity in the emargination of the cornea. The postocular tooth is small and easily broken off; it is thin and, at its origin a little behind the orbit, is laid close to the carapace; it is directed first forward and then outward, close to the eye; viewed from behind it is subtriangular, viewed from below it is narrower. Basal article of antenna very deep, with a prominent crest below, which near the anterior end bifurcates, the longer, outer branch continuing to epistome where it terminates in a lobe. The exognath of the maxillipeds has a tooth on its outer margin.

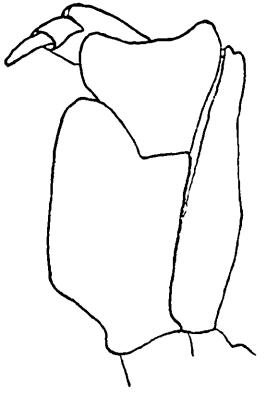


FIG. 28.—AEPINUS SEPTEMSPINOSUS (15165), MAXILLIPED, ×9.8

Chelipeds slightly enlarged; longitudinal lines of granules or small tubercles on margins and between; palm narrow; fingers gaping slightly in their basal half in male, the propodal finger hollowed out

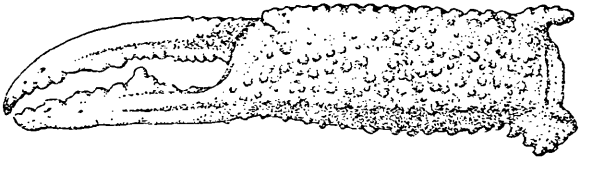


FIG. 29.—AEPINUS SEPTEMSPINOSUS, MALE (15165), LEFT CHELA, 3.3 MM. LONG

in the gape. Merus, carpus and propodus of ambulatory legs a little thickened at middle; dactylus very slender, slightly curved and hairy with below a row of minute spinules.

The sternum of the male has a very prominent crest connecting the coxae of the chelipeds; and four minor crests opposite the ambulatory legs; in the younger and less developed males the sternal segments have transverse lines of granules. Abdomen of old female coarsely pitted, terminal portion tuberculate, a smooth median carina; in the smaller females the abdomen is granulate,

Material examined of Aepinus septemspinosus

Locality	Bearings		Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″			°C						
Bahama Banks						May 18, 1893	----	State Univ. Iowa	1♂ 1♀	Mus. S.U.I.	
								Bahama Exped.			
West of Tortugas, Florida	24 43 00	83 25 00	37			1877-78	11	*Blake*	1♂	2882, M.C.Z.	Type.
West coast of Florida	28 46 00	84 49 00	26	crs. S. Co		Mar. 15, 1885	2406	*Albatross*	1♂	46086	
Do	28 45 00	85 02 00	30	gy. S.brk. Co		---do	2405	---do	1♀	18118	
Do	29 15 30	85 29 30	27	G		Feb. 7, 1885	2372	---do	1♂ 1♀	15165	
Do	29 14 00	85 29 15	25	Co		---do	2373	---do	1♀	15164	
Off St. Thomas	Sail Rock, W. by N. ½ N., 6 m.		20-23	Co	25.8	---do	6079	*Fish Hawk*	1♂ 1♀	24150	
Off Culebra Island, Porto Rico	Pt. Mula Lighthouse, SW. ½ S., 8½ m.		14.75	Co. S	25.5	Feb. 8, 1899	6086	---do	1♂	24145	
Do	Pt. Mula Lighthouse, SW. ¼ S., 10½ m.		15.25	Co. S	25	---do	6087	---do	1♂ 1♀	24146	
Do	Culebrita Lighthouse, NE., 5¼ m		15	Co	25.2	Feb. 10, 1899	6093	---do	1♂	24144	
Off Vieques Island, Porto Rico	Culebrita Lighthouse, N. ¼ E., 7¼ m.		21	Co	25.8	---do	6089	---do	1♀	24147	
Do	Culebrita Lighthouse, NE. by N., 10 m.		15	Co	26	---do	6091	---do	2♂	24149	
Do	Culebrita Lighthouse, NE. ⅜ E., 7¼ m.		16	Co	25.2	---do	6092	---do	1♀	24148	

the confluence of these granules forming intervening pits or depressions in the old.

Measurements.—Male (24150), length of carapace to tips of rostrum 7.4, width of carapace 6 mm. Female (15164), length of carapace 8.5, width 6.5 mm.

Variations.—The Porto Rican and St. Thomas specimens are more delicate than those from the Gulf. The four conical elevations of the carapace, gastric, cardiac and branchial (paired), are less high, but the surmounting spines are longer and slenderer, and the branchial spines tend to be less erect, more divergent. Besides the variations in the abdomen, already mentioned, the supraorbital spines vary in direction, being either slightly divergent, parallel, or convergent.

Range.—Bahama Banks; Straits of Florida; Gulf of Mexico; St. Thomas and Porto Rico; Island of Fernando Noronha, Brazil. Depth, 7 to 37 fathoms.

Material examined.—See table, page 94.

Genus EUPROGNATHA Stimpson

Euprognatha Stimpson, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 122; type, *E. rastellifera* Stimpson.—A. Milne Edwards, Crust. Rég. Mex., 1878, p. 182.—Miers, Journ. Linn. Soc. London, Zool., vol. 14, 1879, p. 645.—Rathbun, Bull. U. S. Fish Comm., vol. 20, for 1900, pt. 2 (1901), p. 57.

Carapace pyriform. Rostrum short, with two small teeth or horns. Interantennular spine usually present, pointing forward and downward at a much lower level than rostrum. Basal antennal article narrowly triangular, with an outer and an inner granulate or dentate crest; armed at anterior extremity with a slender spine reaching forward as far or nearly as far as do the rostral horns; movable part of antennae exposed from its insertion. A spine or tubercle on orbital arch. Eye peduncle short, with a tubercle at the emargination of cornea. Postocular spine reaching beyond extremity of eye. Merus of external maxillipeds somewhat L-shaped, strongly produced beyond insertion of palpus in front and at postero-inner angle. Abdomen of male with last two segments coalesced.

Chelipeds with palms dilated; fingers in the male slightly gaping. Ambulatory legs of first pair much the longest, the others decreasing regularly in length. Dactyli long and slender, more than half the length of the propodal joints. These crabs are almost naked, the ambulatory legs with a few curled setae above.

Restricted to American waters. Distributed on the Atlantic coast, from south of Nantucket (lat. 40° 13′ N.) to south part of Gulf of Mexico and the West Indies as far as Grenada and Barbados; and on the Pacific coast from Lower California, Mexico, to Panama.

KEY TO THE SPECIES OF THE GENUS EUPROGNATHA

A¹. Interantennular spine present.
  B¹. Antennal spines about equaling, or falling short of, the pair of rostral spines.
    C¹. Interantennular spine long. Sternum forming a narrow border around postero-lateral portions of carapace. Antennal spines diverging anteriorly. Immovable finger without a noticeably enlarged tooth.
      D¹. Gastric, cardiac and branchial regions each surmounted by a tubercle. Legs without spinules.....**rastellifera marthae**, p. 96.
      D². Gastric, cardiac and branchial regions each surmounted by a spine. Legs spinulous above.
        E¹. Dorsal spines stout. Legs finely and sparingly spinulous above. **rastellifera**, typical, p. 96.
        E². Dorsal and other spines slender. Legs more spinulous. Carapace closely and finely roughened.....**rastellifera acuta**, p. 96.
    C². Interantennular spine very short. Sternum forming a wide border around postero-lateral portions of carapace.....**gracilipes**, p. 101.
  B². Antennal spines considerably overreaching the pair of rostral horns. Anterior margins of postocular spines laciniated.....**granulata**, p. 104.
A². Interantennular spine absent. Two spines on intestinal region. Gastric, cardiac and branchial regions each surmounted by a spine. Antennal spines as advanced as pair of rostral spines.....**bifida**, p. 103.

ANALOGOUS SPECIES OF EUPROGNATHA ON OPPOSITE SIDES OF THE CONTINENT

Atlantic	Pacific
rastellifera	*bifida.*
rastellifera marthae	

EUPROGNATHA RASTELLIFERA Stimpson

EUPROGNATHA RASTELLIFERA MARTHAE, new subspecies

EUPROGNATHA RASTELLIFERA ACUTA A. Milne Edwards

Plate 33; plate 34, figs. 1 and 2; plate 35, figs. 3 and 4; plate 216

Euprognatha rastellifera STIMPSON, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 123 (type-locality, Florida Keys, 80 to 138 fathoms; type not extant).—A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 183 (*Euprognata);* 1879, pl. 33, figs. 2–2*e;* Bull. Mus. Comp. Zoöl., vol. 8, 1880, p. 7. — SMITH, Proc. U. S. Nat. Mus., vol. 3, 1880 (1881), p. 415, and vol. 6, 1883, p. 9; Rept. U. S. Fish Commr. for 1882 (1884), p. 347, pl. 1, figs. 3 and 3*a*, and for 1885 (1886), p. 621.—RATHBUN, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 55; Bull. U. S. Fish Comm., vol. 20, for 1900, part 2 (1901), p. 58.

Euprognatha inermis A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 183, (*Euprognata);* 1879, pl. 35, figs. 2 and 2*a* (type-locality, Guadeloupe; type in Paris Mus.); Bull. Mus. Comp. Zoöl., vol. 8, 1880, p. 7.—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zoöl., vol. 47, 1923, p. 374, text-fig. 17.

Euprognatha acuta A. MILNE EDWARDS, Crust. Rég. Mex., 1880, p. 348 (type-localities, St. Kitts, St. Vincent, and Barbados, 84 to 208 fathoms; types, Cat. Nos. 2728, 2580, 2600, M. C. Z.); Bull. Mus. Comp. Zoöl., vol. 8, 1880, p. 7.—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zoöl., vol. 47, 1923, p. 376, pl. 11, fig. 3.

Euprognatha rastellifera spinosa RATHBUN, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 55 (type-locality, off Havana; holotype, Cat. No. 18108, U.S.N.M.).

? *Inachus cardenensis* GUNDLACH and TORRALBAS, An. Acad. Habana, vol. 36, 1899 (1900), p. 299, text-fig. (type-locality, Bay of Cardenas, Cuba; type in Mus. Habana?); reprint, 1917, pl. [1], fig. 3.

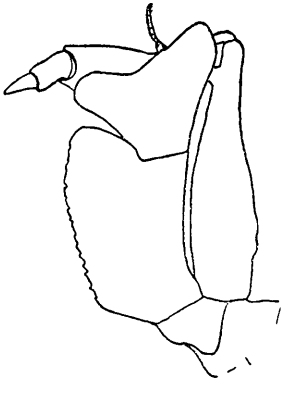


FIG. 30.—EUPROGNATHA RASTELLIFERA MARTHAE (3350), MAXILLIPED, × 11.1

Diagnosis.—Antennal spines nearly or quite as advanced as the front and directed obliquely forward. Interantennular spine equaling or surpassing the front. Four principal regions of carapace each surmounted by a spine or tubercle.

Description.—Carapace granulate, a tubercle or spine on the gastric, cardiac, and each branchial region and on supraorbital margin. Postorbital projection dentiform, tapering to a slender point. Frontal teeth short, spiniform or triangular; basal antennal article terminating in a slender spine directed obliquely forward and equally advanced with the front or nearly so. Interantennular spine inclined downward, equaling or surpassing the front. A few small spines on sides of branchial and on hepatic and pterygostomian regions. Sternum regularly granulated, except on concave portion between the chelipeds.

Chelipeds nearly twice as long as carapace, granulate, margins spinous; manus swollen; fingers more than half the length of palm, gaping, though narrowly, for two-thirds their length. Ambulatory legs granulate, with tufts of curled setae and often small spines.

Variations.—In the northern part of its range where the species occurs in greatest abundance, the dorsal protuberances are very short, usually tubercles or sometimes short truncate spines; the postorbital projection is rather broad, triangular, dentiform; the margins of the merus of the chelipeds are irregularly granulate; the legs are granulate, not spinulous. This form is designated as *Euprognatha rastellifera marthae*, new subspecies.

Among the Florida Keys which is the type region for the species, the four dorsal protuberances are each surmounted by an undoubted spine of medium length, capitate; the postorbital projection is narrower and the spines of the frontal region slenderer than in the northern form; the merus of the chelipeds is somewhat rougher; the legs are finely and sparingly spinulous.

The most southern form (Havana, Porto Rico) has longer, slenderer and sharper spines; surface of carapace more closely and finely roughened; spines bordering the merus of the chelipeds well developed; legs more spinulous; carapace a little narrower and higher and the regions more deeply separated than in more northern forms. This form is *E. rastellifera acuta.*

None of these forms is entirely restricted to its own range, they overlap one another, and two forms may occur in the same haul. (See table, pages 98–101.)

The specimen of *rastellifera* figured by A. Milne Edwards [23] is a typical one, but the roughness of the merus of the cheliped is not indicated. The subspecies *marthae* was described and figured by S. I. Smith, 1881 to 1886.[24] I am unable to say whether *inermis* should rank as a subspecies or not; it may be identical with *marthae.*

Measurements.—Male, holotype of *marthae* (18749), length of carapace 14.3, width 11.6 mm. Typical male *rastellifera* (55482), length 9.8, width 7 mm. Male, *acuta*, holotype of *spinosa* (18108), length of carapace 9, width 6.8 mm. The length is measured to the tip of the rostral teeth.

Range.—From off Nantucket Island, Massachusetts, to Straits of Florida, southern part of Gulf of Mexico, and Caribbean Islands, as far as Grenada and Barbados. Depth, 15 to 387 fathoms.

Material examined.—See table, pages 98–101

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[23] Crust. Rég. Mex., 1879, pl. 33, figs. 2–2*e*.

[24] Proc. U. S. Nat. Mus. vol. 3, 1880 (1881), p. 415, and vol. 6, 1883, p. 9; Rept. U. S. Fish Commr. for 1882 (1884), p. 347, pl. 1, figs. 3 and 3*a*, and for 1885 (1886), p. 621.

Material examined of Euprognatha rastellifera

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	° ′ ″	° ′ ″			°F						
South of Nantucket	39 57 00	69 28 00	120	S	47	Sept. 14, 1881	1035	*Fish Hawk*	2♀	34210	*marthae*. Larger female lacks median tubercles.
Do	39 58 00	69 30 00	94	S	51	do	1036	do	1	Y. U. M.	
Do	39 54 00	69 51 30	134	brd. S. Sponges	52	Aug. 4, 1881	940	do			On record, but not examined by writer.
Do	40 01 00	69 56 00	79	brd. S. M	52	do	941	do	numerous	3657	
Do	40 00 00	70 06 00	93	S. Sh	66	Sept. 21, 1881	1040	do	10	Y. U. M.	
Do	39 58 00	70 06 00	146	do	47	do	1038	do	2	do	
South of Marthas Vineyard	40 05 00 to 40 05 42	70 22 06 to 70 23 00	61-65			Sept. 4, 1880	865 to 867	do	20	do	
Do	40 02 18	70 23 06	192	fne. S	50	do	869	do	6	do	
Do	40 02 54	70 23 40	115	M. fne. S	49	do	871	do	1♀ numerous 1♂	55485 18746 38020	*acuta*. *marthae*. typical.
Do	40 05 39	70 23 52	86	S.G.Sh.Sponge	50.5	do	872	do	1♂ 1♂	40762 38019	*marthae*. Antennal spines overreach front.
Do	40 03 00	70 31 00	100	yl. M	52	Aug. 23, 1881	949	do	25	Y. U. M.	
Do	40 07 00	70 32 00	71	S. Sh. M	52	do	950	do	1♂ 1♀	21463	
Do	40 13 00	70 41 54	63	gn. M	49	July 16, 1881	920	do	7♂		On record but not examined by writer.
Do	40 07 48	70 43 58	67	do	52	do	921	do	200	3350	*marthae*.
Do	40 03 48	70 45 54	69	gn. M. S	52	do	922	do	numerous	4789	
Do	40 01 24	70 46 00	98	S	52	do	923	do	26♂ 11♀		On record but not examined by writer.
Do	39 55 00	70 47 00	229	S. M	42	do	925	do	5♀		Do.
Southwest of Marthas Vineyard.	39 55 00	70 54 15	142.5	M	52	Sept. 13, 1880	878	do	25	Y. U. M.	
Do	39 56 00	70 54 18	126	sft. sticky M	57	do	877	do	20	5773, 37971	*marthae*.
Do	39 57 00	70 56 00	120	do	53	do	876	do	6	Y. U. M.	
Do	40 02 00	70 57 00	100	do	51	do	873	do	numerous	18748	
Do	40 00 00	70 57 00	85	do	51	do	874	do	do	18749, 34013, 34015	1 male is holotype. *marthae*.
Do	40 25 35	71 10 30	44	gn. M	49	July 21, 1880	346	*Blake*	1♀ ovig	3178, M. C. Z	Do.
East of New Jersey	39 48 00	71 48 30	120	br. M. S		Aug. 10, 1885	2559	*Albatross*	4	10590	Woods Hole Mus.

East of Delaware Bay	38	53	30	72	52	00	188	gn. M. S			Sept. 21, 1885	2591	do	1♂ 1♀	11101	*marthae.*
Do	38	39	00	73	11	00	130	S	49		Oct. 10, 1881	1043	*Fish Hawk*	10♂	4846	Do.
Do	38	46	00	73	05	45	102	gn. M	53.3		Sept. 18, 1887	2746	*Albatross*	5	12742	Y. U. M.
Do	38	31	00	73	21	00	156	S	49		Oct. 10, 1881	1047	*Fish Hawk*	7♂	4841	*marthae.*
Do	38	22	05	73	33	40	89	gn. S. bk. Sp	56.5		July 18, 1880	335	*Blake*	1♂	3176, M.C.Z.	Do.
East of Chesapeake Bay	37	26	00	74	19	00	56	S. Sh	55		Nov. 16, 1880	896	*Fish Hawk*	1♀ juv	40761	*acuta*, probably.
Do	37	22	00	74	29	00	57.5	S	54		do	899	do	4♂ 2♀	4847	*marthae*, with tendency to longer carapace spines.
Do	37	19	45	74	26	06	102	gn. M. Sh			Mar. 23, 1883	2004	*Albatross*	26♂ 4♀	5527, 5537	*marthae.*
Do	37	18	11	74	27	36	82	bu. M. S. brk. Sh.			do	2005	do	10♂ 2♀	5520, 5542	*marthae.*
Do	37	10	15	74	32	00	143	gn. M. fne. S			June 3, 1885	2423	do	3	15155	
Do	37	08	30	74	33	30	85	crs. gy. S. bk. Sp. brk. Sh.	52.5		do	2422	do	54	10092	Do.
Do	37	07	50	74	34	20	167	gy. S	46.8		Oct. 18, 1884	2264	do	4♂ 2♀	8741	Do.
Do	37	07	40	74	35	40	70	gn. M. G	57.9		do	2265	do	80	8775, 8906	*marthae*, one specimen with tendency to longer carapace spines.
Do	37	07	00	74	34	30	64	fne. gy. S. P			June 3, 1885	2421	do	13	15154	
Do	37	03	20	74	31	40	104	bk. S. M. G	47.7		Apr. 5, 1885	2420	do	26	15153	*marthae.*
Do	36	41	15	74	39	50	66.5				Apr. 30, 1883	2012	do	1♂	7133	Do.
East of Cape Hatteras, North Carolina.	35	43	00	74	53	30	45	gy. & bk. S			Oct. 21, 1884	2308	do	1♀	8864	Y. U. M.
Do	35	12	30	75	05	00	48	crs. gy. bk. S	77		Oct. 19, 1884	2269	do	3♂	8748	
Gulf Stream	30 m. due S. of Cape Lookout Lightship, North Carolina.							In trawl					*Fish Hawk*	3♂	55483	*acuta.*
														1♂ 2♀	51086	typical.
														1♀	55484	*marthae.*
Off South Carolina	32	53	00	77	53	00	99					2313	*Albatross*	1♂	9141	*acuta.*
Off Fowey, Fla							80				Aug., 1916	354	*Eolis*, J. B. Henderson.	1♀	50929	*marthae.*
Do							100				May, 1917	360	do	1♀	50930	typical.
Do							75–100				do	361	do	1♂ 1♀	50931	Do.
Do							95				do	362	do	1♂	50932	Do.
Off Carysfort, Fla	25	20	30	79	58	00	217	gy. S	42.6		Apr. 9, 1886	2642	*Albatross*	1♂	18110	*marthae.*
Off Sambo Key, Fla							120				1916		*Eolis*, J. B. Henderson.	1♂	55486	*acuta.*
Gulf Stream off Key West	24	21	55	81	58	25	98	S	55		Feb. 14, 1902	7279	*Fish Hawk*	2♀	46977	typical.
Do	24	17	05	81	58	25	132	S	52		do	7280	do	1♂	46978	Do.
Do	24	17	30	81	53	30	127	S. G	53		do	7283	do	2♂	46979	Do.
Florida Straits	Sand Key, Florida, S. by E.						85						*Eolis*, J. B. Henderson.	1♂ 2♀	55489	Do.
Do	Off Sand Key.						120				1916		do	1♂	55482	Do.
Do	Pourtales Plateau, S m. S. of Sand Key Light.						100						do	1♂	46976	Do.

Material examined of Euprognatha rastellifera—Continued

Locality	Bearings		Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	Latitude N.	Longitude W.									
	° ′ ″	° ′ ″			°F						
Florida Straits	Sand Key Light bearing NW. by N., Key West Light, N. ½ E.		50–60			June 19, 1893	27	State Univ. of Iowa Bahama Exped.	4♂ 3♀	Mus. S. U. I.	
Do	Sand Key Light bearing N. about 6 miles.		116			do	28	do	3♂	do	
Do	Near the preceding						29	do	1♂	do	
Do	Sand Key Light bearing N. ½ W., about 6 miles.		ca. 105			June 20, 1893	33	do	2♀	do	
Do	Off Key West, Sand Key Light bearing N.NW., about 5 miles.		ca. 90			June 21, 1893	35	do	3♂	do	
Do	Sand Key Light bearing W., about 8 miles.		15			June 24, 1893	41	do	1♀	do	
Do	Bearings about as in preceding.					do	42	do	1♀	do	
Do	Key West Light bearing NW. by N., Sand Key Light, W. by N.		ca. 80			June 26, 1893	47	do	3♂	do	
Do	Key West Light bearing NW. by N., Sand Key Light, W. by N. ½ N.		ca. 80			do	48	do	2♂ 1♀	do	
Do	American Shoal Light bearing N. by W., 10 miles.		ca. 100			June 27, 1893	51	do	1♂	do	
Pourtales Plateau	24 16 00	81 22 00	ca. 200			do	56	do	1♂ 2♀	do	
Off American Shoal	American Shoal Light bearing NE. by N., 8 miles.		70–80			June 29, 1893	62	do	2♀	do	
West of Tortugas	24 37 30	83 36 00	110		58.5		26	*Blake*	1♂	2880, M.C.Z.	
Off Havana, Cuba						May 26, 1893		State Univ. of Iowa Bahama Exped.	2♀	Mus. S. U. I.	
2½ miles northwest of Havana Light.			387	Co	49	Apr. 30, 1884	2152	*Albatross*	1♀	7794	*acuta.*

Off Havana, Cuba	23	10	39	82	20	20	192	Co.			May 1, 1884	2161	do.	1♂ 1♀	7784	Do.
Do	23	10	39	82	20	21	201	Co.			Jan. 19, 1885	2342	do.	4♂ 1♀	13105	*acuta*. 1 male is holotype of *spinosa*.
Do	23	10	39	82	20	20	216	Co.			Jan. 20, 1885	2347	do.	1♂ 1♀	9528	*acuta*.
Do	23	10	39	82	20	21	200	Co.			do.	2316	do.	1♂ 1♀	9884	Do.
Do	23	10	39	82	20	21	211	Co.			do.	2318	do.	1♂ 1♀	9529	Do.
Do	23	10	40	82	20	15	182	Co.			do.	2349	do.	1♂	9531	Do.
Do	23	10	40	82	20	15	184	Co.			do.	2345	do.	1♀	18109	Do.
North part of Yucatan Bank.	23	32	00	88	05	00	95					32	*Blake*	2♂ 2♀	2879, M.C.Z.	typical.
Mayaguez Harbor, Porto Rico.				Customhouse, E. 5/8 S., 9 miles.			220–225	rky.		°C 21.6	Jan. 21, 1899	6070	*Fish Hawk*	1♂	21133	*acuta*.
										°F 55.25						
Off St. Kitts	17	17	12	62	46	43	208	fne. gy. S. blk. Sh.			Jan. 14, 1879	148	*Blake*	1♂	2728, M.C.Z.	*acuta*. Identified by A. M. E.
Off Martinique	14	26	18	60	55	00	170	fne. S.			Feb. 10, 1879	206	do.	1♂	2709, M.C.Z.	*acuta*.

NOTE.—In the column "Remarks" the subspecific classification is indicated for only those specimens which are now in hand. Many of the lots listed have been distributed as exchanges, duplicates, or returned specimens.

EUPROGNATHA GRACILIPES A. Milne Edwards

Plate 34, figs. 3 and 4

Euprognatha gracilipes A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 184 (*Euprognata*); 1879, pl. 35, figs. 3 and 3*a* (type-locality, lat. 23° 32′ N., long. 88° 05′ W., 95 fathoms; cotypes, Cat. No. 2881, M. C. Z.); Bull. Mus. Comp. Zoöl., vol. 8, 1880, p. 7.—RATHBUN, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 56; Bull. U. S. Fish Comm., vol. 20, for 1900, pt. 2 (1901), p. 58.—A. MILNE EDWARDS and BOUVIER, Mem. Mus. Comp. Zoöl., vol. 47, 1923, p. 375, pl. 11, fig. 2.

Diagnosis.—Antennal spines nearly or quite as advanced as the front and subparallel to each other. Interantennular spine short. Regions surmounted by a spine. Sternum forming a wide crenate border around the posterior portion of the carapace.

Description.—Branchial region less swollen and hepatic region more prominent than in *E. rastellifera*. Carapace densely granulous, the granules of varying size and intermixed with tubercles, of which there are five in a transverse row on gastric region. Gastric, cardiac, and branchial regions tipped with a cylindrical spine; a smaller abdominal spine. Hepatic margin with a stout spine. Margins of branchial region and ptergygostomian ridge armed with smaller spines and tubercles. Front having a deep median groove and terminating in two small triangulate teeth; spines of basal antennal article slender, equaling or not quite reaching front; interantennal spine very short. Supraorbital arches very thick and well marked, tipped with a spine directed diagonally forward and outward. Postorbital spines also much more oblique than in *E. rastellifera*. A wide prominent lobe diagonally across sides

Material examined of Euprognatha gracilipes

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
					°F						
Florida Keys	Sand Key, S. by E		85					J. B. Henderson	1♂	55491	
Do	Sand Key, S		85					do	1♀	55490	
	° ′ ″	° ′ ″									
Gulf of Mexico (Yucatan Bank).	23 32 00	88 05 00	95			1877–78	32	*Blake*	2	2881, M.C.Z.	Cotypes.
Off Havana, Cuba	23 10 39	82 20 21	201	Co		Jan. 19, 1885	2342	*Albatross*	1♀	18112	
Do	23 10 31	82 19 55	114	Co		Jan. 17, 1885	2331	do	1♂	9504	
Do	23 10 48	82 18 52	157	Co		Jan. 19, 1885	2336	do	1♂	9509	
Do	23 10 39	82 18 48	130	fne. Co		Jan. 17, 1885	2320	do	2♂	9483	
Do	23 10 54	82 17 45	115	Co		do	2322	do	2♀	18111	
Do	Morro Castle bearing SW. by W., about 2½ miles.		200			May 26, 1893	8½	State Univ. Iowa Exped.	5♂ 1♀	Mus. S. U. I.	
Mayaguez Harbor, Porto Rico.	Point del Algarrobo, E., 2¾ miles.		75–76	rky. S. Co	68.5	Jan. 20, 1899	6063	*Fish Hawk*	1♂	24134	
					°C						
Do	Point del Algarrobo, E. by N. ½ N., 5¾ miles.		97–120	Co	24	do	6067	do	1♂	24132	
					°F						
Off Frederickstadt, St. Croix	17 37 55	64 54 20	117	R. brk. Sh	65	Jan. 5, 1879	132	*Blake*	2♀ (1 ovig.) 1	2651, M.C.Z. 2647, M.C.Z.	
Off Barbados	13 11 54	59 38 45	73	Co. S. Sh	70.75	Mar. 9, 1879	290	do	1♀	2584, M.C.Z.	
Do	13 04 50	59 37 40	69	Co. Sh	68	Mar. 6, 1879	278	do	1	2699, M.C.Z.	
Do	13 04 12	59 36 45	76	Co. brk. Sh	64.75	Mar. 5, 1879	272	do	1♂ 2	2753, M.C.Z. 2602, M.C.Z. 2725, M.C.Z.	

of epistome in place of two or three tubercles. Sternum covered with large tubercles. Sternum extended over bases of legs, forming crenate border around posterior portion of carapace. Chelipeds about one and a half times the length of the carapace, granulate; margins of merus with short triangular spines; palms swollen; fingers very slender and gaping, a large triangular tooth not far behind middle of fixed finger. Ambulatory legs also rough with sharp granules, and with tufts of curled hair above.

Measurements.—Male (9504), length of carapace to tip of rostral horn 9, width without spines 7.3 mm.

Range.—Southern part of Gulf of Mexico and West Indies as far as Barbados. Depth, 69 to 201 fathoms.

Variation.—In some small specimens, 3 or 4 mm. long, the carapace is more oblong than in the old, lateral spines stronger, dorsal sternal plates subtriangular (55490, 55491, and 2651), epistomial tooth large, triangular, acute, and merus of legs with a few rows of short spines. This form is figured by A. Milne Edwards, 1879, but not by Bouvier, 1923 (pl. 11, fig. 2). Perhaps two subspecies are involved.

Material examined.—See table, page 102.

EUPROGNATHA BIFIDA Rathbun

Plate 34, figs. 5 and 6

Euprognatha bifida RATHBUN, Proc. U. S. Nat. Mus., vol. 16, 1893, p. 231 (type-locality, Gulf of California, 33 fathoms; holotype, Cat. No. 17335, U.S.N.M.).

Diagnosis.—No interantennular spine. Two spines side by side on intestinal region. An arched lamina at each end of epistome. Pterygostomian spine visible from above.

Description.—Carapace conspicuously and coarsely granulate; a spine on gastric, cardiac, and branchial regions and on first segment of abdomen; two spines on intestinal region. Postocular tooth with slender tip. Frontal teeth small, triangular, subacute. Antennal spines slender, directed obliquely forward, equally advanced with the front; a shallow, subtriangular, interantennular plate without spine. A short spine on orbital arch. Lateral margins spinous; one hepatic spine, two prominent branchial spines, and one spine on pterygostomian ridge, visible in dorsal view just behind the hepatic region.

An oblique arched lamina at each end of epistome. Sternum of male and abdomen of female coarsely granulate; in both a granulate raised $\wedge$-shaped ridge at anterior end of sternum.

Legs covered with spiniform granules, larger on margins of chelipeds. Palm inflated; fingers moderately gaping in proximal three-fourths. First pair of ambulatory legs a little more than twice as long as carapace.

Material examined of Euprognatha bifida

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	° ′ ″	° ′ ″	*Meters*		°*F*						
West coast of Lower California: Off Cerros Island	27 54 00	115 08 00	33					Scripps Inst.	(2♂	53955	
									1♂	Scripps Inst.	
Middle of east side of Cerros Island.						Mar. 12, 1911		*Albatross*	(1♂ 1♀	55759	
									2♂ 1♀	Amer. Mus.	
Gulf of California: Southeast of Tiburon Island.	28 28 00	112 04 30	*Fathoms* 29	gy. S	62.9	Mar. 23, 1889	3011	do	1♀	17336	
Off San Josef Island	24 55 15	110 39 00	33	fne. gy. S. brk. Sh.	64.5	Mar. 16, 1889	3001	do	1♂	17335	Holotype.
Do	24 51 00	110 39 00	40	S. brk. Sh	64	do	2998	do	1♀	17334	

Measurements.—Male (53955), length of carapace to tip of rostral horns 15.3, width without spines 13 mm.

Range.—Both coasts of Lower California, Mexico. Depth, 18 to 40 fathoms.

Material examined.—See table, page 104.

EUPROGNATHA GRANULATA Faxon

Plate 35, figs. 5 and 6

Euprognatha granulata FAXON, Bull. Mus. Comp. Zoöl., vol. 24, 1893, p. 149 (type-locality, near Cocos Island, 52 fathoms; cotypes, Cat. No. 4477, M. C. Z.); Mem. Mus. Comp. Zoöl., vol. 18, 1895, p. 6, pl. 1, figs. 1 and 1*a*.

Diagnosis.—Antennal spine greatly exceeding, and interantennular spine equaling, the rostral horns. Anterior margin of postocular spines laciniated.

Description.—Carapace coarsely granulate; two erect blunt spines in median line, one on gastric, the other on cardiac region; a transverse row of four or five small tubercles in front of gastric spine; a spine near middle of each branchial region, with a smaller lateral spine below and a little in advance of it; the hepatic region bears a short blunt spine on its most prominent part; there are, besides, three or four prominent tubercles on the angle which divides the hepatic and pterygostomian regions. Antennal spine very long, reaching beyond rostral horns; the three horns of the rostrum (interantennular and lateral) are about equal in length; the supraocular spines are well developed and, like the antennal and three rostral spines, are conspicu-

ously granulate. Postocular spines even more coarsely tuberculate; when viewed from above their margins appear laciniate.

Surface of abdomen thickly set with beadlike tubercles; the first segment bears a prominent granulate spine, and there is a rudimentary spine on each of the three following segments.

Chela slender (in female), covered with small tubercles; remaining articles of cheliped and also ambulatory appendages furnished with small spines, tubercles, and scattered curled setae. (After Faxon.)

Measurements.—Female, cotype, length of carapace 7, width 6 mm.

Range.—Known only from the type-locality, Cocos Island, off Bay of Panama.

Material recorded.—Near Cocos Island; lat. 5° 32′ 45″ N., long. 86° 55′ 20″ W.; 52 fathoms; nullipore or rky.; 62.2° F.; February 28, 1891; station 3369, *Albatross;* 2 females, cotypes (Cat. No. 4477, M. C. Z.).

Genus COLLODES Stimpson

Collodes Stimpson, Ann. Lyc. Nat. Hist. N. Y., vol. 7, 1860, p. 193; type, *C. granosus* Stimpson.—A. Milne Edwards, Crust. Rég. Mex., 1878, p. 175.—Miers, Journ. Linn. Soc. London, Zool., vol. 14, 1879, p. 645.—Alcock, Journ. Asiat. Soc. Bengal, vol. 64, 1895, p. 189.—Rathbun, Bull. U. S. Fish Comm., vol. 20, for 1900, pt. 2 (1901), p. 55.

Carapace ovate-triangulate. Rostrum short, entire or bifid. Hepatic region convex. Postorbital process usually large, triangular, not close to eye and separated from the supraorbital arch by a deep, open, marginal fissure. Eyes of moderate length, partially retractile. Basal joint of antenna with a terminal tooth or spine and two margins more or less dentate, the inner margin in a plane at right angles to the outer; flagellum longer than rostrum. Merus of outer maxillipeds obcordate, deeply cut on distal margin, strongly produced at outer and inner angles. Chelipeds of moderate length; merus trigonal, curved. Ambulatory legs of moderate length, the first pair a little longer or shorter than the second pair; third pair usually shorter than either; fourth pair the shortest, dactyli very slender.

Abdomen of male with six, of female with five segments. Surface usually hairy, the hairs collecting and retaining particles of mud; upper surface of legs usually furnished with curved hairs, lower surface with long, straight hairs or bristles.

Distributed on the Atlantic coast of America from S. of Marthas Vineyard, Massachusetts (northern limit, lat. 40° 07′ 48″ N., eastern limit, long. 69° 30′ 00″ W.), to Gulf of Mexico (eastern half) and West Indies (as far as Martinique); also from Cape Frio, Brazil, to Gulf of San Matias, Patagonia. Pacific coast of Mexico from Abreojos Point, Lower California, to Cape St. Lucas and into the Gulf of California. Also Malabar coast of India (Alcock).

Bathymetric range, shallow water to 373 fathoms.

KEY TO THE AMERICAN SPECIES OF THE GENUS COLLODES

A¹. Carapace with median spines.
B¹. Rostrum bifid.
C¹. Ambulatory legs hairy.
D¹. Inner or lower margin of basal antennal article denticulate.
E¹. Rostrum narrowed to a spine which has a bifid tip. tenuirostris, young, p. 113.
E². Rostrum not narrowed to a spine, but with two small teeth or spines at tip.
F¹. Granules evenly distributed on branchial region. trispinosus, p. 107.
F². Granules of branchial region unequal, divided into two areas by a smooth space rostratus, small, p. 110.
D². Inner or lower margin of basal antennal article unarmed. Carapace and female abdomen coarsely granulate granosus, p. 106.
C². Ambulatory legs naked nudus, p. 110.
B². Rostrum simple, not bifid.
C¹. Rostrum with a terminal spine tenuirostris, adult, p. 113.
C². Rostrum triangular, without terminal spine.
D¹. Basal antennal article with inner crest unarmed. rostratus, large, p. 110.
D². Basal antennal article with inner crest armed with three spiniform teeth obesus, p. 109.
A². Carapace without median spines.
B¹. Ambulatory legs not spinous.
C¹. Interantennular spine advanced as far as rostrum. Chelipeds slender. leptocheles, p. 117.
C². Interantennular spine not advanced as far as rostrum.
D¹. Carapace smooth. Postorbital lobe small levis, p. 120.
D². Carapace granulate or partly so.
E¹. Carapace mostly smooth, four tubercles near its center. Male sternum finely granulate tumidus, p. 121.
E². Carapace mostly granulate. Male sternum coarsely granulate.
F¹. Postorbital lobe of good size. Basal antennal article with conspicuously dentate crests robustus, p. 114.
F². Postorbital lobe small. Basal antennal article with almost smooth crests inermis, p. 119.
B². Ambulatory legs spinous. Rostrum short, subtruncate armatus, p. 122.

ANALOGOUS SPECIES OF COLLODES ON OPPOSITE SIDES OF THE CONTINENT

Atlantic	Pacific
trispinosus.	*granosus.*
rostratus.	*tenuirostris.*
inermis.	*tumidus.*

COLLODES GRANOSUS Stimpson

Plate 36, figs. 1 and 2; plate 217, fig. 1

Collodes granosus STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, 1860, p. 194[66], pl. 2, fig. 4 (type-locality, Cape St. Lucas; holotype not extant).—A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 177.—RATHBUN, Proc. U. S. Nat. Mus., vol. 21, 1898, p. 569.

Diagnosis.—Three median spines; rostrum subtriangular, tip bifid; carapace and female abdomen coarsely granulate.

Description.—Carapace nearly naked, conspicuously granulated, especially on the branchial regions; granules rather large and distinctly prominent. An erect obtuse spine on the gastric region, a larger one on the cardiac region, and one on the first segment of the abdomen. Anterior half of cardiac region and sulci or depressed parts of carapace generally, smooth and glabrous. Rostrum subtriangular, fissured; tip minutely bifid, points tuberculiform. A minute tooth on superior arch of orbit.

FIG. 31.—COLLODES GRANOSUS, FEMALE (21863), ROSTRUM, × 26.66

Chelipeds of female weak. Ambulatory legs rather depressed, ciliated, dactyli hairy. Margin of female sternum raised around egg-cavity; abdomen strongly indurated, with the outer surface covered with large closely set granules.

Measurements.—Female (55766), length of carapace 9.7, width 8.6, length of first ambulatory leg 15.6 mm.

Range.—Southern and Gulf coasts of Lower California, Mexico. Shallow water to 10 fathoms.

Material examined.—

Cape St. Lucas, Lower California; March 23, 1911; *Albatross;* 1 ovigerous female (55766).

E. of La Paz, in Gulf of California; lat. 24° 11′ 30″ N.; long. 109° 55′ 00″ W.; 10 fathoms; Sh.; April 30, 1888; station 2828, *Albatross;* 1 ovigerous female (21863).

COLLODES TRISPINOSUS Stimpson

Plate 36, figs. 5 and 6

Collodes trispinosus STIMPSON, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 120 (type-localities, off the Quicksands, off Carysfort Reef, and off French Reef, 34 to 50 fathoms; types not extant).—A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 178.

Collodes depressus A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 176; 1879, pl. 32, figs. 4–4*e* (type-localities, near Sombrero, 54 fathoms, and west coast of Florida, 20 fathoms; cotypes from Sombrero and W. Florida in M. C. Z., and from W. Florida in Paris Mus.).—SMITH, Proc. U. S. Nat. Mus., vol. 6, 1883, pp. 5 and 8; Rept. U. S. Fish Commr. for 1885 (1886), p. 621 [17].—RATHBUN, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 52.

Diagnosis.—Three long, slender, median spines. Rostral spines slender, longer than broad. Female abdomen covered with large, depressed granules.

Description.—Carapace hairy, covered with coarse granules everywhere except on the front, the anterior portion of the gastric region, and about the bases of the spines. There is a slender, erect, capitate spine on the gastric, and one on the cardiac region, and a third on the first segment of the abdomen. The rostrum bears two minute

Material examined of Collodes trispinosus

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
North Carolina:	° ′ ″	° ′ ″			°F						
Off Cape Hatteras	35 35 20	74 58 45	27	crs. gy. S.		Oct. 20, 1884	2296	*Albatross*	3♀ (2 ovig.)	7248	
Do	35 08 30	75 10 00	49	gy. S.		Oct. 17, 1885	2596	do	1♂ 2♀	18100	
Off Cape Lookout	34 38 00	76 12 00	18	fne. gy. S.		Oct. 19, 1885	2607	do	1♀	18952	
South Carolina:											
East of Charleston	32 55 00	77 54 00	79	crs. S. bk. Sp.	59.1	Jan. 3, 1885	2311	do	1♂	18095	
Florida:											
Southwest of Cape San Blas.	29 18 15	85 32 00	25	crs. gy. S. brk. Sh.		Feb. 7, 1885	2370	do	1♂ 2♀	18096	
Do	29 15 30	85 29 30	27	G.		do	2372	do	2♀	18097	
Do	29 11 30	85 29 00	26	S. G. brk. Sh.		do	2374	do	2♀	18098	
Southeast of Apalachicola.	28 46 00	84 49 00	26	crs. S. Co.		Mar. 15, 1885	2406	do	1♂	46985	
South of Apalachicola	28 45 00	85 02 00	30	gy. S. brk. Co.		do	2405	do	4♂ 8♀	9783	
Pepperfish Key Section						Nov. 21, 1901		*Fish Hawk*	1♂ 1♀	46970	
West of Marco	26 00 00	82 57 30	24	fne. S. bk. Sp. brk. Sh.		Mar. 19, 1885	2413	*Albatross*	2♂	18099	
Do	25 54 00	83 20 00	31	gy. S. bk. Sp. brk. Sh.	69	Mar. 15, 1889	5092	*Grampus*	1♂	20118	
West Florida			20					*Bache*, W. Stimpson.	1	2948, M.C.Z.	Cotype of *C. depressus*.
Tortugas reefs			4					J. B. Henderson	1♂ 2♀	46971	
Tortugas			16					do	1 ovig. ♀	47075	
Off Key West	Sand Key Light bearing W. NW., Key West Light bearing N.		60			June 19, 1893	24	State Univ. Iowa Exped.	2♂ 2♀	Mus. S. U. I.	
Off Sombrero			54			Apr. 2, ——		*Bache*	1	2653, M.C.Z.	Cotype of *C. depressus*.

and usually well-separated horns. The basal article of the antenna is so twisted that the terminal spinule of the four or five on the outer margin is in the same horizontal plane as the rostrum; the laminate crest near the inner margin ends in a large tooth. A short interantennular spine present. A granule on upper orbital border. Postorbital tooth slender. Sternum of male very finely granulate;

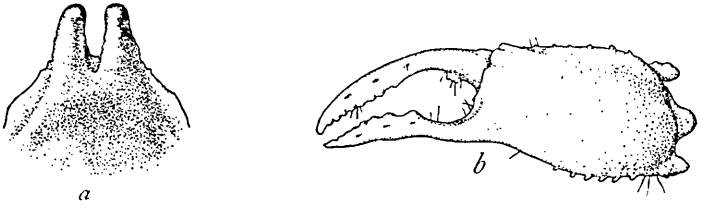

FIG. 32.—COLLODES TRISPINOSUS, MALE (9783). *a*. ROSTRUM, × 16. *b*. LEFT CHELA, × 6.66

terminal or seventh article of abdomen elongate-triangular. Abdomen of female furnished with coarse but depressed granules.

Chelipeds of male moderately stout; palm thick, smooth outside; margins of merus and palm and surface of carpus spinulous; fingers widely gaping, a triangular tooth near middle of fixed finger, a very shallow, molariform tooth near base of dactylus. Ambulatory legs long; dactyli about as long as the preceding article.

Measurements.—Male (9783), length of carapace 14, width 11.5, length of first leg 28.7 mm. Female (9783), length of carapace 12, width 9.7 mm.

Range.—North and South Carolina; Florida, gulf coast, and keys from Tortugas to Carysfort. Depth, 4 to 82 fathoms.

Material examined.—See table, page 108.

COLLODES OBESUS A. Milne Edwards

Plate 36, figs. 3 and 4; plate 217, figs. 2–5

Collodes obesus A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 177; 1879, pl. 32, figs. 3–3*d* (type-locality, near Sombrero, Florida Strait, 54 fathoms; holotype in M. C. Z.).

Diagnosis.—Carapace narrow, entirely covered with granules. Postorbital lobes large and turned outward, not forward.

FIG. 33.—COLLODES OBESUS FEMALE (46984), ROSTRUM OF CARAPACE 11 MM. LONG

Description (after A. Milne Edwards).—Near *trispinosus*. Distinguished by the form of the carapace which is longer and narrower, but wider across the postorbital lobes. Surface entirely covered with large flattened granules. Postorbital lobes broadly triangular and turned directly outward, the anterior margin being quite transverse. Median spines as in *trispinosus*. Inner, lower crest of basal antennal article ornamented with three large spiniform teeth; the outer edge bears three teeth followed by small granules. Chelipeds

smooth, fingers finely denticulate on prehensile edges and, as in the female of *trispinosus*, without a large tooth. Ambulatory legs short and hairy.

Measurements.—Female, holotype, length of carapace 13, width 9 mm.

Range.—Sombrero, Florida Strait, 54 fathoms.

Material examined.—A somewhat smaller female in the National Museum is placed here with some reserve, as it has, at the end of the rostrum, two small teeth. The specimen was taken by the *Fish Hawk* in the Gulf Stream off Cape Florida, one mile E. ¼ N. of Fowey Rocks Light, 50 fathoms, fine gray sand, coral, temp. 69° F., March 30, 1903, station 7516 (Cat. No. 46984). It has not been compared with the holotype.

Remarks.—For occasional bifurcation of an entire rostrum see under *C. rostratus* and *tenuirostris*.

COLLODES NUDUS Stimpson

Collodes nudus STIMPSON, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 120 (type-locality, off Carysfort Reef, 40 fathoms; holotype not extant).—A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 178.

Diagnosis.—Carapace and feet naked. Dactyli of ambulatories spinous on inner edge.

Description (after Stimpson).—Allied to *C. granosus* and *C. trispinosus*, having three spines on the dorsum similar in shape and position to the spines of those species. *C. nudus* differs, however, in its naked carapace and feet and in the less numerous and prominent granulated tubercles on the dorsal surface. The carapace is also much broader anteriorly. The ambulatory legs of the second pair are rather longer than those of the first pair; dactyli of the legs armed with spines along the inner edge.

Measurements.—Male, holotype, length of carapace 0.24 inch (6 mm.), width 0.18 inch (4.6 mm.), length of first ambulatory leg 0.45 inch (11.4 mm.).

Range.—Known only from the type male from off Carysfort Reef, Florida, lat. 25° 13′ 40″ N.; long. 80° 10′ 45″ W.; 40 fathoms; sand; March 21, 1869; station 7, U. S. Coast Survey steamer *Bibb*.

COLLODES ROSTRATUS A. Milne Edwards

Plate 36, figs. 7 and 8

Collodes rostratus A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 179; 1879, pl. 32, figs. 2–2*d* (type-locality, lat. 41° 40′ S., long. 63° 13′ W., [30 fathoms, *Hassler*, Mar. 7, 1872]; holotype, Cat. No. 2962, M. C. Z.).—RATHBUN, Proc. U. S. Nat. Mus., vol. 21, 1898, p. 569.

Diagnosis.—Rostrum narrow, hood-shaped, without terminal spine. Postorbital lobe broad, directed strongly forward, then outward. Fingers of adult male narrowly gaping.

Material examined of Collodes rostratus

Locality	Bearings Latitude S.	Bearings Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	° ′ ″	° ′ ″			°F						
Brazil: Off Cape Frio			35			Jan. 22, 1872	236P	*Hassler*	2♀	2057, M. C. Z.	Var. with rostrum slightly bifid.
Argentina: Off Rio de la Plata	36 47 00	56 23 00	10.5	S. brk. Sh		Jan. 12, 1888	2766	*Albatross*	1♂	21864	
Patagonia: East of Colorado River	40 03 00	58 56 00	52	fne. dk. S		Jan. 13, 1888	2767	do	1♀	21865	
									1♂	2962, M. C. Z.	Holotype.
Entrance of Gulf of San Matias.	41 40 00	63 13 00	30			Mar. 7, 1872	246P	*Hassler*	2♂ 2♀ (1 ovig)	2019, M. C. Z.	
									1 immat. ♀	2565, M. C. Z.	Var. with rostrum slightly bifid.

Material examined of Collodes tenuirostris

Locality	Bearings Latitude N.	Bearings Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	° ′ ″	° ′ ″			°F						
West coast of Mexico: Off Abreojos Point, Lower California.	26 14 00	113 13 00	48	yl. M	53.9	May 3, 1888	2834	*Albatross*	8♂ 9♀	21867	
Magdalena Bay, Lower California.	24 38 00	112 17 30	51	gn. M		May 2, 1888	2833	do	2♀	21866	
Gulf of California	29 19 00	112 50 00	145	br. M	54.9	Mar. 24, 1889	3015	do	1♂	17332	
Do	30 16 00	113 05 00	36	gy. S. brk. Sh	63.3	do	3018	do	2♂	17333	Holotype.
Do	29 30 00	112 40 00	45			1880–1882		Lieut.-Comdr. H. E. Nichols, U. S. N.	2 y. ♂, 2 y. ♀	18104	

Description.—Carapace covered with curved hairs and coarse granulation except in the deep interregional furrows which are smooth; granules less numerous on gastric and frontal regions. Spines of gastric and cardiac regions stout, spine of first abdominal segment slenderer. Rostrum narrow, advanced, hood-shaped, edge arcuate, a median keel, and a very short, closed, median incision at the end in the male. In the female the rostrum is narrower and without incision. In the type male described by Edwards the rostrum was more pointed and not incised. Basal antennal article long and narrow, inner lamina not deep, subentire, ending in a lobe, outer margin obscurely denticulate, terminal lobe elongate. Postorbital lobe large, advanced, its margins parallel in basal half, its inner margin then becoming transverse. Male sternum and female abdomen covered with fine granules.

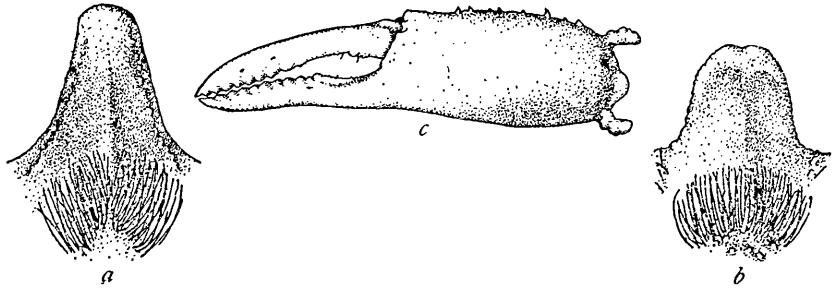

FIG. 34.—COLLODES ROSTRATUS. *a*. ROSTRUM OF FEMALE (21865), × 16.66. *b*. ROSTRUM OF MALE (21864) × 13.33. *c*. LEFT CHELA OF MALE (21864), × 10.66

Chelipeds feeble, merus and carpus and upper surface of manus finely roughened, fingers gaping for two-thirds their length, basal two-fifths of fixed finger hollowed on its prehensile edge in male.

Variation.—Three small specimens, one of which is from the type-locality, differ from typical *rostratus* in having the rostrum split for a short distance into two small horns. As the other characters are so close to *rostratus*, it is very probable that the bifid form is the early form and that the horns disappear with age leaving an entire rostrum, which may show slight indication of a bilobed tip.

Measurements.—Male (21864), length of carapace 11.6, width 8.4, length of cheliped 12, length of first ambulatory leg 20 mm. Female (21865), length of carapace 11.7, width 9 mm. Male (2049), length 20.1, width 15.6 mm. Female (2057), length 7, width 5.2 mm.

Range.—From Cape Frio, Brazil, to Gulf of San Matias, Patagonia. Depth, 10½ to 52 fathoms.

Material examined.—See table, page 111.

COLLODES TENUIROSTRIS Rathbun

Plate 37

Collodes tenuirostris Rathbun, Proc. U. S. Nat. Mus., vol. 16, 1893, p. 230 (type-locality, Gulf of California, lat. 30° 16′ N., long. 113° 05′ W., 36 fathoms; holotype, Cat. No. 17333, U. S. N. M.); Proc. U. S. Nat. Mus., vol. 21, 1898, p. 569.

Collodes, doubtful species, Rathbun, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 53.

Diagnosis.—Rostrum terminating in a slender spine; in addition, three median spines on carapace. Chelipeds slender.

Description.—Carapace slightly pubescent; unevenly granulate with unequal granules, the largest ones on the summit of the branchial regions, which have the greatest number of granules; a few small granules on cardiac and gastric regions; more on the hepatic regions; lateral and posterior margins covered with small granules. Four median capitate spines, one at end of rostrum, one gastric, one cardiac, and one directed obliquely backward and upward on the first abdominal segment. In young specimens the rostral spine is bifid at tip; and this bifurcation sometimes persists in older specimens up to 12 mm. in carapace length. A supraorbital tubercle; a rather broad postorbital lobe directed obliquely forward. Basal antennal segment with a prominent inner lamina ending in a lobe and an outer margin cut into numerous denticles. The male sternum is granulate on the cheliped segment near the abdomen and especially on the most protuberant parts; granules few on other segments except close to abdominal cavity. Female abdomen roughened with numerous but separated granules.

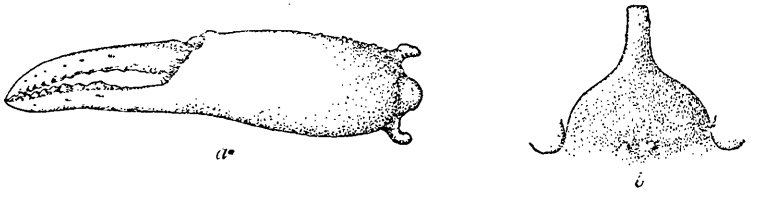

Fig. 35.—Collodes tenuirostris, male (21867), × 8. *a*. Left chela. *b*. Rostrum

Chelipeds slender; outer margin of merus armed with about eight stout spinules, other margins finely spinulous, as is also the inner margin of the carpus; manus nearly smooth; fingers narrowly gaping in basal half. Legs long-hairy, the hairs retaining large quantities of mud.

Measurements.—Male (21867), length of carapace 18.8, width 14.7, length of cheliped 20.6, of first ambulatory leg 35.7 mm. Female (21867), length of carapace 17, width 13.4 mm.

Range.—West coast of Lower California and Gulf of California. Depth, 36 to 145 fathoms.

Material examined.—See table, page 111.

COLLODES ROBUSTUS Smith

Plate 29

Collodes depressus Smith, Proc. U. S. Nat. Mus., vol. 3, 1880 (1881), p. 414; not *C. depressus* A. Milne Edwards, 1878, nor Smith, 1883 or 1886.

Collodes robustus Smith, Proc. U. S. Nat. Mus., vol. 6, 1883, p. 5 (type-localities, 21 stations between off Marthas Vineyard and off Chesapeake Bay, 56 to 156 fathoms; cotypes in U.S.N.M. and Y.U.M.; largest cotypes, station 940, Cat. No. 18763, U.S.N.M.); Rept. U. S. Fish Commr. for 1882 (1884), p. 347, pl. 1, figs. 1, 1*a*, 2-2*b*; for 1885 (1886), p. 621 [17].

Diagnosis.—Carapace granulate, without median spines. Rostrum two-spined. Palms of chelipeds dilated.

Description.—Larger than *C. trispinosus*, carapace longer and hepatic regions more protuberant. The median spines of *trispinosus*

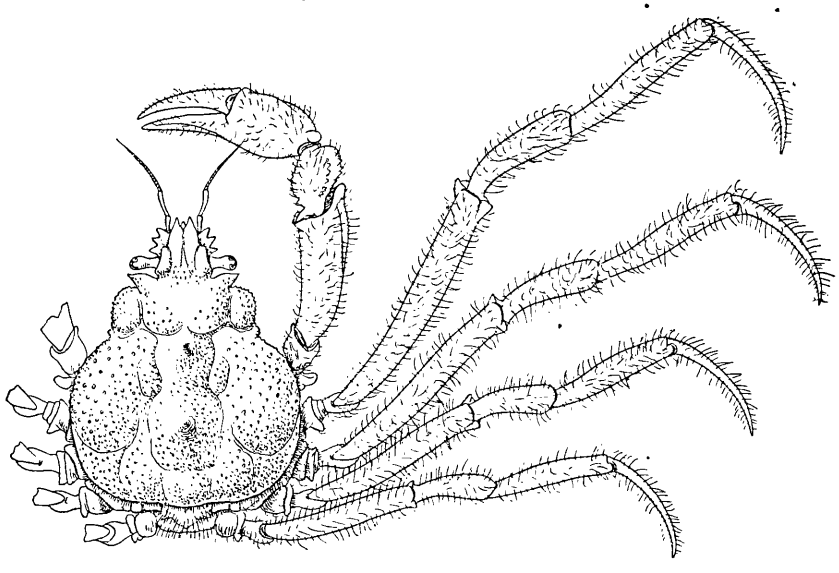

Fig. 36.—Collodes robustus, male, station 940, Fish Hawk, dorsal view, × 1.5. (After Smith)

are replaced by small tubercles which, in full grown specimens, are scarcely larger than the granules of the rest of the surface. Granules less abundant on the gastric region than elsewhere. Rostrum wider than in *trispinosus*, with two short horns more widely separated at the tips. Postorbital tooth triangulate, broader than in *trispinosus*, slightly exceeding the eyes in adults. Sternum of male coarsely granulate. Margins of basal antennal article dentate. Interantennular spine long and slender.

Chelipeds much as in *trispinosus;* in addition to the enlarged teeth on the fingers in *trispinosus*, there is in *robustus* a tooth on the dactylus opposite the one on the immovable finger. Ambulatory legs long-hairy.

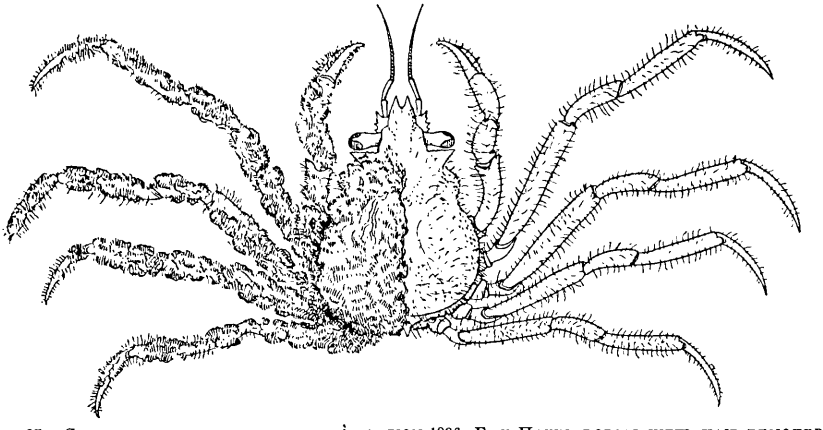

FIG. 37.—COLLODES ROBUSTUS, YOUNG MALE, STATION 1036, FISH HAWK, DORSAL VIEW, HAIR REMOVED FROM ONE SIDE, × 2.9. (AFTER SMITH)

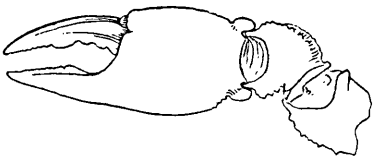

FIG. 38.—COLLODES ROBUSTUS, MALE, STATION 940, FISH HAWK, RIGHT CHELA, × 1. (AFTER SMITH)

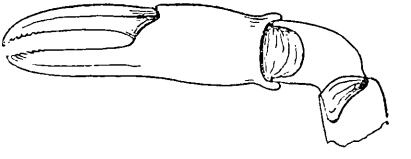

FIG. 39.—COLLODES ROBUSTUS, YOUNG MALE, STATION 1036, FISH HAWK, LEFT CHELA, × 8. (AFTER SMITH)

Color.—Yellowish, in alcohol.

Measurements.—Male (18763), length of carapace 27, width 21.2, length of first ambulatory leg 68 mm.

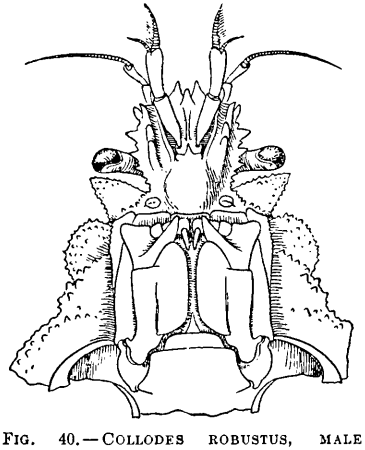

FIG. 40.—COLLODES ROBUSTUS, MALE STATION 940, FISH HAWK, VENTRAL VIEW OF ANTERIOR HALF, × 2.66. (AFTER SMITH)

FIG. 41.—COLLODES ROBUSTUS (5775), MAXILLIPED, × 5.92

Material examined of Collodes robustus

Locality	Bearings: Latitude N.			Bearings: Longitude W.			Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	°	′	″	°	′	″			°F						
Massachusetts:															
South of Nantucket	39	58	00	69	30	00	94	S	51	Sept. 14, 1881	1036	*Fish Hawk*	4	18764	
Do	39	54	00	69	51	30	134	hrd. S. Sponges	52	Aug. 4, 1881	940	do	21	18763	Cotypes.
													10	3288, M. C. Z	Do.
Do	40	01	00	69	56	00	79	hrd. S. M	52	do	941	do	6	Y. U. M	
Do	40	00	00	70	06	00	93	S. Sh	66	Sept. 21, 1881	1040	do	10	Y. U. M	
Do	39	58	00	70	06	00	146	S. Sh	47	do	1038	do	4 ♀	18768	
South of Marthas Vineyard.	40	05	00	70	23	00	65	Compact fne. S. M.	68	Sept. 4, 1880	865	do	1 ♂	Y. U. M	
													1 ♂ 1 ♀ ovig	18766	
Do	40	02	54	70	23	40	115	M. fne. S	49	do	871	do	8 ♂ 1 ♀	18767	
Do	40	05	39	70	23	52	86	S. G. Sh. Sponge.	50.5	do	872	do	1 ♂	Y. U. M	
Do	40	03	00	70	31	00	100	yl. M	52	Aug. 23, 1881	949	do	5 ♂ 5 ♀ ovig	18765	
Do	40	07	00	70	32	00	71	S. Sh. M	52	do	950	do	2 ♂ 2 ♀ ovig	5775	
Do	40	07	48	70	43	54	67	gn. M	52	July 16, 1881	921	do	4 ♂ 1 ♀	4566	
Do	40	03	48	70	45	54	69	gn. M. S	52	do	922	do	2 ♂	4567	
Do	39	55	00	70	54	15	142.5	M	52	Sept. 13, 1880	878	do	1 ♂ 1 ♀ ovig	Y. U. M	
Do	40	00	00	70	57	00	85	sft. sticky M	51	do	874	do	1 ♂	40760	
													5	Y. U. M	
Do	40	02	00	70	57	00	100	sft. sticky M	51	do	873	do	3 ♂ 3 ♀	Y. U. M	
Do	39	57	00	70	57	30	126	sft. sticky M	53	do	875	do	1 ♀	Y. U. M	
Delaware:															
East of Delaware Bay	38	39	00	73	11	00	130	S	49	Oct. 10, 1881	1043	do	3 ♂	4844	
													2 ♂	Y. U. M	
Do	38	33	00	73	18	00	104	S	51	do	1046	do	2	Y. U. M	
Do	38	31	00	73	21	00	156	S	49	do	1047	do	1 ♂	4845	
Virginia:															
East of Virginia	37	36	00	74	15	00	179	bu. M. fne. S	45	May 21, 1883	2021	*Albatross*	4 ♂	5746	
Do	37	26	00	74	19	00	56	S. Sh	55	Nov. 16, 1880	896	*Fish Hawk*	6 ♂ 1 ♀	4832	
Do	37	22	00	74	29	00	57.5	S	54	do	899	do	6 ♂	4833	
													3	Y. U. M	
Do	37	19	45	74	26	06	102	gn. M. Sh	51	Mar. 23, 1883	2004	*Albatross*	3 ♂ 1 ♀ ovig	5518	
													1 ♀	5528	
Do	37	18	11	74	27	36	82	bu. M. S. brk. Sh.		do	2005	do	7 ♂ 2 ♀	5532	
East of mouth of Chesapeake Bay.	37	08	30	74	33	30	85	crs. gy. S. bk	52.5	June 3, 1885	2422	do	2	15152	
								Sp. brk. Sh							
Do	37	07	40	74	35	40	70	gn. M. G	57.9	Oct. 18, 1884	2265	do	10 ♂ 3 ♀	7211	
Do	37	07	00	74	34	30	64	fne. gy. S. P		June 3, 1885	2421	do	11 ♂	10085	
Do	37	03	20	74	31	40	104	bk. S. M. G	47.7	Apr. 5, 1885	2420	do	16	9868	
East of Virginia	36	41	05	74	38	53	373	gn. M. fne. S		May 1, 1883	2014	do	1 ♂	5600, Y.U.M.	
North Carolina: Northeast of Cape Hatteras.	35	38	00	74	53	00	49	bk. M. brk. Sh.		Oct. 20, 1884	2297	do	1 ♂	8901	
													1 ♀	7261	

Range.—South of Nantucket, Massachusetts, to off Cape Hatteras, North Carolina. Depth 49 to 373 fathoms.

Material examined.—See table, page 116.

COLLODES LEPTOCHELES Rathbun

Plate 38, figs. 5 and 6

Collodes leptocheles RATHBUN, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 53 (type-locality, Gulf of Mexico, 68 to 169 fathoms; holotype, Cat. No. 9748, U.S.N.M.).

Diagnosis.—No median spines. Carapace granulate. Rostrum bidentate. Spine on fifth abdominal segment. Chelipeds slender.

Description.—Allied to *C. robustus;* surface granulate, without median spines. Rostrum divided by a V-shaped notch into two acute teeth shorter than in *robustus*, their outer margin convex Interantennular spine rather slender, extending a little beyond the rostrum. Postorbital tooth long, exceeding the eyes, and pointing directly outward.

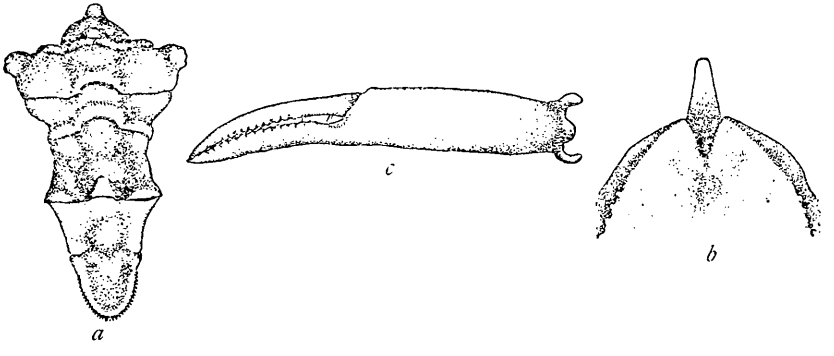

FIG. 42.—COLLODES LEPTOCHELES, MALE (9748). *a.* ABDOMEN, × 4.66. *b.* ROSTRUM, × 12.66. *c.* LEFT CHELA, × 7.33

Abdomen of male broader than in *robustus*, constricted at fifth segment, which bears a long spine directed downward and backward; a sharp median tubercle on first segment; tips of first pair of appendages more slender than in *robustus*. A small spine is present on the fifth segment in the female.

Inner margin of basal article of antenna very prominent, cut into three coarse spiniform teeth; outer margin also dentate with four or five teeth including the one at the extremity. Chelipeds weak in both sexes and about as long as carapace; hand slender, fingers as long as palm and very narrowly gaping in their basal portion. First and second pairs of legs nearly equal in length, second often exceeding first, about twice as long as carapace; dactylus of last two pairs longer than propodus.

Color.—In alcohol, a pale ecru.

Material examined of Collodes leptocheles

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
Gulf of Mexico:	° ′ ″	° ′ ″			°F						
South of Alabama	29 14 30	88 09 30	68	gy. M.		Feb. 11, 1885	2378	*Albatross*	1 ♀	18101	
Off Florida	28 41 00	86 07 00	169	gy. M.		Mar. 14, 1885	2400	do	5 ♂ 4 ♀	9748	1 male is holotype.
Do	28 38 30	85 52 30	142	gn. M. brk. Sh.		do	2401	do	9 ♂ 10 ♀	9751	
Do	28 36 00	85 33 30	111	gy. M.		do	2402	do	1 ♂	18102	
Do	28 42 30	85 29 00	88	gy. M.		Mar. 15, 1885	2403	do	1 ♂	18103	

Material examined of Collodes levis

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
Porto Rico:					°C						
Off Vieques Island	Culebrita Lighthouse, NE. by N., 10 miles.		15	Co.	26	Feb. 10, 1899	6091	*Fish Hawk*	3 ♀	23772	1 is holotype.
Do	Culebrita Lighthouse, NE. ⅜ E., 7¼ miles.		16	Co.	25.2	do	6092	do	1 ♀	24085	
Off Culebra Island	Point Mula Lighthouse, SW. ½ S., 8½ miles.		14.75	Co. S.	25.5	Feb. 8, 1899	6086	do	1 ♂	24083	
Do	Point Mula Lighthouse, SW. ¼ S., 10½ miles.		15.25	Co. S.	25	do	6087	do	1 ♀	24084	

Measurements.—Male, holotype, length of carapace 16.5, width 12.7 mm. Female (18101), length 17.5, width 13.2 mm.

Range.—Gulf of Mexico; 68 to 169 fathoms.

Material examined.—See table, page 118.

COLLODES INERMIS A. Milne Edwards

Plate 38, figs. 3 and 4

Collodes inermis A. Milne Edwards, Crust. Rég. Mex., 1878, p. 179; 1879, pl. 32, figs. 1–1c (type-locality, coast of Brazil, 17 fathoms, lat. 11° 49′ S., long. 37° 27′ W.; holotype, Cat. No. 2949, M. C. Z.).—Aurivillius, K. Sv. Vet.-Akad. Handl., vol. 23, 1889, p. 36.—Rathbun, Bull. U. S. Fish Comm., vol. 20, for 1900, pt. 2 (1901), p. 56.

Diagnosis.—Postorbital lobe small. No spines on carapace. Carapace partially granulate. Two very small rostral teeth. Fingers of male widely gaping.

Description.—Carapace depressed; partially granulate, especially along the posterior margin, on the summit of the cardiac region and the outer two-thirds or more of the branchial regions; a few granules on the front, on the middle of the gastric region and on the outer margin of the hepatic region. Amount of granulation variable. Rostrum bluntly triangular, tip cut into two minute teeth. Postorbital lobes small, directed straight outward and much exceeded by the eyes. Sternum of male coarsely granulate except between the chelipeds; abdomen nearly smooth save for the boss at either side of the third segment and the spine or tubercle on the first segment. Abdomen of female covered with depressed granules.

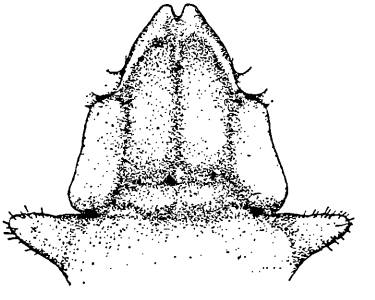

Fig. 43.—Collodes inermis, male (24142), frontal and orbital region, × 15

Basal article of antenna with margins almost unarmed, the outer one finely roughened, the inner margin not exceeded by the outer one. Merus of chelipeds with denticulate margins, chela dilated in male, fingers widely gaping for their proximal fifth, this portion of the fixed finger being curved downward and excavate, a triangular tooth at end of gape; a broad, low tooth projects from the dactylus into the middle of the gape.

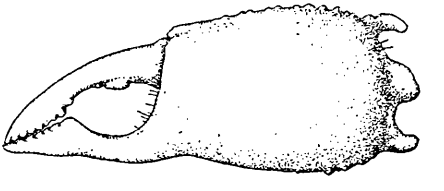

Fig. 44.—Collodes inermis, male (24142), left chela, × 13.33

Color.—Probably dark, as the paratype after long preservation showed traces of dark blue and olive; chelipeds green.

Measurements.—Male, holotype (2949), length 7.5, width 5.5 mm. Male (24142), length 8.7, width 7 mm.

Range.—Porto Rico; Martinique; Brazil, north of Bahia. Depth, 5½ to 18 fathoms.

Material examined.—

Porto Rico; 1899; *Fish Hawk:* Mayaguez Harbor; Black buoy entrance, N. by W. ½ W., ½ mile; 12 to 18 fathoms; S. M.; temp. 26° C.; January 20; station 6061; 1 male, 2 females (24142). Off Porto Real; Point Guaniquilla, S. ¼ E., 2 miles; 8½ fathoms; Co. S.; temp. 26° C.; January 25; station 6074; 1 female (24143).

Off coast of Brazil, North of Bahia; lat. 11° 49′ S.; long. 37° 27′ W.; 17 fathoms; January 18, 1872; U. S. C. S. S. *Hassler;* 1 male, figured type (2949, M. C. Z.).

COLLODES LEVIS Rathbun

Plate 38, figs. 1 and 2

Collodes levis RATHBUN, Bull. U. S. Fish Comm., vol. 20, for 1900, pt. 2 (1901), p. 56, text-fig. 9 (type-locality, off Vieques, 15 fathoms; holotype, Cat. No. 23772, U.S.N.M.).

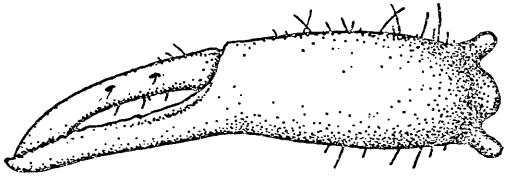

FIG. 45.—COLLODES LEVIS, MALE (24083), LEFT CHELA, × 24

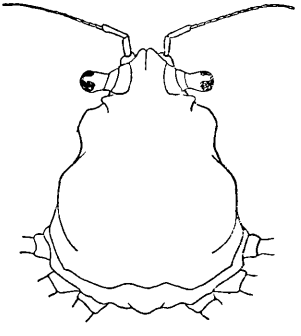

FIG. 46.—COLLODES LEVIS, FEMALE (23772), DORSAL VIEW OF CARAPACE, × 2.5. (AFTER RATHBUN)

Diagnosis.—Postorbital lobe small. No median spines on carapace or abdomen. Carapace smooth. Two very small rostral teeth.

Description.—Carapace narrow, moderately convex, pubescent, smooth, without spines, tubercles, or granules. Rostrum medially sulcate, tip minutely emarginate forming two small, blunt lobes or teeth. Interantennular tooth little developed. Postorbital tooth very small, reaching only about one-third the length of the eyestalk. Male sternum nearly smooth, abdomen smooth in both sexes. The vertical plate along the inner margin of the basal antennal article is entire and anteriorly very prominent; outer margin feebly denticulate. The only male known is immature; its chela is scarcely more enlarged than in the female.

Measurements.—Male (24083), length of carapace 5.4, width 4 mm.; female (23772), length 5.5, width 4.6 mm.

Range.—Porto Rico; 14¾ to 16 fathoms.

Material examined.—See table, page 118.

COLLODES TUMIDUS Rathbun

Plate 40, figs. 1 and 2; plate 218, fig. 5

Collodes tumidus RATHBUN, Proc. U. S. Nat. Mus., vol. 21, 1898, p. 569, pl. 41, fig. 1 (type-locality, Magdalena Bay, Lower California, 12 fathoms; holotype, Cat. No. 21571, U. S. N. M.).

Diagnosis.—Carapace mostly smooth; four elevated tubercles forming a cross near the middle. Postorbital lobe curved. Male sternum finely granulate.

Description.—Carapace granulate along the posterior and lateral margins, the granules large on the hepatic region and reaching forward a little on the branchial and cardiac regions; a few granules also between the orbits. Four tubercles near the middle of the carapace at the most elevated portions, one gastric, one cardiac, the other two at the inner angles of the branchial regions. Otherwise the central part of the carapace is smooth. Front bidentate, the teeth triangular, blunt, and separated by a space subequal to either tooth. Postorbital tooth slightly curved, convex forward, shorter than the eye. Basal antennal article broad, inner or lower edge entire, outer edge unevenly dentate, upper and lower terminal lobes equally advanced. Male sternum and elevations of first three abdominal segments finely granulate; otherwise the abdomen of both sexes is nearly smooth.

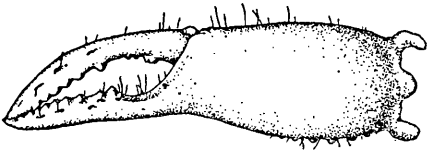

FIG. 47.—COLLODES TUMIDUS, MALE (21571), LEFT CHELA, × 9.33

Chelipeds of adult male slightly enlarged. The palm narrows perceptibly near the distal end. Fingers gaping to near the tips, dactylus with an enlarged tooth near the base, fixed finger with a similar tooth marking the proximal third. Ambulatory legs rather stout.

Measurements.—Male, holotype, length of carapace 11.6, width 9.5 mm.

Range.—Lower California, Mexico; 10 to 12 fathoms.

Material examined.—

Middle of east side of Cerros Island; March 12, 1911; *Albatross;* 1 young female (56221).

Magdalena Bay, Lower California; lat. 24° 32′ 00″ N.; long. 111° 59′ 00″ W.; 12 fathoms; fne. gy. S.; May 2, 1888; station 2831, *Albatross;* 1 male, holotype (21571).

Southern part of Gulf of California; lat. 24° 11′ 30″ N.; long. 109° 55′ 00″ W.; 10 fathoms; Sh.; April 30, 1888; station 2828, *Albatross;* 1 female (21868).

COLLODES ARMATUS Rathbun

Plate 217, fig. 6

Collodes armatus RATHBUN, Bull. Lab. Nat. Hist. State Univ. Iowa, vol. 4, 1898, p. 252, pl. 2, fig. 1 (type-locality, off Havana; holotype in Mus. S. U. I).

Diagnosis.—Carapace smooth and unarmed above. Rostrum short, subtruncate. Ambulatory legs spinous beneath.

Description.—Carapace narrow; dorsal surface smooth and shining, nearly naked; cardiac, branchial and gastric regions much swollen; hepatic region depressed and with one or more granules and a spinule on the margin; pterygostomian region with ten or more sharp spines. Front subtruncate, margin slightly excavate, not advanced beyond the antennular fossae, with a deep median sulcus terminating in the interantennular partition which projects slightly forward as a median tooth, not visible in dorsal view. Postorbital tooth triangular, shorter than eyestalk. Abdomen of female with two median tubercles on the coalesced segment; surface covered with curved hairs. Basal antennal article with an acute tooth at antero-external angle; outer margin with four irregular lobes; inner margin with a shallow sinus, anterior angle rounded. Maxillipeds spinulous.

Chelipeds of female slender, margins spinous, largest spines on outer margin of merus and inner margin of carpus. Manus slender, unarmed distally; fingers nearly as long as palm, in contact. Legs long, slender, and of nearly equal length, margined with long, straight bristles set in short, stout, cylindrical sockets, which remain as hard, beadlike projections when the bristles are removed; a few curved hairs present; the first two pairs of legs bear sharp spines underneath.

Measurements.—Female, holotype, length of carapace 9, width 6.8 mm.

Material examined.—The type female is the only specimen known; it was taken in 1893 off Havana, Cuba, by the State University of Iowa Expedition, and is deposited in the museum of that university.

Genus BATRACHONOTUS Stimpson

Batrachonotus STIMPSON, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 122; type, *B. fragosus* Stimpson.—A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 180.—RATHBUN, Bull. U. S. Fish Comm., vol. 20 for 1900, pt. 2 (1901), p. 56.

Carapace triangular, broadly expanded behind, especially in male; surface rough with granulations; gastric, cardiac and branchial regions strongly protuberant; hepatic region angular, approximating the postorbital tooth; cervical depressions deep and broad, giving carapace a superior outline much like that of a frog's back. Rostrum very short, scarcely projecting beyond the walls of antennulary fossae, slightly emarginated at the middle. Basal joint of antennae

with dentate margins and a small tooth or spine at anterior extremity. Postorbital tooth or spine small, close to eye. Merus of outer maxillipeds broad, with prominent outer and inner front angles. Last two segments of abdomen in male and last three in female anchylosed. Ambulatory legs of first pair very long in male, more than twice as long as those of second pair; posterior pairs very short. In the female all the ambulatory legs are short. Dactyli rather long.

This genus is very closely allied to *Collodes*, from which it differs chiefly in its carapace, broader posteriorly, its smaller postorbital tooth, in the shape of the hepatic region, which is angular in outline instead of rounded, the anterior margin being at right angles to median line, in the merus of the maxillipeds, which has the inner lobe more produced and transverse than in *Collodes*, and in the great length of the first ambulatory legs of the male.

Found only in American waters, between Cape Hatteras, North Carolina, and Rio de Janeiro, Brazil, on the Atlantic side, and on the coasts of Lower California, Mexico, on the Pacific side.

KEY TO THE SPECIES OF THE GENUS BATRACHONOTUS

A[1]. Postorbital tooth small, not nearly reaching end of eye. A large tooth on immovable finger of male ..... **fragosus**, p. 123.

A[2]. Postorbital tooth larger, reaching or nearly reaching end of eye. No large tooth on immovable finger of male ..... **nicholsi**, p. 127.

Analogous species on opposite sides of the continent: *fragosus* (Atlantic); *nicholsi* (Pacific).

BATRACHONOTUS FRAGOSUS Stimpson

Plate 39, figs. 1–4.

Gripus januarii KRØYER, *nomen nudum*, on label in Copenhagen Museum.

Batrachonotus fragosus STIMPSON, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 122 (type-locality, south of Tortugas, lat. 24° 36′ 40″ N., long. 83° 02′ 20″ W., 16 fathoms; type not extant).—A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 180.—RATHBUN, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 54; Bull. U. S. Fish Comm., vol. 20, for 1900, pt. 2 (1901), p. 57.

Batrachonotus brasiliensis RATHBUN, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 54 (type-locality, Rio de Janeiro; holotype, Cat. No. 19943, U. S. N. M.); Bull. U. S. Fish Comm., vol. 20, for 1900, pt. 2 (1901), p. 57.

Diagnosis.—Postorbital tooth small, not nearly reaching end of eye. A large tooth at middle of immovable finger of male. Antennal spines subparallel.

Description.—Male: Carapace coarsely granulate, especially on protuberant portions. Cardiac, gastric, and branchial regions and first segment of abdomen each surmounted by a stout spine or large tubercle. Two small tubercles on intestinal region just above posterior margin, and one enlarged tubercle on the margin of the

Material examined of Batrachonotus fragosus

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Variations
	° ′ ″	° ′ ″			°F						
North Carolina: Off Cape Hatteras.	35 35 20	74 58 45	27	crs. gy. S.		Oct. 20, 1884	2296	*Albatross*	2♂ 1♀	18437	Male, cardiac tubercle, 4 dorsal spines; male, cardiac and right branchial tubercles, 3 dorsal spines; female, branchial spines, 3 dorsal tubercles.
Florida:											
Off Pensacola	Pensacola Light, N. NW. ⅛ N., 9⅜ m.		12	S.	59.7	Jan. 18, 1913	28	*Fish Hawk*	1♀	55493	Branchial spines, gastric and abdom. tubercle, no cardiac tubercle nor spine.
Southwest of Cape San Blas.	29 18 15	85 32 00	25	crs. gy. S. brk. Sh.		Feb. 7, 1885	2370	*Albatross*	2♂	18105	5 dorsal spines.
Southeast of Cape San Blas.	28 45 00	85 02 00	30	gy. S. brk. Co.		Mar. 15, 1885	2405	do	4♂ 3♀	18106	Males, 5 dorsal spines; 1 female, with cardiac tubercle, 2 females, without; all females have 4 dorsal spines or tubercles.
Off Boca Grande	Boca Grande Light, N. NE. ⅜ E., 24½ m. to NE. ¼ N., 20 m.		12.5		68.5	Jan. 2, 1913	10	*Fish Hawk*	1♂	55492	Cardiac tubercle, 4 dorsal spines.
Off Fowey			75–100			May, 1917	361	*Eolis*, J. B. Henderson.	1♂	50928	Cardiac and right branchial tubercle, 3 dorsal spines.
Off Tortugas			16					do	4♂	47069	1 male, 5 spines; 2 males, 4 spines, cardiac tubercle; 1 male, 4 tubercles, abdominal spine.

Do			4				do		1♂	47070	4 tubercles, abdominal spine.
Cuba: Bahia Honda						June 7, 1914	*Tomas Barrera*		1♂ 1♀	48739	Female, abdominal tubercle, no other tubercles or spines. Male, soft shell.
Jamaica:											
Montego Bay	Bathing beach		(1)			July 19, 1910	E. A. Andrews		1♂	43020	No tubercles nor spines.
Do			40			Aug. 4, 1910	C. B. Wilson		1♀	43021	No tubercles nor spines; cardiac region almost smooth.
Porto Rico:					°C						
San Juan Harbor	NW. angle Morro Castle, ¾ m.	4. 5–5. 5	S. M		25. 2	Jan. 16, 1899	6051	*Fish Hawk*	1♂	24135	No tubercles nor spines.
Off Humacao	Humacao, N. ½ W., 3m.	12. 5	Co		26. 4	Feb. 6, 1899	6098	do	1♀	24114	5 short spines.
Off Vieques Island	Point Mula L. H., S. SW. ⅜ W., 5¾ m.	14	Co. S. Sh		25. 6	do	6085	do	1♀	21109	4 short spines; cardiac regions covered with bryozoan.
Do	Culebrita L. H., NE. by N., 10 m.	15	Co		26	do	6091	do	2♀	24108	5 spines.
Do	Culebrita L. H., NE. ⅜ E., 7¼ m.	16	Co		25. 2	do	6092	do	1♂ 1♀	24113	Do.
Off Culebra Island	Point Mula L. H., SW. ½ S., 8½ m.	14. 75	Co. S		25. 5	do	6086	do	3♀	21110	1 female, 5 spines; 1 female, 4 spines, no cardiac tubercle; 1 female, 4 tubercles, no abdominal tubercles nor spine, an intestinal spine.
Do	Culebrita L. H., NE., 5¼ m.	15	Co		25. 2	do	6093	do	1♂	21111	5 spines.
St. Thomas	Sail Rock, W. by N. ½ N., 6 m.	20–23	Co		25. 8	do	6079	do	1♂	24112	Do.
Curaçao	Rifwater (lagoon)	(2)				Sept. 28, 1905	J Boeke		1♂	Leiden Mus.	
Brazil:											
Rio de Janeiro		(3)				1876–77	R. Rathbun, Hartt Explor.		1♀ ovig	19943	4 very small tubercles; no abdominal tubercle nor spine. Holotype of *B. brasiliensis*.
Do									2♂	Copenhagen Mus.	4 tubercles; abdominal spine.

[1] Beach [2] Shallow water. [3] Dredged.

branchial region; also a short spine on subhepatic and on pterygostomian region. Rostrum formed of two rounded lobes separated by a shallow notch; its margin and the supraorbital margin denticulate. Abdomen and sternum granulate, except for a transverse smooth area between bases of chelipeds.

Chelipeds a little longer than carapace, spinulous; ischium with a distal spine; manus slightly compressed; fingers nearly as long as the palm, gaping for nearly their whole length, a large tooth in middle of pollex.

Female: Carapace narrower behind and wider in front than male, tuberculation more uniform, spines less frequent. First ambulatory leg very little longer than second, about one and a half times length of the carapace. Abdomen tuberculate or granulate.

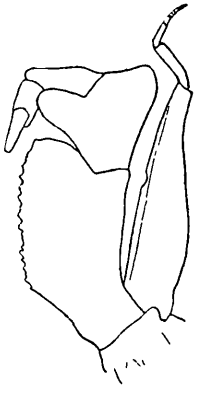

FIG. 48.—BATRACHONOTUS FRAGOSUS (47070), MAXILLIPED, × 18.1

Variations.—This species shows wide variations from the type. Stimpson described a single male from south of the Tortugas as having tubercles on the protuberant parts of the carapace and the first segment of the abdomen. Two males out of five from the Tortugas (47069 and 47070) resemble Stimpson's in having four carapace tubercles but differ in having an abdominal spine. From this there are all variations of roughness, from five spines in place of tubercles, on the one hand, to no tubercles or spines at the summit of elevations on the other. The different combinations of variations in this character are shown in the list of specimens (pp.124–125), under column "Variations," where the five prominences dealt with are the gastric, cardiac, and branchial (paired) regions and the first abdominal segment.

Unique is one female out of three (23110) which bears a median intestinal spine, no enlarged tubercle or spine on abdomen and four tubercles elsewhere.

Measurements.—Male (47070), length of carapace to tip of rostral teeth 7.2, width 6.2 mm. Female (19943), length 7, width 6 mm.

Range.—From Cape Hatteras, North Carolina, to Gulf of Mexico (coast of Florida), to West Indies and Rio de Janeiro, Brazil. Depth, 4 to 75 fathoms.

Material examined.—See table, pages 124–125.

BATRACHONOTUS NICHOLSI Rathbun

Plate 39, figs. 5–8

Batrachonotus nicholsi RATHBUN, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 55 (type-locality, Gulf of California, lat. 29° 30′ N., long. 112° 40′ W.; holotype, Cat. No. 18107, U.S.N.M.); vol. 21, 1898, p. 570.

Diagnosis.—Postorbital tooth reaching or nearly reaching end of eye. No large tooth on immovable finger of male. Antennal spines divergent.

Description.—Compared to *B. fragosus*, the granulation is everywhere coarser and more beadlike. Two enlarged tubercles or spines on branchial margin. Rostral teeth more acute; basal antennal spines more produced and very divergent from each other, the distance between the tip of each spine and the tip of the nearest rostral tooth being more than twice as great as between the tips of the rostral teeth. Supraorbital margin more elevated. Sternum behind the chelipeds not completely granulate, the granules larger, the segments bearing the ambulatory legs having only one or two irregular rows of granules, the depressions between the segments smooth.

Chelipeds very rough, the immovable finger without an enlarged tooth. First leg a little more than one and a half times as long as carapace.

Variations.—While in most of the specimens the dorsal protuberances are crowned by a stout spine, varying in length, sometimes one or more of these is replaced by a tubercle. In the type females, the tubercles are very small, and the smooth space between regions is greater than in any other specimens.

Measurements.—Male (21782), length of carapace to tips of rostrum 9, width without spines 7.9 mm. Female (21869), length 7.5, width 6.5 mm.

Range.—Lower California, Mexico, from Abreojos Point on the west coast to Gulf of California. Depth, 12 to 145 fathoms.

Material examined.—See table, page 128.

Genus PYROMAIA Stimpson

Pyromaia STIMPSON, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 109; type, *P. cuspidata* Stimpson.—A. MILNE EDWARDS, Crust. Rég. Mex., 1879, p. 197.
Apiomaia VON MARTENS, Zool. Rec., 1871 (1873), p. 182; substituted for *Pyromaia*.—MIERS, Journ. Linn. Soc. London, vol. 14, 1879, p. 651.

Carapace pyriform, convex, rough with tubercles and spines; rostrum simple, well developed; supraorbital spine usually present; postorbital spine large, distant from the ocular cavity, and curved around end of eye, tip directed forward. Basal article of outer antennae long and narrow, tapering anteriorly; movable portion very slender. Epistome a little wider than long. Buccal cavity not

Material examined of Batrachonotus nicholsi

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	° ′ ″	° ′ ″			°F						
Mexico:											
Off Abreojos Point	26 14 00	113 13 00	48	yl. M	53.9	May 3, 1888	2834	*Albatross*	1♂	21872	
Magdalena Bay	24 38 00	112 17 30	51	gn. M		May 2, 1888	2833	do	2♂ 2♀	21871	
Do	24 32 00	111 59 00	12	fne. gy. S		do	2831	do	1♀	21870	
Off Cape St. Lucas	22 52 00	109 55 00	31	rky	74.1	May 1, 1888	2829	do	1♂ 1♀	21869	
Gulf of California	29 19 00	112 50 00	145	br. M	54.9	Mar. 24, 1889	3015	do	1♀	22290	
Do	29 30 00	112 40 00	45			1880–82		Lieut.-Comdr. H. E. Nichols, U. S. N.	2♀	18107	1 is holotype.

Material examined of Pyromia arachna

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.
	° ′ ″	° ′ ″			°F					
Southeast of Charleston, South Carolina	32 10 00 to 32 11 00	79 07 00 to 79 04 00	117	gn. M. S		Dec. 9, 1919	20035	*Albatross*	1♂	54457
Southwest of Cape San Blas, Florida	28 36 00	85 33 30	111	gy. M		Mar. 14, 1885	2402	do	7♂ 3♀ ovig. 1y	9758
Do	28 38 30	85 52 30	142	gn. M. brk. Sh		do	2401	do	8♂ 9♀ (1 ovig.)	9750
Do	28 41 00	86 07 00	169	gy. M		do	2400	do	1♂ holotype, 2♀ ovig.	18144
Do	28 44 00	86 18 00	196	gy. M	51.6	do	2399	do	1♀ y	9745
South of Mobile Bay, Alabama; east of Delta of Mississippi River.	29 07 30	88 08 00	210	gy. M	67	Feb. 11, 1885	2377	do	2	9649

completely filled by the outer maxillipeds; ischium with its inner distal portion strongly advanced; merus cordate, with a prominent narrow lobe on the inner side. Chelipeds of moderate length, merus triangulate, manus swollen, fingers long and curving inward. Ambulatory legs very long and slender, cylindrical, decreasing successively in length from first to fourth pair; dactyli long and slightly curved. Abdomen of male with the last two segments, of female with the last three segments, fused.

Not found outside of America, where it ranges from North Carolina to Florida Straits and Gulf of Mexico; and from Monterey Bay, California, to Panama.

KEY TO THE SPECIES OF THE GENUS PYROMAIA

A¹. A spine near middle of basal antennal article. Ambulatory legs long, first leg in male three or more times as long as carapace.

B¹. Rostrum tapering regularly to tip. Chelipeds and legs covered with short, soft pubescence. No spine at proximal end of merus of ambulatory legs ..... cuspidata, p. 129.

B². Rostrum triangular at base, then narrowing to a slender spine. Chelipeds and legs not noticeably pubescent. An erect spine at proximal end of merus of ambulatory legs; a short fringe of hair on either side of the dactyls ..... arachna, p. 131.

A². No spine near middle of basal antennal article. Ambulatory legs shorter than in A¹, first leg in male usually not much over twice as long as carapace.

B¹. Two large median gastric tubercles. Granules few; greater part of carapace smooth. Legs unusually long and slender, but less than three times as long as carapace ..... tuberculata, var. A., p. 136.

B². Not more than one large median gastric tubercle. Granules more numerous than in B¹.

C¹. One large median gastric tubercle. Granules not nearly covering carapace. Rostrum longer, or just as long, as wide. tuberculata, typical, p. 133.

C². No large median gastric tubercle. Granules coarse, almost covering carapace. Rostrum short, wider than long. tuberculata, var. B., p. 136.

PYROMAIA CUSPIDATA Stimpson

Plate 41

Pyromaia cuspidata STIMPSON, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 110 (type-localities, off Sand Key, 82 fathoms; off Alligator Reef, 88 fathoms; off the Samboes, 93 and 121 fathoms; S. W. of Sand Key, 125 fathoms; types not extant).—A. MILNE EDWARDS, Crust. Rég. Mex., 1879, p. 197; pl. 36, figs. 2-2*f*.—RATHBUN, Proc. U. S. Nat. Mus., vol. 17, 1894, p.73 (part).—HAY and SHORE, Bull. Bur. Fisheries, vol. 35, 1915-16 (1918), p. 455, pl. 38, fig. 4.

Apiomaia cuspidata VON MARTENS, Zool. Rec., 1871 (1873), p. 182.—MIERS, Journ. Linn. Soc. London, vol. 14, 1879, p. 651.

Diagnosis.—Four (or five) spines on branchial margin. Six median spines or large tubercles on carapace. Rostrum tapering rather regu-

larly to the tip. Manus of male cheliped subglobular. No spine near proximal end of merus of ambulatory leg.

Description.—Adult male: Regions of carapace well marked, tumid, rough with granules, sharp tubercles, and spines. Six of the larger spines are median (2 mesogastric, 1 urogastric, 2 cardiac, 1 intestinal), one is protogastric, two or three are hepatic, and the remainder branchial, as follows: Four (or five) marginal and seven or eight scattered on dorsal surface. Of the median spines, the anterior cardiac and posterior mesogastric are the longest. The granules which cover the surface are not close together and are irregular in size. In the depressions separating the branchial from the cardiac, gastric and hepatic regions, there are several deep pits. Rostrum simple, between one-fourth and one-fifth the postrostral length of carapace, narrow, inclined upward, trigonal, acute, its upper and lateral margins spinulous. There is an acute, triangular, interantennular spine, pointing downward and slightly forward. Supraorbital spine almost erect, directed slightly outward and forward. Anterior margin of postorbital tooth, both above and below, fringed with hair.

Basal article of antenna with a terminal spine, a large spine at middle of inner margin, and a small spine at middle of outer margin followed by a row of tubercles or spinules. A single row of spinules and one spine on pterygostomian region, a tubercle at angle of buccal cavity. Outer maxillipeds spinulous; a longitudinal median depression on ischium. Chelipeds and ambulatory legs covered with a short fur, underneath which the surface is rough with sharp granules or spinules. Margins of merus of cheliped armed with short spines, terminal spine of upper margin longer; upper margin of carpus spinulous, a few larger spines on outer surface; propodus much inflated, subglobular; dactylus as long as the upper margin of propodus; both fingers bare and with two longitudinal sulci on the outer side; prehensile margins evenly dentate and in contact to near the base, where they are denticulate and gape slightly. Ambulatory legs spinulous; merus with an acute oblique spine at distal end. First abdominal segment long, bearing an acute spine pointing backward. Sternum oblique; anterior portion strongly retreating.

Adult female: Chelipeds and legs almost bare. Chelipeds not much stouter than ambulatory legs, dactylus one and a half times as long as the small palm. Legs shorter than in male.

Young: Pubescence slight, as in female. Postorbital tooth less extensive, tip directed obliquely outward and forward; in very small specimens, about 7.5 mm. long, the postorbital tooth is slender and projects directly outward.

Measurements.—Male (46778), length of carapace 40.7, width 32.3 mm.

Range.—From Cape Lookout, North Carolina, to Florida Straits, Gulf of Mexico (west coast of Florida) and Yucatan Channel. Depth, 15 to 200 fathoms.

Material examined.—See table, page 132.

PYROMAIA ARACHNA Rathbun

Plates 42 and 43

Pyromaia cuspidata RATHBUN, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 73 (part); not *P. cuspidata* Stimpson.

Pyromaia arachna RATHBUN, Proc. U. S. Nat. Mus., vol. 64, art. 14, 1924, p. 1 (type-locality, Gulf of Mexico, SW. of Cape San Blas, Florida; 169 fathoms; station 2400, *Albatross;* male holotype, Cat. No. 18144, U.S.N.M.).

Diagnosis.—Three spines on branchial margin. Five median spines on carapace. Rostral spine slender, acuminate. Manus of male cheliped elongate. An erect spine near proximal end of merus of ambulatory legs; a fringe of hair on each side of dactylus.

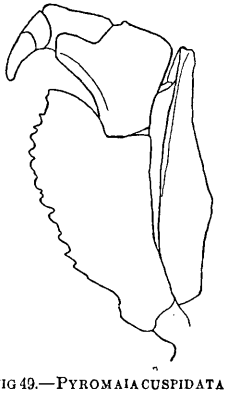

FIG 49.—PYROMAIA CUSPIDATA (46778), MAXILLIPED, × 3.75

Description.—Adult male: In form, strongly resembles *cuspidata*. Five median spines on carapace, no urogastric spine. Three marginal spines on branchial regions; these are exclusive of the spine above postero-lateral margin. Spines more slender than in *cuspidata*, the posterior gastric, anterior cardiac and intestinal spines being longest. The fine granules of the carapace are further apart than in *cuspidata*, and the interregional depressions are, to some extent, smooth. Rostrum more ascending than in *cuspidata*, and longer, between one-third and one-fourth the postrostral length of carapace; it is triangular at base, then abruptly narrows into a slender spine, having usually two enlarged spinules above. The spine on outer margin of basal article of antenna is situated near the posterior end instead of at the middle.

Chelipeds and ambulatory legs naked, surface rougher than in *cuspidata*. Chelipeds less stout, margins spinous; manus swollen, but much narrower than in *cuspidata*, the length along upper margin twice as great as height, which slightly exceeds thickness; gape at base of fingers very narrow. An erect spine at proximal end of merus of legs, distal spine a little longer than in *cuspidata;* a thick fringe of short hair on each side of dactylus. Spine of first abdominal segment longer than in *cuspidata*.

Adult female: Chelipeds not much stouter than ambulatory legs. All dorsal spines are reduced in size except the long abdominal spine.

Material examined of Pyromaia cuspidata

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
North Carolina:	° ′ ″	° ′ ″			°F						
East of Cape Lookout	34 39 15	75 33 30	107	gy. S. P.		Oct. 18, 1885	2601	*Albatross*	1 ♀	18145	
Do	34 38 30	75 33 30	124	S. R.		do	2602	do	1 ♀ y.	18146	
Fishing grounds, off Beaufort.			15					*Fish Hawk*	3 ♂ y. 2 ♀ y.	51021	
Florida:											
Fowey			100			May, 1917	360	*Eolis*, J. B. Henderson.	3 ♀	50927	
Sambo Key			110					do	2 ♀ y.	55494	
Do			115					do	1 ♀ y.	55501	
Gulf Stream, on edge of Pourtales Plateau, S. of Key West.			90	Co. Frag.				do	3 ♂ 7 ♀ ovig.	46778	
Pourtales Plateau	24 16 00	81 22 00	(1)			June 27, 1893	56	State Univ. Iowa Exped.	1 ♀ y.	Mus. S.U.I.	
Gulf Stream, off Key West.	24 17 05	81 58 25	132	S.	52	Feb. 14, 1902	7280	*Fish Hawk*	1 ♂ 2 ♀ y.	46779	
Do	24 21 55	81 58 25	98	S.	55	do	7279	do	1 ♀ y.	46780	
Off Key West			50–60				27	State Univ. Iowa Exped.	1 ♀ y.	Mus. S.U.I.	
Do			100					*Eolis*, J. B. Henderson.	1 carapace	55502	
Do			100–125					do	3 ♂ y. 2 ♀ y.	55498	
Do			90			Apr. 24, 1916		do	1 ♀ y.	55496	
Do			75					do	1 ♀ ovig.	55499	
SE. by E. ½ E. of Sand Key.			90					do	2 ♂ y.	55497	
S. of Sand Key			85					do	1 ♂ y.	55495	
Sand Key			75–125			Mar. 29, 1872		*Bache*	1	2957, M.C.Z.	
West of Tortugas	24 37 30	83 36 00	110		58.5	1877–78	26	*Blake*	1	2892, M.C.Z.	
West of Charlotte Harbor.	26 31 00	[2]85 53 00	119			do	50	do	2	2891, M.C.Z.	
South of Cape San Blas	28 36 00	85 33 30	111	gy. M.		Mar. 14, 1885	2402	*Albatross*	1 y.	46741	
Yucatan Channel	21 14 00		100			Apr. 22, 1872		*Bache* (Stimpson).	1 ♀	2958, M.C.Z.	

[1] About 200 fathoms.

[2] Position probably wrong.

Young: Spines of young male longer than of young female. Postorbital tooth less extensive and less curved than in the adult, as is also the case in *cuspidata;* in the carapace of the smallest *arachna*, 12.5 mm. long, the tooth is curved and directed obliquely outward. The proximal spine on the merus of the legs is present in all sizes though it is very short, almost tuberculiform, in the smallest.

Measurements.—Male, holotype (18144), length of carapace 45, width without spines 35 mm.

Range.—Off South Carolina; E. part of Gulf of Mexico. Depth, 111 to 210 fathoms.

Material examined.—See table, page 128.

PYROMAIA TUBERCULATA (Lockington)

Plate 40, fig. 3; plate 218, figs. 1–4

Inachus tuberculatus LOCKINGTON, Proc. California Acad. Sci., vol. 7, 1876 (1877), p. 30 [3] (type-locality, mouth of San Diego Bay, 8 fathoms; type not extant).

Microrhynchus (*Inachus*) *tuberculatus* LOCKINGTON, Proc. California Acad. Sci., vol. 7, 1876 (1877), p. 64 [2].

? *Inachoides brevirostrum* LOCKINGTON, Proc. California Acad. Sci., vol. 7, 1876 (1877), p. 75 [13] (type-locality, Magdalena Bay, L. C., 3 fathoms; type not extant).

? *Inachodes brevirostrum* STREETS and KINGSLEY, Bull. Essex Inst., vol. 9, 1877, p. 105.

Inachoides magdalenensis RATHBUN, Proc. U. S. Nat. Mus., vol. 16, 1893, p. 228 (type-locality, off Santa Margarita Island, Lower California; type, Cat. No. 17337, U.S.N.M.); Harriman Alaska Exped., vol. 10, 1904, p. 171.

Neorhynchus mexicanus RATHBUN, Proc. U. S. Nat. Mus., vol. 16, 1893, p. 233 (type-locality, Gulf of California, station 3030; type, Cat. No. 17350, U.S.N.M.).

Dasygyius tuberculatus RATHBUN, Proc. U. S. Nat. Mus., vol. 21, 1898, p. 570; Harriman Alaska Exped., vol. 10, 1904, p. 172, pl. 10, figs. 3 and 3*a*, text-fig. 92.—HOLMES, Occas. Papers California Acad. Sci., vol. 7, 1900, p. 27.—WEYMOUTH, Stanford Univ. Publ., Univ. Ser. No. 4, 1910, p. 27, pl. 3, fig. 8.

Inachoides tuberculatus SCHMITT, Univ. California Publ. Zool., vol. 23, 1921, p. 199, text-fig. 123.

Diagnosis.—Carapace of typical form with three enlarged median tubercles or spines. Antennal spines incurved at tip. Manus of male cheliped subglobular. Dactyls of legs unarmed in adult, spinulous in young.

Description.—Adult male: Carapace broadly pyriform and finely pubescent; elevated portions granulate and tuberculate, with a larger tubercle, often spiniform, on the mesogastric, cardiac and intestinal regions and sometimes on the summit of the branchial regions. There is also a short spiniform tubercle pointing upward and backward on the first segment of the abdomen. Rostrum of variable length, from just as long to one and a third times as long as

Material examined of Pyromaia tuberculata

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
California:	° ′ ″	° ′ ″			°F						
Off Venice						Aug. 2, 1913		*Anton Dohrn*	2♂	50187	From Venice Mar. Biol. Sta.
Do						July 29, 1913		do	1♀	50186	Do.
Southwest of Venice						July 11, 1914		do	1♂	50184	Do.
Between Venice and Rocky Point.						Aug. 11, 1914		do	1♂	50181	Do.
Do						do		do	2♂ 3♀ ovig	50179	Do.
Do						do		do	1♂	50185	Do.
Off El Segundo, Santa Monica Bay.						Aug. 12, 1914		do	1♀, thin shell	50188	Do.
Half mile out between El Segundo and Playa del Rey.						Aug. 2, 1913		do	1♂	50180	Do.
Off Wilmington	33 36 00	118 09 30	27	fne. gy. S. St.		Feb. 5, 1889	2939	*Albatross*	2♀ ovig	18619	
Long Beach								H. N. Lowe	1♂	46776	
San Pedro								do	1♂	32967	
Off San Pedro, Point Fermin and White's Point.						Nov. 30, 1912		*Anton Dohrn*	1♀ ovig	50182	From Venice Mar. Biol. Sta.
San Pedro								E. P. Chace	1♀	54007	
Alamitos Bay								H. N. Lowe	2♂ 4♀	23056	
Newport Bay						Nov. 27, 1914		*Anton Dohrn*	2♂ 1♀	50260	From Venice Mar. Biol. Sta.
Laguna Beach								W. A. Hilton	2♀ ovig	48912	
Do								do	1♂	50605	
Do								do	3♀ ovig	50604	
Balboa, Laguna Beach							D. 5	do	1♀ ovig	51023	
San Diego								S. J. Holmes	1♂ 2♀ ovig	19636	
Do						Mar. 9, 1898		*Albatross*	1♂	21762	
San Diego Bay	Beacon No. 7, E. ¼ N.		6.75	fne. S		Mar. 21, 1894	3575	do	1♂ 2♀ ovig	19338	
Do	End National City Wharf, N. by W. ½ W., 1.4 m.		3.5	R. brk. Sh		Mar. 24, 1894	3590	do	2♂	18982	
Do	Beacon No. 8, SW. ¾ S.		4.5	R. brk. Sh		do	3591	do	1♂	18983	
Do	½ k. S. SE. National City Wharf.		5	M. Sh		Mar. 31, 1896	3616	do	1♂, soft shell, 1♀	20143	
Do	Abreast Beacon No. 9.		4.5	M. Sh		do	3618	do	1♂ 5♀	20144	
Do	1½ k. E. SE. Beacon No. 8.		4	M. Sh		do	3619	do	6♂ 3♀	20145	
Do	¾ k. E. by S., Beacon No. 8.		6	M. Sh		do	3620	do	35♂ 22♀ ovig	20146	
North Island, San Diego Bay.						Apr. 2, 1896		do	2♂	20147	

Coronado dock										Mar. 21, 1904		do	2♂ 1♀	46775	
S. of San Diego Bay	32	35	00	117	13	30	22	gy. M. crs. G	66	Mar. 24, 1898	3679	do	1♀ ovig	21763	
Mexico:															
Rosalia Bay, Lower California.										Aug. 22, 1896		A. W. Anthony	1♀ ovig	19520	
Off Abreojos Point, Lower California.	26	42	30	113	34	15	5.5	gn. M		May 4, 1888	2835	*Albatross*	2♀ 1 yng	21882	
Santa Maria Bay, Lower California.										Mar. 18, 1911		do	1♂ 2♀ 2♀	47120 Amer. Mus.	
Magdalena Bay, Lower California.	24	38	00	112	17	30	51	gn. M	56.4	May 2, 1888	2832	do	1♀ ovig	21881	
Do	24	38	00	112	05	30	17	fne. gy. S	65	Apr. 9, 1889	3042	do	2♀	17339	
Do	24	35	30	112	05	00	27	fne. gy. S	64.5	do	3041	do	1♀	17338	
Do	24	32	00	111	59	00	12	fne. gy. S		May 2, 1888	2831	do	10♂ 20♀	21880	
Do												C. R. Orcutt	5♂	51109, 51110, 51112, 51113, 51114.	
Off Santa Margarita Island.	24	27	00	111	59	00	47	fne. yl. S	68.5	Apr. 8, 1889	3039	*Albatross*	1♂	17337	Holotype of *Inachoides magdalenensis.*
Gulf of California	31	33	00	114	20	30	10.5	fne. gy. S brk. Sh		Mar. 26, 1889	3029	do	1♀	17349	Granulation extensive.
Do	31	07	00	114	29	00	20	M	64	Mar. 27, 1889	3030	do	1♂ 2♀	17350	Type of *Neorhynchus mexicanus.*
Do	31	06	45	114	28	15	33	bn. M	63.8	do	3031	do	1♀ ovig	17351	Granulation extensive.
Do	30	58	30	113	17	15	11	gy. S. bk. Sp	66.1	Mar. 24, 1889	3022	do	2♂ 1♀ ovig	17348	In males a median cardiac, intestinal and abdominal spine.
Do	30	50	45	114	29	45	18	gy. M	63.5	Mar. 27, 1889	3033	do	3♂ 1♀	17352	
Do	30	37	30	113	07	00	7	gy. S. bk. Sp		Mar. 24, 1889	3020	do	1♀	17347	
Do	30	16	00	113	05	00	36	gy. S. brk. Sh	63.3	do	3018	do	1♀ y	17469	
Do	28	28	00	112	04	30	29	gy. S	62.9	Mar. 23, 1889	3014	do	2♂ 2♀	17346	Females almost completely granulate.
Do	28	23	45	111	58	00	14	gy. S. brk. Sh	65	do	3013	do	1♀	17345	Granulation extensive.
Do	27	45	00	110	45	00	20	gn. M	65.2	Mar. 31, 1889	3037	do	3♀ (2 ovig.)	17353	Do.
Do	24	22	30	110	19	30	8	brk. Sh		Apr. 30, 1888	2824	do	1♀	21877	Var. *A.*
Do	24	18	00	110	22	00	26.5	brk. Sh		do	2823	do	7♂ 5♀	21876	Var. *A.*
Do	24	16	00	110	22	00	21	gy. S. brk. Sh		do	2822	do	1♂	25237	Var. *A.*
Do	24 to 24	11 to 12	30 00	109	55	00	9.5–10	Sh		do	2826–8	do	2♂	21878, 54466	Var. *A.*
Off Cape St. Lucas, Lower California	23	33	00	110	37	00	66	fne. S	66	May 1, 1888	2830	do	2♂	21879	Var. *A.*
Panama:															
Bay of Panama	8	51	00	79	31	00	7	gn. M		Mar. 30, 1888	2800	do	1♀	21874	Var. *B.*
Do	8	38	00	79	31	30	16	gn. M		do	2802	do	1♂ 1♀	21875	Var. *B.*

wide, width measured behind the eyestalks. Supraorbital arch with a tubercle at summit. Postorbital tooth large, curving about the extremity of the eye, tip directed nearly forward. Spine at end of basal antennal segment slightly incurved. Sternum conspicuously granulate or tuberculate, pubescent, deeply grooved between segments, a large tubercle opposite base of each cheliped.

Chelipeds stout, shorter than first two or three pairs of ambulatories. Hand inflated, subglobular, sparsely granulate, a longitudinal row of four or five tubercles through middle of proximal end of outer surface. Fingers nearly as long as palm, triangularly gaping when closed; a large low tooth at proximal third of immovable finger. Ambulatory legs slender, similar, diminishing in length from first to fourth pair; dactyli moderately curved, almost smooth.

Adult female: Smaller than male; granulation more extensive, median and branchial tubercles less enlarged, rostrum shorter (at the most very little longer, about one-tenth, than wide), abdomen irregularly tuberculate, chelipeds slender, shorter than any of the legs, palms only slightly inflated, fingers not gaping.

Young: In the adult, the postorbital tooth is large and curves partly about the eye, as in typical *Pyromaia;* in the young, however, the postorbital tooth is smaller and more slender than in the adult and is directed outward and very little forward, the dactyls of all the ambulatory legs are, relative to their propodites, shorter and more curved than in the adult, and armed with spinules, that is, they are more prehensile. The young, therefore, are typical *Inachoides.*

Variations.—Besides the remarkable variations referable to sex and age, there are also variations in the width of carapace, and amount and uniformity of granulation, the length of the rostrum, and the prominence of the supraorbital tubercle, which may be spiniform. There are two varieties which stand out noticeably by a combination of characters:

Variety *A:* Two large, sometimes high, median gastric tubercles. Granules few. Legs unusually long and slender; first leg in male between two and a half and three times length of carapace. Small specimens with postorbital tooth pointing outward. Locality, near the tip of the peninsula of Lower California (Cat. Nos. 21879, 21876, 25237).

Variety *B:* Carapace short, stout, branchial regions uncommonly swollen, hepatic region crowded toward the postorbital tooth. Granules coarse, fairly uniform in size, almost covering the carapace. Rostrum broader than long. Panama Bay (Cat. No. 21875). A young one of the same shape but with fewer granules comes from a neighboring locality (Cat. No. 21874).

Measurements.—Male (20146), length 21.7, width 17.7 mm. Female of large size (20146), length 15, width 12.2 mm. Male, var. *A* (21879), length 11, width 8 mm. Male, var. *B* (21875), length 13.4, width 12.1 mm.

Range.—Monterey Bay, California, 45 fathoms, 1 specimen (Weymouth). From Venice, California, to Bay of Panama. Depth, 3½ to 66 fathoms.

Material examined.—See table, pages 134–135.

Genus DASYGYIUS Rathbun

Microrhynchus Bell, Proc. Zool. Soc. London, vol. 3, 1835, p. 88; type, *M. gibbosus* Bell; Trans. Zool. Soc. London, vol. 2, 1836, p. 40. Name preoccupied by Megerle von Mühlfeld for a genus of Coleoptera in Dahl's "Coleoptera und Lepidoptera" [price list], Wien, 1823, p. 63.[25]

Cyrnus Audouin in de Haan, Fauna Japon., 1839, p. 86 (as synonym of subgenus *Microrhynchus*). Name preoccupied by Stephens in 1836 for a genus of insects.

Neorhynchus A. Milne Edwards, Crust. Rég. Mex., 1879, p. 186 (substituted for *Microrhynchus*). Name preoccupied by Sclater in 1869 for a genus of birds.

Dasygyius Rathbun, Proc. Biol. Soc. Washington, vol. 11, 1897, p. 164 (substituted for *Neorhynchus*).

Carapace ovate, terminating in a short rostrum. Postocular tooth well developed. A fissure at middle of upper margin of orbit. Eyes stout, constricted before the cornea. The basal segment of the antennae bears a tooth or spine at its extremity, and its inner crest projects downward. Merus of maxillipeds cordiform. Chelipeds short, merus curved, subtriangular in section; fingers about as long as palm. Ambulatory legs subcylindrical, hairy, the first and last pairs shorter than the second and third; dactyli long and slender, slightly curved. In the male the last two segments of the abdomen are fused, in the female the last three segments; the first segment is armed with a spine or tubercle and is much longer than the second.

Only two species known, from the west coast of middle America.

KEY TO THE SPECIES OF THE GENUS DASYGYIUS

A[1]. Carapace convex. Rostrum bifid. Extremity of male abdomen narrowly triangular ..... gibbosus, p. 138.

A[2]. Carapace flattened. Rostrum simple. Extremity of male abdomen broadly rounded ..... depressus, p. 138.

[25] The name of the genus is followed by a list of species included.

DASYGYIUS GIBBOSUS (Bell)

Plate 274, figs. 1–4

Microrhynchus gibbosus Bell, Proc. Zool. Soc. London, vol. 3, 1835, p. 88 (type-locality, Galapagos Islands, 6 fathoms, sandy mud; holotype not extant); Trans. Zool. Soc. London, vol. 2, 1836, p. 41, pl. 8, figs. 1–1c.
Neorhynchus gibbosus A. Milne Edwards, Crust. Rég. Mex., 1879, p. 187.
Dasygyius gibbosus Rathbun, Proc. U. S. Nat. Mus., vol. 38, 1910, p. 571.

Diagnosis.—Carapace convex. Rostrum bifid. Extremity of male abdomen narrowly triangular. Ambulatory legs diminishing in the order 2. 3. 1. 4.

Description.—Carapace convex; regions elevated and separated by rather deep furrows; surface covered, particularly on each branchial region, with numerous distinct, rounded tubercles resembling very minute pearls. Rostrum very small and bifid. Antennae half as long as body, basal article as long as rostrum, with a tooth at outer angle. Antennular fossae less open than in *D. depressus*. Merus of maxillipeds cordate, deeply notched for the attachment of the palp. First segment of abdomen of male with a small tubercular tooth, last segment very long, its terminal portion narrowly triangular.

Chelipeds moderately enlarged, granulate; hand rounded; fingers arched, gaping for more than half their length, denticulate at the extremities, a basal tooth on the dactylus. The ambulatory legs diminish in length in the order 2, 3, 1, 4; they are cylindrical and hairy. (After Bell.)

Color.—Yellowish-white.

Measurements.—Male, holotype, length of carapace 15.2 mm. (6 lines), width 12.7 mm. (5 lines.) (Bell.)

Range.—Known only from the type-specimen from the Galapagos Islands, 6 fathoms, sandy mud.

DASYGYIUS DEPRESSUS (Bell)

Plate 1; plate 274, figs. 5–8

Microrhynchus depressus Bell, Proc. Zool. Soc. London, vol. 3, 1835, p. 88 (type-locality, Galapagos Islands, 6 fathoms, sandy mud; female, holotype not extant); Trans. Zool. Soc. London, vol. 2, 1836, p. 42, pl. 8, figs. 2, 2*d-f*.
Neorhynchus depressus A. Milne Edwards, Crust. Rég. Mex., 1879, p. 187.
Dasygyius depressus Rathbun, Proc. U. S. Nat. Mus., vol. 21, 1898, p. 570; vol. 38, 1910, p. 571.

Diagnosis.—Carapace flattened. Rostrum simple. Extremity of male abdomen broadly rounded. Ambulatory legs diminishing in the order 3, 2, 4, 1.

Description.—Carapace depressed, covered with fine granulations with here and there occasional larger ones; a short stout spine near the margin of the branchial region. Epimeral plates well developed and produced in a spine between the second and third, and third

and fourth ambulatory legs. Rostrum triangular, tipped with a small, slightly capitate spine. Eyes large, flattened. Basal antennal article with dentate margins, terminating in two teeth, the outer the longer, incurved at tip. Second article (or first movable article) of the antennules exceeding in length the fossa, and in large specimens exceeding the rostrum. Maxillipeds rather widely separated; ischium with a shallow sulcus; merus strongly cordiform, very narrow at base.

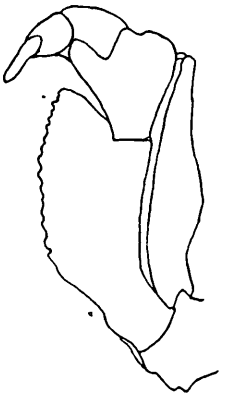

FIG. 50.—DASYGYIUS DEPRESSUS (21873), MAXILLIPED, × 5.26

Chelipeds of male stout, granulate; margins of merus tuberculate; palm inflated, subglobular; fingers narrowly gaping at base, finely crenulate in the gape, crenate along meeting edges; dactylus with a notch at base. Chelipeds of female weaker than legs, palms not swollen. The ambulatory legs diminish in the order 3, 2, 4, 1, three and two being nearly the same length; they are granulate and hairy, the first pair conspicuously hairy with a fringe of hair on either side; the hairiness diminishes from the first to the fourth pair, and the granulation diminishes from the proximal to the distal end of each leg; dactyli unarmed.

First segment of abdomen armed with a long, horizontal, conical, acute spine. In the male the sides of the last two segments are subparallel, the extremity broadly rounded. In the mature female the last or fused segment is much wider than long, almost covering the sternum laterally, the distal margin straight or slightly concave. Sternum of male flat, except in front of the chelipeds where, in both sexes, there is a smooth swelling and anterior to that a small spine between the maxillipeds.

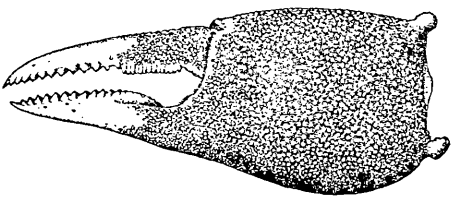

FIG. 51.—DASYGYIUS DEPRESSUS, MALE (21873), LEFT CHELA, × 2.66

Color.—Nearly white, with a very slight pinkish tinge. (Bell.)

Measurements.—Male (21874), length of carapace 20.6, width 19.8 mm. Female (21874), length of carapace 20, width 20 mm.

Range.—Gulf of California, Mexico; Galapagos Islands. Depth, 6 to 26.5 fathoms.

Material examined.—

Gulf of California; April 30, 1888; *Albatross:*

Lat. 24° 18′ 00″ N., long. 110° 22′ 00″ W.; 26.5 fathoms; brk. Sh.; station 2823; 14 males, 22 females (21873).

Lat. 24° 16′ 00″ N., long. 110° 22′ 00″ W.; 21 fathoms; gy. S. brk. Sh.; station 2822; 2 males, 3 females (18143).

Subfamily ACANTHONYCHINAE

Epialtidae+Huenidae M'LEAY, in Smith, Illus. Zool. S. Africa, Annulosa, 1838, p. 56.

Acanthonychinae ALCOCK, Journ. Asiat. Soc. Bengal, vol. 64, 1895, pp. 160, 164, 190.

Acanthonychidae STEBBING, Ann. S. Afr. Mus., vol. 6, 1910, p. 286.

Eyes without true orbits; eyestalks little movable, either short and more or less concealed beneath a forwardly-directed supraocular spine, or obsolescent and almost or completely sunk either in the sides of a huge beak-like rostrum, or between low preocular and postocular excrescences; a distinct postocular spine, which is not cupped (except in *Sphenocarcinus*) may be present. Rostrum either simple or two-spined. Basal antennal article truncate-triangular. External maxillipeds with the merus as broad as the ischium and with the palp arising from the antero-internal angle of the merus. Dactyli of ambulatory legs often prehensile or subchelate, the legs of the first pair often disproportionately long compared to those of the last three pairs. (After Alcock.)

KEY TO THE AMERICAN GENERA OF THE SUBFAMILY ACANTHONYCHINAE

A¹. Carapace broadly oval, smooth. Rostrum subtriangular, bidentate. Postorbital tooth wanting or small----------Taliepus, p. 162.

A². Carapace subpentagonal, oblong or pyriform, or, if oval, not smooth.

B¹. Carapace subpentagonal or oblong, with only two lateral lobes (one hepatic, one branchial), postorbital tooth lacking or minute, rostrum simple or bilobed at tip only.

C¹. Eyestalks short, immovable, without the shelter of a supraocular eave or postocular tooth. Carapace lumpy----------Mocosoa, p. 158.

C². Eyestalks longer, movable.

D¹. Some strong tubercles on dorsal surface of carapace. A strong thumblike process near proximal end of propodites of ambulatory legs----------Eupleurodon, p. 160.

D². Carapace nearly smooth. Preorbital tooth usually lacking; when present, small----------Epialtus, p. 144.

B². Not as in B¹.

C¹. Ambulatory legs subchelate. Carapace suboblong, with three lateral teeth or lobes. A blunt preorbital lobe; no postorbital tooth. Acanthonyx, p. 141.

C². Ambulatory legs not subchelate.

D¹. Carapace oval. Postorbital tooth present. Preorbital tooth absent. Carapace lumpy. Front tuberculiform, broader than long. Esopus, p. 191.

D². Carapace subpentagonal or suboblong.

E¹. Antennae visible in dorsal view at sides of rostrum.

F¹. No postorbital tooth or spine. Rostrum, in American species, bifurcate for half its length, horns widely divergent.
Menaethiops, p. 189.

F². A postorbital tooth. Carapace with two lateral expansions, one or both more or less laminate, the hepatic expansion subdivided, its anterior portion forming a postorbital tooth or lobe.

G¹. Lateral expansions both very broad, inwardly united, outwardly marked by a closed fissure.....**Mimulus**, p. 182.

G². Lateral expansions narrower and separated by a sinus.
Pugettia, p. 167.

E². Antennae not visible in dorsal view at sides of rostrum.

F¹. Rostrum short, triangular, partly divided by a closed median slit. Legs more or less cristate.....**Leucippa**, p. 184.

F². Rostrum long, two-horned. Legs not cristate.
Sphenocarcinus, p. 185.

Genus ACANTHONYX Latreille

Acanthonyx LATREILLE, Encyc. Méth., Hist. Nat., Insectes, vol. 10, 1825, p. 698; type, *A. lunulatus* (Risso); Cuvier's Règne Anim., ed. 2, vol. 4, 1829, p. 58.—MILNE EDWARDS, Hist. Nat. Crust., vol. 1, 1834, p. 342 (part).—A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 142.—MIERS, Journ. Linn. Soc. London, vol. 14, 1879, p. 650; *Challenger* Rept., Zool., vol. 17, 1886, p. 42.—ALCOCK, Journ. Asiat. Soc. Bengal, vol. 64, 1895, p. 198.—RATHBUN, Bull. U. S. Fish Comm., vol. 20, for 1900, pt. 2 (1901), p. 60.

Meria GRIFFITH, Cuvier's Animal Kingdom, vol. 13, 1833, p. 165, in synonymy of *Acanthonyx;* type, *M. glabra* Griffith. Not *Meria* Rossi, 1807 (Hymenoptera).

Peltinia DANA (part), Amer. Journ. Sci., ser. 2, vol. 11, 1851, pp. 272 and 433; U. S. Expl. Exped., vol. 13, Crust., pt. 1, 1852, pp. 84 and 129; vol. 2, 1853, p. 1422.

Carapace suboblong, rounded behind, almost smooth, not markedly constricted behind the prominent antero-lateral angles, the lateral branchial spines small and not prominent. Preocular spine or lobe prominent. Orbits small, entirely filled by the stout eyestalks; corneal end small. No postorbital tooth. Spines of rostrum united at base, acute, little divergent. Antennae visible at sides of rostrum. Merus of outer maxillipeds transverse, dilated at antero-external angle, slightly notched at antero-internal angle.

Chelipeds of adult male well developed; palm compressed, but slightly turgid in the middle, often slightly carinate above; fingers acute, gaping when closed. Legs short, rather stout, decreasing in length successively from first to fourth pair, compressed; penultimate article more or less dilated, the posterior margin concave and setose near end, at broadest part forming a blunt tooth against which the dactylus fits like a claw, when flexed; dactylus spinous on posterior margin. Abdomen of male with five or six segments.

Widely distributed on both coasts of middle America; Azores; Cape Verde Islands; Mediterranean; Red Sea; Indian Ocean; Hawaiian Islands.

Only one American species, which is found on both sides of the continent.

ACANTHONYX PETIVERII Milne Edwards

Plate 44; plate 222, figs. 1–6

Acanthonyx petiverii MILNE EDWARDS, Hist. Nat. Crust., vol. 1, 1834, p. 343 (type-locality, Antilles; type in Paris Mus.).—DANA, U. S. Expl. Exped., vol. 13, Crust., pt. 1, 1852, p. 128; 1855, atlas, pl. 5, fig. 6*a–d*.—A. MILNE EDWARDS, Crust. Rég. Mex., 1878, pl. 27, figs. 7–7*f*.—RATHBUN, Bull. U. S. Fish Comm., vol. 20, for 1900, pt. 2 (1901), p. 60; Proc. U. S. Nat. Mus., vol. 38, 1910, p. 534, pl. 46, fig. 4 (after Milne Edwards and Lucas).

Acanthonyx emarginatus MILNE EDWARDS and LUCAS, d'Orbigny's Voy. l'Amér. Mérid., vol. 6, pt. 1, 1843, p. 9; atlas, vol. 9, 1847, pl. 5, fig. 2 (type-locality, near Lima, Peru; type in Paris Mus.).

Acanthonyx debilis DANA, Amer. Journ. Sci., ser. 2, vol. 11, 1851, p. 272 (type-locality, Valparaiso, Chile; type not extant); U. S. Expl. Exped., vol. 13, Crust., pt. 1, 1852, p. 127; 1855, atlas, pl. 5, fig. 5 *a* and *b*.

Peltinia scutiformis DANA, Amer. Journ. Sci., ser. 2, vol. 11, 1851, p. 273 (type-locality, Bay of Rio Janeiro; type not extant); U. S. Expl. Exped., vol. 13, Crust., pt. 1, 1852, p. 130; 1855, atlas, pl. 5, fig. 7*a–c*.

Acanthonyx concamerata KINAHAN, Journ. Roy. Dublin Soc., vol. 1, 1857, p. 334, pl. 14, fig. 1 (type-locality, North Cinchas Island, Peru; type in Mus. Roy. Dublin Soc.).

Acanthonyx petiveri STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 10, 1871, p. 97.—A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 143, and synonymy.

Pugettia scutiformis[26] MIERS, *Challenger* Rept., vol. 17, 1886, p. 40, footnote.—MOREIRA, Arch. Mus. Nac. Rio de Janeiro, vol. 11, 1901, pp. 65 and 138; Bull. Soc. Zool. France, vol. 45, 1920, p. 126, footnote.—?LENZ and STRUNCK, Deutsche Südpolar Exped. 1901–1903, vol. 15, Zool. 7, 1914, p. 276.

Diagnosis.—Hepatic lobe large; two small branchial lobes. Preorbital tooth obtuse. Male abdomen with six segments.

Description.—Antero-lateral angles subrectangular, obtuse, frontal region triangular. Two small teeth on margin of branchial region. Carapace almost smooth; three obscure setiferous tubercles on gastric region, one on the cardiac and one on the intestinal region; these tubercles are obsolete in the female, but the setae remain. Lateral teeth and rostrum setiferous. Rostrum short, deflexed, bifid. Preorbital lobes obtuse, elevated. Basal article of antennae unarmed, the next two articles subcylindrical, attaining end of rostrum; flagellum very slender. Chelipeds with merus subtriangulate; carpus with an external crest and two or three setiferous

[26] Dana's *Peltinia scutiformis* is undoubtedly the young of *Acanthonyx petiverii*. A young male in the National Museum collection (19066), 5 mm. long, approximately the size of Dana's *P. scutiformis*, agrees with Dana's colored figure, 7*a*, U. S. Expl. Exped. atlas, pl. 5, except that the greater part of the yellow spot in the center of the carapace has disappeared. A. Milne Edwards (Crust. Rég. Mex.) comments on the narrowness of the penultimate article of the legs in the young of *A petiverii*. It is impossible to tell with certainty whether Lenz and Strunck's specimens are the young of *petiverii* or of an allied species.

tubercles; manus enlarged and compressed; fingers finely dentate, gaping to the extremity in male, almost entirely closed in female. Ambulatory legs with tufts of setae on extremities of articles; merus and carpus with a few setiferous tubercles on anterior or upper margin. Abdomen with fourth and fifth segments coalesced in both sexes.

Color.—Dark fawn-color (Milne Edwards and Lucas).

Measurements.—Male (40455), length of carapace to tip of horns 18.7, width 12.5 mm.

Variations.—A variable species. Ambulatory legs less cheliform in females and young than in adult males. Propodites in the young (5 mm. long) only slightly enlarged. (See *Peltinia scutiformis.*) Different names have been given on the size of the male hand, the development of the crest on the wrist, the presence or obsolescence of tubercles on the carapace, and other minor and age characters.

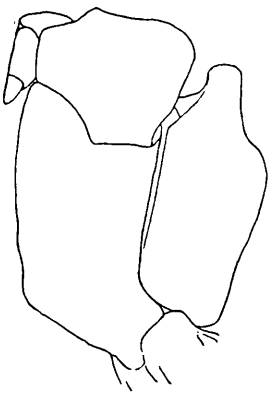

FIG. 52.—ACANTHONYX PETIVERII (40455), MAXILLIPED, × 11.2

Range.—Southern Florida and the Bahamas to Rio de Janeiro; Lower California, Mexico, to Valparaiso, Chile; Galapagos Islands (Bell). Shallow water to 6 fathoms.

Material examined.—

Miami, Florida: G. M. Gray; 1 male (42150).

Harbor Island, Bahamas: July 8, 1893; State University of Iowa Expedition; 1 male (18673), 2 males (Mus. S. U. I.).

Ensenada de Santa Rosa, Cuba: May 19, 1914; station 7; *Tomas Barrera* Exped., Henderson and Bartsch; 1 male, 1 female (48670).

Port Royal Cayes, Jamaica: P. W. Jarvis; 1 young (19066).

Porto Rico; 1899; *Fish Hawk:* 1 young (24151). Arroyo; February 3 and 4; 1 male, 2 females (24153). Arroyo, on lighthouse reef; February 3; 1 female, 1 young (24152).

St. Thomas, West Indies (Copenhagen Mus.).

St. John, West Indies (Copenhagen Mus.).

St. Croix, West Indies (Copenhagen Mus.).

Fox Bay, Colon, Panama: January 20, 1912; Meek and Hildebrand, Smithson. Biol. Surv.; 1 ovigerous female (56538).

Klein Bonaire, Dutch West Indies; among coral rocks, in tide pools; July 11, 1905; J. Boeke; 1 female (42959), 1 female (Leiden Mus.).

Curaçao: Great Bay, Wacao; one-half fathom, among algae; October 3, 1905; 1 male (Leiden Mus.). Caracas Bay; April 8, 1920; C. J. van der Horst; 8 males, 7 females (Amsterdam Mus.), 2 males, 2 females (56862). West Point; May 14, 1920; C. J. van der Horst; 4 males, 2 females (1 ovigerous) (Amsterdam Mus.).

Puerto Cabello, Venezuela: F. Meinert (Copenhagen Mus.).

Mamanguape stone reef, Brazil: June 22, 1899; A. W. Greeley, Branner-Agassiz Exped.; 1 female (25752).

Pernambuco, Brazil (?); 1875–1877; R. Rathbun, Hartt Explorations; 1 male, 1 female (19946).

Boa Viagem, Brazil, stone reef 5 miles S. of Pernambuco; 1899; A. W. Greeley, Branner-Agassiz Exped.; 1 female (Stanford Univ.).

Mar Grande, Bay of Bahia, Brazil; 1875–1877; R. Rathbun, Hartt Explorations; 1 female (U.S.N.M.).

Guaraparim, Brazil; Thayer Exped.; 1 ovigerous female (2035, M. C. Z.).

Rio de Janeiro, Brazil (Copenhagen Mus.).

Copacabana, Rio de Janeiro, Brazil; Carlos Moreira; 1 male, 1 young female (56010).

Rat Island, Rio de Janeiro, Brazil; 3 males, 2 females (1 ovigerous) (2038, M. C. Z.).

Magdalena Bay, Lower California, Mexico: 1 male (Mus. San Diego Nat. Hist. Soc.).

Perico Island, Panama: October 26, 1904; *Albatross;* 1 male (33394).

Bay of Sechura, Peru: About half way between Bayovar and Matacaballo; 5 to 6 fathoms; April 10, 1907; R. E. Coker; 1 female (40454), received from Peruvian Government.

Near Callao, Peru: 5 specimens (2118, M. C. Z.).

Chincha, North Island, Peru: June 18, 1907; R. E. Coker; 1 male, 1 female (Peruvian Government); 1 male, 2 females (40455), received from Peruvian Government.

Chincha Islands, Peru: R. C. Murphy; 1 very young (Brooklyn Mus.).

Paracas Bay, Peru: U. S. C. S. S. *Hassler;* 1 male (2036, M. C. Z.).

Caldera, Chile: U. S. C. S. S. *Hassler;* 1 ovigerous female (2037, M. C. Z.).

Genus EPIALTUS Milne Edwards

Epialtus Milne Edwards, Hist. Nat. Crust., vol. 1, 1834, p. 344 (part); type, *E. bituberculatus* Milne Edwards; type specified by Miers, Journ. Linn. Soc. London, vol. 14, 1879, p. 650.—A. Milne Edwards, Crust. Rég. Mex., 1878, p. 138 (part).—Miers, Journ. Linn. Soc. London, vol. 14, 1879, p. 650 (part; *Antilibinia* excluded).

Carnifex Gistel, Naturg. Thierreichs, Stuttgart, 1848, p. IX; substituted for *Epialtus* Milne Edwards, thought to be preoccupied by *Ephialtes* Gravenhorst.

Carapace broad, subpentagonal or oblong, almost smooth, with two lateral, more or less laminate projections, sometimes very largely developed. Rostrum broad, triangular or oblong, entire or bilobed at tip. Eyes small. Preorbital tooth either present or absent;

postorbital small, minute, or wanting. Basal article of antenna triangular; movable part concealed beneath rostrum. Chelipeds of male strong; fingers either gaping or in contact; tips excavate or spoon-shaped. Ambulatory legs subcylindrical, diminishing successively in length from first to fourth; propodites sometimes with an inferior tooth or bunch of setae; dactyli with two rows of spinules beneath. Abdomen of male with six or seven segments, of female with five or seven segments. Small species.

Found on both sides of the American continent, from southern California to Chile and from northern Florida to the State of Santa Catharina, Brazil. Bermudas (Verrill). South Africa (Stebbing).

The subdivision of the motley genus *Epialtus* was suggested by A. Milne Edwards and by Miers.[27] The former went so far as to make three subgeneric divisions which he formed on two characters, the absence or presence of lobes on the rostrum and of a tooth on the lower margin of the propodites of the legs. This grouping would bring together species known to-day which differ widely in other respects and would separate other species which are in the main closely related. It is possible, however, to regroup the species on general characters. On this basis I have placed the three large oval species of similar aspect, occurring on the west coast of America, in the genus *Taliepus* (subgenera Nos. 2 and 3 of A. Milne Edwards, exclusive of *E. productus*). *E. productus* is more closely related to *Pugettia* than to true *Epialtus* and has been transferred to that genus.

This leaves in *Epialtus* numerous small forms which are wonderfully diversified, but indubitably of one genus.

The species with bilobed rostrum appear to be derived from those with simple rostrum, and those rostra which approach an oblong shape are more likely to be divided than those which are triangular or linear. *E. dilatatus* shows the simplest form of bilobed rostrum, the lobes so shallow that Milne Edwards, while figuring the emargination, yet groups the species among those with entire and obtuse rostra. The character of the propodal tooth may be the result of environment, the habit of clinging to algae having perhaps required a means of attachment afforded by subchelate ambulatories. At present we know too little of the relative habits of *E. bituberculatus* and *E. brasiliensis* to determine why, with similar carapaces and chelipeds, one should have slender, unarmed propodites and the other, stout propodites provided with a strong, digital tooth.

Various forms allied to *bituberculatus* have been described in the past but their relative value has been in doubt owing to intermediates. In recent years the collection in the National Museum has increased to such an extent that it is possible to say, with a fair degree of

[27] Journ. Linn. Soc. London, vol. 14, 1879, p. 650.

probability, that certain forms are specifically distinct, while others showing minor but rather constant differences, not correlated with geographical distribution, are designated as *formae*.

KEY TO THE AMERICAN SPECIES OF THE GENUS EPIALTUS

A¹. Propodites of ambulatory legs without a tooth on lower surface.
B¹. Rostrum simple, margin entire or nearly so.
C¹. Rostrum not dorsally carinate.
D¹. Tip of rostrum either rounded or truncate, not spiniform.
E¹. Carapace with a very shallow sinus between lateral lobes. Hand of male high. Preorbital angles obtuse. Tip of rostrum rounded. **bituberculatus**, p. 148.
E². Carapace with a deep sinus between lateral lobes.
F¹. Rostrum narrow. Hand of male elongate. Preorbital angles sharp.
G¹. Rostrum very narrow, sides parallel, tip subtruncate, with faint indication of two lobes---**longirostris**, p. 151.
G². Rostrum a little wider, tip slightly arcuate in dorsal view. **longirostris forma portoricensis**, p. 151.
F². Rostrum broad. Branchial lobe acute, hepatic lobe rounded.
G¹. Legs long and very slender, especially the first pair. Postorbital part of carapace nearly one and a half times as wide as long---**bermudensis** [28]
G². Legs stout and shorter than in G¹. Postorbital part of carapace about one and a fourth times as wide as long. Margin of hepatic lobe crenulate---**crenulatus**, p. 158.
D². Tip of rostrum spiniform below. Upper crest of palm laminiform. **sulcirostris**, p. 150.
C². Rostrum dorsally carinate. Carapace widest at hepatic regions. Cardiac region conical---**kingsleyi**, p. 152.
B². Rostrum either bilobed or bidentate.
C¹. Rostrum short; carapace in front of anterior margin of hepatic lobe much shorter than behind the same margin; hepatic lobe much larger than branchial lobe.
D¹. Hepatic lobe directed more or less forward; rostrum oblong; no tuft of hair on propodites of legs---**hiltoni**, p. 156.
D². Hepatic lobe not directed forward; rostrum narrowing anteriorly; a tuft of hair on propodites of legs---**dilatatus**, p. 153.
C². Rostrum long; hepatic and branchial lobes more nearly of a size; a tuft of hair on propodites of legs.
D¹. Carapace widest across branchial regions; length in front of hepatic lobes nearly as great as behind the same line. **dilatatus forma elongata**, p. 154.
D². Carapace about equally wide across hepatic and across branchial regions; length in front of hepatic lobes greater than, or nearly as great as, behind the same line---**minimus**, p. 155.
A². Propodites of ambulatory legs with a tooth on lower surface.
B¹. Rostrum triangular, simple. Carapace subtriangular---**brasiliensis**, p. 149.
B². Rostrum oblong, with bilobed tip---**peruvianus**, p. 157.

Species on both sides of the continent: *bituberculatus*.

[28] Not American. Verrill, Trans. Connecticut Acad. Sci., vol. 11, 1901, p. 16, pl. 1, fig. 1.

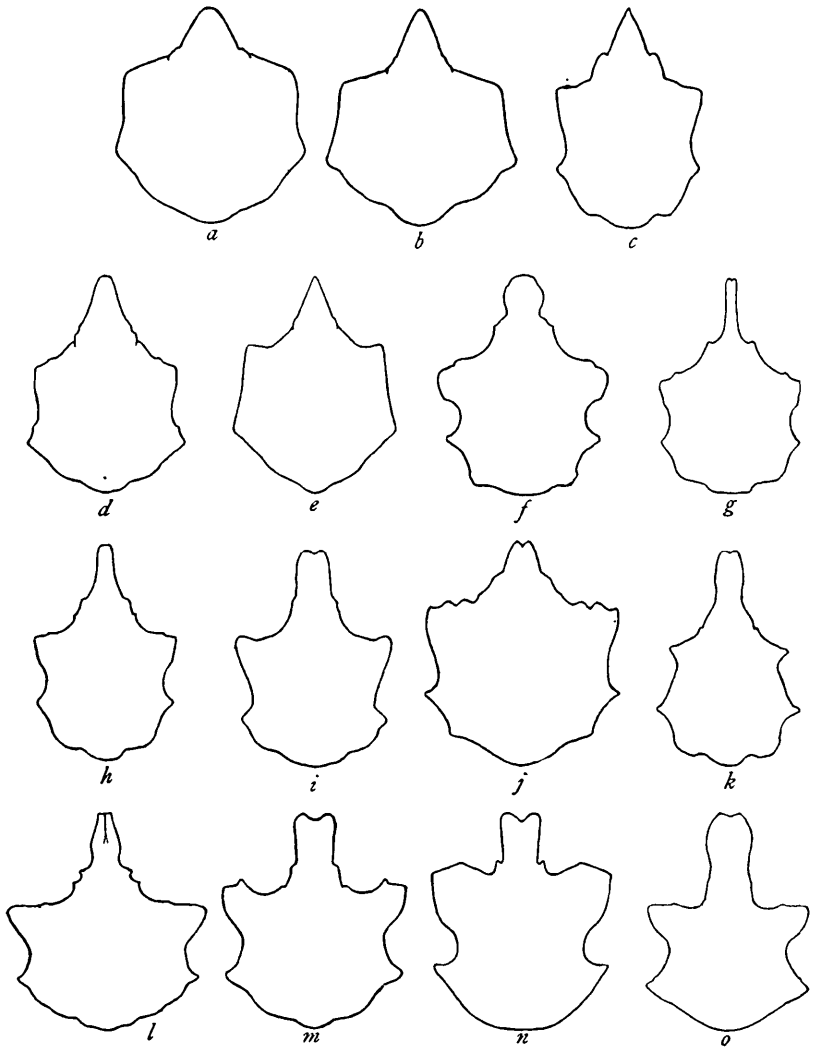

FIG. 53.—EPIALTUS, OUTLINES OF THE CARAPACE OF DIFFERENT SPECIES. *a*. BITUBERCULATUS, MALE, CHILE, × 3.5, AFTER A. MILNE EDWARDS. *b*. BITUBERCULATUS, FEMALE, CHILE, × 2.8, AFTER A. MILNE EDWARDS. *c*. SULCIROSTRIS, MALE (47112), 5.7 MM. LONG. *d*. BRASILIENSIS, MALE (56011), 6.6 MM. LONG. *e*. BRASILIENSIS, 13.7 MM. LONG, AFTER DANA. *f*. CRENULATUS, FEMALE (18135), 6.4 MM. LONG. *g*. LONGIROSTRIS, FEMALE (43019), 7 MM. LONG. *h*. LONGIROSTRIS FORMA PORTORICENSIS, MALE (24154), 5.7 MM. LONG. *i*. PERUVIANUS, MALE (54208), 4.8 MM. LONG. *j*. DILATATUS, FEMALE, ST. THOMAS, AFTER A. MILNE EDWARDS. *k*. DILATATUS FORMA ELONGATA, MALE (47090), 11.5 MM. LONG. *l*. KINGSLEYI, MALE HOLOTYPE, 7.7 MM. LONG. *m*. HILTONI, MALE, HOLOTYPE, 13.6 MM. LONG. *n*. HILTONI, MALE, LAGUNA, 16.1 MM. LONG. *o*. MINIMUS, MALE, PATOS ISLAND, 21 MM. LONG.

EPIALTUS BITUBERCULATUS Milne Edwards

Plate 45, figs. 3 and 4

Epialtus bituberculatus MILNE EDWARDS, Hist. Nat. Crust., vol. 1, 1834, p. 345, pl. 15, fig. 11 (type-locality, Chile; type in Paris Mus.).—GIBBES, Proc. Amer. Assoc. Adv. Sci., 3rd meeting, 1850, p. 173 [9].—A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 139 (part), pl. 27, figs. 1–1*d*, 2–2*e*, 3–3*c*.—RATHBUN (part), Proc. U. S. Nat. Mus., vol. 17, 1894, p. 67; Bull. U. S. Fish Comm., vol. 20, for 1900, pt. 2 (1901), p. 60; Harriman Alaska Exped., vol. 10, 1904, p. 173.

Epialtus affinis STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, 1859, p. 49 (type-locality, Indian River, Florida; type not extant); Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 128.

Diagnosis.—Rostrum simple. Lateral margin with a very shallow sinus between the lobes. Preorbital angles obscure. Hand high.

FIG. 54.—EPIALTUS BITUBERCULATUS, MALE (24849), MAXILLIPED, × 16

Description.—Carapace subpentagonal; two tubercles on gastric region; two lateral lobes, one hepatic, the other branchial; carapace widest across the branchial lobes; anterior margin of hepatic lobes oblique. Preorbital angles scarcely marked; postorbital teeth minute. Rostrum triangular, extremity simple, obtuse. (Fig. 53, *a*, *b*.)

Chelipeds of adult male strong. Inner margin of merus and carpus laminate; two crests on outer surface of carpus. Palm very high at distal end, compressed, upper edge acute. Dactylus with a very large tooth in the gâpe of the fingers. Legs slender, a tuft of hairs on lower border of penultimate article, occasionally occupying a slight prominence. Body and appendages covered with a coat of short, brown pubescence. Fourth and fifth abdominal somites united in male, fourth, fifth and sixth in female.

Measurements.—Male (19944), length of carapace 11.8, width 8.7 mm.

Range.—From Indian River, Florida, to Desterro, Brazil; Chile (Milne Edwards).

Material examined.—

Key West, Florida; February 4, 1901; B. A. Bean and W. H. King; 1 male, 2 females (24849).

Porto Rico; 1899; *Fish Hawk:* Arroyo; February 3; 1 male, 5 young (24157); on lighthouse reef, 1 young (24156). Fajardo; February 17; 1 female (24158).

Fox Bay, Colon, Panama; January 20, 1912; Meek and Hildebrand, Smithson. Biol. Surv.; 1 ovigerous female (56535).

Sabanilla, Colombia; March, 1884; *Albatross;* 1 male (18131).

Pernambuco (?), Brazil; 1876–1877; R. Rathbun, Hartt Explorations; 1 male, 1 female (19944).

EPIALTUS BRASILIENSIS Dana

Plate 220, fig. 1

Epialtus brasiliensis Dana, U. S. Explor. Exped., vol. 13, Crust., pt. 1, 1852, p. 132; atlas, 1855, pl. 6, fig. 1 (type-locality, Rio Janeiro, Brazil; type not extant).—Moreira, Bull. Soc. Zool. France, vol. 45, 1920, p. 126.

Diagnosis.—A large tooth on propodites of last three legs. Rostrum simple. Anterior margin of hepatic lobe transverse (fig. 53, *d*, *e*).

Description.—Carapace and chelipeds much as in *E. bituberculatus;* the anterior margin of the hepatic lobe is transverse instead of sloping

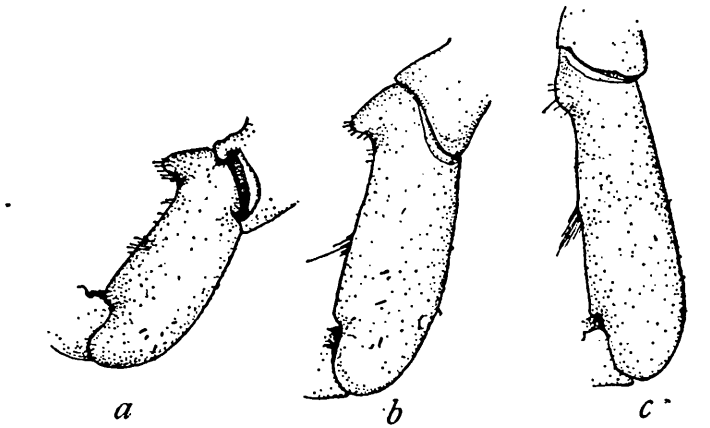

Fig. 55.—Epialtus brasiliensis, male (56011), propodus of last three legs, × 18. *a*. Fourth leg. *b*. Third leg. *c*. Second leg

backward and outward. The legs are much stouter than in *bituberculatus* and the last three pairs also very short, the propodite bearing a large tooth on the lower margin near the proximal end.

Color (from figure).—Natal brown, with a large triangular patch in center of carapace, and also the two gastric tubercles, colored a pale vinaceous-fawn.

Measurements (from Dana's figure).—Male, type, length of carapace about 13.7, width about 10.7 mm.

Locality.—Known only from Rio de Janeiro and vicinity. Along the seashore, among seaweed (Dana); in *Fucus natans* (Moreira).

Material examined.—Copacabana, Rio de Janeiro, Brazil; Carlos Moreira; 1 male, 1 immature female (56011).

Variation.—The specimens at hand are small, the larger one, male, 6.6 mm. long, little more than half as large as the male figured by Dana. The propodites of the last three legs are furnished with a

basal protuberance which is much smaller than in the type and is directed not distad but normal to the article; the tubercle is smallest on the second ambulatory and largest on the fourth. The rostrum is faintly bilobed at tip. The anterior margin of the hepatic region slopes backward and outward and bears a small tubercle not far from the antero-lateral angle; the outer or anterior margin of the branchial lobe likewise has a tubercle about the same distance from the postero-lateral angle. These characters may represent age variations.

EPIALTUS SULCIROSTRIS Stimpson

Plate 46, fig. 3; plate 47, fig. 2

Epialtus sulcirostris STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, 1860, p. 198 [70] (type-locality, Cape St. Lucas; cotype in Paris Mus.).—A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 141, pl. 27, figs. 6–6*b*.

Diagnosis.—Rostrum thick, simple, tip spiniform below. Crest on hand laminiform.

Description.—Carapace nearly or quite as wide at hepatic as at branchial regions; hepatic angles squarer and more prominent than in *E. bituberculatus.* No postorbital tooth; a prominent preorbital lobe on which is a small tooth and in front of which the rostrum abruptly narrows. Rostrum thick, upper margins somewhat angled, tip produced below in a slender spine, shorter in the old than in the young; upper and lower surfaces a little concave; lower surface triangular in shape, narrower than upper, and separated from it by a deep lateral groove. (Fig. 53, *c*.)

Body and feet nearly smooth and naked. Chelipeds pubescent; upper crest of hand laminiform, very prominent above insertion of dactylus. Ambulatory legs slender, with no vestige of a thumb-process on the penult article, excepting in the first pair, where there is, at the distal fourth of the lower side, a small projection or socket bearing a few hairs.

Measurements.—Male, type, length of carapace 0.36 inch (9.1 mm.), width 0.27 inch (6.9 mm.). Male (47112), length 5.7, width 4 mm. Male (San Marcos), length 11, width 9 mm.

Range.—Lower California, from Santa Maria Bay to Cape St. Lucas and Gulf of California.

Material examined.—Santa Maria Bay, Lower California; March 18, 1911; *Albatross;* 1 small male (47112), without chelipeds or legs.

San Marcos Island; on kelp; June, 1921; Johnson and Baker, California Academy Expedition; 2 males (Cal. Acad. Sci.).

EPIALTUS LONGIROSTRIS Stimpson

Epialtus longirostris STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 7, 1860, p. 199 (type-locality, St. Thomas; cotype in Paris Mus.); Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 128.—A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 141, pl. 27, figs. 5–5c.—KINGSLEY, Proc. Acad. Nat Sci. Philadelphia, 1879, p. 385.

Diagnosis.—Rostrum very narrow, truncate. Sides of carapace deeply bilobed. Arm cylindrical, hand long and narrow, fingers thick.

Description.—Postgastric and cardiac regions rather prominent. Carapace nearly as wide across hepatic as across branchial regions. Lateral sinus much deeper than in the three preceding species and deeper in male than in female. Hepatic lobe a little larger than branchial lobe, both acute. The two gastric tubercles are distinct. Preorbital angle strong, sharp; from it the rostrum rapidly narrows to a long, slender beak, which is rather thick, truncated at extremity, the anterior surface rectangular, about twice as wide as high. Postorbital tooth obscure, not projecting; a tubercle on anterior margin of hepatic lobe. (Fig. 53, *g*.)

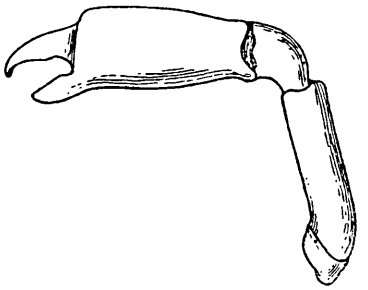

FIG. 56.—EPIALTUS LONGIROSTRIS, MALE (48742), LEFT CHELIPED. THE CARAPACE IS ABOUT 7.5 MM. LONG

Chelipeds without sharp margins; merus cylindrical; carpus with large tubercle on outer surface; palm elongate, little compressed, enlarging slightly toward distal end; fingers short and very stout, bent down, a small oval gape at base in male. Ambulatory legs slender, without tufts of hair on propodites except a slight one on first pair.

Measurements.—Male (48742), length (tip of rostrum lacking) 7.5, width 5.5 mm. Female (43019), length 7, width 4.8 mm.

Range.—Florida (Sarasota Bay and Key West), Cuba, Jamaica and St. Thomas.

Material examined.—

On reef Lavesos Italienos, opposite Cayo Lavesos, Cuba; 2 to 3 fathoms; Co. S. R.; station 14, *Tomas Barrera* Exped.; Henderson and Bartsch; 1 male (48742).

Jamaica; 1910; E. A. Andrews; 1 female (43019).

EPIALTUS LONGIROSTRIS forma PORTORICENSIS Rathbun

Epialtus longirostris forma portoricensis RATHBUN, Proc. Biol. Soc. Washington, vol. 36, 1923, p. 72 (type-locality, Ensenada Honda, Culebra Island; holotype, Cat. No. 24154, U.S.N.M.).

Diagnosis.—Differs from typical *longirostris* only in the rostrum being slightly wider and less thick, and the tip slightly arcuate in dorsal view.

Description.—Of the two specimens the male is much smaller than the female. In both the carapace is just as wide at the hepatic as at the branchial regions, but the rostrum is a little wider in the female than in the male and its sides less parallel. (Fig. 53, *h.*)

Measurements.—Male, holotype, length of carapace 5.7, width 3.7 mm. Ovigerous female (24155), length 8.6, width 6.4 mm.

Range.—Known only from Porto Rican waters.

Material examined.—

Ensenada Honda, Culebra Island, Porto Rico; February 9, 1899; *Fish Hawk*; 1 male holotype (24154).

Mayaguez, Porto Rico; January 20, 1899; *Fish Hawk;* 1 ovigerous female (24155).

EPIALTUS KINGSLEYI Rathbun

Plate 45, fig. 1

Epialtus kingsleyi RATHBUN, Proc. Biol. Soc. Washington, vol. 36, 1923, p. 71 (type-locality, Florida; holotype, Cat. No. 53068, U.S.N.M.).

Diagnosis.—Rostrum dorsally carinate, truncate. Carapace widest at hepatic regions. Cardiac region conical. (Fig. 53, *l.*)

Description.—Carapace nearly as broad as long, broadest across hepatic regions. Rostrum strongly deflexed, very high, broadest at its middle, from which it tapers to a truncate tip which is an equilateral triangle in front view; lower surface concave, upper surface much smaller, triangular, followed anteriorly by an acute ridge from which the sides fall obliquely. Orbital arches swollen, without tooth. A small postorbital tooth or angle, close behind the eye. Hepatic lobe much larger than branchial, extremity broadly rounded, anterior margin nearly transverse, bearing a low tooth or tubercle about half way between tip and eye, posterior margin convex. Interregional sinus deep. Branchial lobe small, sides concave, extremity narrow, acute. Cardiac region very high, conical; branchial region occupied chiefly by a smooth, round boss. The antennae fall short of end of rostrum. Third, fourth, and fifth segments of abdomen fused.

The cheliped is heavy for the size of the animal and is elongate, the palm gradually increasing in height from the proximal to the distal end, and, measured horizontally, is about twice as long as the strongly arched fingers; it is sparingly tuberculated on and near the upper margin. The merus is less obviously tuberculated, having one or two tubercles on each margin. The fingers gape widely, the propodal finger being curved well below the palm; at the proximal third of the prehensile margin of the dactylus, there is a small tooth.

Measurements.—Male, holotype, length of carapace 7.7, greatest width (hepatic) 7.2, branchial width 6.7 mm.

Range.—Florida.

Material examined.—Florida; exact locality not given; A. S. Packard, collector; 1 male holotype (53068); presented by J. S. Kingsley to the Boston Society of Natural History.

* EPIALTUS DILATATUS A. Milne Edwards

Plate 45, fig. 2

Epialtus dilatatus A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 140, pl. 27, figs. 4–4*b* (type-locality, St. Thomas; type in Paris Mus.).
Epialtus bituberculatus RATHBUN, Bull. Lab Nat. Hist. State Univ. Iowa, vol. 4, 1898, p. 255.

Diagnosis.—Rostrum slightly bilobed. Hepatic lobe larger than branchial. Preorbital tooth distinct (fig. 53, *j*).

Description.—According to A. Milne Edwards, this species is distinguished from *E. bituberculatus* by the carapace wider anteriorly, the hepatic expansions being much more developed and limited anteriorly by a sinuous border, the rostrum wider, shorter, and slightly depressed on the median line above; this depression is continued below where it is limited by two crests which unite behind in an acute angle. Length of female 10.5 mm., width 8 mm. (A. M. E.)

A specimen in hand, also female (15204), resembles figure 4 cited; the anterior border of the hepatic expansion is transverse but its antero-lateral corner is rounded, the rostrum is a little longer and less triangular, the preorbital tooth is small but distinct.

Five other smaller specimens which seem to belong here show the anterior hepatic margin directed more or less backward; not only is this margin sinuous, but the margin of the lateral sinus may be also; the rostrum varies from subtriangular, as figured by Edwards, to suboblong; the amount of emargination is variable, but is always insignificant.

Chelipeds, so far as observed, moderate; merus not cristate; carpus with four longitudinal crests; manus slightly enlarged distally, upper margin blunt, defined by a depression on either side; fingers short and stout. A slight tuft of hair on the lower margin of the propodites of the ambulatories is inconspicuous. Fourth and fifth abdominal segments of male and fourth, fifth, and sixth segments of female coalesced.

Measurements.—Female (15204), total length of carapace 10.2, hepatic width 8.4, branchial width 9 mm.

Range.—West Florida; Yucatan; Bahamas; Porto Rico; St. Thomas.

Material examined.—

North Key section, Florida; lat. 29° 05′ 00″ N.; long. 83° 22′ 30″ W.; 5.5 fathoms; sdy. rky. Co.; temp. 15.5° C.; November 27, 1901; station 7177, *Fish Hawk;* 1 female (47085).

Material examined of Epialtus dilatatus forma elongata

Locality	Bearings: Latitude N.	Bearings: Longitude W.	Fathoms	Bottom	Temp.	Date	Station	Collector	Specimens	Cat. No.	Remarks
	° ′ ″	° ′ ″			°C						
Florida:											
North Key section	28 52 15	83 24 00	7.5	R. Co.	16.2	Nov. 28, 1901	7183	*Fish Hawk*	1♂	47086	
St. Martin's section	28 36 00	82 57 00	3	sdy. grsy.	11.6	Jan. 17, 1902	7223	do	1♀	47087	
Highland section	27 55 30	82 51 30	3	hrd. S. brk. Sh.	15.8	Jan. 28, 1902	7249	do	1♂ 2♀	47088	
Key West						Dec. —, 1883		D. S. Jordan	1♂	18134	
Do						Feb. 4, 1901		B. A. Bean and W. H. King.	3 ovig. ♀	55694	
			Feet								
North of Knights Key Channel	⅝ mile N. ½ E. of Hog Key.		7	rky		Jan. 22, 1903	7419	*Fish Hawk*	1♀	47089	
Hawk Channel	½ mile SE. by S. of SE. end of Duck Key.		14	rky		Jan. 27, 1903	7429	do	1♂	47090	Holotype.
Florida Bay						Jan. 29, 1903	(1)	do	1 ovig. ♀	47091	
West coast of Florida								Henderson and Simpson.	1♀	18133	

[1] Between stations 7432 and 7412.

Bird Key, Florida; April 8, 1889; *Grampus;* 1 ovigerous female (15204).

Dry Tortugas, Florida; Edward Palmer; 1 female (18132).

Florida (?); 1 male (14465).

Off Mujeres Island, Yucatan; 12 fathoms; crs. cor. S.; 1 small, immature female (2022, M. C. Z.), identified by A. Milne Edwards.

Harbor Island, Bahamas; July 8, 1893; State Univ. Iowa Exped.; 1 male (11866, Mus. S. U. I.).

Porto Real, Porto Rico; January 27, 1899; *Fish Hawk;* 1 male, 1 female, 1 young (24159).

EPIALTUS DILATATUS forma ELONGATA Rathbun

Plate 48

Epialtus dilatatus forma elongata RATHBUN, Proc. Biol. Soc. Washington, vol. 36, 1923, p. 72 (type-locality, off Duck Key, Florida; holotype, Cat. No. 47090, U.S.N.M.).

Diagnosis.—Rostrum elongate, slightly bilobed. Hepatic and branchial lobes similar. Preorbital tooth obscure (fig. 53, *k*).

Description.—Similar to *E. dilatatus* but with a longer rostrum and with lateral lobes subequal in size and shape, the hepatic lobe having an antero-

lateral angle, either acute, right, or a little obtuse; there is only one exception, a female (18133), in which the hepatic lobe is rounded. As in typical *dilatatus*, the carapace is widest at the branchial lobes. The rostrum is suboblong, narrowing slightly at distal end, where there is a shallow notch; one exception, a full grown male (47088), has what appears to be an abnormal rostrum, of great length, increasing in width distally, terminal notch a strong V. Preorbital tooth feeble, obsolescent. Palm of cheliped widening considerably toward distal end; propodal finger arched downward, forming a wide gape, into which just behind the middle one tooth of moderate size projects from the dactylus. Otherwise as in typical *dilatatus*.

Measurements.—Male, holotype, total length of carapace 11.5 branchial width 8.3, hepatic width 6.7 mm.

Range.—West and South Florida.

Material examined.—See table, page 154.

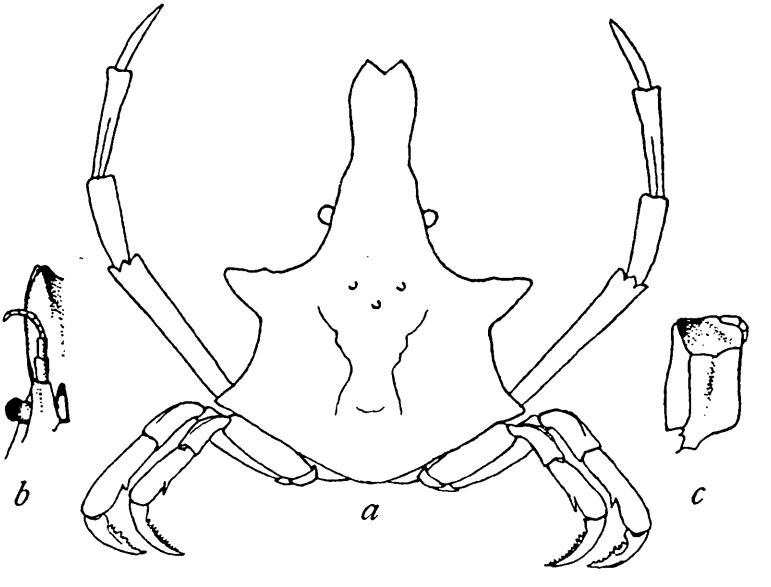

FIG. 57.—EPIALTUS MINIMUS. *a*, *b*, AND *c* FROM DRAWINGS BY J. S. KINGSLEY OF A COTYPE. *a*. CARAPACE AND THREE LEGS, × 4. *b*. ANTERIOR PORTION, VENTRAL VIEW, × 4. *c*. MAXILLIPED, ENLARGED

EPIALTUS MINIMUS Lockington

Plate 47, fig. 1

Epialtus minimus LOCKINGTON, Proc. California Acad. Sci., vol. 7, 1876 (1877), p. 77 [15] (type-localities, Port Escondido and San Jose Island, both in the Gulf of California; types not extant).—KINGSLEY, Proc. Acad. Nat. Sci. Philadelphia, vol. 31, 1879 (Mar. 9, 1880), p. 385.

Diagnosis.—A bunch of setae at middle of propodites of ambulatories. Hepatic and branchial lobes subequal. Rostrum long, bilobed (fig. 53, *o*).

Description.—Antero-lateral margin of carapace with two large triangular lobes; the hepatic lobe has a shallow tooth on its anterior margin; this margin is transverse, and its distance from the end of the rostrum either exceeds (as in Kingsley's figure), or is less than, its distance from the posterior margin of the carapace. Rostrum elongate-oblong, bilobed at tip. Cheliped strong, longer than first ambulatory. Legs slender, cylindrical, penultimate article bearing below distal to its middle and also at its proximal end (save in first pair), a bunch of setae which simulates a spine.

Measurements.—Male, cotype, length of carapace 14, width 11, length of cheliped 18 mm.; female, cotype, length 14, width 12 mm. (Lockington). Male (Patos Island), median length 21, posterior width 16 mm.

FIG. 57 *d*.—PROPODUS OF SECOND RIGHT LEG TO SHOW TWO TUFTS OF HAIR, MALE, SAN MARCOS, × 12

Range.—West coast of Mexico, in Gulf of California. Found at low tide under stones and in coral (Lockington).

Material examined.—Mexico: Patos Island, Gulf of California; at anchorage, 4.5 fathoms; May 23, 1921; Fred Baker, California Academy Expedition; 1 male, paper-shell (Cal. Acad.). San Marcos Island; on kelp; June, 1921; Johnson and Baker, California Academy Expedition; 1 male (Cal. Acad.).

Remarks.—Although the type-specimen is not extant, it is possible to determine the species from pencil drawings (fig. 57, *a*, *b*, *c*) made by Kingsley from what was probably a cotype. By comparing these with the specimens in hand, it became certain that the propodal articles of the ambulatories are not armed with a spine as represented by Lockington and Kingsley but are furnished with setae crowded together in a socket and of varying length so as to form a pointed mass simulating a spine.

EPIALTUS HILTONI Rathbun

Plate 46, figs. 1 and 2

Epialtus hiltoni RATHBUN, Proc. Biol. Soc. Washington, vol. 36, 1923, p. 72 (type-locality, Laguna Beach, California; holotype, Cat. No. 50599 U.S.N.M.).

Diagnosis.—Rostrum oblong, bilobed. Hepatic lobe widespread, with a tooth or tubercle on anterior margin. Hand very long, fingers short.

Description.—Carapace high in median region; lateral wings broad, ascending; anterior or hepatic lobe much the larger, intervening sinus deep; width at branchial regions a little greater than, or just equal to, that at hepatic regions. The posterior margin of the hepatic lobe is convex, the anterior is oblique (in the half grown) to

nearly transverse (in the full grown); on the anterior margin near its middle there is a lobe or tooth, very small in the half grown but increasing until it equals the tooth at the antero-lateral angle of the lobe. Branchial lobe triangular, acute or subacute. Preorbital tooth distinct, outstanding, tuberculiform; postorbital tooth inconspicuous, not projecting beyond carapace margin and indicated only by a closed fissure. Rostrum broadly oblong, sides subparallel, extremity bilobed, median sinus broad, shallow. (Fig. 53, *m*, *n*.)

Chelipeds of moderate size; merus very bluntly angled; carpus and manus with a subacute, outer carina; a tubercle on upper surface of carpus; manus elongate, not widening much until just before the fingers, which are short, very wide, deflexed, outer margin acutely carinate, gape narrow, a large tooth on the dactyl within the gape. Ambulatory legs rather stout; two tubercles on lower margin of proximal half of merus of first leg; propodites without tooth or tufts of hair. Third, fourth, and fifth segments of male abdomen fused.

Measurements.—Male (Laguna Beach), median length 16.1, anterior width 14.5, posterior width 15 mm. Male holotype (50599), median length 13.6, total length 14, anterior width 12.2, posterior width 12.4 mm.

Range.—California: Laguna Beach and Santa Catalina Island.

Material examined.—Laguna Beach, Orange County; William A. Hilton, Pomona College; 1 male, holotype (50599), 1 male returned to sender.

Catalina Harbor, Santa Catalina Island; W. H. Dall; 1 male (18136).

EPIALTUS PERUVIANUS Rathbun

Epialtus peruvianus RATHBUN, Proc. Biol. Soc. Washington, vol. 36, 1923, p. 72 (type-locality, Chincha Islands, Peru; holotype, Cat. No. 54208, U.S.N.M.).

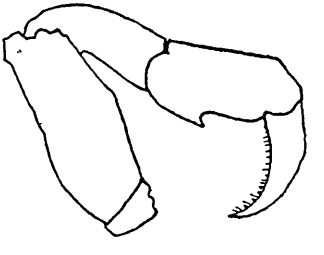

FIG. 58.—EPIALTUS PERUVIANUS, MALE (54208), LOOSE LEG. THE CARAPACE IS 4.8 MM. LONG

Diagnosis.—A tooth at base of propodites of ambulatories. Carapace very uneven. Hepatic lobe large, branchial small. Rostrum oblong, bilobed (fig. 53, *i*).

Description of male.—Median region separated from hepatic and branchial regions by a deep furrow; a transverse, depressed area across the carapace embraces anterior edge of hepatic lobes; a sharp, median, interorbital sulcus. Hepatic lobe very large, recurved, anterior margin transversely concave, outer angle lobiform, prominent, posterior margin slightly convex; branchial lobe very small, acute, sides concave. Orbital arch swollen, margin forming an angle, not a tooth, with the margin of the rostrum. Rostrum deflexed,

thin, oblong, sides parallel to near the tip, where they are thick, recurved and convergent; tip bilobed, lobes small, sinus wide. Cheliped of young male shorter than first leg, fingers not gaping.

First and second legs (others missing) similar, stout, merus laminate above, and two or three toothed, the tooth at distal end prominent, upstanding; propodus with a strong tooth below, at proximal end, similar to that in *E. brasiliensis*.

Measurements.—Male, holotype, length of carapace 4.8, greatest width 3.5 mm.

Range.—Known only from the type-locality.

Material examined.—Chincha Islands, Peru; November 30 to December 1, 1919; Robert Cushman Murphy, collector; 1 male, holotype (54208); received from the Brooklyn Museum.

EPIALTUS CRENULATUS Rathbun

Epialtus crenulatus RATHBUN, Proc. Biol. Soc. Washington, vol. 36, 1923, p. 71 (type-locality, Lower California; holotype, 1 ovigerous female; Cat. No. 18135, U.S.N.M.).

Diagnosis.—An *Epialtus* with large hepatic lobe, small, acute, branchial lobe, oblong, entire rostrum, and no tooth on propodites of legs.

Description.—The hepatic lobe is not advanced, the anterior margin transverse and forming with the outer margin a rounded lobe with crenulated edge. The rostrum is about as broad as long, sides arcuate for the most part, extremity truncate, with a faint indication of emargination; below there is a median furrow with a crest on either side. Preorbital tooth large, not projecting. Hepatic and branchial widths of carapace equal (fig. 53, *f*).

Cheliped of female short, palm short and stout. The first ambulatory is longer than the cheliped and noticeably longer than the other legs; propodites of last three provided with a tuft of hair at proximal end of lower margin.

Measurements.—Female, holotype, length of carapace 6.4, width 5 mm.

Range.—Known only from the type-specimen.

Genus MOCOSOA Stimpson

Mocosoa STIMPSON, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 128; type, *M. crebripunctata* Stimpson.—A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 137.

Carapace subpentagonal, tumid; rostrum subtriangular, obtuse, excavated below. Eyes large, immovable, filling the orbit. External antennae concealed beneath the rostrum and not reaching to its tip; basal article triangular, unarmed. External maxillipeds very broad, closing the buccal cavity; merus particularly short and broad, quadrate, with the outer angle much projecting outward, and the inner

one rounded, not at all notched for the reception of the palpus; this last is short and stout, almost concealed by the merus. The third, fourth, and fifth segments of the male abdomen are coalesced.

Contains only one species.

MOCOSOA CREBRIPUNCTATA Stimpson

Plate 49, figs. 3 and 4

Mocosoa crebripunctata STIMPSON, Bull. Mus. Comp. Zoöl., vol. 2, 1871, p. 128 (type-locality, off French Reef, Florida, 15 fathoms; holotype not extant).—A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 137.—RATHBUN, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 65.

Diagnosis.—Eyes immovable. Merus of outer maxillipeds not notched at inner angle. Rostrum subtriangular, subtruncate. Carapace lumpy.

Description.—Carapace very convex antero-posteriorly, naked, punctate and uneven; two prominences between the eyes, three on the gastric region of which the posterior is mesogastric, one large, bituberculate protuberance on the cardiac region, one on each hepatic, and three on each branchial region. Of the three branchial protuberances the most anterior is the largest; the two posterior are in a transverse line, the outermost being marginal and bearing a small tubercle at the postero-lateral angle of the carapace. Rostrum deflexed, slightly emarginate. The regular curve of the eye socket is interrupted by a very shallow, posterior tooth, which does not project outwardly and is scarcely evident in dorsal view; no preocular spine. Subbranchial region granulate.

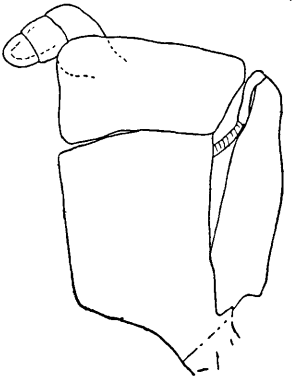

FIG. 59.—MOCOSOA CREBRIPUNCTATA, MALE (18129), MAXILLIPED. THE CARAPACE IS 7 MM. LONG.

Chelipeds stout, longer than carapace; merus cylindrical, sparingly granulate; carpus subglobular. Manus slightly compressed, widening distally; propodal finger very short, stout, bent downward; dactylus longer, very deep at base, much deflexed; fingers spoon-shaped, when closed leaving a narrow slit, cutting edges dentate. Legs short, thick; merus armed with a few short blunt spines or tubercles arranged in two rows along upper surface; dactylus as long as preceding article, curved and gradually tapering.

Color.—Body of a strawberry color; upper surface of carapace iridescent. (Stimpson.)

Measurements.—Male (18129), length of carapace 7, posterior width 6.2, hepatic width 5.4, approximate length of cheliped 9, of last ambulatory leg 4 mm. Female (immature), holotype, length of carapace 0.2 inch (5 mm.), width 0.17 inch (4.3 mm.). (Stimpson.)

Range.—Florida Straits and Gulf coast of Florida. Depth, 15 to 27 fathoms.

Material examined.—Gulf of Mexico; southwest of Cape San Blas, Florida; lat. 29° 15′ 30″ N., long. 85° 29′ 30″ W.; 27 fathoms; G.; February 7, 1885; station 2372, *Albatross;* 1 male (18129). Only the body, the right cheliped and one of the second and of the fourth pair of legs are preserved.

Genus EUPLEURODON Stimpson

Eupleurodon STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 10, 1871, p. 98; type, *E. trifurcatus* Stimpson.—MIERS, Journ. Linn. Soc. London, vol. 14, 1879, p. 650.

Euplorodon A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 141.

Allied to *Epialtus*, but with a depressed and uneven carapace; antero-lateral angles strongly prominent, forming projecting teeth directed forward, almost parallel to axis of body. Ambulatory legs strongly prehensile, with dentigerous penult articles. Size small.

West coast of America at Cape St. Lucas, Mexico, and Ferrol Bay, Peru.

KEY TO THE SPECIES OF THE GENUS EUPLEURODON

A¹. Carapace as wide between antero-lateral as between postero-lateral teeth. A small tooth between antero-lateral and postero-lateral tooth. No preocular tooth ..... trifurcatus, p. 160.

A². Carapace narrower between antero-lateral than between postero-lateral teeth. No small tooth between antero-lateral and postero-lateral tooth. A preocular tooth ..... peruvianus, p. 161.

EUPLEURODON TRIFURCATUS Stimpson

Eupleurodon trifurcatus STIMPSON, Ann. Lyc. Nat. Hist. New York, vol. 10, 1871, p. 98 (type-locality, Cape St. Lucas; holotype not extant).—RATHBUN, Proc. U. S. Nat. Mus., vol. 38, 1910, pp. 535 and 572 (part).

Euplorodon trifurcatus A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 142.

Diagnosis.—Orbital arch without tooth. A small tooth on lateral margin between the two large teeth or lobes.

Description.—Carapace with a deep depression in front of the gastric region and one on either side of the cardiac region, which with the gastric region forms a prominent median ridge. Branchial region depressed, with a tubercle near the postero-lateral angle. Teeth and prominences of the carapace generally setose. Rostrum half as long as the postfrontal part of the carapace and one-third as broad as long, flattened, truncate, and emarginate at extremity. Tooth at antero-lateral angle half as long as rostrum and curving forward; the distance between the tips of these equals the greatest width of the carapace, and is one-third greater than the middle width. There is a small tooth on the lateral margin behind the antero-lateral angle. Orbital margin arched but not toothed. Feet with an angular or dentated carpus. (After Stimpson.)

Measurements.—Female, holotype, length of carapace 0.31 inch (7.9 mm.), width between tips of antero-lateral teeth 0.25 inch (6.3 mm.). (Stimpson.)

Range.—Known only from the type-locality, Cape St. Lucas, Lower California, Mexico. The Peruvian specimen formerly supposed to be a variant of Stimpson's species is now considered a distinct species.

EUPLEURODON PERUVIANUS Rathbun

Plate 49, figs. 5 and 6

Eupleurodon trifurcatus RATHBUN, Proc. U. S. Nat. Mus., vol. 38, 1910, pp. 535 and 572 (part), pl. 49, fig. 5. Not *E. trifurcatus* Stimpson.

Eupleurodon peruvianus RATHBUN, Proc. U. S. Nat. Mus., vol. 64, art. 14, 1924, p. 2 (type-locality, north end of Ferrol Bay (Chimbote), Peru; holotype, Cat. No. 40462, U.S.N.M.).

Diagnosis.—Orbital arch provided with a preocular tooth. No small tooth on lateral margin between the two large teeth or lobes.

Description.—Carapace pentagonal; depressions as in *trifurcatus*. A transverse row of tubercles across the gastric region above the depression, the inner pair larger than the outer pair; a large tubercle near the postero-lateral angle; a smaller one in the branchio-cardiac furrow; a still smaller tubercle on the mesogastric and the intestinal regions, and three on the cardiac region forming a triangle pointing backward. Teeth and prominences of carapace setose. Lateral teeth or lobes recurved, blunt at tips; width of carapace at middle of antero-lateral lobes greater than at tip of lobes and appreciably less than width between tips of postero-lateral lobes. Rostrum a third as long as the postfrontal part of the carapace and one-half as broad as long, lateral margins raised, extremity incised for about one-fourth of its length to form two rounded lobes. Eyestalks flattened.

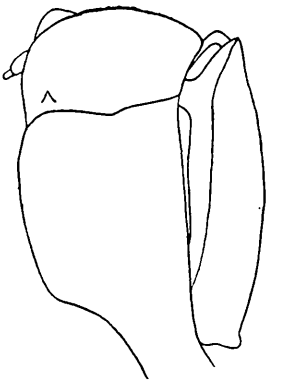

FIG. 60.—EUPLEURODON PERUVIANUS, FEMALE HOLOTYPE, MAXILLIPED. THE CARAPACE IS 10 MM. LONG

The antennae reach nearly to end of rostrum. The antennular cavity reaches to middle of rostrum, is not nearly filled with the antennules, and is very incompletely divided into two fossae. Merus of maxillipeds slightly notched at antero-internal angle; first article of palp flattened, angular, last two articles small and slender, hidden behind the merus. Carpus of cheliped nodose, merus and manus nodose at distal articulations; two low tubercles on upper margin of merus; propodal finger strongly deflexed, dentate; fingers stout, the dactylus with a basal tooth and near the tip a few smaller teeth. Dactyli of legs strongly falcate, finely dentate, the digital tooth of the propodus strong and with hairy tip.

A row of five tubercles on first segment of female abdomen.

Measurements.—Female, holotype, length of carapace to ends of rostrum 10, length of rostrum 2.2, greatest width of carapace 8.2 mm.

Range.—Peru; known only from the type-locality.

Material examined.—North end of Ferrol Bay (Chimbote), Peru; from rocks between tide lines; March 1; R. E. Coker, collector; received from the Peruvian Government; 1 ovigerous female, holotype (40462).

Genus TALIEPUS A. Milne Edwards

Taliepus A. MILNE EDWARDS, Crust. Rég. Mex., 1878, p. 138 (subgenus of *Epialtus*) part; type not specified.
Epialtus of authors (part).

Type.—*T. nuttallii* (Randall).

Carapace broadly oval, convex in all directions, smooth, armed laterally with from two to four teeth, mostly small, and following the outline of the carapace. Postocular and preocular tooth small or absent. Rostrum inclined, sides convergent, tip bidentate. Antennae hidden, or partly visible at sides of rostrum; basal article subtriangular.

Chelipeds strong; fingers with tips excavate or spoon-shaped, gaping in the old male. Ambulatory legs stout, subcylindrical; dactyls strongly curved, two rows of spinules beneath. Large species.

Inhabits the west coast of America, from southern California (Santa Barbara) to Patagonia. Rio de Janeiro (Bell).

KEY TO THE SPECIES OF THE GENUS TALIEPUS

A¹. Propodites of ambulatory legs without a tooth on lower surface. Two small, thick, blunt, lateral teeth on either side of carapace. No preorbital tooth. A small postorbital tooth ..... nuttallii, p. 162.
A². Propodites of ambulatory legs with a tooth on lower surface. A preorbital, no postorbital tooth.
  B¹. Three lateral teeth on a strongly rimmed margin. Tooth of propodites small in adults, stronger in young ..... marginatus, p. 164.
  B². Four lateral teeth. Tooth of propodites strong in adults ..... dentatus, p. 165.

Species on both sides of the continent: *marginatus*.

TALIEPUS NUTTALLII (Randall)

Plates 50 and 51

Libinia nuttallii RANDALL, Journ. Acad. Nat. Sci. Philadelphia, vol. 8, 1839 (1840), pl. 3.
Epialtus nuttallii RANDALL, Journ. Acad. Nat. Sci. Philadelphia, vol. 8, 1839 (1840), p. 109 (type-locality, Upper California; types, Cat. No. 598, Mus. Phila. Acad.).—GIBBES, Proc. Amer. Assoc. Adv. Sci., 3rd meeting, 1850, p. 173.—STIMPSON, Journ. Boston Soc. Nat. Hist., vol. 6, 1857,

p. 458.—Lockington, Proc. California Acad. Sci., vol. 7, 1876 (1877), p. 77.—Rathbun, Proc. U. S. Nat. Mus., vol. 21, 1898, p. 572; Harriman Alaska Exped., vol. 10, 1904, p. 173.—Holmes, Occas. Papers California Acad. Sci., vol. 7, 1900, p. 23.—Schmitt, Univ. California Publ. Zool., vol. 23, 1921, p. 202, text-fig. 125.

Epialtus (*Taliepus*) *nutallii* A. Milne Edwards, Crust. Rég. Mex., 1878, p. 138.

Epialtus (*Antilibinia*) *nuttallii* Rathbun, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 69.

Diagnosis.—Carapace ovate. No preorbital tooth. First lateral tooth not prominent.

Description.—Carapace ovate, convex antero-posteriorly and transversely, smooth. No preocular tooth, postocular tooth small. Lateral teeth small, subequal, blunt, the margins between them convergent anteriorly. Rostrum with strongly convergent sides, inclined downward, flattened or slightly concave above, and with an equilaterally triangular notch at the end. Antennae not reaching end of rostrum.

Chelipeds of old male very stout, unarmed, subequal to first leg; fingers gaping moderately for two-thirds of their length, a shallow lobe on the dactyl at middle of gape, extremities of fingers crenate. Legs stouter than in *Pugettia producta*.

Fifth segment of male abdomen longer than sixth.

Color.—Dark purplish, besprinkled with testaceous spots becoming large and somewhat ocellate behind, and still larger and brighter on the under side of the body (Randall).

Measurements.—Male (3108), total length of carapace 100.8, width 85.5 mm.

Range.—From Santa Barbara, California, to Magdalena Bay, Lower California.

Material examined.—

CALIFORNIA

Santa Barbara; 1880; D. S. Jordan; 1 large male (3108).

One-fourth mile west of Venice Pier, Venice, Santa Monica Bay; found inside live fish trap; December 7, 1912; *Anton Dohrn* (J. Ross Beck); 1 young (50308), from Venice Mar. Biol. Sta.

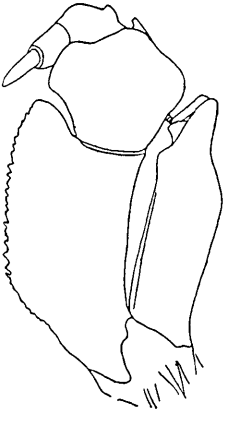

Fig. 61.—Taliepus nuttallii (50014), maxilliped, × 2.63

San Pedro; on kelp; H. N. Lowe; 1 young male (23049).

Santa Catalina Island: Isthmus Harbor; November 27, 1913; *Anton Dohrn;* 1 female (50014), from Venice Mar. Biol. Sta. Catalina Harbor; 1874; W. H. Dall; 1 young female (14798). Avalon Bay; October 22, 1910; *Anton Dohrn* (P. S. Barnhart); 1 young (50309), from Venice Mar. Biol. Sta.

La Jolla; in kelp hold-fast on beach; September 19, 1918; W. L. Schmitt; 1 female (53978).

Point Loma; January 28, 1889; *Albatross;* 3 females (15517).

San Diego; H. Hemphill; 7 young females (18139).

California; T. Nuttall; 1 large male, 1 adult female, cotypes (598, Phila. Acad.). J. S. Kingsley; 1 young female (53064), from Boston Soc. Nat. Hist.

CALIFORNIA-MEXICAN BOUNDARY

Lat. 32° 32′ N., long. 117° 07′ W.; Monument 258, Mexican Boundary Survey; July 18, 1894; Dr. E. A. Mearns, U. S. A.; 1 female, encrusted with barnacles (18661).

LOWER CALIFORNIA, MEXICO

San Benito Island: July 25, 1896; A. W. Anthony; 1 male (19506). West of; March 9, 1911; *Albatross;* 1 young female (Amer. Mus.).

Natividad Island; August 3, 1896; A. W. Anthony; 1 female (19507).

Ballenas Bay; May 3, 1888; *Albatross;* 1 female (21904).

Magdalena Bay; March, 1917; C. R. Orcutt; 1 young (50655).

TALIEPUS MARGINATUS (Bell)

Plates 52 and 53; plate 220, fig. 2; plate 221

Epialtus marginatus Bell, Proc. Zool. Soc. London, vol. 3, for 1835 (1836), p. 173 (type-locality, "*ad oras Brasiliae*"; type not extant); Trans. Zool. Soc. London, vol. 2, 1836, p. 62, pl. 11, fig. 4, 4*i*, 4*j*, 4*k* (♀), pl. 13 (♂).—Heller, Reise *Novara*, Crust., Wien, 1865, p. 5.—Smith, Trans. Connecticut Acad. Sci., vol. 2, 1869, p. 33.—A. Milne Edwards, Crust. Rég. Mex., 1878, p. 138.—Miers, Proc. Zoöl. Soc. London, 1881, p. 66.—Ortmann, Zool. Jahrb., Syst., vol. 7, 1893, p. 42.—Lenz, Zool. Jahrb., Suppl. 5, 1902, p. 756.—Rathbun, Proc. U. S. Nat. Mus., vol. 38, 1910, p. 534, pl. 36, fig. 2.—Aurivillius, K. Svenska Vet.-Akad. Handl., vol. 23, 1889, p. 43.

Epialtus (*Antilibinia*) *marginatus* Miers, Journ. Linn. Soc. London, vol. 14, 1879, p. 650.—Rathbun, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 69.

Diagnosis.—Propodites of legs armed below with a tooth. A preorbital tooth. Postorbital tooth obsolete.

Description.—Carapace very convex, suborbicular, save for the flat deflexed rostrum, smooth; lateral margin narrowly rimmed, the rim ending forward in a strong, antero-lateral tooth, pointing forward, and posteriorly with a slight thickening; a shallow obtusangled tooth or lobe at widest part. Posterior edge of orbit a little swollen, but without tooth. An acute hepatic tooth half way between the orbit and the larger antero-lateral tooth. Rostrum longer and narrower than in *T. nuttallii;* a small, blunt preocular tooth on either side; terminal emargination small, longer than its greatest width.

Chelipeds of old male longer than first ambulatory leg. Two tubercles on upper edge, and one on lower surface, of proximal half of arm; a tubercle on inner margin of ischium; a tooth at inner angle of wrist; fingers gaping for two-thirds their length, and armed in the gape with a few lobes or crenations which are more irregular than those at the extremity. Propodites of legs armed below near the distal end, with a tooth or lobe bearing a tuft of hair. The tooth increases in size from the first to the fourth pair; in the old male it is obsolescent and bare on the first leg. The dactyls while diminishing in length, increase in curvature from the first to the fourth.

Male abdomen narrower than in *T. nuttallii*.

Color.—Adult male, dark brown; young female, paler and reddish (Bell).

Measurements.—Male (40459), total length of carapace 100, width 80.4 mm.

Range.—From Independencia Bay, Peru, to Talcahuano (Miers) and Guajacan, Chile (Lenz). Galapagos Islands (Bell, A. Milne Edwards). Rio de Janeiro (Bell).

Material examined.—

Peru; R. E. Coker; gift of Peruvian Government: Independencia Bay; July, 1907; 2 carapaces (40461). Mollendo; taken in fish net near shore; July 23, 1908; 2 males (40459, 40460).

Chile: Caldera; June 14, 1863; Captain Putnam, 1 male, 1 female (2029, M. C. Z.). Valparaiso; U. S. Exploring Expedition, J. D. Dana; 1 male, 1 female (2372).

TALIEPUS DENTATUS (Milne Edwards)

Plates 54 and 55

? Cancer xaiva Molina, Saggio sulla storia naturale del Chili, 1782, p. 206 (type-locality, Chile; type not extant); French translation, 1789, p. 182.

Epialtus dentatus Milne Edwards, Hist. Nat. Crust., vol. 1, 1834, p. 345 (type-locality, Chile; type in Paris Mus.).—Bell, Trans. Zool. Soc. London, vol. 2, 1836, p. 62.—Nicolet, in Gay's Hist. Chile, vol. 3, 1849, p. 131.—Cunningham, Trans. Linn. Soc. London, vol. 27, 1871, p. 491.—Targioni Tozzetti, Zool. *Magenta*, Crost., 1877, p. 18, pl. 2, figs. 1–4, 6–9, 11.—Miers, Proc. Zool. Soc. London, 1881, p. 66.—Aurivillius, K. Svenska Vet.-Akad. Handl., vol. 23, 1889, p. 42.—Lenz, Zool. Jahrb., Suppl. 5, 1902, p. 756.

Inachus mitis Poeppig, Arch. f. Naturg., vol. 2, 1836, p. 141 (type-locality, "ad littora prope Valparaiso, Talcahuano, etc."; type not extant).—Nicolet, in Gay, Hist. Chile, vol. 3, 1849, p. 125.

Epialtus (*Taliepus*) *dentatus* A. Milne Edwards, Crust. Rég. Mex., 1878, p. 138.

Epialtus (*Antilibinia*) *dentatus* Miers, Journ. Linn. Soc. London, vol. 14, 1879, p. 650.—Rathbun, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 69.

Diagnosis.—Four lateral teeth. A preorbital tooth. A postorbital tubercle. Fingers of male narrowly gaping. Propodites of legs armed below with a slight tooth.

Description.—Carapace suborbicular, save for the rostrum, very convex in both directions, densely punctate and with four lateral teeth, the first three acute, the last one blunt, tuberculiform; two small, obscure tubercles on anterior part of gastric region. Rostrum with strongly convergent margins, bifid at extremity, notch narrow. Postocular lobule minute, formed by a thickening of the orbital rim, and separated by a sinus from an infraorbital lobule. Antennae not exceeding rostrum. Chelipeds of old male no longer than first leg; tubercles or stout spines on the upper surface near the proximal end and one or two smaller ones on the lower surface; carpus with a short, stout spine or tooth at the antero-internal angle; manus compressed, little dilated; fingers stout, dentate, narrowly gaping to near the extremity; prehensile teeth strong. Ambulatory legs shorter than in allied species, especially the dactyli which have two rows of strong, graduated, horny spinules beneath; propodites with an obscure tubercle or tooth below near distal end. Fifth segment of male abdomen longer than sixth.

Color.—Yellowish with red dots (Tozzetti).

Measurements.—Male (21903), total length of carapace 94.5, width 83.2 mm.

Habitat.—In crevices of rocks in deep water (Bell).

Range.—Panama (?); Peru to Trinidad Channel, Patagonia.

Material examined.—

? Panama; J. M. Dow; 1 female (2402), from Boston Soc. Nat. Hist.

Callão, Peru; U. S. Exploring Expedition, J. D. Dana; 1 female (2365).

Cobija, Chile; specimen in Copenhagen Mus.

San Felix Island, Chile; about lat. 26° S., long. 80° W.; 1 male; photograph lent by C. E. Porter and returned to him.

Valparaiso, Chile; U. S. Exploring Expedition, J. D. Dana; 1 male, 1 female (2367).

Talcahuano, Chile; April, 1872; U. S. C. S. Str. *Hassler;* 10 male and female (2027, M. C. Z.).

Puerto Corral, Province of Valdivia, Chile; C. E. Porter; 1 very young; returned to sender.

Port Otway, Patagonia; February 9–10, 1888; *Albatross;* 3 males, 3 ovigerous females, encrusted with small Serpulids (21903).

West coast of South America; Dr. H. E. Ames, U. S. N.; 1 female (18138).

Locality not given; 1 large male (2410).

Genus PUGETTIA Dana

Pugettia DANA, Amer. Journ. Sci., ser. 2, vol. 11, 1851, pp. 268 and 433; type, *P. gracilis* Dana; U. S. Expl. Exped., vol. 13, Crust., pt. 1, 1852, pp. 84 and 116; pt. 2, 1853, p. 1421.—HOLMES, Occas. Papers California Acad. Sci., vol. 7, 1900, p. 24.—STIMPSON, Smithson. Misc. Coll., vol. 49, 1907, p. 24.—SCHMITT, Univ. California Publ. Zool., vol. 23, 1921, p. 205.
Epialtus of authors (part).

Carapace suboblong or ovate-oblong, tuberculate or uneven, with two prominent, angular, lateral projections, separated by a concave interspace. Supra-orbital eave well developed, advanced to form a preocular tooth; postorbital tooth commonly formed by the anterior angle of the hepatic expansion. Rostrum bifid. Antennae visible at sides of rostrum, basal article rather broad, next two articles flattened. Merus of maxillipeds broad, antero-external angle dilated, antero-internal angle notched for the insertion of the palpus. Chelipeds of male well developed, merus trigonal, palm dilated and compressed, fingers usually gaping at base. Ambulatory legs subcylindrical, the penultimate article not dilated and compressed. Abdomen composed of seven segments in both sexes.

Inhabits both sides of the North Pacific Ocean, also the East Indian Islands and Australia.

KEY TO THE AMERICAN SPECIES OF THE GENUS PUGETTIA

A¹. No small spine between the postocular tooth or lobe and the larger hepatic projection.
  B¹. Postorbital projection a triangular tooth.
    C¹. Hepatic expansion very wide (postorbital tooth and first antero-lateral tooth united by a leaflike expansion of the carapace).
      D¹. Carapace constricted behind the hepatic expansions.--**gracilis**, p. 172.
      D². Carapace scarcely constricted behind the hepatic expansions, the outer (or posterior) margins of these expansions being subparallel. **producta**, p. 167.
    C². Hepatic expansion narrow, transverse (postorbital tooth and first antero-lateral tooth acute and distinct)----------**richii**, p. 176.
  B². Postorbital projection an oval, obtuse lobe----------**dalli**, p. 178.
A². A small spine between the postocular tooth or spine and the larger hepatic projection----------**venetiae**, p. 180.

PUGETTIA PRODUCTA (Randall)

KELP CRAB

Plates 56 and 57

Epialtus productus RANDALL, Journ. Acad. Nat. Sci. Philadelphia, vol. 8, 1839 (1840), p. 110 (type-locality, Upper California; type not extant).—GIBBES, Proc. Amer. Assoc. Adv. Sci., 3rd meeting, 1850, p. 173.—DANA, U. S. Expl. Exped., vol. 13, Crust., pt. 1, 1852, p. 133; atlas, 1855, pl. 6, fig. 2*a* and *b*.—STIMPSON, Proc. Acad. Nat. Sci. Philadelphia, vol. 9, 1857, p. 219; Boston Journ. Nat. Hist., vol. 6, 1857, p. 457 [17].—LOCKINGTON, Proc. California Acad. Sci., vol. 7, 1876 (1877), p. 77 [15].—R. RATHBUN, Fisheries Industries of U. S., sec. 1, 1884, p. 778, pl. 268.—NEWCOMBE,

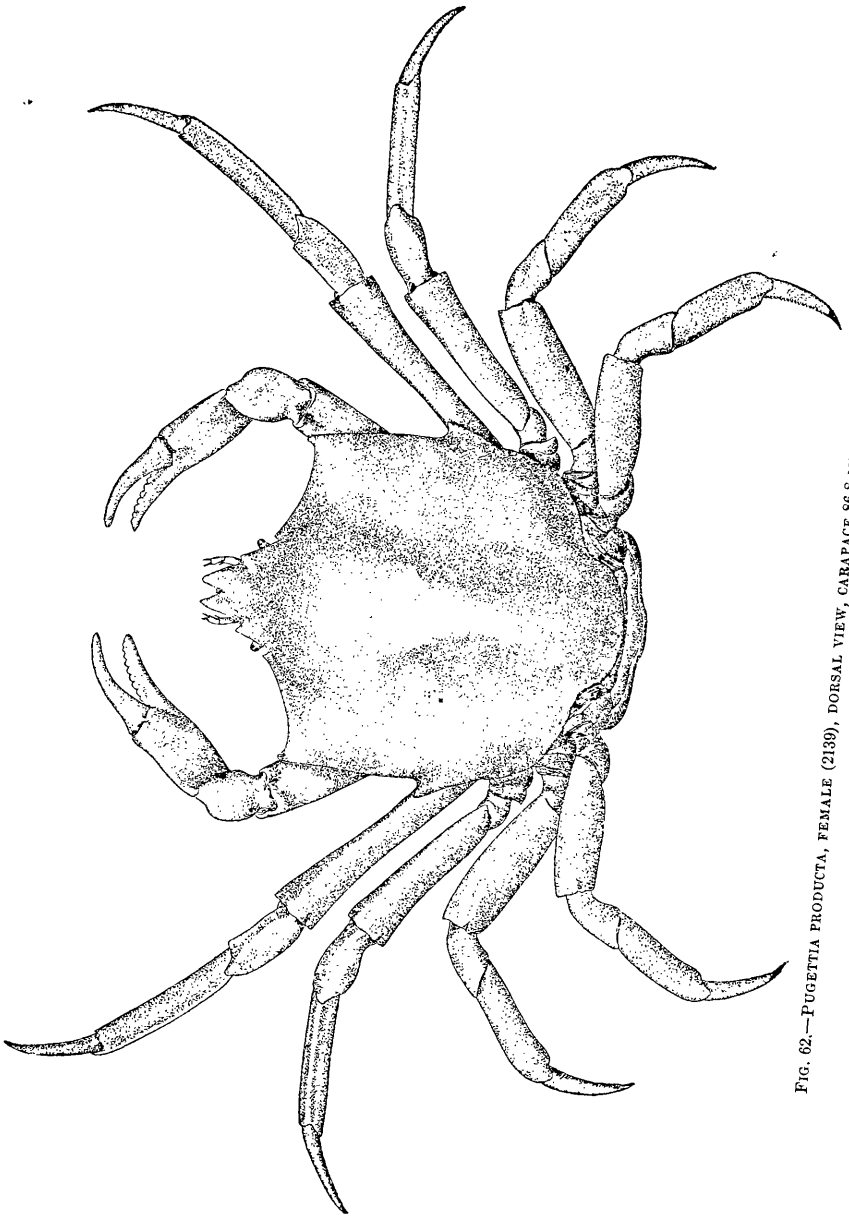

FIG. 62.—PUGETTIA PRODUCTA, FEMALE (2139), DORSAL VIEW, CARAPACE 86.8 MM. LONG. (AFTER R. RATHBUN)

Bull. Nat. Hist. Soc. Brit. Columbia, 1893, p. 22.—Ortmann, Zool. Jahrb., Syst., vol. 7, 1893, p. 42.—M. J. Rathbun, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 68 (except Alaskan locality).—Holmes, Occas. Papers California Acad. Sci., vol. 7, 1900, p. 22.—Weymouth, Stanford Univ. Publ., Univ. Ser., No. 4, 1910, p. 28, pl. 3, fig. 9.—Baker, Rep. Laguna Mar. Lab., vol. 1, 1912, p. 100.—Way, Puget Sd. Mar. Sta. Publ., vol. 1, 1917, p. 1, pl. 82, fig. 25.—Schmitt, Univ. Calif. Publ. Zool., vol. 23, 1921, p. 201, text-fig. 124.

Epialtus (*Taliepus*) *productus* A. Milne Edwards, Crust. Rég. Mex., 1878, p. 138.

Diagnosis.—Lateral margin of carapace with two teeth, the first very prominent and winglike. A preocular and postocular tooth. Fingers of male gaping. Propodites of ambulatory legs naked and unarmed.

Description.—Carapace smooth, sides in front of posterior lateral teeth nearly parallel; first tooth of antero-lateral margin large and prominent. Rostrum bifid, deeply notched, inner margin of horns slightly concave, outer convex. Preocular spine small, triangular; postocular also small. Antennae exceeding rostrum. Chelipeds stouter than ambulatory legs, and in old males longer; two tubercles above proximal end of merus, carpus and manus bluntly carinate; chela much enlarged in full-grown males, palm swollen, fingers widely gaping for half their length, a large tooth on dactyl in middle of gape, extremities of both fingers evenly toothed; in females and immature males, the fingers are dentate and meeting throughout their length or nearly so. Sixth segment of male abdomen longer than fifth, both segments much wider than long.

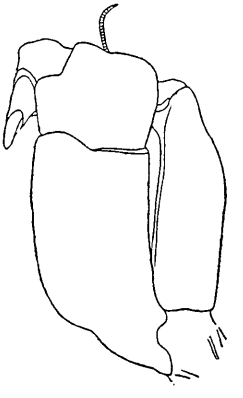

Fig. 63.—Pugettia producta (19315), maxilliped, × 2.78

Color.—Dark brown to tan (in young or recently moulted); under parts reddish, often bright brick red, sometimes with light markings on coxae of legs and on maxillipeds (Weymouth). Color reddish brown to olive brown, mottled with darker, small, round spots (Holmes).

Measurements.—Male (47970), total length of carapace 87.3, width 76 mm. Male (Weymouth), total length 107 (by error 170), width 93 mm.

Habitat.—In kelp beds, young common in tide pools, clinging to *Fucus* and other brown algae (Baker). Abundant in eel grass, on kelp, and on the piles under docks; common to at least 40 fathoms (Way).

Range.—From Vancouver Island, British Columbia, to Santa Rosalia Bay, Lower California.

Material examined.—

West coast North America; Dr. G. Suckley, N. Pacific R. R. Survey; 1 female (2139).

BRITISH COLUMBIA

Beaver Harbor, Queen Charlotte Sound; July 12, 1888; *Albatross;* 1 male (15519).

Union Bay; East of coal wharf; May 27, 1911; *Albatross;* 1 male, 1 female (50493).

Comox: 1893; *Albatross;* 1 male, 1 female (18307). Between tides; July, 1915; W. Spreadborough; 2 young females (Victoria Memor. Mus.).

Denman Island; *Albatross:* Shore; June 21, 1903; 4 males, 2 females (31545). North side; May 12, 1914; 2 males, 2 young (48834).

Gabriola Island, Taylor Bay; June 20, 1903; 1 female (31544).

Ucluelet; low tide; Geol. Survey of Canada; 2 males, 2 females (40057, 40058).

Barclay Sound; Sept. 27, 1888; *Albatross;* 1 female, soft shell (15521).

Victoria: Dr. C. F. Newcombe; 2 specimens (15796). Mr. Nichols; 1 male (46627).

WASHINGTON

Sucia Islands; May 6, 1894; *Albatross;* 1 male, 1 female (18981).

Straits of Fuca; 1880; D. S. Jordan; 1 male, 1 female (3064).

Marrowstone Point, near Port Townsend, Puget Sound; shore; June 29, 1903; *Albatross;* 2 females (31546).

Port Ludlow: W. H. Dall; 2 specimens (14796). *Albatross;* 6 specimens (19315).

Port Orchard: O. B. Johnson; 2 males, 5 females (14974). U. S. Fish Comm.; 2 specimens (15518).

Dockton; 1906; *Albatross:* May 10; 1 male (43826). May 11; 1 male (43827).

Oyster Bay (near New Kamilche); W. L. McAtee, U. S. Biol. Survey; 1 male (47970).

CALIFORNIA

Tomales Bay; E. Samuels; 1 specimen (14853).

Point Reyes; Mr. Campbell; 1 male (55344); from Bur. Fisheries.

Sausalito; *Albatross:* March 30, 1912; 1 young (55330). Near landing; Oct., 1912; 1 male (55336). May 4, 1913; 9 young (55328).

Point Bonita; *Albatross:* Between tide marks; June 3, 1912; 1 young (55334). From seaweed, below low water mark and between tide marks; Aug. 1, 1912; 4 specimens (52925).

San Francisco; 1880; D. S. Jordan; 1 young male, 2 young females (3095). California; probably San Francisco; J. D. Dana, U. S. Explor. Exped.; 1 male (2366).

Middle San Francisco Bay; Fort Point Light bears 288.5° (true), distant 0.32 mile; 3.5 to 2.25 fathoms; fne. clean gy. S., med. sized

rounded St.; Apr. 17, 1912; station D 5778 *b*, *Albatross;* 1 male (55329).

Pillar Point, Half Moon Bay; June 30, 1903; C. F. Baker; 1 young (29313). May 11, 1913; *Albatross;* 6 specimens (55332, 55333).

Santa Cruz; J. S. Kingsley; 3 females (1 with Rhizocephalid parasite) (53045); from Boston Soc. Nat. Hist.

Monterey Bay; *Albatross;* 12 males, 11 females (15520). On *Macrocystis* and other kelps at shore-line; Harold Heath; 1 male (22872).

Monterey; A. S. Taylor; 1 male, 1 female, 2 young (2054). H. Hemphill; 4 females (2289), 2 young (3292). 1880; D. S. Jordan; 3 males, 3 females (3129).

Pacific Grove; John C. Brown; 5 specimens (23924). June, 1905; J. E. Benedict; 1 male, 2 females (46628). 1918; T. S. Oldroyd; 5 males, 2 females (1 ovigerous), 5 young (54019).

Santa Barbara; June, 1875; Mr. Shoemaker, Explor. W. of 100th Meridian; 1 male, 3 females (2316). 1880; D. S. Jordan; 1 male, 1 female (3048).

Venice, Santa Monica Bay; under aquarium; *Anton Dohrn;* 2 young (50009, 50288); from Venice Mar. Biol. Station.

Vicinity of Santa Monica and San Pedro Bays; *Anton Dohrn;* 4 males, 2 females, 4 young (49984–49986, 50008, 50287); from Venice Mar. Biol. Station.

San Pedro: 1880; D. S. Jordan; 1 male, 1 female (3088). Portuguese Bend; littoral; June 26, 1914; *Anton Dohrn;* 1 young (50286); from Venice Mar. Biol. Station. Foot of breakwater; Feb. 21, 1913; *Anton Dohrn;* 1 young female (50289); from Venice Mar. Biol. Station. Near foot of breakwater; Oct. 30, 1917; E. P. Chace; 1 young female (53991).

Laguna Beach; W. A. Hilton; 1 male, 1 female, 5 young (48910, 48993).

Santa Catalina Island: Catalina Harbor; beach; 1874; W. H. Dall; 1 male, 1 female (14793). Avalon Bay; Oct. 22, 1910; *Anton Dohrn* (P. S. Barnhart); 1 young (50285); from Venice Mar. Biol. Station.

San Clemente Island: August 23, 1894; Dr. E. A. Mearns; 1 female (18667). Jan., 1899; H. N. Lowe; 1 young male (23063). Thomas L. Casey; 1 female (46629).

La Jolla: March 6, 1898; *Albatross;* 2 young males (21764). In tide pools; Sept. 20, 1918; W. L. Schmitt; 1 young male (53979).

Point Loma; Jan. 28, 1889; *Albatross;* 1 female (15522).

San Diego: Rosa Smith; 1 female (7633). Rosa Smith Eigenmann; 1 male (14652). 1880; D. S. Jordan; 2 young (3560). H. Hemphill; 2 males, 3 females (18137).

California: Dr. T. B. Wilson; 1 small male (Mus. Phila. Acad.); "=*E. sayanus* White." E. Samuels; 1 male (53046); from Boston Soc. Nat. Hist.

LOWER CALIFORNIA, MEXICO

Rosalia Bay; August 22, 1896; A. W. Anthony; 1 young (19519).

PUGETTIA GRACILIS Dana

GRACEFUL KELP CRAB

Plate 58

Pugettia gracilis Dana, Amer. Journ. Sci., ser. 2, vol. 11, 1851, p. 268 (type-locality, Puget Sound; cotypes, Cat. No. 1237, M. C. Z.); U. S. Expl. Exped., vol. 13, Crust., pt. 1, 1852, pl. 4, fig. 3*a–c*.—Stimpson, Boston Journ. Nat. Hist., vol. 6, 1857, p. 456.—Lockington, Proc. California Acad. Sci., vol. 7, 1876 (1877), p. 76 [14].—Miers, Journ. Linn. Soc. London, vol. 14, 1879, p. 650; *Challenger* Rept., Zool., vol. 17, 1886, p. 40.—Rathbun, Proc. U. S. Nat. Mus., vol. 17, 1894, p. 69; Harriman Alaska Exped., vol. 10, 1904, p. 173.—Holmes, Occas. Papers California Acad. Sci., vol. 7, 1900, p. 25.—Lenz, Zool. Jahrb., vol. 14, Syst., 1901, p. 452.—Weymouth, Stanford Univ. Publ., Univ. Ser., No. 4, 1910, p. 29, pl. 4, fig. 10.—Way, Puget Sd. Mar. Sta. Publ., vol. 1, 1917, p. 370, pl. 82, fig. 21.—Schmitt, Univ. California Publ. Zool., vol. 23, 1921, p. 206, pl. 33, fig. 7, text-fig. 128.

Pugettia lordii Spence Bate, Proc. Zool. Soc. London, 1864, p. 662 (type-locality, Esquimalt Harbour, B. C.; type in Brit. Mus.); Lord's Nat. in Brit. Columbia, vol. 1, 1866, p. 265.

Pugettia quadridens, var. *gracilis* Ortmann, Zool. Jahrb., vol. 7, Syst., 1893, p. 43.

Diagnosis.—Hepatic expansion very wide, the triangular postocular tooth and first antero-lateral tooth united by a leaflike expansion of the carapace. Merus of chelipeds with a prominent, irregularly dentate carina on the upper side; carpus cristate. Ambulatory legs with merus and propodus more or less carinate above. Ischium of maxillipeds with a longitudinal groove, exognath also grooved.

Description.—Carapace lyrate to broadly ovate, tuberculate; four median tubercles, of which two are gastric (the anterior one small), one cardiac and one intestinal; two large branchial tubercles, and one protogastric tubercle. A tuft of setae proceeds from each tubercle; from the protogastric pair two rows of curled setae run forward and inward; upper surface and margins of rostrum, as also the subbranchial regions setiferous. Lateral projections broad, the anterior one large and winglike, its antero-external angle advanced in a tooth, its posterior margin nearly longitudinal; the posterior projection is smaller, posterior end spiniform, anterior end lobiform. Postorbital tooth broad, separated from the broad supraocular eave by a narrow fissure. Outer margins of rostral horns subparallel, convex near tips; inner margins concave.

The basal article of the antennae bears a tooth at the antero-external angle; flagellum not reaching end of rostrum. A row of tubercles on pterygostomian region. Chelipeds large and strong. Merus triangulate, margins cristate; superior crest with three or more teeth; outer surface crossed by a blunt ridge. Carpus with two longitudinal crests; upper surface with an oblique ridge, outer surface uneven. Propodus very broad, compressed, and with a superior crest; inferior margin with a prominent posterior lobe. Fingers in adult males widely gaping; cutting edges dentate; a large tooth near base of dactylus. Ambulatory legs stout, obscurely tuberculate.

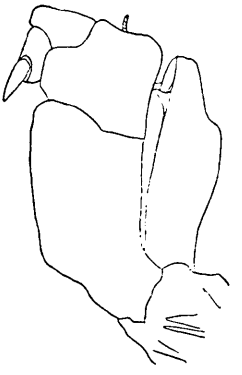

FIG. 64.—PUGETTIA GRACILIS (18140), MAXILLIPED, × 4.44

Color.—Dorsal surface usually greenish brown, ventral side much lighter; but specimens found among red algae are a brilliant red (Way).

Measurements.—Male (5771), length of carapace to end of horn 53, width 39.2 mm.

Range.—From the western extremity of the Aleutian Islands eastward and southward to Mendocino, California. "To San Francisco" (Bate). "San Luis Obispo" (Lockington). Shore to about 40 fathoms. The more southern of the reported occurrences of the species in California need confirmation; intensive collecting in San Francisco and Monterey Bays has failed to reveal it.

Material examined.—

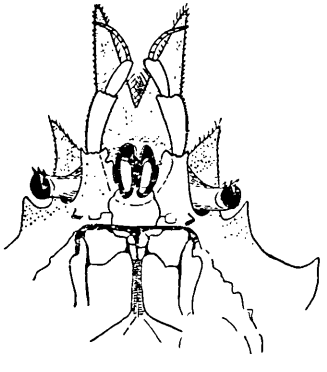

FIG. 65.—PUGETTIA GRACILIS, ANTERIOR PORTION, VENTRAL VIEW, × 1.5. (AFTER DANA AND SCHMITT)

ALASKA

Chichagof Harbor, Attu Island, Aleutians; 5 to 7 fathoms; G. S.; 1873; W. H. Dall; 1 male, 1 female (14756).

Attu Island; shore; June 10–11, 1906; *Albatross;* 9 males, 2 females (46632).

Agattu Island; shore, among rocks; June 8, 1906; *Albatross;* 6 males, 5 females (1 ovigerous).

Kiska Harbor, Kiska Island; 1873; W. H. Dall; 9 to 12 fathoms; sdy. M.; 1 male (14797), covered with sponge. In Pass; 10 fathoms; 1 male (14759).

Petrel Bank, Bering Sea; Semisopochnoi Island, r. t. S. 45° W., l. t. S. 12° W., about 12 miles; lat. 52° 12′ N., long. 179° 52′ E.; 43–33 fathoms; fne. bk. G.; June 5, 1906; station 4778, *Albatross;* 2 females (1 young, 1 soft shell) (46532).

Adakh Island; July 2, 1893; *Albatross;* 50 specimens (18296).

Nazan Bay, Atka Island; low water; 1873; W. H. Dall; 1 male (14757).

Unalaska; S. Applegate; 5 males, 2 females (12050).

Dutch Harbor, Unalaska; W. R. Coe, Harriman Alaska Exped. (Yale Univ. Mus.). May 25–27, 1906; *Albatross;* 3 females (2 ovigerous) (46529).

Off Imagnee Pinnacle, Captains Bay, Unalaska; 8 to 20 fathoms; W. H. Dall; 1 specimen (12538).

Shores of Amaknak Island, Captains Bay, Unalaska; 1871; W. H. Dall; 1 male (13131).

Unalaska Bay, Unalaska; May 24, 1906; *Albatross;* 1 male (46528) from stomach of cod.

Bering Sea, off Akutan Island; lat. 54° 12′ 00″ N., long. 165° 42′ 00″ W.; 36 fathoms; G. bk. S.; August 31, 1893; station 3546, *Albatross*; 1 female (18298), encrusted with bryozoan.

Belkofski Bay, Alaska Peninsula; 15 to 25 fathoms; 1880; W. H. Dall; 2 males, 1 female (14754).

Popof Strait, Shumagins; 6 fathoms; 1872; W. H. Dall; 1 male, 4 females, 1 young (14753).

Chirikof Island; beach; W. H. Dall; 1 specimen (15375).

Kodiak Island: William J. Fisher; 7 males, 12 females (5747). U. S. Fish Commission: 2 specimens (15571). W. R. Coe, Harriman Alaska Exped. (Yale Univ. Mus.).

Woody Island, Kodiak Island ; low tide; September 21, 1920; G. D. Hanna; 1 ovigerous female (Cal. Acad. Sci.).

Afognak Bay, Afognak Island; Point Lipsett, S. 82° W., 1.5 miles; 19 to 14 fathoms; hrd. gy. S. R.; August 3, 1903; station 4269, *Albatross;* 2 males (31606).

West side of Middleton Island; 10 to 12 fathoms; G. St.; 1874; W. H. Dall; 2 males, 4 females, 15 young (14758).

Fox Island, Prince William Sound; T. Kincaid, Harriman Alaska Exped.; 4 males, 2 females (23844).

Virgin (or Gladbaugh) Bay, northeast coast of Prince William Sound; W. R. Coe, Harriman Alaska Exped. (Yale Univ. Mus.).

Orca; Harriman Alaska Exped.

Yakutat; Harriman Alaska Exped.

Port Mulgrave, Yakutat Bay; 6 to 40 fathoms; 1874; W. H. Dall; 2 young (14763).

Alert Bay, Cormorant Island; beach; February 22, 1882; Dr. W. H. Jones, U. S. N.; 1 female (5815).

Lituya Bay; 6 to 9 fathoms; 1874; W. H. Dall; 1 young (14764).

Dundas Bay, Icy Strait; Port Wimbleton, S. 20° W., 0.4 mile; 9 to 6.5 fathoms; crs. S. rky.; July 24, 1903; station 4263, *Albatross;* 1 male (31670).